Does Mandatory Adoption of International Accounting Standards Reduce the Cost of Equity Capital?

Siqi Li
Leventhal School of Accounting
Marshall School of Business
University of Southern California
Los Angeles, CA 90089

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Abstract

This paper examines whether the mandatory adoption of International Accounting Standards (IAS) in the European Union (EU) in 2005 reduces the cost of equity capital. Using a sample of 6,456 firm-year observations of 1,084 EU companies during the period of 1995 to 2006, I find evidence that mandatory introduction of IAS, on average, significantly reduces the cost of equity for mandatory adopters by 48 basis points. I also find that this reduction is present only in countries with strong enforcement systems and that both increased disclosure and enhanced information comparability help explain why IAS reduces the cost of equity. Taken together, these findings suggest that mandatory IAS adoption benefits shareholders, but that the benefits depend critically on the strength of the countries’ enforcement systems.

1 This paper is based on my dissertation at the University of Southern California. I am grateful to my dissertation committee, especially my co-chairs, Mark DeFond and Mingyi Hung, for their invaluable guidance and support. I am also thankful to Robert Trezevant and Biqin Xie for their helpful comments and suggestions. This work is supported in part by U.S. Department of Education Title V1-B funds administered by USC’s Center for International Business, Education, and Research.
1. Introduction

International Accounting Standards (IAS) have become increasingly popular, with the European Union mandating that all EU-listed companies adopt IAS beginning in 2005. The proponents of mandatory IAS adoption assert that IAS will “reduce the cost of capital and open new opportunities for diversification and improved investment returns” (Tweedie 2006). While prior research finds some evidence that voluntary IAS adoption reduces the cost of equity capital (e.g., Leuz and Verrecchia 2000; Barth, Landsman and Lang 2007), there is little empirical evidence to date supporting this assertion for mandatory IAS adoption, and the economic consequences of mandatory adoption remain largely unclear (e.g., Daske, Hail, Leuz and Verdi 2007a, b). Thus, the purpose of this paper is to explore the effects of mandatory IAS adoption on the cost of equity capital.

There are at least two reasons why mandatory IAS adoption may be expected to reduce the cost of equity capital. First, prior research finds that IAS requires greater financial disclosure than most local accounting standards (e.g., Ashbaugh and Pincus 2001) and that increased disclosure reduces the cost of equity capital (e.g., Botosan 1997; Easley and O’Hara 2004; Lambert, Leuz and Verrecchia 2007). Second, prior research argues that one set of uniform accounting standards is likely to improve information comparability across firms, which is also expected to reduce the cost of capital (e.g., Armstrong, Barth, Jagolinzer and Riedl 2007). However, prior research also suggests that the benefits of IAS are likely to depend on features of the local economic institutions, such as the ability to enforce its proper application (Ball, Robin and Wu 2003). Therefore, it is ultimately an empirical question whether mandatory IAS adoption reduces the cost of capital.
I test whether mandatory IAS adoption affects the cost of equity capital using a sample of 6,456 observations representing 1,084 distinct companies in 18 EU countries during the period of 1995 to 2006. I define firms that do not adopt IAS until it becomes mandatory in 2005 as mandatory adopters, firms that adopt IAS before 2005 as voluntary adopters, and I divide the sample period into pre- and post-mandatory adoption periods. Consistent with prior research, I measure the cost of equity in my primary analysis using the average estimates from four implied cost of capital models proposed by Gebhard, Lee and Swaminathan (2001), Claus and Thomas (2001), Gode and Mohanram (2003), and Easton (2004).

My primary analysis consists of regressing the cost of equity on a dummy variable indicating the type of adopter (mandatory versus voluntary), a dummy variable indicating the time period (pre- versus post-mandatory adoption period), the interaction between these two dummies, and a set of control variables that include whether the firm is cross-listed in the U.S., the country’s inflation rate, firm size, return variability, financial leverage, as well as industry and country fixed effects. This difference-in-differences design (which includes the population of both mandatory and voluntary adopters over the period 1995 through 2006) estimates the change in the cost of equity for mandatory adopters before and after the mandatory switch, relative to the corresponding change in the cost of equity for voluntary adopters.

The results of my primary analysis find that mandatory adopters experience a significant reduction in the cost of equity by 48 basis points after the mandatory introduction of IAS in 2005, and voluntary adopters experience no significant change in the cost of equity capital around the mandatory switch. The results also show that while
voluntary adopters have a significantly lower cost of capital compared to mandatory adopters in the pre-mandatory adoption period, this difference becomes insignificant after mandatory adoption in 2005. I also find similar results after deleting the “transition period” around the mandatory adoption (i.e., the year before and the first year of mandatory adoption). In summary, these findings suggest that mandatory IAS adoption, on average, benefits shareholders.

I also perform additional tests designed to assess whether legal enforcement plays a significant role in the effects of mandatory IAS adoption on the cost of equity. Specifically, I rerun the above described multivariate analysis after including a country-level measure of the strength of legal enforcement (from La Porta, Lopez-de-Silanes, Shleifer and Vishny (1998)), along with its interaction with the type of adopter (mandatory versus voluntary) and the time period (pre- versus post-mandatory adoption period). This analysis finds that the reduction in the cost of equity is significant only for mandatory adopters in countries with strong legal enforcement mechanisms, suggesting that the quality of legal enforcement is an important determinant of whether IAS adoption is likely to benefit shareholders.

Further, I conduct analyses to investigate whether increased disclosure and/or enhanced comparability are factors that help explain why mandatory IAS adoption reduces the cost of equity capital. Specifically, I rerun the above described multivariate analysis after including a measure of the number of additional disclosures required by IAS relative to local standards (to capture increased disclosure), and a measure of the number of inconsistencies between IAS and local standards (to capture enhanced comparability). This analysis finds evidence that both increased disclosure and enhanced
comparability help explain why mandatory IAS adoption reduces the cost of equity, but that these factors are only important in the presence of strong legal enforcement.

Finally, I perform a set of sensitivity tests and find the main results are robust to: (1) distinguishing between voluntary adopters that adopted IAS relatively early and voluntary adopters that adopted relatively late; (2) controlling for potential self-selection bias in the pre-mandatory adoption period; (3) using dividend yield as an alternative measure of the cost of equity capital (and thereby avoiding the use of analyst forecasts); (4) controlling for differences in analyst forecast properties; (5) controlling for nominal risk-free interest rates and using risk premiums instead of cost of equity capital measures; (6) controlling for differences in growth expectations; (7) deleting observations from Germany and Finland as these two countries have the largest number of voluntary IAS adopters in the sample; (8) deleting observations that are listed in Germany’s New Market; (9) deleting observations that use U.S. GAAP; (10) deleting utilities and firms in the financial services industry; (11) restricting the pre-mandatory IAS adoption sample period to 1999-2004; and (12) deleting IAS adopters in Austria after 2001 and in Greece after 2002 as they were required to adopt IAS before 2005.

This study contributes to the literature in several ways. First, it provides timely and relevant insights into the economic consequences of mandatory IAS adoption.\(^2\) Despite the mandatory adoption of IAS by over 8,000 EU companies, there is little clear evidence on its capital market effects. This study improves our understanding of the implications

\(^2\) The International Accounting Standards (IAS) issued by the International Accounting Standards Committee (IASC) were succeeded by the International Financial Reporting Standards (IFRSs) issued by the International Accounting Standards Board (IASB) in 2001. For ease of expression, I use IAS to refer to both IAS and IFRS.
of mandatory IAS adoption by providing evidence that it benefits shareholders by reducing the cost of equity capital.³

This study is most closely related to a contemporaneous working paper by Daske et al. (2007b). Daske et al. (2007b) examine various economic implications of mandating IAS adoption across 26 countries from 2001-2005 but find mixed evidence in their tests of the effects of IAS adoption on the cost of equity capital. An important difference between my study and Daske et al. (2007b), is that my sample period covers two years during the mandatory adoption regime (i.e., 2005 and 2006), while Daske et al. (2007b) only covers one year (i.e., the first year of mandatory adoption, 2005). The mixed results in Daske et al (2007b) may be due to transitional effects surrounding the adoption of IAS, such as difficulties in forecasting earnings under IAS.⁴

Second, this study contributes to the limited empirical research on the economic consequences of disclosure regulation. Despite the extensive and diverse disclosure regulations around the world, there is surprisingly little evidence on the costs and benefits of disclosure regulation (Healy and Palepu 2001). This study examines mandatory IAS adoption, arguably one of the most profound events in the history of financial reporting regulation and provides new insights on the important question of whether the government can play a useful role in mandating disclosures and other regulations (Coffee 1984).

³ Prior research suggests that the reduced cost of equity is not the only determinant of IAS adoption choice (e.g., Harris and Muller 1999; Leuz and Verrecchia 2000; Ashbaugh 2001; Leuz 2003). Anecdotal evidence indicates that IAS adoption could create substantial costs, such as standards preparation and implementation costs as well as the costs related to proprietary information disclosed under IAS. Further, greater disclosure required by IAS can also make monitoring less costly and hence reduces the private benefits that controlling shareholders and managers could expropriate (e.g., Stulz 1999).

⁴ See page 4 in Daske et al. (2007b) for a detailed discussion.
Third, the findings in this study highlight the importance of institutional arrangements in shaping the outcomes of financial reporting convergence. One of the ultimate goals of mandating IAS across the EU is to develop the financial reporting infrastructure for a common European capital market (Tweedie 2006). Prior studies indicate that high quality accounting standards do not guarantee high quality financial reporting (e.g., Ball et al. 2003). Consistent with this view, this paper finds that the cost of equity benefits are evident only in stronger enforcement regimes, which underlines the substantial variations in outcome convergence across jurisdictions and the significance of institutional environments in achieving financial reporting convergence. This paper also provides timely and important insights as the FASB and IASB are making joint efforts to achieve consistency, comparability and efficiency in global capital markets.

Finally, this study complements prior research that uses the implied cost of capital models in cross-country settings (e.g., Hail and Leuz 2006a, b; Daske et al. 2007a, b). Although prior studies point out that cost of capital estimates based on analyst forecasts are subject to various measurement error problems (e.g., Easton and Monohan 2005), I find consistent results using an alternative measure that is independent of analyst forecasts. I note, however, that because of the difficulties inherent in empirically measuring the cost of capital, these findings should be interpreted carefully.

The remainder of the paper is organized as follows: Section 2 discusses the motivation. Section 3 presents the research design. Section 4 describes the sample selection and descriptive statistics. Section 5 reports the empirical results. Section 6 discusses additional analyses. Section 7 reports sensitivity checks and Section 8 concludes the study.
2. Motivation

As one of most far-reaching financial reporting regulations in history, mandatory IAS adoption in the EU has given rise to substantial controversy. Proponents of IAS argue that a single set of high quality accounting standards can benefit investors by reducing the cost of capital through enhanced information transparency and improved information comparability (Tweedie 2006). Opponents, one the other hand, express concerns about whether mandatory IAS adoption can credibly increase disclosure and comparability in settings where implementation and enforcement of IAS is poor.

Arguments that cast doubt on the benefits of mandatory IAS adoption note the importance of institutional arrangements on the effectiveness of new accounting rules (e.g., Ball et al. 2003; Burgstahler et al. 2006), and observe the substantial variations in institutional arrangements across the EU countries. Thus, the potential benefits of mandatory IAS adoption are likely to vary across countries, depending on the government’s ability to effectively enforce the new rules. Consistent with this argument, standard setters recognize that “an enforcement or oversight mechanism that ensures that the principles as laid out by the accounting and auditing standards are followed” is a necessary condition for “a sound financial reporting infrastructure” (Tweedie and Seidenstein 2005). Therefore, given the existing institutional variations across the EU member states, it is unclear, ex ante, whether mandatory IAS adoption will unambiguously reduce the cost of capital in all financial reporting environments.

Given proper implementation and enforcement, prior research suggests that mandatory IAS adoption can reduce the cost of equity capital through at least two mechanisms. The first mechanism is increased financial disclosure, because IAS
typically requires greater disclosure than local accounting standards (Ashbaugh and Picus 2001). Consistent with this argument, a frequently voiced motive for firms voluntarily adopting IAS is to respond to criticisms regarding deficient disclosure policies (e.g., Burt and Harnischfeger (2000)). The information asymmetry literature suggests that greater disclosure mitigates the adverse selection problem, enhances liquidity, and therefore reduces the cost of capital through lower transaction costs and/or stronger demand for a firm’s securities (e.g., Amihud and Mendelson 1986; Diamond and Verrecchia 1991; Easley and O’Hara 2004). Moreover, the estimation risk literature predicts that firms with more disclosure of information have lower forward-looking betas which lead to a lower cost of capital (e.g., Barry and Brown 1985; Lambert et al. 2007). These theoretical predictions find support in several empirical studies, including Botosan (1997), who shows that greater disclosure is associated with a lower cost of equity capital for firms with a low analyst following; and Francis, Khurana and Pereira (2005), who report that firms with expanded disclosure policy enjoy a lower cost of capital.

The second mechanism through which mandatory IAS adoption may reduce the cost of capital is enhanced information comparability. A uniform set of accounting standards can result in financial information that is more comparable across firms, especially those residing in different countries, which reduces the costs associated with investors using the information and thereby reduces information asymmetry and/or estimation risk, leading to a lower cost of capital. The theoretical model in Barth, Clinch and Shibano (1999), for example, makes a similar argument by showing that international accounting

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5 For instance, the German accounting standards (HGB) has no specific rules requiring disclosure of a primary statement of changes in equity (IAS 1.7), current cost of inventory when LIFO is used (IAS 2.36), fair values of financial assets and liabilities (IAS 32.77), fair values of investment properties (IAS 40.69), related party transactions other than certain disclosures (IAS 24.22), discontinuing operations (IAS 35), or earnings per share (IAS 33) (GAAP 2001).
harmonization will reduce the expertise acquisition costs incurred when foreign investors interpret financial statements prepared under domestic GAAP. Furthermore, IAS convergence can bring about positive information externalities. Such positive information externalities arise because firms’ values and cash flows are correlated, and the information disclosed by firms in one country becomes more comparable and thereby more useful in valuing firms in another country if both countries adopt IAS, thus reducing estimation risk and the cost of equity capital (Dye 1990). As the number of countries converging to IAS increases, the effect of positive externalities is magnified. The effects of improved comparability are consistent, for example, with Covrig, DeFond and Hung (2007), who find that average foreign mutual fund ownership is higher among voluntary IAS adopters as they provide more information or information in a more familiar form to foreign investors.

The existing research focuses primarily on the economic consequences of voluntary IAS adoption, and provides some evidence that voluntary adoption reduces the cost of capital (e.g., Leuz and Verrecchia 2000; Barth et al. 2007). There is, however, little empirical evidence on the effects of mandatory IAS adoption on the cost of capital. While providing useful insights, the findings regarding voluntary IAS adoption may not generalize to the effects of mandatory IAS adoption. Therefore, it is unclear ex ante how mandatory IAS adoption impacts firms’ cost of equity capital and this remains an empirical question.

3. Research design
I explore the impact of mandatory IAS adoption on the cost of equity by regressing the cost of equity capital on a dummy variable indicating the type of adopter (mandatory versus voluntary adopters), a second dummy variable indicating the time period (pre-versus post-mandatory adoption period), the interaction between these dummies, and a set of control variables. This research design allows me to investigate the change in the cost of equity in the pre- versus post-mandatory adoption period for mandatory adopters, relative to the change for voluntary adopters over the same time period. This difference-in-differences design helps alleviate the concern that unspecified concurrent macroeconomic and institutional changes may be responsible for the results.

As in prior research, I use the ex ante cost of equity implied in current stock prices and analysts’ forecasts of future earnings. Relative to other measures, these implied cost of equity measures are generally more suitable in my research setting when compared to the alternatives. I use a measure that relies on four estimation models: the industry ROE model proposed by Gebhardt et al. (2001), the economic-wide growth model in Claus and Thomas (2001), the unrestricted abnormal earnings growth model in Gode and Mohanram (2003), and the restricted abnormal earnings growth model in Easton (2004). Each of these models represents a different form of the dividend discount valuation model and varies in terms of the use of analysts’ forecasts and the assumptions of short-term and long-term growth. A detailed description of each model is provided in the Appendix. Because there is substantial measurement error and potential bias in implied

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6 One alternative cost of equity measure is realized return, which often requires a long time-series of past return data (Stulz 1999). Moreover, IAS adoption is a major corporate event which makes it difficult to obtain equilibrium estimates of expected returns. Another cost of capital estimate relies on international asset pricing models (e.g., Bhattacharya, Daouk, and Welker 2003). These estimates are less reliable in an international setting because the necessary assumptions of a similar degree of market segmentation and similar exposure to the global market portfolio are hard to maintain (Hail and Leuz 2006a).
cost of capital estimates (Easton and Monahan 2005), I use the mean of these four measures as the proxy for cost of equity capital (Hail and Leuz 2006a, b; Daske et al. 2007a, b). \(^7\)

My independent variables of interest consist of three dummy variables. The first dummy variable captures whether the firm is a mandatory IAS adopter and is coded one when the firm does not adopt IAS until it becomes mandatory in 2005, and zero otherwise. A firm is classified as a mandatory adopter when the data item “astd” (accounting standards) in Compustat Global Vantage does not equal “DI” prior to 2005. \(^8\)

A second dummy variable captures whether the observation falls in the post-mandatory adoption period and is coded one when the firm-year is 2005 or later, and zero otherwise. \(^9\) A third dummy variable captures the interaction of the first two dummy variables. Using these dummy variables allows for a two-by-two analysis on the cost of capital effects of mandatory IAS adoption for mandatory versus voluntary adopters across the pre- versus post-mandatory adoption periods.

\(^7\) For example, analyst forecasting behaviors are likely to vary across countries, which might introduce biases to the implied cost of capital estimates. I control for these potential biases and check for another alternative cost of capital measure in later analyses. However, I note that the results should nevertheless be interpreted with caution and considered as complementary with prior studies.

\(^8\) In Compustat Global Vantage, “DI” code represents domestic standards generally in accordance with IASC. There are two other relevant codes related to IAS adoption: “DA” (domestic standards generally in accordance with IASC and OECD (Organization for Economic Cooperation and Development)) and “DT” (domestic standards in accordance with principles generally accepted in the United States and generally in accordance with IASC and OECD guidance). To check the robustness of the results, I redefine IAS adoption using codes “DI”, “DA” and “DT” and rerun the analysis in Table 4. The results (not tabled) are robust to the alternative definition of IAS adoption. I emphasize that, however, to be comparable with the code of IAS adoption in the post-mandatory adoption period, main inferences shall be drawn from the results based on “DI” code.

\(^9\) There are two cases where member States of the EU may exempt certain companies temporarily from the mandatory IAS adoption in 2005, but only until 2007: (1) companies that are listed both in the EU and on a non-EU exchange and that currently use U.S. GAAP as their primary accounting standards; (2) companies that have only publicly traded debt securities (Deloitte 2005). Additionally, non-EU companies listed on EU exchanges can continue to use their national GAAP until 2007. The main analysis is based on the sample after deleting these observations.
The multivariate regression also includes several control variables expected to influence the cost of equity capital: (1) three forms of U.S. cross-listing (from JP Morgan ADR Analytics) to capture its impact on the cost of capital (Hail and Leuz 2006a): a dummy variable indicating whether the firm has a private placement under Rule 144A, a dummy variable indicating whether the firm has its shares traded in the over-the-counter markets, and a dummy variable indicating whether a firm has its shares listed on the NYSE, Nasdaq or AMEX;\(^{10}\) (2) the expected future inflation rate estimated by the median of next year’s monthly inflation rates (from Datastream and the World Bank) to capture the cross-country variations in inflation rates because the implied cost of capital measures are expressed in local currency and nominal terms (Hail and Leuz 2006a); (3) variables controlling for firms’ financial characteristics that are associated with the cross-sectional variations of returns (Fama and French 1992, 1993): firm size measured as the natural logarithm of total assets in US dollars at year end, return variability computed as the annual standard deviation of monthly stock returns at year end,\(^{11}\) and financial leverage estimated by the ratio of total liabilities over total assets; and (4) dummy variables to control for industry and country fixed effects (Fama and French 1997; Hail and Leuz 2006b). The formal regression model follows (firm and year subscripts are suppressed):

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\text{Cost of equity capital} = \alpha_0 + \alpha_1 \times \text{Dummy for Mandatory IAS adopters} + \alpha_2 \times \text{Dummy for Post-mandatory adoption period} + \alpha_3 \times \text{Dummy for Mandatory IAS adopters} \times \text{Dummy for Post-mandatory adoption period} + \alpha_4 \times \text{Private placement} + \alpha_5 \times \text{OTC listing} + \]

\(^{10}\) The results in Table 4 are robust to using an indicator combining these three cross-listing dummy variables.

\(^{11}\) Alternatively, I could use market beta to control for risk. However, the estimation of market beta in an international setting requires a global portfolio, whose validity depends on the degree of market integration. Moreover, studies have shown that future returns in emerging markets have no or even a negative relation with beta factors computed using the world market portfolio (e.g., Harvey 1995). Nevertheless, I also include a beta factor in the main analysis and the results in Table 4 are robust to this specification.
\[ a_0 \times \text{Exchange listing} + a_7 \times \text{Inflation} + a_8 \times \text{Log_total assets} + a_9 \times \text{Return variability} + a_{10} \times \text{Leverage} + a_m \times \text{DIndustry} + a_n \times \text{DCountry} + \epsilon \] (1)

Where,

Cost of equity capital: the mean of \( r_{mpeg} \) (implied cost of equity capital estimates based on modified PEG ratio by Easton (2004)), \( r_{gm} \) (implied cost of equity capital estimates based on Gode and Mohanram (2003)), \( r_{ct} \) (implied cost of equity capital estimates based on Claus and Thomas (2001)), and \( r_{gls} \) (implied cost of equity capital estimates based on Gebhardt et al. (2001)).

Dummy for mandatory IAS adopters: a dummy variable equal to one if a firm does not adopt IAS until 2005, and zero otherwise.

Dummy for post-mandatory adoption period: a dummy variable equal to one if a firm-year observation falls in 2005 or later, and zero otherwise.

Dummy for mandatory IAS adopters* Dummy for post-mandatory adoption period: the interaction term between the two dummy variables.

Private placement: a dummy variable equal to one if a firm has a private placement under Rule 144A according to JP Morgan ADR Analytics.

OTC listing: a dummy variable equal to 1 if a firm trades its shares in the over-the-counter markets of the U.S. according to JP Morgan ADR Analytics.

Exchange listing: a dummy variable equal to 1 if a firm trades its shares on the NYSE, NASDAQ or AMEX according to JP Morgan ADR Analytics.

Inflation: the yearly median of country-specific, one-year-ahead monthly inflation rates.

Log_total assets: the natural logarithm of total assets in millions of U.S. dollars at year end.

Return variability: the return variability computed as the annual standard deviation of monthly stock returns at year end.

Leverage: financial leverage computed as the total liabilities divided by total assets at year end.

DIndustry: dummy variables indicating a firm’s industry membership based on the industry classification in Campbell (1996).

DCountry: dummy variables for countries.
4. Sample selection and descriptive statistics

4.1. Sample selection

The full sample used to estimate the above regression is obtained from the Compustat Global Vantage database and consists of 6,456 firm-year observations (including 1,783 IAS firm-year observations) from 18 EU member countries from 1995 to 2006. After deleting the adoption transition period, i.e., the last year before and the first year of mandatory IAS adoption, the secondary sample includes 4,599 firm-year observations (including 743 IAS firm-year observations) from 18 EU countries. My investigation period begins in 1995 because this is when the IAS Comparability/Improvement Project was completed by the International Accounting Standards Committee (IASC) and was endorsed by the International Organization of Securities Commissions (IOSCO). To be included in the sample, each firm has to have data available for both pre- and post-mandatory adoption periods.

To estimate the cost of equity measures, I obtain analyst forecasts and price information from I/B/E/S. I obtain other estimation inputs, including the dividend payout ratio and book value of equity, from Compustat Global Vantage. These price and forecast data are in local currencies and are taken seven months after the fiscal year end to ensure the financial data are publicly available and priced at the time of estimation (Hail and Leuz 2006a). To be included in the sample, I require each firm-year

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12 IAS has undergone constant changes and revisions since the 1970s. Significant events such as the completion and endorsement of the Comparability/Improvement Project in 1994, the completion of the Core standards project in December 1998, and the mandatory adoption regulation passed in 2002 all have profound impact over the course of EU financial reporting convergence. Later in the sensitivity tests, I check the robustness of the results in an alternative sample period.

13 Hail and Leuz (2006a) use the data as of month +10 as well as month +7 after the fiscal year end. The specification of month +10, however, greatly limits the number of qualified observations, especially for the mandatory adoption period, because analyst forecast data in I/B/E/S is only available until September 2007 at the time I conducted the analyses.
observation to have current stock price data and analyst mean consensus earnings forecasts for at least two periods ahead. All earnings forecasts are restricted to be positive and the long-term growth rate forecasts are used if the three-year through five-year-ahead earnings forecasts are missing. The dividend payout ratio is computed using the historic three-year average for each firm, and it is replaced by the country-year median payout ratio when missing or out of the range of zero to one (Hail and Leuz 2006a). I further require all four individual cost of capital estimates to be available in order to calculate the average cost of equity measure. Cost of capital estimates below zero and above one are deleted.

The financial statement variables, including accounting standards, are collected from Compustat Global Vantage. I require each observation to have necessary data for computing the control variables specified in Section 3. Finally, to mitigate the influence of outliers, I winsorize all firm-level continuous variables at the top and bottom 1% of their distributions, with the exception of firm size (the log of total assets).

Table 1 provides the sample distribution and country-level descriptive statistics for the test variables used in the full sample. Columns two and four in Panel A of Table 1 report that the number of observations varies widely across the sample countries. For instance, in the pre-mandatory adoption period (1995-2004), the U.K. has the largest number of observations (1,713) while Hungary has the lowest (three). The third column also reports a large cross-country variation in the proportion of firm-year observations.

14 Prior studies suggest that Compustat contains many data errors in coding accounting standards (Covrig et al. 2007). I therefore manually check the following cases based on the corresponding annual reports and/or company websites: (1) companies that are shown to adopt IAS and later switch back to local standards; (2) companies with fiscal year end in months of January to May as well as December yet still using local standards (“DS”) in 2005. In total, I identify and correct 34 firm-year observations that are mistakenly classified.
that voluntarily use IAS during the pre-mandatory adoption period. As Covrig et al. (2007) suggest, countries have specific regulations regarding financial reporting and disclosure, which imposes different costs on IAS adoption and thus introduces different incentives for firms to adopt IAS. Ireland and the U.K., for example, require public companies to use local standards prior to 2005, and thus have no voluntary IAS adopters in the sample (Deloitte 2003). Other countries, such as Germany, have a relatively high proportion of voluntary IAS adopters (25%), consistent with German regulations allowing companies to use IAS before 2005 (Leuz and Verrecchia 2000; Deloitte 2003). Finally, column five shows that all listed companies in the EU use IAS once it becomes mandatory in 2005.

4.2. Descriptive statistics

Panel B of Table 1 reports the descriptive statistics by country for the cost of equity capital, inflation rate, total assets, market value of equity, return variability and financial leverage. It shows that the country average of cost of equity capital measure ranges from a low of 10.02% in Spain to a high of 15.38% in Luxembourg, with a median of 10.37% and a standard deviation of 3.48%. The magnitude of these estimates is generally consistent with prior cross-country studies such as Leuz and Hail (2006a, b). In addition, Panel B indicates that the one-year-ahead inflation rate across the sample countries is on average 1.89% with a standard deviation of 1.82%. Total assets and market value of equity are highly skewed, with mean values of $27.3 B and $5.1 B and median values of $1.0 B and $783 M, respectively. I therefore use the log transformations for these two variables in the main tests. Finally, the average return variability and financial leverage are 0.094 and 0.626, respectively.
Table 2 compares the descriptive statistics for IAS and non-IAS users for the firm-level variables over the full sample period (1995-2006). The mean (median) value of the average cost of equity measure is 10.39% (9.84%) for IAS users, which is smaller than the measure for non-IAS users (mean of 11.19% and median of 10.60%). The differences are significant in both the t-test and Wilcoxon two-sample test (with two-sided p<1%). Examining the individual measures of cost of equity reveals that all four estimates are significantly lower for IAS adopters than non-IAS adopters (both mean and median values) at p<1% (two-sided). Table 2 also indicates that IAS users are more frequently cross-listed in the U.S., are larger in size, have less volatile stocks returns and have higher financial leverage (all with two-sided p<10%). These results are generally consistent with prior studies such as Covrig et al. (2007) except for return variability, which could be due to the differences in the sample composition.

Table 3 reports the Pearson correlation coefficients for the test variables of the full sample. I find a significantly negative correlation between the cost of equity capital and IAS adoption (with two-sided p<1%). Consistent with Hail and Leuz (2006a), I find the cost of equity capital is negatively correlated with U.S. cross-listings in the forms of OTC trading and exchange listings (both with two-sided p<1%), but not with private placements under Rule 144A. In addition, the cost of equity capital is negatively correlated with firm size, and positively correlated with the inflation rate, stock return variability as well as financial leverage (all with two-sided p<1%).

5. Empirical results
Table 4 presents the results of the multivariate regression analysis. Columns two and three of Panel A report the coefficients and two-sided p-values of the regression model for the full sample period (1995-2006) while Columns four and five report those for the sample after deleting the transition period, i.e., 2004 and 2005. To examine the relation between the cost of equity capital and mandatory IAS adoption, however, I must first combine some of the coefficients in Panel A and test the significance of the aggregated coefficients. Therefore, for ease of exposition, Panel B reports the reconstructed coefficients and the significance levels in a two-by-two analysis for the full sample period. The columns in Panel B partition the sample by the pre- and post-mandatory IAS adoption period and the rows partition the sample by mandatory and voluntary IAS adopters. The individual cells as well as the row differences and column differences are constructed using the coefficients from Panel A.  

Comparing the two columns in Panel B shows that mandatory adopters experience a significant reduction in the cost of equity capital after the mandatory adoption (8.76% versus 9.24%, with two-sided p<1%), suggesting that mandatory IAS adoption indeed yields real economic benefits for shareholders. For voluntary adopters, on the other hand, their cost of equity capital does not change significantly after the imposition of mandatory IAS adoption in 2005 (8.55% versus 8.39%, with two-sided p=0.61), indicating that the mandatory IAS adoption does not significantly affect those already using IAS. Consistent with these results, comparing the two rows in Panel B shows that

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15 For example, the cell for mandatory adopters in the pre-mandatory adoption period in Panel B (9.24%) equals the sum of the intercept (0.084) and the coefficient on the dummy variable for mandatory adopters in Panel A (0.008). Similarly, the cell for mandatory adopters in the post-mandatory adoption period in Panel B (8.76%) equals the sum of the intercept (0.084), the coefficient on the dummy variable for mandatory adopters (0.008), the coefficient on the dummy variable for post-mandatory adoption period (0.002), and the coefficient for the interaction term (-0.006) in Panel A.
mandatory adopters have a significantly higher cost of equity capital than voluntary adopters in the pre-mandatory adoption period (9.24% versus 8.39%, with two-sided p<1%).\textsuperscript{16}\textsuperscript{17} Further, these cross-sectional differences between mandatory and voluntary adopters prior to 2005 become insignificant after the mandatory IAS adoption (8.76% versus 8.55%, with two-sided p=0.48), consistent with a uniform set of high quality accounting standards improving financial reporting convergence across the EU member states (Tweedie 2006).

Similarly, Panel C reports the reconstructed coefficients and the significance levels in a two-by-two analysis for the sample after deleting the transition period (2004 and 2005). The results and inferences in Panel C are consistent with those in Panel B, indicating that the transitional period under the new reporting regime does not influence the results found using the full sample.

In summary, the results in Table 4 suggest that mandatory IAS adoption leads to a significant reduction in the cost of equity capital only for mandatory adopters, and as a result, the cost of equity difference between mandatory and voluntary adopters in the pre-mandatory adoption period becomes insignificant after 2005. This is consistent with mandatory IAS adoption, on average, benefiting shareholders by reducing the cost of equity capital.

6. Additional analyses

\textsuperscript{16} The results for voluntary adopters are consistent with prior studies in that voluntary IAS adoption reduces the cost of equity capital (e.g., Leuz and Verrecchia 2000; Barth et al. 2007).

\textsuperscript{17} The results comparing mandatory versus voluntary adopters in the pre-mandatory adoption period could be subject to potential self-selection bias, which I will address later in the sensitivity analysis.
6.1. Investigating the role of legal enforcement in explaining the effects of IAS adoption on the cost of capital

Prior studies suggest that the outcome of implementing accounting standards is determined not only by the quality of the standards alone, but also by the country’s institutional arrangements (Ball et al. 2003). In particular, firms in countries with weak enforcement mechanisms are more likely to abuse the discretion afforded by accounting rules and engage in earnings manipulation (Burgstahler et al. 2006). This suggests that the cost of capital benefits from mandatory IAS adoption are expected to be sensitive to whether the government effectively enforces the new rules. To explore the role of legal enforcement in influencing the impact of mandating IAS, I compare the results of my primary analysis across countries with strong versus weak enforcement mechanisms.

Following prior studies such as Leuz et al. (2003) and Burgstahler et al. (2006), I measure the quality of legal enforcement using the average score of the efficiency of the judicial system, rule of law, and corruption from La Porta et al. (1998). This enforcement measure ranges from zero to ten, with higher values indicating stronger enforcement environments. I transform this measure into a dummy variable, based on whether a country-specific value is above or below the sample country median, and coded one for strong legal enforcement and zero for weak legal enforcement. I then rerun the analysis in Table 4 after including this dummy variable in regression equation (1), along with its interaction with the IAS adopter dummy and the adoption period dummy. I then use the resulting regression coefficient estimates on the dummy variables to construct two-by-two tables partitioned in the strong versus weak enforcement settings.

18 The results are qualitatively similar if I use a more recent proxy for legal and enforcement environment, i.e., the rule of law variable for the year 2005 from Kaufmann et al. (2007).
Table 5 summarizes the results of this additional analysis. Specifically, Panel A reports the descriptive statistics on the legal enforcement variable, and indicates that the sample countries vary significantly in terms of their strength of the legal enforcement mechanisms. For example, Denmark, Finland, Netherlands and Sweden have the highest scores (ten) while Greece has the lowest (6.82). Panel B of Table 5 presents the results of the two-by-two analysis for the full sample partitioned on the legal enforcement system.\textsuperscript{19} The results show that mandatory adopters in strong enforcement environments experience a reduction of 91 basis points in the cost of equity capital after IAS becomes mandatory in 2005 (two-sided \(p<1\%\)), while mandatory adopters in poor enforcement environments experience no significant change in the cost of equity capital after 2005. For voluntary adopters, however, the cost of equity does not change regardless of the enforcement environments. Furthermore, the difference in the cost of equity between mandatory and voluntary adopters becomes insignificant in the post-mandatory adoption period. Thus, the results in Panel B indicate that the cost of equity benefits of mandatory IAS adoption are present only in strong enforcement environments, consistent with the quality of legal enforcement being a necessary condition for effective accounting changes.

6.2. Investigating the mechanisms through which mandatory IAS adoption affects the cost of equity capital

Proponents of IAS argue that a common financial language, when applied properly, can reduce firms’ cost of capital through two non-mutually exclusive mechanisms: improved financial disclosure and enhanced comparability of financial information (Tweedie 2006). This section performs tests to determine whether these two mechanisms do indeed appear to be responsible for the reduction in the cost of capital found in the

\textsuperscript{19} The results and inferences in Table 5 are robust to deleting the transition period, i.e., 2004 and 2005.
prior analysis, by including variables in the regression analysis that capture the extent to which IAS adoption is likely to increase disclosure and enhance comparability.

I measure the extent to which IAS adoption increases financial disclosure using the number of additional disclosures required by IAS (GAAP 2001), with higher values indicating a greater increase in disclosure level. For example, the measure of increased financial disclosure for Austria has a value of eight, because IAS requires eight additional financial disclosures which are not mandatory under the Austrian accounting standards. I measure the extent to which IAS adoption enhances information comparability using the number of inconsistencies between local GAAPs and IAS (GAAP 2001), with a larger number of inconsistencies indicating a greater increase in information comparability. For example, the measure of enhanced comparability for Austria has a value of 20, because there are 20 major inconsistencies between the Austrian rules and IAS. One example of these inconsistencies is that inventories are valued at the lowest of cost, net realizable value and replacement cost under the Austrian rules, but are valued at the lowest of cost and realizable value under IAS. As a result, the financial information regarding inventory values are not directly comparable between the Austrian standards and IAS.

I create dummy variables capturing the increased disclosure and enhanced comparability measures based on whether a country-specific value is above or below the sample country median and then rerun the multivariate regression in equation (1) after including the disclosure and comparability dummies, along with the enforcement dummy variable and their interaction with the IAS adopter dummy and the adoption period dummy. Using the resulting estimated regression coefficients, I reconstruct two-by-two tables that compare the change in the cost of equity in countries with a larger versus
smaller increase in disclosure and comparability, conditioned on the strength of the enforcement environment.

Table 5 summarizes the results of these additional analyses. Panel A reports the descriptive statistics on the disclosure and comparability variables and indicates that the sample countries vary significantly in terms of the increased disclosures and comparability from the mandatory IAS adoption. For example, Ireland and the U.K. have the smallest number of additional disclosures required by IAS (zero) while Greece and Spain have the largest (nine). Netherlands has the smallest number of inconsistencies between local GAAP and IAS (five) while Spain has the largest (22).

Panel C of Table 5 presents the results of the two-by-two analysis for the full sample partitioned on the increase in disclosures due to IAS adoption and the strength of the legal enforcement environment. Consistent with the results in Section 6.1, mandatory adopters experience a reduction in the cost of equity after 2005 only in strong enforcement environments (with two-sided p<1%). Further, in countries with strong legal enforcement, the reduction in the cost of equity is significantly greater among mandatory adopters in countries with a larger increase in disclosures than those in counties with a smaller increase in disclosures (with two-sided p<5%). This result is consistent with increased disclosure helping to explain why IAS adoption reduces the cost of equity. In addition, mandatory adopters in countries with weak enforcement mechanisms and a smaller increase in disclosures from mandatory IAS adoption actually experience an increase in their cost of equity (with two-sided p<10%), consistent with more discretion afforded under IAS having a detrimental effect to shareholders when the standards are not properly enforced. Finally, voluntary adopters do not experience a
decline in the cost of equity capital after IAS adoption becomes mandatory, irrespective of the increase in disclosures.

Panel D of Table 5 presents the results of the two-by-two analysis for the full sample partitioned on the increase in comparability due to IAS adoption and the strength of the legal enforcement environment. Again, consistent with the results in Section 6.1, mandatory adopters experience a reduced cost of equity after 2005 only in strong enforcement environments (with two-sided p<1%). Importantly, in countries with strong legal enforcement environments, the reduction in the cost of equity is significantly greater among mandatory adopters in countries with a larger increase in comparability than those in countries with a smaller increase in comparability (with two-sided p<1%). This result is consistent with increased comparability helping to explain why IAS adoption reduces the cost of equity. In addition, voluntary adopters do not experience a decline in the cost of equity capital after IAS becomes mandatory irrespective of the increase in comparability.

In summary, the findings in Panel C and D of Table 5 provide evidence consistent with both increased disclosure and enhanced comparability helping to explain why mandatory IAS adoption reduces the cost of equity capital, and reinforces the importance of strong legal enforcement systems.

7. Robustness checks

7.1. Distinguishing between voluntary adopters that adopted IAS relatively early and voluntary adopters that adopted relatively late
In June 2002, The Council of the European Union adopted the IAS Regulation requiring all EU-listed companies to prepare their consolidated accounts in accordance with IAS from 2005 onwards. In addition, firms in some countries were allowed to adopt IAS early, in anticipation of the mandatory IAS introduction in 2005. Thus, I also perform tests to check whether my primary findings are impacted by classifying voluntary adopters as either early or late voluntary adopters. Following Daske et al. (2007), I distinguish early voluntary adopters (firms that adopt IAS before June 2002) from late voluntary adopters (firms that do not adopt IAS until June 2002). I rerun the multivariate regression analysis in equation (1) by regressing the cost of equity capital on dummy variables capturing three types of adopters (mandatory, early voluntary and late voluntary) and their interactions with the post-mandatory adoption period. Based on these regression coefficients, Table 6 Panel A reports the reconstructed coefficients and the significance levels in a three-by-two analysis for the full sample period. This analysis finds that while mandatory adopters experience a significant reduction in their cost of equity after 2005, neither early nor late voluntary adopters experience any significant change in their cost of equity around the mandatory switch. Panel A also finds that while the cost of equity among these three types of adopters differs significantly in the pre-mandatory adoption period, this difference between mandatory adopters and late voluntary adopters narrows after the mandatory adoption. Additionally, after excluding the transition period, the results in Panel B of Table 6 are generally consistent with Panel A except that there is a greater convergence in the cost of equity among the three types of adopters in the post-mandatory adoption period. Thus, the results in Table 6 suggest that early voluntary adopters enjoy a lower cost of equity than late voluntary adopters prior to
2005, but that mandatory IAS introduction does not appear to affect the cost of equity capital for either of them, consistent with voluntary adopters experiencing no significant change in the cost of equity around the mandatory switch.

7.2. Controlling for potential self-selection bias in the pre-mandatory adoption period

As suggested in prior research, firms that voluntarily adopt IAS do not represent a randomly selected sample (Leuz and Verrecchia 2000). As a result, the cross-sectional comparison between voluntary versus mandatory adopters in the pre-mandatory period is subject to potential self-selection bias. I therefore implement the Heckman (1979) two-stage regression procedure to control for the self-selection effect. For the sample period 1995-2004, the first stage models the voluntary adopters’ decisions to follow IAS by estimating a probit model in which the dependent variable is a dummy variable with a value of one for voluntary adopters and zero for mandatory adopters, and the independent variables are the factors influencing firms’ voluntary IAS adoption decisions, and consist of financial performance (ROA), firm size (log of market value of equity), whether the firm is cross-listed in the U.S., financing needs (earnings growth), industry competitiveness (industry Herfindahl index), country-specific regulations regarding IAS adoption (Deloitte 2003), as well as industry and year fixed effects. In the second stage, I include the Inverse Mills Ratio from the first stage as an additional explanatory variable and regress the cost of equity on the dummy variable for voluntary adopters and the same set of control variables as in equation (1). The results (not tabled) show that in the first stage the coefficients on size, earnings growth and the country specific IAS regulations are significantly positive while the coefficient on ROA is significantly negative (with

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20 These independent variables are selected based on prior studies such as Harris and Muller (1999) and Leuz and Verrecchia (2000).
two-sided p<5%). This indicates firms that are larger, with more financing needs, in a more lax regulation environment and performing poorly are more likely to follow IAS voluntarily. The second stage regression indicates that, after controlling for the self-selection bias, mandatory adopters still have a significantly higher cost of equity than voluntary adopters prior to 2005 (with two-sided p<5%). Thus, the conclusion on the cross-sectional differences in the cost of equity between mandatory and voluntary adopters in the pre-mandatory adoption period is robust to controlling for the self-selection effect.

7.3. Using dividend yield as an alternative measure of cost of equity capital

A concern about using analyst forecasts to estimate the cost of equity is that the cost of equity effects may be driven by a mechanical change in analyst forecasts under IAS. To alleviate this concern, I follow prior studies and use an alternative cost of capital measure that does not rely on analysts forecasts i.e., dividend yield, measured as the actual dividends paid during the last fiscal year scaled by the market value of equity at the fiscal year end (Bekaert and Harvey 2000; Hail and Leuz 2006b).

I rerun the multivariate regression analysis in equation (1) and find results consistent with Table 4 (not tabled). Thus, the primary conclusion is robust to this alternative measure of the cost of equity.

7.4. Controlling for differences in analyst forecast properties

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21 The results are quantitatively similar for the sample after deleting the transition period.
22 Although dividend yield is less dependent on changes in accounting rules, and less affected by shocks to firms’ growth opportunities than the implied cost of capital estimates, it still suffers from its own measurement error problems and therefore the results should be interpreted as complementary (Bekaert and Harvey 2000).
23 I define “results consistent with those reported in Table 4” to mean that (1) the first row difference and the first column difference in the two-by-two analysis for the full sample as well as for the sample after deleting the transition period are significantly positive at p<10% (two-sided), (2) the second row difference and the second column difference in the two-by-two analysis for the full sample as well as for the sample after deleting the transition period are not significant at the convention levels.
Prior research shows that analyst forecasting behavior differs over time and across industries and countries, and that this may affect the implied cost of capital estimates (Easton and Monahan 2005). While I include fixed effects in the model to pick up these effects, I also test whether the primary results are sensitive to these forecasting differences. Specifically, I repeat the multivariate regression analysis in equation (1) after including proxies for forecast bias (the difference between earnings forecast and actual earnings deflated by the price as of last fiscal year end), forecast accuracy (absolute value of forecast bias) and earnings growth projections (forecasted one-year-ahead earnings growth rate). The analyses (not tabled) find results consistent with those reported in Table 4. Thus, the primary conclusion is robust to controlling for differences in analyst forecast properties.

7.5. Controlling for nominal risk-free interest rates and using risk premiums instead of cost of equity capital measures

The tests in Table 4 control for the expected inflation rates under the assumption that these are the only source causing variations in the nominal risk-free rates. However, another source is the real interest rates varying over time and across countries, which affects the cost of equity capital. Following prior studies (e.g., Hail and Leuz 2006a, b), I explicitly control for the local nominal risk-free rates, computed as the country-year median of the monthly risk-free interest rates using yields of local treasury bills, central bank papers or inter-bank loans provided by Datastream. Furthermore, I use the risk premium computed by subtracting the expected inflation rates (or the nominal risk-free interest rates) from the raw implied cost of equity capital estimates as the dependent variable, instead of including the inflation rates (or the nominal risk-free interest rates) as
separate control variables. These sensitivity analyses (not tabulated) find results consistent with those reported in Table 4. Thus, the primary conclusion is robust to controlling for nominal risk-free interest rates and using risk premiums instead of the cost of equity capital measures.

7.6. Controlling for differences in growth expectations

The implied cost of equity measures are estimated based on the valuation models with certain assumptions about the growth in abnormal earnings beyond explicit forecast horizons (i.e., $r_{gm}$ in Gode and Mohanram (2003) and $r_{ct}$ in Claus and Thomas (2001)). However, growth expectations might be different between mandatory and voluntary adopters and/or before and after the mandatory switch, which can bias the cost of capital estimates and mechanically produce the desired results (Hail and Leuz 2006a, b). To check whether the results in Table 4 are robust to controlling for these differential growth expectations, I include as additional explanatory variables analysts’ long-run EPS growth estimates provided by I/B/E/S, one-year ahead projected growth rates in EPS, and the ex post realized growth rates, computed as the historic two-year geometric average of annual percentage growth in net sales (Hail and Leuz 2006a). These sensitivity analyses (not tabulated) find results consistent with those reported in Table 4. Thus, the primary conclusion is robust to controlling for differences in growth expectations.

7.7. Deleting observations from Germany and Finland

The sample distribution by country in Table 1 Panel A indicates that Germany and Finland have the highest number of voluntary IAS adopters during 1995-2004. To ensure that the results are not driven by IAS adopters in Germany and Finland, I delete observations in these two countries and repeat the multivariate regression analysis in
equation (1). The analysis (not tabled) finds results consistent with those reported in Table 4. Thus, the primary conclusion is robust to deleting observations from Germany and Finland.

7.8. Deleting observations that are listed in Germany’s New Market

Prior studies show that firms listed in Germany’s New Market have to use IAS or U.S. GAAP in preparing their financial statements (Leuz 2003). These firms, as a result, could be inherently different from other voluntary IAS users. Therefore delete these observations and repeat the multivariate regression analysis in equation (1). The analyses (not tabled) find results consistent with those reported in Table 4. Thus, the primary conclusion is robust to deleting firms listed in the German New Market.

7.9. Deleting observations that use U.S. GAAP

Prior studies suggest insignificant differences between U.S. GAAP and IAS in producing high quality financial information (Leuz 2003). To ensure that my results are not driven by observations using U.S. GAAP, I delete these observations and repeat the multivariate regression analysis in equation (1). The analyses (not tabled) find results consistent with those reported in Table 4. Thus, the primary conclusion is robust to deleting observations using U.S. GAAP.

7.10. Deleting utilities and firms in the financial services industry

Relative to industrial firms, utilities and banks are subject to different regulations and thus may experience a different cost of capital impact as a result of mandatory IAS adoption. To ensure that my results are not driven by these regulated firms, I delete firms in the financial services and utilities industries (SIC codes 4900-4999 and 6000-6999) and repeat the multivariate regression analysis in equation (1). The analyses (not tabled)
find results consistent with those reported in Table 4. Thus, the primary conclusion is robust to deleting utilities and firms in the financial services industry.

7.11. Restricting the pre-mandatory IAS adoption sample period to 1999-2004

By the end of 1998, the International Accounting Standards Committee (IASC) completed the Core Standards Project, which led to substantial revisions to IAS. As a result, the quality of the IAS standards and the resulting financial reporting and disclosure may also improve along with these revisions (Holthausen 2003). To explore whether the results in Table 4 are sensitive to the standards revisions, I restrict the pre-mandatory adoption sample period to 1999-2004 and repeat the multivariate regression analysis in equation (1). The analyses (not tabled) find results consistent with those reported in Table 4. Thus, the primary conclusion is robust to varying the pre-mandatory adoption period.

7.12. Deleting IAS adopters in Austria after 2001 and in Greece after 2002

All domestically-listed companies in Austria and Greece are required to follow IAS beginning in 2002 and 2003, respectively (Deloitte 2003). To ensure that my results are not driven by these adopters, I delete the firms who adopt IAS in Austria (Greece) after 2002 (2003) and repeat the multivariate regression analysis in equation (1). The analysis (not tabled) finds results consistent with those reported in Table 4. Thus, the primary conclusion is robust to deleting firms adopting IAS in Austria after 2001 and in Greece after 2002.

24 In Austria, the Vienna stock exchange requires all domestic and foreign companies listed on the A-Market and the Austrian Growth Market (AGM) to submit consolidated financial statements under either IFRS or U.S. GAAP since April 2001. Other listed companies are permitted to use IFRS or U.S. GAAP or they may use Austrian GAAP (for details see http://www.iasplus.com/country/austria.htm#0105).
8. Conclusion

The purpose of this study is to explore the cost of equity effects of mandatory IAS adoption in the European Union. I find evidence that mandatory adopters, on average, experience a significant reduction in the cost of equity of 48 basis points after the mandatory introduction of IAS in 2005. Voluntary adopters, in contrast, do not experience any significant change in the cost of equity after the mandatory adoption in 2005. Additional analysis finds that mandating IAS has a significant cost of equity impact only in countries with strong enforcement mechanisms, and identifies two channels through which mandatory IAS adoption reduces the cost of equity: increased disclosure and enhanced comparability.

This study is subject to several caveats. First, prior research suggests that it is difficult to empirically measure the cost of capital and various proxies are shown to have different advantages and drawbacks (e.g., Easton and Monahan 2005). For this reason, although the implied cost of equity is arguably more suitable in the cross-country setting (Hail and Leuz 2006a) and my results are robust to many sensitivity checks, the findings should nevertheless be interpreted with caution and be viewed as suggestive. Second, compared to the longer time period of voluntary adoption (1995-2004), the mandatory adoption period examined in this study is limited to two years, i.e., 2005 and 2006. Thus, the results may not fully capture the long-run cost of capital consequences of mandatory IAS adoption and hence should be interpreted as preliminary. Finally, as the EU countries have been making continuous efforts to strengthen their legal and enforcement systems along with mandating IAS, the findings of reduced cost of capital might be a joint outcome of the IAS adoption and the recent improvement in enforcement and
governance. However, to the extent that the enforcement and governance improvement in strong enforcement environments is not systematically greater than the improvement in weak enforcement environments, the improvement in the institutional environment is less likely to be responsible for the main results in this paper.

\footnote{To illustrate, I compare the rule of law index (Kaufmann et al. 2007) in year 2006 vs. 1996 for strong and weak enforcement environments and find that the index remains statistically unchanged in both environments, consistent with the notion that countries’ institutional features tend to change slowly over time (Burgstahler et al. 2006).}
References


Daske, H., L. Hail, C. Leuz, and R. Verdi. 2007b. Mandatory IFRS reporting around the world: Early evidence on the economic consequences. Working paper, University of Mannheim, the Wharton School, University of Chicago, and MIT.


Appendix

Alternative Estimates of Implied Cost of Equity Capital

1. Gebhardt, Lee and Swaminathan (2001): r_{GLS}

\[ P_t = BV_t + \sum_{t=1}^{11} \frac{FROE_{t+\tau} - r_{GLS} BV_t}{(1 + r_{GLS})^\tau} BV_{t+1} + \frac{FROE_{t+12} - r_{GLS}}{r_{GLS} (1 + r_{GLS})^{11}} BV_{t+11} \]

For the first three years, future ROE is estimated as \(\text{FROE}_t = \frac{\text{FEPS}_t}{BV_{t-1}}\). Beyond year 3 till year 12, future ROE is computed by linearly interpolation to the sector-specific (industrial, service and financial sectors) median ROE. The negative ROEs are replaced by the historic three-year average in a given country and year. Beyond year 12, abnormal earnings are assumed to be constant.

2. Claus and Thomas (2001): r_{CT}

\[ P_t = BV_t + \sum_{t=1}^{5} \frac{FROE_{t+\tau} - r_{CT} BV_t}{(1 + r_{CT})^\tau} BV_{t+5} + \frac{(FROE_{t+5} - r_{GLS} BV_{t+4})(1 + g)}{(r_{CT} - g)(1 + r_{CT})^5} \]

For the first five years, future ROE is estimated as \(\text{FROE}_t = \frac{\text{FEPS}_t}{BV_{t-1}}\). Beyond year 5, the abnormal earnings growth at a rate \(g\) equal to the expected inflation rate. I use the yearly median of country-specific, one-year ahead realized monthly inflation rates.


\[ P_t = \frac{\text{FEPS}_{t+1}}{r_{GM}} + \frac{\left(\text{FEPS}_{t+2} - \text{FEPS}_{t+1} - r_{GM} (\text{FEPS}_{t+1} - k \times \text{FEPS}_{t+1})\right)}{r_{GM} (r_{GM} - g)} \]

So, \(r_{GM} = A + \sqrt{A^2 + \frac{\text{FEPS}_1}{P_0} (g_2 - (\gamma - 1))} \)

Where, \(A \equiv \frac{1}{2} \left((\gamma - 1) + \frac{k \times \text{FEPS}_1}{P_0}\right)\); \(g_2 = \frac{(\text{FEPS}_2 - \text{FEPS}_1)}{\text{FEPS}_1}\).

The long-term growth rate, \(\gamma\) is estimated as the yearly country-specific median of one-year-ahead realized monthly inflation rates. The model requires positive earnings forecasts.

4. Modified PEG ratio by Easton (2004): r_{MPEG}

\[ P_t = \frac{\text{FEPS}_{t+2} + r_{MPEG} \times \text{d}_{t+2} - \text{FEPS}_{t+1}}{r_{MPEG}^2} \]

This model assumes that abnormal earnings persist in perpetuity. The model requires positive earnings forecasts.

Notes:
- \(P_t\): stock price at year t.
- \(BV_t\): book value of equity per share at the beginning of year t.
- \(BV_{t+\tau}\): expected future book value of equity per share at the beginning of year \(t + \tau\), where \(BV_{t+\tau} = BV_t + \text{FEPS}_t \tau - k \times \text{FEPS}_t \tau\).
- \(\text{FEPS}_{t+\tau}\): expected future earnings per share at year \(t + \tau\).
- \(\text{FROE}_{t+\tau}\): expected future return on equity at year \(t + \tau\).
- \(k\): dividend payout ratio estimated as the historic three-year average for the firm.
Table 1: Sample distribution and country-level descriptive statistics (N=6,456 firm-year observations, with 1,783 IAS firm-year observations)

Panel A: Sample distribution

<table>
<thead>
<tr>
<th>Country</th>
<th>Pre-mandatory Adoption Period</th>
<th>Post-mandatory Adoption Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>% using IAS</td>
</tr>
<tr>
<td>Austria</td>
<td>63</td>
<td>35%</td>
</tr>
<tr>
<td>Belgium</td>
<td>167</td>
<td>5%</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>5</td>
<td>80%</td>
</tr>
<tr>
<td>Denmark</td>
<td>164</td>
<td>11%</td>
</tr>
<tr>
<td>Finland</td>
<td>242</td>
<td>11%</td>
</tr>
<tr>
<td>France</td>
<td>653</td>
<td>2%</td>
</tr>
<tr>
<td>Germany</td>
<td>457</td>
<td>25%</td>
</tr>
<tr>
<td>Greece</td>
<td>78</td>
<td>8%</td>
</tr>
<tr>
<td>Hungary</td>
<td>3</td>
<td>0%</td>
</tr>
<tr>
<td>Ireland</td>
<td>101</td>
<td>0%</td>
</tr>
<tr>
<td>Italy</td>
<td>302</td>
<td>0%</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>7</td>
<td>0%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>326</td>
<td>0%</td>
</tr>
<tr>
<td>Poland</td>
<td>16</td>
<td>0%</td>
</tr>
<tr>
<td>Portugal</td>
<td>44</td>
<td>0%</td>
</tr>
<tr>
<td>Spain</td>
<td>240</td>
<td>0%</td>
</tr>
<tr>
<td>Sweden</td>
<td>303</td>
<td>0%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>1,713</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,884</td>
<td>4%</td>
</tr>
</tbody>
</table>
Table 1 cont’d
Panel B: Country-level descriptive statistics

<table>
<thead>
<tr>
<th></th>
<th>Cost of equity capital</th>
<th>Inflation</th>
<th>Total assets</th>
<th>Market value of equity</th>
<th>Return variability</th>
<th>Leverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>10.14%</td>
<td>1.70%</td>
<td>3,888</td>
<td>2,307</td>
<td>0.085</td>
<td>0.626</td>
</tr>
<tr>
<td>Belgium</td>
<td>11.24%</td>
<td>1.82%</td>
<td>28,775</td>
<td>2,921</td>
<td>0.081</td>
<td>0.599</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>10.46%</td>
<td>2.16%</td>
<td>16,523</td>
<td>3,185</td>
<td>0.084</td>
<td>0.922</td>
</tr>
<tr>
<td>Denmark</td>
<td>11.35%</td>
<td>2.09%</td>
<td>11,590</td>
<td>1,865</td>
<td>0.089</td>
<td>0.587</td>
</tr>
<tr>
<td>Finland</td>
<td>12.54%</td>
<td>1.44%</td>
<td>1,759</td>
<td>1,042</td>
<td>0.098</td>
<td>0.515</td>
</tr>
<tr>
<td>France</td>
<td>10.80%</td>
<td>1.52%</td>
<td>35,299</td>
<td>6,506</td>
<td>0.104</td>
<td>0.635</td>
</tr>
<tr>
<td>Germany</td>
<td>11.08%</td>
<td>1.51%</td>
<td>42,554</td>
<td>6,132</td>
<td>0.108</td>
<td>0.641</td>
</tr>
<tr>
<td>Greece</td>
<td>11.56%</td>
<td>3.49%</td>
<td>11,480</td>
<td>3,221</td>
<td>0.103</td>
<td>0.694</td>
</tr>
<tr>
<td>Hungary</td>
<td>11.53%</td>
<td>5.49%</td>
<td>462</td>
<td>617</td>
<td>0.145</td>
<td>0.160</td>
</tr>
<tr>
<td>Ireland</td>
<td>11.47%</td>
<td>3.30%</td>
<td>27,511</td>
<td>3,879</td>
<td>0.079</td>
<td>0.726</td>
</tr>
<tr>
<td>Italy</td>
<td>10.23%</td>
<td>2.35%</td>
<td>37,062</td>
<td>5,562</td>
<td>0.083</td>
<td>0.711</td>
</tr>
<tr>
<td>Luxembourg</td>
<td>15.38%</td>
<td>2.29%</td>
<td>4,468</td>
<td>2,124</td>
<td>0.156</td>
<td>0.590</td>
</tr>
<tr>
<td>Netherlands</td>
<td>12.30%</td>
<td>2.19%</td>
<td>42,003</td>
<td>5,410</td>
<td>0.094</td>
<td>0.612</td>
</tr>
<tr>
<td>Poland</td>
<td>12.30%</td>
<td>2.96%</td>
<td>8,677</td>
<td>2,423</td>
<td>0.113</td>
<td>0.746</td>
</tr>
<tr>
<td>Portugal</td>
<td>11.11%</td>
<td>2.89%</td>
<td>15,728</td>
<td>3,803</td>
<td>0.067</td>
<td>0.811</td>
</tr>
<tr>
<td>Spain</td>
<td>10.02%</td>
<td>2.97%</td>
<td>35,753</td>
<td>9,662</td>
<td>0.073</td>
<td>0.702</td>
</tr>
<tr>
<td>Sweden</td>
<td>11.27%</td>
<td>1.22%</td>
<td>15,985</td>
<td>3,093</td>
<td>0.108</td>
<td>0.582</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>10.60%</td>
<td>1.68%</td>
<td>23,698</td>
<td>5,405</td>
<td>0.092</td>
<td>0.608</td>
</tr>
<tr>
<td>Mean</td>
<td>10.97%</td>
<td>1.89%</td>
<td>27,304</td>
<td>5,114</td>
<td>0.094</td>
<td>0.626</td>
</tr>
<tr>
<td>Median</td>
<td>10.37%</td>
<td>1.82%</td>
<td>1,018</td>
<td>783</td>
<td>0.080</td>
<td>0.630</td>
</tr>
<tr>
<td>Std Dev</td>
<td>3.48%</td>
<td>0.80%</td>
<td>124,277</td>
<td>14,355</td>
<td>0.053</td>
<td>0.194</td>
</tr>
</tbody>
</table>

Table 1 reports the sample distribution and country-level descriptive statistics. The full sample comprises 6,456 firm-year observations representing 1,084 distinct companies from 18 EU countries during the period of 1995 to 2006. Panel A of Table 1 reports the number of firm-year observations and the proportions of IAS users by country. Panel B of Table 1 reports the descriptive statistics on key variables by country.

**Variable definitions:**

*Cost of equity capital:* the mean of \( r_{mepg} \) (implied cost of equity capital estimates based on modified PEG ratio by Easton (2004)), \( r_{gm} \) (implied cost of equity capital estimates based on Gode and Mohanram (2003)), \( r_{ct} \) (implied cost of equity capital estimates based on Claus and Thomas (2001)), and \( r_{gls} \) (implied cost of equity capital estimates based on Gebhardt et al. (2001)).

*Inflation:* the yearly median of country-specific, one-year-ahead monthly inflation rates.

*Total assets:* the firm’s total assets in millions of U.S. dollars at year end.

*Market value of equity:* the firm’s market value of equity in millions of U.S. dollars at year end.

*Return variability:* the return variability computed as the annual standard deviation of monthly stock returns at year end.

*Leverage:* financial leverage computed as the total liabilities divided by total assets at year end.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Accounting standards</th>
<th>Mean</th>
<th>Median</th>
<th>Std Dev</th>
<th>t-test p-value</th>
<th>Wilcoxon p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of equity capital</td>
<td>other</td>
<td>11.19%</td>
<td>10.60%</td>
<td>3.63%</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>IAS</td>
<td>10.39%</td>
<td>9.84%</td>
<td>2.97%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>other</td>
<td>12.13%</td>
<td>11.26%</td>
<td>4.35%</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>rmpeg</td>
<td>IAS</td>
<td>11.70%</td>
<td>10.88%</td>
<td>4.02%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>other</td>
<td>12.56%</td>
<td>11.71%</td>
<td>4.45%</td>
<td>0.003</td>
<td>0.008</td>
</tr>
<tr>
<td>rgm</td>
<td>IAS</td>
<td>12.21%</td>
<td>11.42%</td>
<td>4.15%</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>other</td>
<td>9.86%</td>
<td>9.15%</td>
<td>3.85%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rct</td>
<td>IAS</td>
<td>9.22%</td>
<td>8.84%</td>
<td>2.86%</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>other</td>
<td>9.97%</td>
<td>9.30%</td>
<td>4.96%</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>rgl</td>
<td>IAS</td>
<td>8.35%</td>
<td>8.21%</td>
<td>3.93%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private placements</td>
<td>other</td>
<td>0.007</td>
<td>0</td>
<td>0.086</td>
<td>0.023</td>
<td>0.009</td>
</tr>
<tr>
<td></td>
<td>IAS</td>
<td>0.015</td>
<td>0</td>
<td>0.120</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>other</td>
<td>0.066</td>
<td>0</td>
<td>0.249</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>OTC listings</td>
<td>IAS</td>
<td>0.093</td>
<td>0</td>
<td>0.291</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>other</td>
<td>0.079</td>
<td>0</td>
<td>0.269</td>
<td>0.134</td>
<td>0.123</td>
</tr>
<tr>
<td></td>
<td>IAS</td>
<td>0.090</td>
<td>0</td>
<td>0.287</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log of total assets</td>
<td>other</td>
<td>7.151</td>
<td>6.827</td>
<td>2.144</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>IAS</td>
<td>7.523</td>
<td>7.241</td>
<td>2.308</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Return variability</td>
<td>other</td>
<td>0.102</td>
<td>0.087</td>
<td>0.057</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>IAS</td>
<td>0.075</td>
<td>0.067</td>
<td>0.034</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leverage</td>
<td>IAS</td>
<td>0.633</td>
<td>0.646</td>
<td>0.193</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 reports the descriptive statistics for key variables across IAS and non-IAS firm-year observations for the full sample of 6,456 observations representing 1,084 distinct companies from 18 EU countries during the period of 1995 to 2006. The t-test tests the null hypothesis that the mean difference on key variables across IAS and non-IAS observations is zero. The Wilcoxon test is a non-parametric method testing the null hypothesis that the median difference on key variables across IAS and non-IAS observations is zero.

**Variable definitions:**

Cost of equity capital: the mean of rmpeg (implied cost of equity capital estimates based on modified PEG ratio by Easton (2004)), rgm (implied cost of equity capital estimates based on Gode and Mohanram (2003)), rct (implied cost of equity capital estimates based on Claus and Thomas (2001)), and rgl (implied cost of equity capital estimates based on Gebhardt et al. (2001)).

Private placement: a dummy variable equal to one if a firm has a private placement under Rule 144A according to JP Morgan ADR Analytics.

OTC listing: a dummy variable equal to 1 if a firm trades its shares in the over-the-counter markets of the U.S. according to JP Morgan ADR Analytics.

Exchange listing: a dummy variable equal to 1 if a firm trades its shares on the NYSE, NASDAQ or AMEX according to JP Morgan ADR Analytics.

Log of total assets: the natural logarithm of total assets in millions of U.S. dollars at year end.

Return variability: the return variability computed as the annual standard deviation of monthly stock returns at year end.

Leverage: financial leverage computed as the total liabilities divided by total assets at year end.
<table>
<thead>
<tr>
<th>Variable</th>
<th>IAS adoption</th>
<th>Cost of equity capital</th>
<th>Private placements</th>
<th>OTC listings</th>
<th>Exchange listings</th>
<th>Inflation</th>
<th>Log of total assets</th>
<th>Return variability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of equity capital</td>
<td>-0.103</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Private placements</td>
<td>0.033</td>
<td>0.015</td>
<td>0.008</td>
<td>-0.058</td>
<td>0.095</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>OTC listings</td>
<td>0.046</td>
<td>-0.058</td>
<td>0.095</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Exchange listings</td>
<td>0.019</td>
<td>-0.041</td>
<td>-0.029</td>
<td>-0.084</td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Inflation</td>
<td>0.143</td>
<td>0.031</td>
<td>0.028</td>
<td>-0.004</td>
<td>0.040</td>
<td></td>
<td></td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Log of total assets</td>
<td>0.076</td>
<td>-0.174</td>
<td>0.102</td>
<td>0.248</td>
<td>0.337</td>
<td>0.118</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Return variability</td>
<td>-0.231</td>
<td>0.308</td>
<td>-0.022</td>
<td>-0.067</td>
<td>0.001</td>
<td>-0.099</td>
<td>-0.240</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.022</td>
<td>0.105</td>
<td>0.085</td>
<td>0.114</td>
<td>0.097</td>
<td>0.131</td>
<td>0.576</td>
<td>-0.070</td>
</tr>
<tr>
<td></td>
<td>0.077</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 3 presents the Pearson correlation coefficients among the test variables based on the full sample of 6,456 observations representing 1,084 distinct companies from 18 EU countries during the period of 1995 to 2006. P-values (in italics) are two-sided.

**Variable definitions:**

*Cost of equity capital:* the mean of $r_{mPEG}$ (implied cost of equity capital estimates based on modified PEG ratio by Easton (2004)), $r_{gm}$ (implied cost of equity capital estimates based on Gode and Mohanram (2003)), $r_{ct}$ (implied cost of equity capital estimates based on Claus and Thomas (2001)), and $r_{gls}$ (implied cost of equity capital estimates based on Gebhardt et al. (2001)).

*Private placement:* a dummy variable equal to one if a firm has a private placement under Rule 144A according to JP Morgan ADR Analytics.

*OTC listing:* a dummy variable equal to 1 if a firm trades its shares in the over-the-counter markets of the U.S. according to JP Morgan ADR Analytics.

*Exchange listing:* a dummy variable equal to 1 if a firm trades its shares on the NYSE, NASDAQ or AMEX according to JP Morgan ADR Analytics.

*Log of total assets:* the natural logarithm of total assets in millions of U.S. dollars at year end.

*Inflation:* the yearly median of country-specific, one-year-ahead monthly inflation rates.

*Return variability:* the return variability computed as the annual standard deviation of monthly stock returns at year end.

*Leverage:* financial leverage computed as the total liabilities divided by total assets at year end.
Table 4: Primary analysis on the cost of equity effects of mandatory IAS adoption
Panel A: A pooled regression

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coeff.</td>
<td>2-sided p-value</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.084</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Dummy for mandatory adopters (1)</td>
<td>0.008</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Dummy for post-mandatory adoption period (2)</td>
<td>0.002</td>
<td>0.606</td>
</tr>
<tr>
<td>Dummy for mandatory adopters*Dummy for post-mandatory adoption period (3)</td>
<td>-0.006</td>
<td>0.052</td>
</tr>
<tr>
<td>Private placements</td>
<td>0.010</td>
<td>0.024</td>
</tr>
<tr>
<td>OTC listings</td>
<td>0.001</td>
<td>0.751</td>
</tr>
<tr>
<td>Exchange listings</td>
<td>0.002</td>
<td>0.134</td>
</tr>
<tr>
<td>Inflation</td>
<td>0.401</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Log of total assets</td>
<td>-0.004</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Return variability</td>
<td>0.169</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Leverage</td>
<td>0.055</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Industry dummies</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>Country dummies</td>
<td>Included</td>
<td></td>
</tr>
<tr>
<td>Test: (2) + (3) =0</td>
<td>&lt;0.001</td>
<td></td>
</tr>
<tr>
<td>Test: (1) + (3) =0</td>
<td>0.475</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>6,456</td>
<td></td>
</tr>
<tr>
<td>Adj. R2</td>
<td>0.22</td>
<td></td>
</tr>
</tbody>
</table>
Table 4 cont’d
Panel B: Two-by-two analysis of mandatory versus voluntary adopters, by period, using the coefficients in Panel A

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory adopters</td>
<td>9.24% N=4,431</td>
<td>8.76% N=1,447</td>
<td>0.48% ***</td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>8.39% N=453</td>
<td>8.55% N=125</td>
<td>-0.16%</td>
</tr>
<tr>
<td>Diff.</td>
<td>0.85% ***</td>
<td>0.21%</td>
<td></td>
</tr>
</tbody>
</table>

Panel C: Two-by-two analysis of mandatory versus voluntary adopters, by period, after deleting transition period (2004 and 2005), using the coefficients in Panel A

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory adopters</td>
<td>10.28% N=3,614</td>
<td>9.32% N=549</td>
<td>0.96% ***</td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>9.19% N=380</td>
<td>8.97% N=56</td>
<td>0.22%</td>
</tr>
<tr>
<td>Diff.</td>
<td>1.09% ***</td>
<td>0.35%</td>
<td></td>
</tr>
</tbody>
</table>
Table 4 reports the empirical results of the main analysis. Panel A reports the pooled regression coefficients and two-sided p-values for the full period sample of 6,456 firm-year observations from 1995-2006, as well as for the sample after deleting transition period including 4,599 firm-year observations from 1995-2003 and 2006. Panel B reports the two-by-two analysis of mandatory adopters versus voluntary adopters by period for the full sample, constructed using the coefficients in Panel A. Panel C reports the two-by-two analysis of mandatory adopters versus voluntary adopters by period for the sample after deleting the transition period, constructed using the coefficients in Panel A. * denotes significant at 10% level, ** denotes significant at 5% level, *** denotes significant at 1% level, all two-sided.

Regression model: (firm and year subscripts are suppressed):

\[
\text{Cost of equity capital} = \alpha_0 + \alpha_1 \text{Dummy for Mandatory IAS adopters} + \alpha_2 \text{Dummy for Post-mandatory adoption period} + \alpha_3 \text{Dummy for Mandatory IAS adopters} \times \text{Dummy for Post-mandatory adoption period} + \alpha_4 \text{Private placement} + \alpha_5 \text{OTC listing} + \alpha_6 \text{Exchange listing} + \alpha_7 \text{Inflation} + \alpha_8 \text{Log_total assets} + \alpha_9 \text{Return variability} + \alpha_{10} \text{Leverage} + \alpha_{11} \text{DIndustry} + \alpha_{12} \text{DCountry} + \varepsilon
\]

Variable definitions:
Cost of equity capital: the mean of \( r_{\text{mpe}} \) (implied cost of equity capital estimates based on modified PEG ratio by Easton (2004)), \( r_{\text{gm}} \) (implied cost of equity capital estimates based on Gode and Mohanram (2003)), \( r_{\text{ct}} \) (implied cost of equity capital estimates based on Claus and Thomas (2001)), and \( r_{\text{gls}} \) (implied cost of equity capital estimates based on Gebhardt et al. (2001)).

Dummy for mandatory IAS adopters: a dummy variable equal to one if a firm does not adopt IAS until 2005, and zero otherwise.

Dummy for post-mandatory adoption period: a dummy variable equal to one if a firm-year observation falls on or after 2005, and zero otherwise.

Dummy for mandatory IAS adopters \times Dummy for post-mandatory adoption period: the interaction term between the two dummy variables.

Private placement: a dummy variable equal to one if a firm has a private placement under Rule 144A according to JP Morgan ADR Analytics.

OTC listing: a dummy variable equal to one if a firm trades its shares in the over-the-counter markets of the U.S. according to JP Morgan ADR Analytics.

Exchange listing: a dummy variable equal to one if a firm trades its shares on the NYSE, NASDAQ or AMEX according to JP Morgan ADR Analytics.

Inflation: the yearly median of country-specific, one-year-ahead monthly inflation rates.

Log_total assets: the natural logarithm of total assets in millions of U.S. dollars at year end.

Return variability: the return variability computed as the annual standard deviation of monthly stock returns at year end.

Leverage: financial leverage computed as the total liabilities divided by total assets at year end.

DIndustry: dummy variables indicating a firm’s industry membership based on the industry classification in Campbell (1996).

DCountry: dummy variables for countries.
Table 5: Additional analyses
Panel A: Country-level conditioning variables

<table>
<thead>
<tr>
<th>Country</th>
<th>Enforcement</th>
<th>Additional disclosure required by IAS relative to local standards</th>
<th>The number of inconsistencies between local standards and IAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>9.36</td>
<td>8</td>
<td>20</td>
</tr>
<tr>
<td>Belgium</td>
<td>9.44</td>
<td>7</td>
<td>15</td>
</tr>
<tr>
<td>Czech Republic</td>
<td></td>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>Denmark</td>
<td>10</td>
<td>5</td>
<td>13</td>
</tr>
<tr>
<td>Finland</td>
<td>10</td>
<td>8</td>
<td>19</td>
</tr>
<tr>
<td>France</td>
<td>8.68</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Germany</td>
<td>9.05</td>
<td>7</td>
<td>20</td>
</tr>
<tr>
<td>Greece</td>
<td>6.82</td>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>Hungary</td>
<td></td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Ireland</td>
<td>8.36</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Italy</td>
<td>7.07</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Luxembourg</td>
<td></td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>Netherlands</td>
<td>10</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Poland</td>
<td></td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>Portugal</td>
<td>7.19</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>Spain</td>
<td>7.14</td>
<td>9</td>
<td>22</td>
</tr>
<tr>
<td>Sweden</td>
<td>10</td>
<td>4</td>
<td>11</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>9.22</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td><strong>8.74</strong></td>
<td><strong>6</strong></td>
<td><strong>16</strong></td>
</tr>
<tr>
<td><strong>Median</strong></td>
<td><strong>9.14</strong></td>
<td><strong>7</strong></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td><strong>Std dev</strong></td>
<td><strong>1.21</strong></td>
<td><strong>3</strong></td>
<td><strong>4</strong></td>
</tr>
</tbody>
</table>
Table 5 cont’d
Panel B: The role of legal enforcement systems in explaining the cost of equity effects of mandatory IAS adoption

<table>
<thead>
<tr>
<th>Weak enforcement</th>
<th>Strong enforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandatory adopters</td>
<td></td>
</tr>
<tr>
<td>N=1,585</td>
<td>8.87%</td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>7.88%</td>
</tr>
<tr>
<td>N=290</td>
<td></td>
</tr>
<tr>
<td>Diff.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandatory adopters</td>
<td>9.61%</td>
</tr>
<tr>
<td>N=2,820</td>
<td></td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>8.96%</td>
</tr>
<tr>
<td>N=158</td>
<td></td>
</tr>
<tr>
<td>Diff.</td>
<td>0.64% **</td>
</tr>
</tbody>
</table>
Table 5 cont’d
Panel C: The increase in disclosures as a mechanism behind the cost of equity effects of mandatory IAS adoption

<table>
<thead>
<tr>
<th>Small increase in disclosures due to IAS adoption and</th>
<th>Strong enforcement</th>
<th>Large increase in disclosures due to IAS adoption and</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre-mandatory</td>
<td>Post-mandatory</td>
</tr>
<tr>
<td></td>
<td>adoption (1995-</td>
<td>adoption (2005-</td>
</tr>
<tr>
<td></td>
<td>2004)</td>
<td>2006)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandatory adopters</td>
<td>9.70%</td>
<td>8.91%</td>
</tr>
<tr>
<td></td>
<td>N=2,459</td>
<td>N=693</td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>9.45%</td>
<td>8.03%</td>
</tr>
<tr>
<td></td>
<td>N=47</td>
<td>N=10</td>
</tr>
<tr>
<td>Diff.</td>
<td>0.25% ***</td>
<td>0.88%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large increase in disclosures due to IAS adoption</td>
<td>0.79% ***</td>
<td>-1.60% ***</td>
</tr>
<tr>
<td>and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre-mandatory</td>
<td>Post-mandatory</td>
</tr>
<tr>
<td></td>
<td>adoption (1995-</td>
<td>adoption (2005-</td>
</tr>
<tr>
<td></td>
<td>2004)</td>
<td>2006)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandatory adopters</td>
<td>9.17%</td>
<td>7.58%</td>
</tr>
<tr>
<td></td>
<td>N=361</td>
<td>N=143</td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>8.43%</td>
<td>7.87%</td>
</tr>
<tr>
<td></td>
<td>N=111</td>
<td>N=29</td>
</tr>
<tr>
<td>Diff.</td>
<td>0.75% **</td>
<td>-0.29%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small increase in disclosures due to IAS adoption</td>
<td>0.32% *</td>
<td>-0.18%</td>
</tr>
<tr>
<td>and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre-mandatory</td>
<td>Post-mandatory</td>
</tr>
<tr>
<td></td>
<td>adoption (1995-</td>
<td>adoption (2005-</td>
</tr>
<tr>
<td></td>
<td>2004)</td>
<td>2006)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandatory adopters</td>
<td>8.28%</td>
<td>8.60%</td>
</tr>
<tr>
<td></td>
<td>N=1,028</td>
<td>N=391</td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>7.33%</td>
<td>8.44%</td>
</tr>
<tr>
<td></td>
<td>N=28</td>
<td>N=8</td>
</tr>
<tr>
<td>Diff.</td>
<td>0.95%</td>
<td>0.16%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large increase in disclosures due to IAS adoption</td>
<td>1.09% ***</td>
<td>0.37%</td>
</tr>
<tr>
<td>and</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre-mandatory</td>
<td>Post-mandatory</td>
</tr>
<tr>
<td></td>
<td>adoption (1995-</td>
<td>adoption (2005-</td>
</tr>
<tr>
<td></td>
<td>2004)</td>
<td>2006)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mandatory adopters</td>
<td>8.95%</td>
<td>8.78%</td>
</tr>
<tr>
<td></td>
<td>N=557</td>
<td>N=210</td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>7.87%</td>
<td>8.41%</td>
</tr>
<tr>
<td></td>
<td>N=262</td>
<td>N=77</td>
</tr>
<tr>
<td>Diff.</td>
<td>1.09% ***</td>
<td>0.37%</td>
</tr>
</tbody>
</table>

Table 5 cont’d
Panel D: The increase in comparability as a mechanism behind the cost of equity effects of mandatory IAS adoption

<table>
<thead>
<tr>
<th>Small increase in comparability due to IAS adoption and</th>
<th>Strong enforcement</th>
<th>Large increase in comparability due to IAS adoption and</th>
<th>Strong enforcement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre-mandatory</td>
<td>Post-mandatory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>adoption (1995-</td>
<td>adoption (2005-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2004)</td>
<td>2006)</td>
<td></td>
</tr>
<tr>
<td>Mandatory adopters</td>
<td>9.71%</td>
<td>8.91%</td>
<td>9.34%</td>
</tr>
<tr>
<td></td>
<td>N=2,604</td>
<td>N=735</td>
<td>N=216</td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>9.42%</td>
<td>8.54%</td>
<td>8.39%</td>
</tr>
<tr>
<td></td>
<td>N=69</td>
<td>N=17</td>
<td>N=89</td>
</tr>
<tr>
<td>Diff.</td>
<td>0.29%</td>
<td>0.36%</td>
<td>0.95%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small increase in comparability due to IAS adoption and</td>
<td>Weak enforcement</td>
<td>Large increase in comparability due to IAS adoption and</td>
<td>Weak enforcement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pre-mandatory</td>
<td>Post-mandatory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>adoption (1995-</td>
<td>adoption (2005-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2004)</td>
<td>2006)</td>
<td></td>
</tr>
<tr>
<td>Mandatory adopters</td>
<td>9.08%</td>
<td>8.31%</td>
<td>8.30%</td>
</tr>
<tr>
<td></td>
<td>N=145</td>
<td>N=45</td>
<td>N=1,440</td>
</tr>
<tr>
<td>Voluntary adopters</td>
<td>8.37%</td>
<td>8.82%</td>
<td>7.34%</td>
</tr>
<tr>
<td></td>
<td>N=0</td>
<td>N=0</td>
<td>N=290</td>
</tr>
<tr>
<td>Diff.</td>
<td>0.71%</td>
<td>-0.51%</td>
<td>0.96%</td>
</tr>
</tbody>
</table>
Table 5 reports the results for the additional analyses. Panel A reports descriptive statistics for the country-level conditioning variables. Panel B reports the two-by-two analysis for the sub-samples conditioned on the enforcement index. Panel C reports the two-by-two analysis for the sub-samples conditioned on the enforcement index and the increase in disclosures due to mandatory IAS adoption. Panel D reports the two-by-two analysis for the sub-samples conditioned on the enforcement index and the increase in comparability due to mandatory IAS adoption. The continuous conditioning variables are transformed to binary variables based on the sample country median values. * denotes significant at 10% level, ** denotes significant at 5% level, *** denotes significant at 1% level, all two-sided.

**Variable definitions:**
- *Enforcement index*: the average of efficiency of judicial system, rule of law and corruption (La Porta et al. 1998; Leuz et al. 2003);
- *Increase in disclosures due to mandatory IAS adoption*: the number of additional disclosures required by IAS when compared to local accounting standards, constructed from GAAP (2001).
- *Increase in comparability due to mandatory IAS adoption*: the number of inconsistencies between local standards and IAS, constructed from GAAP (2001).
Table 6: Distinguishing early versus late voluntary adopters


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Mandatory adopters</td>
<td>9.32% N=4,431</td>
<td>8.85% N=1,447</td>
<td>0.47% ***</td>
</tr>
<tr>
<td><strong>B</strong> Late Voluntary adopters</td>
<td>8.84% N=232</td>
<td>9.12% N=74</td>
<td>-0.28%</td>
</tr>
<tr>
<td><strong>C</strong> Early Voluntary adopters</td>
<td>8.02% N=221</td>
<td>7.86% N=51</td>
<td>0.16%</td>
</tr>
</tbody>
</table>

Panel B: Analysis after deleting transition period (2004 and 2005)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Mandatory adopters</td>
<td>10.32% N=3,614</td>
<td>9.36% N=549</td>
<td>0.96% ***</td>
</tr>
<tr>
<td><strong>B</strong> Late Voluntary adopters</td>
<td>9.62% N=187</td>
<td>9.55% N=32</td>
<td>0.07%</td>
</tr>
<tr>
<td><strong>C</strong> Early Voluntary adopters</td>
<td>8.80% N=193</td>
<td>8.23% N=24</td>
<td>0.57%</td>
</tr>
</tbody>
</table>

Diff. A-B 0.70% *** -0.19%
Diff. A-C 1.52% *** 1.13% *
Diff. B-C 0.82% ** 1.32%
Table 6 reports the analysis of mandatory adopters versus late voluntary adopters versus early voluntary adopters by period. The tables are constructed using coefficients from the pooled regression as follows. Panel A reports the analysis for the full sample of 6,456 firm-year observations from 1995-2006. Panel B reports the analysis for the sample after deleting transition period, including 4,599 firm-year observations from 1995-2003 and 2006. * denotes significant at 10% level, ** denotes significant at 5% level, *** denotes significant at 1% level, all two-sided.

Regression model: (firm and year subscripts are suppressed):
\[\text{Cost of equity capital} = \alpha_1 \text{Dummy for Mandatory IAS adopters} + \alpha_2 \text{Dummy for Late voluntary IAS adopters} + \alpha_3 \text{Dummy for Early voluntary IAS adopters} + \alpha_4 \text{Dummy for Early voluntary IAS adopters} \times \text{Dummy for Post-mandatory adoption period} + \alpha_5 \text{Dummy for Late voluntary IAS adopters} \times \text{Dummy for Post-mandatory adoption period} + \alpha_6 \text{Dummy for Early voluntary IAS adopters} \times \text{Dummy for Post-mandatory adoption period} + \alpha_7 \text{Private placement} + \alpha_8 \text{OTC listing} + \alpha_9 \text{Exchange listing} + \alpha_{10} \text{Inflation} + \alpha_{11} \text{Log_total assets} + \alpha_{12} \text{Leverage} + \alpha_{13} \text{Return variability} + \alpha_m \text{DIndustry} + \alpha_n \text{DCountry} + \epsilon\]

Variable definitions:
- **Cost of equity capital**: the mean of \(r_{mpeg}\) (implied cost of equity capital estimates based on modified PEG ratio by Easton (2004)), \(r_{gm}\) (implied cost of equity capital estimates based on Gode and Mohanram (2003)), \(r_{ct}\) (implied cost of equity capital estimates based on Claus and Thomas (2001)), and \(r_{gls}\) (implied cost of equity capital estimates based on Gebhardt et al. (2001)).
- **Dummy for mandatory IAS adopters**: a dummy variable equal to one if a firm does not adopt IAS until 2005, and zero otherwise.
- **Dummy for late voluntary IAS adopters**: a dummy variable equal to one if a firm adopts IAS after June 2002 but before 2005, and zero otherwise.
- **Dummy for early voluntary IAS adopters**: a dummy variable equal to one if a firm does not adopt IAS until June 2002, and zero otherwise.
- **Dummy for post-mandatory adoption period**: a dummy variable equal to one if a firm-year observation falls in or after 2005, and zero otherwise.
- **Dummy for mandatory IAS adopters** * Dummy for post-mandatory adoption period: the interaction term between the two dummy variables.
- **Dummy for late voluntary IAS adopters** * Dummy for post-mandatory adoption period: the interaction term between the two dummy variables.
- **Dummy for early voluntary IAS adopters** * Dummy for post-mandatory adoption period: the interaction term between the two dummy variables.
- **Private placement**: a dummy variable equal to one if a firm has a private placement under Rule 144A according to JP Morgan ADR Analytics.
- **OTC listing**: a dummy variable equal to 1 if a firm trades its shares in the over-the-counter markets of the U.S. according to JP Morgan ADR Analytics.
- **Exchange listing**: a dummy variable equal to 1 if a firm trades its shares on the NYSE, NASDAQ or AMEX according to JP Morgan ADR Analytics.
- **Inflation**: the yearly median of country-specific, one-year-ahead monthly inflation rates.
- **Log_total assets**: the natural logarithm of total assets in millions of U.S. dollars at year end.
- **Leverage**: financial leverage computed as the total liabilities divided by total assets at year end.
- **Return variability**: the return variability computed as the annual standard deviation of monthly stock returns at year end.
- **DIndustry**: dummy variables indicating a firm’s industry membership based on the industry classification in Campbell (1996).
- **DCountry**: dummy variables for countries.