ACCOUNTING STANDARDS AND INTERNATIONAL PORTFOLIO HOLDINGS:

ANALYSIS OF CROSS-BORDER HOLDINGS FOLLOWING MANDATORY ADOPTION OF IFRS

by

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I dedicate this dissertation to my parents, Donwoon Yu and Hyunhan Huh, to my uncle

Donald Yu, to my sister Sungmin Yu, and to my brother Youngsol Yu – all of whom

supported me enormously throughout the Ph D. process.

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ABSTRACT

Accounting Standards and International Portfolio Holdings:

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Prior literature shows that investors under-invest in foreign firms due to information asymmetry problems. I posit that differences in local accounting standards are a source of the information asymmetry among investors. Using security-level holdings of international mutual funds, I find that harmonizing accounting standards (adoption of IFRS) increases foreign mutual fund holdings. Harmonizing accounting standards increases cross-border holdings 1) directly by reducing the information processing cost of foreign investors and 2) indirectly by reducing the effect of other barriers on cross-border investments such as geographic distance. Further analysis suggests that differences in the enforcement of the standards are sufficient to curb the benefits of accounting harmonization.

Chapter 1

Introduction

It is well established that investors are reluctant to hold securities outside their domestic markets. The underweighting of foreign investments, referred to as home bias, has been consistently observed across different classes of investments and types of investors (Ahearne et al. 2004; Kang and Stulz 1997; Lewis 1999). The most common explanation for equity home bias is that additional information costs exist when investing abroad (Coval and Moskowitz 2001; Van Nieuwerburgh and Veldkamp 2009). This paper examines how local accounting standards, and the changes induced by adopting international accounting standards, influence the cross-border holdings decisions of investors.

Accounting information constitutes one of the key inputs in portfolio investment decisions. Therefore, information presented under different accounting standards or practices is likely to be a source of additional processing costs. Such processing costs consist of direct costs to learn different accounting standards as well as indirect costs arising from the need to interpret financial statements in light of local practices. When accounting information is presented under the same standards, investors find it easier to

process the information and are more likely to rely on financial statements relative to other private information.

The difficulty in examining the effect of accounting information on cross-border investment is that determinants of firm's accounting choices are commonly associated with other factors that affect investors' holding decisions. Thus, it is hard to attribute the full extent of the observed association to accounting standards alone rather than to other factors such as quality of institutions or reporting incentives. However, a natural experiment recently occurred when 89 countries mandated the adoption of International Financial Reporting Standards (IFRS) for most, but not all, of their local companies. I examine the effect of IFRS adoption on cross-border investment decisions using security-level holdings data of international mutual funds. The change in the regulatory environment provides a powerful setting to identify how lowering information cost affects investment decisions across borders. Furthermore, since not all firms in a country were required to adopt IFRS, and some have already adopted it, there is a natural control for country-level changes in non-information based motives for international portfolio holdings. While the ideal research design would be to have firms randomly assigned to the adopter and non-adopter group, such a natural experiment is not possible. Hence, I exploit the variation in the capital sources within an adopting firm and examine the changes in firm-level holdings from various countries following IFRS adoption. By focusing on changes in the holdings from different countries, and relating it to the varying degree of harmonization triggered by the IFRS adoption, the research design effectively

uses investors from other countries investing in the same firm as a control. Hence, I control for changes in firm-level factors that affect all investors equally.

I first start by examining changes in holdings of foreign investors to establish the aggregate holdings pattern following IFRS adoption. Consistent with accounting information lowering information processing costs, I find that foreign mutual funds increase their holdings by 2.7% of total outstanding shares for first-time IFRS adopters relative to firms that were not required to adopt IFRS in the same country.[1] While there was also a general increase in domestic mutual fund holdings during this period, the increase in ownership by foreign funds is higher for the mandatory adopters than the increase in ownership by domestic funds. Consistent with this, firms that were not required to adopt IFRS show almost no change (0.1%) in ownership by foreign funds, yet show a meaningful increase (2.5%) in the ownership of domestic funds. Taken together, these findings suggest that fund managers increased their holdings of foreign securities following IFRS adoption because of the reduction in information processing costs, and they decreased holdings of domestic securities where IFRS reduced their local information advantage.

I explore two channels through which harmonizing accounting standards increases foreign holdings. First, I examine whether the adoption of IFRS increases cross-border holdings by directly reducing the information processing cost of foreign investors. Using measures of international GAAP differences (Bae, Tan, and Welker 2008), I find that

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[1] Untabulated results show that this finding is robust to alternative control groups (i.e., non-adopting firms matched on size and firms from countries that did not adopt IFRS). Also, firms that voluntarily adopt IFRS before the year of mandate show an increase in foreign mutual fund holdings (2.5%) similar to that of the mandatory adopters in the year of the IFRS mandate. This is consistent with mandatory IFRS adoption increasing comparability even for firms that were not directly affected by the mandate (Barth et al. 2009; DeFond et al. 2009).

differences between the local accounting standards of the reporting firm and the local accounting standards of the investing fund (i.e., accounting distance) can explain the country variation in the holdings of each firm. Specifically, I find that firms have diminishing ownership from funds in countries with greater accounting distance. Furthermore, I find that increase in holdings following adoption of IFRS is driven by capital flows from countries where IFRS triggered a large reduction in the differences between the investing country's and the adopting country's accounting standards.

Second, I examine whether harmonizing accounting standards increases cross-border holdings by reducing the effect of other information barriers. Prior literature finds many other barriers to cross-border investments that are unrelated to accounting standards (i.e. geographic distance, economic distance, and cultural distance). Many of these barriers arise from a general lack of familiarity, and thus have an information asymmetry component (Ahearne et al. 2004; Portes and Rey 2005).[2] Consequently, a natural question is to what extent harmonizing accounting standards can reduce the impact of other information barriers. For example, harmonizing accounting standards can reduce the effect of geographic distance by inducing investors to rely more on public financial statements and less on private information sources.

Identifying the marginal effect of other information barriers following IFRS adoption, however, presents a challenge since different information barriers share common variations, i.e., accounting standards are likely to be more different among distant countries that have less information flows. Hence, simply comparing the impact of

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[2] For example, geographic distance has been interpreted as a measure of information acquisition cost or the likelihood of investors suffering information asymmetry (Portes and Rey 2005).

information barriers before and after IFRS adoption will yield inconclusive results, especially if the global IFRS adoption was clustered among countries with less information flows. Therefore, I hold the level of accounting harmonization constant by comparing the changes in holdings of investors who experienced equal reduction in accounting distance but faced varying level of information barriers. That is, I compare the effect a unit reduction of accounting distance had on holdings of investors with high information barriers and low information barriers within an adopting firm. I find that harmonizing accounting standards has a stronger effect on capital flows among countries with high information barriers, i.e., distant countries and countries. This indicates that reducing 'accounting distance' has an interactive effect of reducing the effect of other information barriers, perhaps because better knowledge of accounting standards makes private information less necessary. That is, harmonizing accounting standards encourages investors to seek remote investment opportunities that they would not have pursued if the information were presented under different accounting standards.

I ask whether reducing the common noise within the boundaries of each accounting standard can reduce the effect of accounting barriers.[3] In particular, I examine whether the effect of 'accounting distance' on cross-border holdings differs by level of common noise shared across all investors. Using analyst forecast errors as the measure of common noise in accounting information, I find that 'accounting distance' impedes cross-border investments more for firms with *less* common noise in the accounting information. I show that this is consistent with an equilibrium model of asset demand where all

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[3] Common noise is defined as noise in the accounting information signal that has common variance for both domestic and foreign investors. Refer to section 2.2 for details.

investors observe a public signal with common noise but have differing abilities to interpret the information. The model shows that when there is less common noise shared across all investors, foreign investors become more sensitive to their information disadvantage because the weight of noise from 'accounting distance' increases. As a result, when there is less common noise in the accounting information, differences in accounting standards become a binding constraint for foreign investors who are less knowledgeable about the local standards. Hence, when foreign investors have limited understanding of the local accounting standards, reducing common noise in the local accounting standards can exacerbate the information disadvantage of the foreign investors. This suggests that harmonization across regimes is a more effective means to reduce the underinvestment from accounting distance than a unilateral improvement in a country's reporting regime.

Finally, I examine the interactive effect of the adoption of IFRS and the enforcement of the new standards. A voluminous strand of literature shows that country-level enforcement is sufficiently important to curb the benefits from adopting certain accounting standards (Schipper 2005; Ball 2006; Holthausen 2009). Partitioning by different level of enforcement, I find that the benefit of accounting harmonization is maximized when it entails rigorous enforcement of the accounting standards. However, weak legal enforcement in a broader sense does not necessarily imply less benefit following IFRS adoption; the benefit of accounting harmonization even in countries with weak legal enforcement is not negligible. The interactive effect of accounting harmonization and enforcement highlights the fact that neither accounting standards nor the correct enforcement can be considered in isolation.

This paper contributes to the literature by directly showing how frictions from accounting standards influence cross border holdings. A strand of empirical studies shows that proxies of information cost can explain a large portion of the variation in cross-border holdings (Obstfeld and Rogoff 2000; Portes and Rey 2005). However, the exact nature of the information costs that causes the asymmetry among investors has received less attention. I show that differences in accounting standards create barriers to cross-border investments even for mutual funds that are among the most sophisticated users of financial information (Beneish and Yohn 2008).

My findings also suggest a possible explanation for the economic benefit of adopting IFRS. Prior literature shows that the benefit of IFRS stems from both the standards being of higher quality (Armstrong et al. 2007; Barth et al. 2008) as well as from accounting information being presented in a form that is more familiar to investors (Bradshaw et al. 2004; Aggarwal et al. 2005).[4] In this paper, I focus on how adopting IFRS changes the mix of investors in each firm. By focusing on changes in holdings of investors from different countries, I control for firm level factors that affect all investors equally, such as an overall improvement in information quality. This is in contrast to most previous studies that examine the effect of IFRS adoption from an *average* investor's perspective (Armstrong et al. 2007; Daske et al. 2008; Florou and Pope 2009; Brüggemann et al. 2009). Thus, my analysis provides direct evidence on how harmonizing accounting standards affects investment decisions by reducing information asymmetry among investors.

The rest of the paper is organized as follows. In section 2, I review the literature and develop the major hypotheses based on a simple model of equilibrium asset demand

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[4] Previous studies refer to the former as the 'information benefit' and the later as the 'harmonization benefit.'

under asymmetric information. In section 3, I describe the data and present a simple analysis of aggregate foreign holdings. In section 4, I empirically test how harmonizing accounting standards changes cross-border holdings of international mutual funds from different countries. In section 5, I test the robustness of the results, and conclude in section 6.

Chapter 2

Background and hypotheses development

2.1 Accounting information and cross-border investment decisions

Prior literature documents that cross-border investment decisions are related to international differences in accounting standards. This relationship is observed because foreign investors have preferences towards information presented in a familiar form when making cross-border investment decisions (Leuz and Verrecchia 2000). Barth, Clinch, and Shibano (1999) analytically show that foreign investors prefer harmonized accounting standards because it reduces the costs of acquiring expertise comparable to local investors. In addition, Leuz, Lins, and Warnock (2009) show that foreign investors prefer investing in countries with higher-quality disclosure rules because local investors are less likely to have access to private information in such countries. However, when information is presented under local accounting standards, foreign investors find it costly to process the information, leading to equity home bias. Taken together, the literature argues that foreign investors prefer international standards because it reduces their information disadvantage relative to the local investors.

Recently, the IASB has promoted adoption of IFRS around the world claiming that one of the motivations for countries to adopt IFRS is to attract foreign capital flows by reducing information barriers. However, there are skeptical views on whether adopting an international accounting standard itself will bring significant changes in investment decisions. Accounting standards are complementary to the institutional environment, thus, it is unclear whether adopting international accounting standards will provide better information to investors in all countries (Holthausen 2003). In addition, given concerns around the implementation and enforcement of standards, critics claim that the benefit of mandating IFRS is not immediately obvious (Ball et al. 2003; Holthausen and Watts 2000).

Nonetheless, several studies show that adopting international accounting standards affects investors' investment decisions. Adopting IFRS changes investors' beliefs because the new standards require increased level of disclosure (Barth et al. 2008). And even if the level of disclosure remains unchanged, adoption of new accounting standards can affect investors by increasing comparability across countries (Bradshaw et al. 2004; DeFond et al. 2009). A recent survey of 187 international mutual fund managers in the European Union finds that 72% of the surveyed fund managers consider adoption of IFRS to have influenced investment decisions, and nearly half of the 72% state that IFRS changed their holdings decisions.[5] Fund managers consider the key benefit of IFRS to be the increased level of consistency in financial reporting between jurisdiction and sectors, suggesting that increased comparability from the adoption of IFRS is significant enough to alter investment decisions.

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[5] PricewaterhouseCoopers MORI Survey (2006) 'IFRS, the European investors' view.'

Another channel through which adopting international accounting standards can affect investment decisions is by increasing visibility of securities in less familiar countries. Investors often overlook certain groups of securities with low visibility (Merton 1987; Lehavy and Sloan 2008; Bushee and Miller 2009). Using harmonized accounting standards can be one way to increase visibility of remote investments that have been overlooked. Consistent with this argument, studies show how adopting IFRS increases private equity investment (Cumming and Johan 2007), foreign direct investment (Marquez-Ramos 2008; Li and Shroff 2009), institutional investment (Florou and Pope 2009), and trading activities of individual investors (Brüggemann et al. 2009). However, a common criticism of these findings is that it is difficult to distinguish whether the observed benefit is from increased familiarity or simply from IFRS providing higher-quality information. In the following section, I address this question using a model of equilibrium asset demand.

2.2 Hypothesis development

To guide my empirical work, I present a simple characterization of the equilibrium asset demand when two investors, domestic and foreign, observe public signals but have differing abilities to interpret the information. I study how the demand of the two investors is affected by changes in the information structure for a given firm.

Each investor j is endowed with shares in two risky assets, one domestic and one foreign, and a single global riskless asset, with a normalized price of one.[6] V_i is the value

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[6] Thus, the model assumes that any exchange risk or purchasing power risk can be completely hedged.

of a risky asset in each country i (i =1, 2). The terminal payoffs of both risky assets (V_i, i=1, 2) are independent and normally distributed with mean μ_i and variance f_i,

$$V \sim \left[\begin{pmatrix} \mu_1 \\ \mu_2 \end{pmatrix}, \begin{pmatrix} f_1 & 0 \\ 0 & f_2 \end{pmatrix} \right].$$

Individual j's wealth is the sum of their exogenous endowment W_0^j and the net returns ($V_i - P_i$) from holding domestic ($D_{i=j}^j$) and foreign ($D_{i \neq j}^j$) risky assets, where P_i is the price of the risky asset in each country i. That is,

$$W^j = W_0^j + D_1^j(V_1 - P_1) + D_2^j(V_2 - P_2). \tag{1}$$

Each investor in country j receives information (Y_i^j) about the value of each asset i, which is used to derive the demand for each asset. The critical assumption is that the precision of the information is asymmetric for domestic and foreign investors. In particular, the noise in investors' information has two components: a common noise component (ε_i^j) for all investors, and an idiosyncratic noise component (δ_i^j) for foreign investors only.[7]

If i = j (domestic investor) $Y_i^j = V_i + \varepsilon_i^j, \text{ where } \varepsilon_i^j \sim N(0, \sigma_i),$

and if i ≠ j (foreign investor) $Y_i^j = V_i + \varepsilon_i^j + \delta_i^j, \text{ where } \delta_i^j \sim N(0, \theta^j).$

ε_i^j represents the common noise shared by domestic and foreign investors, and the precision σ_i depends only on the country where the asset is located. This noise is due to

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[7] An alternative specification is to include idiosyncratic noise for the domestic investors that have lower variance than the idiosyncratic noise of foreign investors. As long as the idiosyncratic noise of the domestic and foreign investors are independent, the specification above is a reduced form of this alternative specification, hence yields identical implications.

an imperfect financial reporting environment arising from management opportunism or weak enforcement. δ_i^j represents the additional noise for investors when they invest in foreign assets, where the precision depends on the location of the investors. This additional noise can arise from investors having a murky understanding of the business in foreign countries, but also from their limited ability to interpret what the accounting information implies about the terminal asset value V_i.[8] It should be noted that my framework deviates from rational expectation models because foreign investors suffer from this informational disadvantage, yet do not use price to infer the signals of domestic investors.[9] That is, there exists some 'cost to arbitrage' (Shleifer 2000) or 'limited attention' (Hirshleifer 2001) for foreign investors that causes them to not attend to the information impounded in price.

With this framework, I can derive the investor's demand function by maximizing the expected conditional utility $E\left[U\left(W^j \middle| Y^j \right) \right]$. Appendix A derives the demand function of domestic and foreign investors assuming a negative exponential utility with a risk aversion factor of one. For a given signal realization, the demand function simply states that each investor compares his expected value to price and weights the difference by his posterior precision. To characterize the equilibrium demand as a function of the information structure, I determine the market-clearing price by equating aggregate demand

[8] This is a common assumption in the analytical models of home bias where the information disadvantage of foreign investors is exogenously given. Gehrig (1993) presents a two-country model where domestic investors are endowed with superior private information and shows that this leads to underinvestment in foreign assets. Gordon and Bovenberg (1996) endogenize the information disadvantage of foreign investors by allowing them the option to acquire costly information. As long as domestic investors are endowed with an initial information advantage, there is underinvestment of foreign investment in equilibrium.

[9] Similar implications can be drawn from standard noisy rational expectation models, where investors use price to infer information about the domestic investors. As long as there is a random noise component that prevents price from perfectly revealing, identical implications can be drawn for the equilibrium demand. See Gehrig (1998).

to aggregate supply, Z_i $(i = 1, 2)$, and then substitute this equilibrium price back into the demand function.[10] Averaging over signal realizations, Appendix A derives the equilibrium expected demand for domestic and foreign investors given as:

domestic investors' demand for asset 1 is

$$E\left(D_1^1\right) = Z_1 \left(\frac{f_1^{-1} + \sigma_1^{-1}}{(f_1^{-1} + \sigma_1^{-1}) + \left(f_1^{-1} + \left(\sigma_1 + \theta^2\right)^{-1}\right)} \right) \qquad (2)$$

and foreign investors' demand for asset 1 is

$$E\left(D_1^2\right) = Z_1 \left(\frac{f_1^{-1} + (\sigma_1 + \theta^2)^{-1}}{(f_1^{-1} + \sigma_1^{-1}) + \left(f_1^{-1} + \left(\sigma_1 + \theta^2\right)^{-1}\right)} \right). \qquad (3)$$

Figure 2.1 illustrates how the equilibrium demand of domestic and foreign investor is affected by varying levels of idiosyncratic noise and common noise. Two major implications can be drawn from the demand functions. First, holding all else constant, equilibrium demand of foreign investors is a decreasing function of the idiosyncratic noise of foreign investors θ^j, illustrated in Panel A. This also implies that domestic investors' demand is increasing in the idiosyncratic noise of foreign investors. Thus, if differences in accounting standards add additional noise to foreign investors' information signals, this lowers the demand for foreign securities consistent with equity home bias. This leads to the following first hypothesis,

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[10] In other words, the equilibrium demand is derived from the indirect demand function with market-clearing price.

H1: Firms will have diminishing ownership from funds in countries with greater accounting distance (i.e., differences in the local accounting standards of the reporting firm and the investing fund).

The second observation from equations (2) and (3) is that a lower level of common noise σ_i will cause investor's demand to be more sensitive to the idiosyncratic noise θ^j. Panel B of Figure 2.1 shows that difference in the equilibrium demand of domestic and foreign investor increases as the common noise shared across all investors σ_i is reduced. This occurs because the holdings of investors are determined by the relative weight of the idiosyncratic noise and the common noise. As the common noise decreases, the relative portion of the idiosyncratic noise becomes larger, making the demand of investors more sensitive to the idiosyncratic noise. As long as domestic investors continue to have an advantage over foreign investors ($\theta^j > 0$), simply improving the information quality of all investors (i.e. reducing σ_i) will exacerbate the information asymmetry among investors. This also implies that in the cross-section, firms with low common noise in the accounting information (i.e. lower σ_i) will have more underinvestment from differences in accounting standards than firms with high common noise.

H2: Underinvestment from funds in countries with greater 'accounting distance' will be more severe for firms with _less_ common noise in their accounting information than for firms with more common noise.

Finally, I examine how accounting harmonization (i.e., adoption of IFRS) will affect cross-border holdings decisions of different investors. Adoption of IFRS will reduce the

'idiosyncratic noise' for investors that are more familiar with IFRS.[11] More broadly, adopting IFRS will have a greater effect on foreign investors who experience a greater reduction in the idiosyncratic noise (θ^j) following the adoption. Hence, I expect firms adopting IFRS to experience greater increase in holdings from countries where differences in accounting standards reduced the most (a greater change in θ^j) following IFRS adoption. Relating changes in accounting distance to the changes in holdings is a direct examination of the downward-sloping demand in Figure 2.1, Panel A.

H3: Holding common noise constant, firms adopting IFRS will have greater increase in holdings from countries where adoption of IFRS resulted in greater reduction in 'accounting distance' (greater change in θ^j).

Note that IFRS adoption is likely to reduce the 'common noise (σ_i)' as well as the 'idiosyncratic noise (θ^j)' in the accounting signals.[12] Furthermore, Panel B of Figure 2.1 shows that reducing accounting distance (i.e., idiosyncratic noise) has a greater effect on foreign investors' demand when there is less common noise shared across all investors. While this implies that the relationship in H3 is likely to be stronger for firms that have less common noise in their accounting information, the prediction of H3 between high and low common noise firms is unclear because the level of common noise is likely to change following IFRS adoption. Since I do not know the resulting level of common noise

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[11] Prior literature refers to this as the 'harmonization benefit' of adopting IFRS. (Barth et al., 1999)

[12] IFRS will reduce the 'common noise' in accounting information if international accounting standards lead to increased disclosure with better quality. Prior literature refers to this as the 'information benefit' (Barth et al., 2008).

following IFRS adoption, I have no differential prediction of H3 for each group of high and low common noise firms.

In the empirical tests that follow, I examine these hypotheses using cross-border holdings of international mutual funds as a proxy for investors' demand from different countries.

Chapter 3

Sample selection and analysis of aggregatge foreign holdings

3.1 Mandatory adoption of IFRS

I determine the year of country-level mandatory adoption of IFRS from International Accounting Standards Plus, an annual newsletter published by Deloitte Touche Tohmatsu, and the country reports of the United Nations Economic and Social Council (ECOSOC). Firm-level adoption dates are collected from Thompson Datastream. Since these established databases are known to have coding errors (Daske et al. 2008), I cross-check the subset of all non-adopting firms with two other databases, Amadeus and Orbis, both provided by Bureau van Dijk Electronic Publishing. For the 86 firms that seem to show discrepancies across databases, I manually search their financial statements and individually code the adoption years.

At the country level, the IAS board has made significant progress in promoting IFRS worldwide, although there is still considerable divergence across countries in the rate and the extent of the adoption. For this study I classify all countries that have endorsed the full version of IFRS (i.e., the EU countries) and countries that chose to gradually adjust national standards in line with IFRS (i.e., Australia, Hong Kong, and New Zealand) as

mandatory adopters.[13] This results in an initial sample of 89 countries. Eliminating countries with missing financial data in Thompson Datastream reduces the final sample to 28 countries.[14]

Table 3.1 shows the percentage of firms adopting IFRS in the 28 countries from 2000 to 2007. Within each country, the adoption process also exhibits considerable heterogeneity across firms. Two findings stand out from Table 3.1. First, a significant number of firms voluntarily adopted IFRS before it was mandated.[15] Second, even after the year of mandate there are firms who still report under the local standards. This is because mandatory adoption of IFRS was limited to consolidated accounts. Companies without consolidated accounts or those that qualify for the small-medium entity exemption continue to report under local accounting standards. The definition of a small-medium entity varies by each country's legislation and is based on the nature of the entity rather than on its size (PricewaterhouseCoopers, IFRS for SMEs Pocket Guide 2007). For example, Aero Inventory Plc., a UK company with total assets over USD 800 million, qualified for the small-medium entity exemption because it was listed on the Alternative Investment Market (AIM).[16] Also, Sadi S.P.A, one of the largest construction companies in Italy, did not report under IFRS in year 2005 because it was not required to report

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[13] Countries that have selectively adopted only a subset of the standards (i.e., India, Malaysia, and Thailand) are not included in the sample.

[14] Firm-level financial data is often missing for the emerging countries, especially in the African continent and the former Republics of the Soviet Union.

[15] Early adoption was permitted in many countries before the year of mandatory adoption. For example, Germany and Austria have allowed firms to adopt for their consolidated accounts as early as 1998. For countries like the UK where early adoption was not permitted, firms had the option to cross-list their shares and report consolidated accounts under other international standards.

[16] Firms listed on the Alternative Investment Market (AIM) were required to adopt IFRS starting after January 2007.

consolidated financial statements.[17]   Both voluntary adopters and non-adopters serve as

useful control samples.

Due to this variation in the adoption process of IFRS, I divide the sample into

three groups: firms that adopted early, firms that adopted in the year of mandate, and firms

that did not adopt during or after the year of mandatory adoption.   Empirically, I

categorize firms that adopted IFRS in fiscal years before IFRS was required as voluntary

adopters.[18] Mandatory adopters are firms that first adopt IFRS within two years after IFRS

was mandated at the country level.[19] All firms that did not adopt IFRS by the end of the

sample period (2007) are categorized as non-adopters. To ensure continuity, I delete firms

that delist before IFRS became mandatory at the country level and firms that exist only

after the mandatory adoption. Also, firms cross-listed in the US are excluded to ensure

that IFRS is the only international standard in consideration.   After merging with the

international mutual fund database, the final sample consists of 4,399 firms (650 voluntary

adopters, 3,474 mandatory adopters, and 274 non-adopters) across 28 countries.

Table 3.2 compares the characteristics of the different types of adopters over years

prior to IFRS adoption. Panel A shows that voluntary adopters are on average larger and

more profitable.   The median size of the mandatory adopters and non-adopters are

comparable, but the difference in the mean suggests that there are large outliers in the

upper tail for mandatory adopters. Although size was one reason non-adopters were

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[17] In 2007, Sadi S.P.A merged as Sadi Servizi Industriali Group and started reporting its consolidated financial statements under IFRS.

[18] Following prior literature (Daske et al. 2008), I also distinguish early voluntary adopters that adopt before the announcement of the mandatory adoption and late voluntary adopters that adopt after the announcement date. Untabulated results show that there are no observable differences in the holdings of the two types of voluntary adopters.

[19] For countries that have decided to adjust national standards to be in line with IFRS (i.e., Australia, New Zealand, and Philippines), all firms are considered to have mandatorily adopted IFRS in the year of mandate.

exempt from the mandatory requirement, the non-adopters in my sample still include many large firms because I require firms to have holdings from international mutual funds to be included in the sample.

In the empirical tests of aggregate foreign holdings, I examine changes in holdings of mandatory adopters using both non-adopters and voluntary adopters as benchmark groups. The regression analysis includes various firm-level and country-level controls to account for determinants of how regulation and a firm's reporting choice sorted the adopting and non-adopting firms. In the main empirical tests of Section 4, however, I focus on the mandatory adopters and exploit the variation in the capital sources within the adopting firm. By breaking down each firm's holdings by each source-country, the empirical test effectively uses investors from other countries investing in the same firm as the control group.

3.2 Cross-border holdings of international mutual funds

I examine how accounting standards affect cross-border holdings using security-level holdings data of international mutual funds. Security-level holdings data are compiled by Thompson Financial Securities (TFS) and contain cross-border mutual fund holdings in 39 countries. Earlier years of the database were used in several studies aggregated at the country level (Chan et al., 2005; Hau and Rey, 2008). In contrast, I use holdings at the security level to account for the variation in the IFRS adoption process within each country. The holdings cover an eight-year period from 2000 to 2007. Since

funds have different reporting frequencies, I undertake my analysis on an annual basis using the latest available reported holdings for each calendar year.[20]

In the TFS mutual fund database, holdings of funds in 59 different jurisdictions are available at the security level. The securities held by the funds cover a wide range of countries around the world. For each security, I compute aggregate holdings held by all mutual funds in the latest reporting period for each year. Thus, mutual fund demand in country j is measured as the aggregate percentage shares held by all funds in country j for a given firm.

An important assumption underlying my analysis is that the country of a fund's incorporation represents where the investor's capital originates. Albeit indirect, I argue that a fund's country of incorporation characterizes the investment decisions of local investors for two reasons. First, legal restrictions require mutual funds to raise capital primarily from domestic investors. For example, Fidelity holds affiliates across the world but restricts capital inflows to the local regions where each affiliate operates. Purchase orders of non-residents outside the region are not accepted for tax and regulatory reasons.[21] With the exception of offshore funds, which are excluded from the sample, capital inflows to each fund are restricted to regional investors.[22] Second, the investment behavior of a particular mutual fund reflects the preference of local investors who have delegated the

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[20] About one-half of the funds report their holdings on a semi-annual basis, and a third report on a quarterly basis.

[21] Similarly, US investors cannot purchase mutual funds issued in another country unless the funds are registered with the SEC. The only exception would be for mutual funds that issue privately to fewer than 100 people or issue only to sophisticated investors. Hedge funds, for example, circumvent the mandatory reporting requirements by qualifying for this exemption.

[22] Offshore funds are defined as funds incorporated in offshore financial centers as defined in the IMF's year 2000 Report on Offshore Financial Centers. Whether financial centers also qualify as offshore funds is disputed in the literature. In this study, I do not consider major financial centers (e.g., London, Hong Kong, and Singapore) as offshore, since they play a major role in processing information in the capital market (Gehrig 1998).

investment decision to the fund managers. Investors select from a variety of funds, which differ in investment strategy and geographic focus. Thus, holdings of particular funds reflect the revealed preference of local investors that invest in each fund.

Table 3.3 shows the descriptive statistics of fund holdings over the sample period 2000 to 2007 for the sample firms in this study. Panel A shows that the total percentage of shares held by mutual funds is 9.6% for an average firm, which is slightly lower than the findings from mutual fund holdings in US securities (Falkenstein 1996). Domestic funds hold 7.0% of these shares, and the remaining 2.6% is held by foreign funds. This indirectly reflects the reluctance of mutual funds to invest in foreign securities.

Panel B of Table 3.2 examines the distribution of foreign and domestic holdings by different types of IFRS adopters. Panel B clearly shows that the level of foreign ownership is related to a firm's tendency to adopt IFRS. For non-adopters, only 0.8% of the 12.5% shares held by mutual funds are held by foreign funds. On the other hand, for the voluntary adopters 3.6% of the 8.2% mutual fund shares are held by foreign funds, far above the 2.5% for mandatory adopters. In the following section, I test how the adoption of IFRS affected the holdings of different type of adopters.

3.3 Multivariate analysis of aggregate holdings

In this section, I examine the changes in aggregate holdings for the mandatory adopters relative to the non-adopters and the early voluntary adopters using the following difference-in-difference model,

$$\text{Holdings}_{i,t} = \alpha_0 + \beta_0 \times D_{\text{Mandatory adopter}} \times D_{\text{Post mandate}} + \gamma_0 \times D_{\text{Non-adopter}} + \gamma_1 \times D_{\text{Non-adopter}} \times D_{\text{Post mandate}}$$
$$+ \delta_0 \times D_{\text{Voluntary adopter}} + \delta_1 \times D_{\text{Voluntary adopter}} \times D_{\text{Post mandate}} + \sum_{n=1}^{N} \lambda_{0,n} \times \text{country control} \qquad (4)$$
$$+ \sum_{m=1}^{M} \lambda_{1,m} \times \text{firm control} + \varepsilon_{i,t}.$$

$\text{Holdings}_{i,t}$ is the percentage of total outstanding shares held by mutual funds for firm i in year t. $D_{\text{Mandatory adopter}}$ is an indicator variable set to one if a firm is a mandatory adopter. $D_{\text{Post mandate}}$ is an indicator variable that takes a value of one for fiscal years ending on or after the mandatory adoption. The β_0 coefficient is the main term of interest, which measures the average increase in fund holdings of mandatory adopters following IFRS adoption. $D_{\text{Non-adopter}}$ is an indicator variable set to one if a firm is a non-adopter, and zero otherwise. Also, $D_{\text{Voluntary adopter}}$ is an indicator variable set to one if a firm is a voluntary adopter.[23] The increase in the holdings of mandatory adopters relative to the increase of non-adopters (voluntary adopters) can be examined by comparing the β_0 coefficient to $\gamma_1 (\delta_1)$.

This difference-in-difference design implicitly controls for any differential holdings in the years following IFRS adoption that affected holdings of all firms and for any differential in holdings among different types of adoption firms not attributable to IFRS. Nonetheless, I also include a rich set of country and firm level controls from prior literature to account for determinants of cross-border holdings that can differentially affect different type of adopters. Country-level controls include both macroeconomic factors and policy factors that affect decisions to invest in a certain country. Specifically, I include

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[23] Note that for voluntary adopters, years prior to adoption are dropped from the sample to control for the changes in holdings from the voluntary adoption.

market capitalization/GDP (*Market cap*), Market return (*Mkt return*), GDP (*GDP*) and GDP growth (*Growth*) to capture macroeconomic performance. I also include withholding tax rate of dividends (*Withholding tax*), market turnover (*Turnover*) and exchange rate regime (*Exchange*) to account for policy factors that affect transaction costs of investing abroad. *Turnover* is a proxy for trading activities that measures indirect cost from barriers to arbitrage (Blouin et al. 2009). *Exchange* represents the stability of the local currency and is an indicator (0–5) that takes a higher value if the currency is free floating (Reinhart and Rogoff 2003). Finally, I include measures of the quality of the institutions (e.g., legal origin (*Code law*), anti-director law index (*SHright*) and rule of law index (*Enforce*)), which have been shown to promote foreign investments (La Porta et al. 1998). Detailed definition and sources of each control variable are described in Table 3.5, Panel A.

Since the estimation of equation (4) uses security-level holdings, I also include firm-level attributes shown to affect cross-border holdings in prior literature (Aggarwal et al., 2005; Barth et al., 2008). Firm-level controls include measures of firm size (*size, # Analysts*), performance (*ROA, ROE, Div. yield*), and growth potential (*Leverage*, MB, and PE). I also include governance measures to control for the preference of foreign investors towards well-governed firms (Leuz et al. 2009), i.e., an indicator variable for firms that are audited by a big five audit firm (*Big 5 audit*) and the percentage of float shares available to ordinary investors (*Free float*).[24] Finally, to control for any unobserved structural shifts in the mutual fund's holdings during the sample period, I include both country fixed effects and industry fixed effects in the estimation.

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[24] A large number of observations are missing for these two governance variables. Firms with missing auditor information are assumed to have an indicator value of zero. Firms with missing float data are assumed to have all shares available to ordinary investors.

Table 3.4 presents the results of estimating equation (4). I predict that if adopting IFRS lowers the information-processing cost of foreign investments, the changes in foreign ownership will be higher for the mandatory adopters than for the non-adopters. Coefficients show that the average foreign holdings of mandatory adopters increase from 3.5% $(= \alpha_0)$ to 6.2% $(= \alpha_0 + \beta_0)$ following adoption of IFRS (Model (3)). This is in contrast to the average foreign holdings of non-adopting firms, which changes from 2.7% $(= \alpha_0 + \gamma_0)$ to 2.71% $(= \alpha_0 + \gamma_0 + \gamma_1)$ during the same time-period (Model (3)). Statistical significance of each coefficient is assessed after correcting for time-series dependence by clustering standard errors on country-industry.[25, 26] F-tests clearly show that the diffences in the two increases (β_0 and γ_1) are statictically significant. In Model (4) of Table 3.4, I estimate equation (4) both with and without the firm-level and country-level controls described earlier. Including the controls yield similar coefficient estimates, with slightly reduced significance. Thus, hereafter I only discuss the estimation results without including the controls.

Interestingly, the changes in the holdings of voluntary adopters are very similar to the changes of mandatory adopters. Coefficients show that the average foreign holdings of voluntary adopters increase from 5.1% $(= \alpha_0 + \delta_0)$ to 7.5% $(= \alpha_0 + \delta_0 + \delta_1)$ following

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[25] There remains a possibility of underestimating standards errors when there is cross-sectional dependence in the observations within each year. However, I do not cluster the standard errors on year because the consistency of clustered standard errors depends on having a sufficient number of clusters (Petersen 2008). Since the time series of this study is relatively short, and far below the required number (see Petersen 2008, Figure 5), I do not cluster the standard errors by year. Untabulated results show that the estimation is robust to two-way clustering on year and country-industry.

[26] Estimating equation (4) with unbalanced number of firm observations across different countries can result in excessive weights being placed on large countries that cannot be completely corrected by clustering the standard errors. To address this concern, section 5 tests the sensitivity of the results using the country-mean as the unit of observation.

adoption of IFRS. Although the voluntary adopters were not directly affected by the mandate, the global harmonization process could have increased foreign holdings of these firms since only recently did most foreign investors participate in the adoption of IFRS. Another possible explanation is that these firms benefit from reporting externality because it is easier to compare across all firms (DeFond et al. 2009).[27] This suggests that in addition to IFRS reducing the information processing cost from accounting standards, improving comparability is another important channel through which adopting IFRS promotes foreign capital.

Figure 3.1 graphically illustrates the average changes in the foreign and domestic holdings.[28] Panel A shows that percentage of foreign holdings increases by 2.7% for mandatory adopters while non-adopters have only a 0.1% increase during the same period. This is in stark contrast to the increase in domestic holdings as shown in Panel B, which shows a smaller increase for the mandatory adopters (1.4%) than for the non-adopters (2.5%). As in Table 3.4, the changes in the foreign and domestic holdings of voluntary adopters are very similar to the changes of mandatory adopters. Taken together, the differences in the changes of foreign and domestic ownership suggest that fund managers have increased their holdings of foreign securities after the adoption of IFRS, and have reduced holdings of domestic securities where IFRS reduced their information advantage.

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[27] Consistent with this, untabulated results show that the increases in holdings of these voluntary adopters are driven by funds that invest primarily (i.e., more than 50% of their asset-under-management) in countries that mandated IFRS.

[28] Since this is a univariate comparison of the average holdings following IFRS adoption across different type of adopters, the changes slightly differ from the estimates of the multivariate model in equation (4).

Chapter 4

Analysis of the effect of accounting distance on bilateral holdings

4.1 Accounting distance and other determinants of bilateral holdings

In the previous section, I examined changes in aggregate holdings following IFRS adoption. In this section, I explore the country-variation in the fund holdings by breaking down the foreign holdings into holdings from different countries. Using a pair-wise measure of differences in local accounting standards between two countries, I directly test whether differences between the local accounting standards of the reporting firm and the local accounting standards of the investing fund can explain the country variation in the holdings for each firm. Disaggregating the foreign holdings by each country also allows me to examine the significance of accounting distance after controlling for other determinants of bilateral cross-border holdings (i.e., geographic, economic, and cultural distance). Also, I can directly test whether the capital flows following IFRS adoption were driven by countries where differences in accounting standards reduced the most following IFRS adoption.

The measure of differences in local accounting standards is based on Bae, Tan, and

Welker (2008).[29] This measure is constructed based on a survey of seven global accounting

firms (Nobes 2002) designed to examine how much national accounting standards deviate

from IFRS.[30] The two-year survey presents a detailed comparison of different accounting

rules, and classifies the accounting rules to be either the same or different from IFRS. Bae

et al. (2008) identify 21 accounting standards based on whether the standards show

sufficient variation across countries and also have been recognized as a key accounting item

in prior literature (Comprix et al. 2003). A composite measure of accounting distance can

be constructed for each country-pair by summing the 21 binary values assigned after

comparing individual accounting standards. Bae et al. (2008) consider two accounting

standards as similar when both rules comply with IFRS or when both rules follow local

standards that are non-compliant with IFRS. However, it is unclear that a pair of non-

compliant local accounting standards should be considered more similar to each other

than a pair of local accounting standards where only one complies with IFRS. Thus, I

modify Bae et al. (2008) and consider two non-compliant local accounting standards to be

similar only if the two countries are from the same legal origin (AD1). This gives a measure

of accounting distance across all country-pairs with a scale from 0 to 21. For robustness,

the empirical tests also include the original measure of Bae et al. 2008 (AD2), treating two

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[29] There exist other measures of differences in accounting standards across countries; however, these often relate to firms' accounting choice (Bradshaw et al. 2004) or their reporting behaviors (Hung 2000). Since my main interest is the extent to which accounting standards differ between two countries, I use a modified measure of Bae et al. (2008), which compares the national accounting standards of each country-pair.

[30] GAAP 2001 (Survey of National Accounting Rules Benchmarked Against International Accounting Standards) is a comprehensive two-year study that presents a detailed comparison of each local GAAP in 80 different accounting dimensions. Comparisons of each local standard are based on both the actual difference in the standards and the difference in accounting standards as perceived by the investors.

local standards that are non-compliant to IFRS as similar, and another measure of accounting distance that assumes two non-compliant local standards to be different (AD3).

Note that global adoption of IFRS introduced time-variation in the accounting distance measure by changing the similarity of accounting standards across all countries. Countries that adopted IFRS experienced a reduction in accounting distance with other countries that adopted IFRS at the same time. Countries not participating in the global adoption, on the other hand, became more distant from the accounting standards of the rest of the world. The empirical test uses this change in the accounting distance triggered by the IFRS adoption(ΔAD) to identify the effect of accounting harmonization on cross-border investments.

Barriers that cause frictions to bilateral holdings go beyond accounting standards. Previous studies have shown that both explicit and implicit barriers play a role in cross-border investment decisions. Explicit barriers such as capital controls exist but have been found to be non-binding (Tesar and Werner 1995). On the other hand, implicit barriers such as a general lack of familiarity due to geographic or economic distance have had greater empirical success. The leading explanation, known as the gravity model, finds that the majority of variance in cross-border capital flows can be explained by geographic distance. [31] In contrast to real goods, financial assets have no 'weight' and geographic distance cannot be a measure of transportation costs. Thus, for financial assets, geographic distance has been interpreted as a measure of the cost of information acquisition, and

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[31] The gravity model has been the workhorse model for cross-border trade in real goods since the 1960s. Geographic distance is shown to explain 70% of the variation in bilateral trade of real goods (Anderson and van Wincoop 2005). However, even in trade of financial assets where trading costs are unlikely to be affected by physical distance, this variable has been shown to be the strongest determinant of cross-border holdings (Portes and Rey 2005).

therefore the likelihood of investors suffering information asymmetry (Portes and Rey 2005).

Table 3.5 summarizes the other determinants of bilateral cross-border holdings included in this study. I include variables which proxy for other information barriers: geographic distance and phone traffic volume. Geographic distance ($ldist_{i,c}$) is a proxy for information cost and is motivated by the strong empirical support from previous studies. I also include measures of economic distance (e.g., phone traffic volume, and trade intensity) and cultural distance (e.g., common language, common border, and an egalitarianism index) between the two countries. Phone traffic volume ($teleph_{i,c}$) is the volume of phone traffic between two countries scaled by the geometric average of each country's population. Trade intensity ($ltrade_{i,c}$) is measured as the log of total net exports between two countries in billion US dollars. Common language ($comlang_{i,c}$) is an indicator variable set to one when two countries use a common language. Border ($border_{i,c}$) is an indicator variable set to one when two countries share a common border. Egalitarianism index ($egal_{i,c}$) is the squared difference of the two countries' cultural egalitarianism score (Siegel, Licht, and Schwartz 2008).

Correlations in Panel B of Table 3.5 show that accounting distance is related to other barriers of cross-border investments. Accounting distance is positively related to geographic distance and negatively related to information flows as measured by telephone traffic and common language. The correlations between accounting distance and other determinants make it hard to identify accounting information as a single binding

constraint on cross-border holdings. Thus, I use the changes in the accounting distance triggered by the IFRS adoption to examine how reducing accounting distance affects cross-border holding decisions.

4.2 Multivariate analysis of accounting distance and bilateral holdings

I examine the effect of accounting distance on holdings of each country-pair using the regression model in equation (5). This is a test of my first hypothesis stating that firms will have diminishing ownership from funds in countries with greater differences in their local accounting standards. The specification of baseline holdings is from Martin and Rey (2000) where holdings of investors from a source country in a destination country are determined by the market size of the two, and the estimates of trading costs between the two countries.

$$Holdings_{i,c,t} = \lambda_0 + \alpha_0 \cdot MVsource_{c,t} + \alpha_1 \cdot MVdest_{i,t} + \beta_0 \cdot AD_{i,c,t} + \sum_{m=1}^{M} \gamma_{1,m} \, controls_{i,t} + \varepsilon_{i,c,t} \quad (5)$$

$Holdings_{i,c,t}$ is the percentage of firm i's shares held by all funds from country c in year t.[32] For every firm-year, I calculate the percentage of shares held by funds from country c using the shares of the latest reporting period. $MVsource_{c,t}$ is the weight of mutual funds in the fund's country c relative to the world's mutual fund holdings. It should be noted that $MVsource_{c,t}$ corresponds to the predicted holdings of the international CAPM, where shares held by investors from a certain country equal the country's weight in the world's portfolio for any assets. Thus, absent any market frictions,

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[32] Aggregating the $Holdings_{i,c,t}$ variable over all countries that invest in firm i will yield the $Holdings_{i,t}$ variable in Section 3.

the theoretical value of α_0 equals 1. $\mathrm{MVdest}_{i,t}$ is the weight of mutual funds in firm i's country relative to the world's mutual fund holdings and measures the economic mass of the country where the firm is located.

$\mathrm{AD}_{i,c,t}$ is the difference in the accounting standards between firm i's reported standards and the local accounting standards of the fund investing from country c. The measure of accounting distance is recalculated for each country-pair when a country mandates IFRS. Since differences in accounting standards represent frictions to cross-border investments, I predict the β_0 coefficient to be negative.

Table 3.6 shows the results of estimating equation (5). For parsimony, the sample in the following tests only includes mandatory adopters. Voluntary adopters and non-adopters can be pooled into the regression with different measures of accounting distance resulting from the early (non-) adoption. However, since the distribution of accounting distance is likely to be different across different types of adopters, I only include mandatory adopters in the regression.[33]

Model (1) of Table 3.6 estimates the effect of the first accounting distance measure $\mathrm{AD1}_{i,c,t}$ on holdings from different countries. The estimated β_0 coefficient is negative and significance (β_0 = -0.0072, t-stat =-8.57) after adjusting for correlations in the time-series and the cross-section. The coefficient estimate on $\mathrm{AD1}_{i,c,t}$ shows that firms have 0.2% fewer shares from funds in countries with a one standards deviation (=0.27) higher level of the $\mathrm{AD1}_{i,c,t}$ measure. Also, coefficient estimates of other determinants of cross-border

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[33] Untabulated results show that including other type of adopters results in a more negative estimate of the β_0 coefficient with slightly higher significance.

holdings are appropriately signed but not always statistically significant. Coefficients of geographic distance($\text{ldist}_{i,c}$) and cultural distance ($\text{egal}_{i,c}$) enter with a negative sign, and proxies of information transmission ($\text{teleph}_{i,c}, \text{comlang}_{i,c}, \text{and border}_{i,c}$) are postive and significant. The overall message from Table 3.6 is that accounting distance ($\text{AD1}_{i,c,t}$) captures a type of information barrier that explains variation in cross-border holdings beyond other determinants found in previous studies. Coefficient estimates on other measures of accounting distance ($\text{AD2}_{i,c,t}$, $\text{AD3}_{i,c,t}$) yield negative coefficients with similar magnitude.

Next, I examine whether the effect of accounting distance on cross-border holdings differs by level of common noise in the accounting information. This is a test of my second hypothesis that greater differences in accounting standards will limit cross-border holdings more for firms with *less* noise in the accounting information. When there is less common noise shared by all investors, demand of each investor becomes more sensitive to differences in accounting standards (idiosyncratic noise) because the information (dis)advantage from accounting standards becomes more relevant.

To test how accounting distance affects cross-border investment in different information environments, I first divide all firms in each country into high and low common noise firms using analyst forecast errors, i.e., mean absolute deviation of the consensus forecast scaled by actual earnings. A firm is categorized as a high (low) level of common noise firm if its average forecast error during the pre-IFRS adoption period is

above (below) the country median.[34] Ranking all firms by level of common noise within each country allows me to examine the effect of common noise after holdings country-level accounting standards constant. I compare the effect of accounting distance on cross-border holdings in each sub-sample using the following equation,

$$Holdings_{i,c,t} = \lambda_0 + \alpha_0 \cdot MVsource_{c,t} + \alpha_1 \cdot MVdest_{i,t} + \beta_H \cdot I_{High}AD_{i,c,t} + \beta_L \cdot I_{Low}AD_{i,c,t}$$
$$+ \sum_{n=1}^{N} \gamma_n \cdot control_{i,c,t} + \varepsilon_{i,c,t} \tag{6}$$

where I_{High} (I_{Low}) is an indicator equal to 1 when the firm has high (low) level of common noise and 0 otherwise. Thus, the β_H (β_L) coefficient measures the association between accounting distance and holdings of investors for firms with high (low) level of common noise.

Table 3.7 presents the result of estimating equation (6). As in Table 3.6, estimated coefficients are negative for different measures of AD, indicating that investors in countries with greater differences in their local accounting standards hold fewer shares in a given firm. More importantly, the coefficient of accounting distance is more negative for firms in countries with low level of common noise (Model (1) β_L = -0.0078, t-stat =-3.89) than for firms with high level of common noise (β_H =-0.0068, t-stat=-2.34). Coefficient estimates using different measures of accounting distance yield similar results suggesting that the results are not sensitive to alternative measure of AD.

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[34] For firms with no analysts following in I/B/E/S, I replace the forecast error with the maximum forecast error in the firm's country-industry. This is consistent with prior literature showing that analyst following is increasing in the quality of the firm's information environment (Lang and Lundholm 1996).

The results suggest that differences in accounting standards cause barriers to cross-border holdings, and increasingly so when there is less common noise shared across all investors. This suggests that when there is information asymmetry among the investors, improving the general information quality can exacerbate the information disadvantage of the less informed. Hence, accounting standards impose barriers to international investments that may not be overcome by improving the information quality within the boundaries of the country's accounting standards.

4.3 Multivariate analysis of changes in holdings from different countries following IFRS adoption

The empirical tests, so far, relied on cross-sectional variation in accounting distance by pooling holdings from various countries over time. This raises the concern of possible omitted variables because accounting standards are likely to share common variations with other factors that determine cross-border holdings. To address this concern, I turn to a changes specification and relate changes in holdings from different countries to changes in accounting distance triggered by the IFRS adoption. In other words, I directly examine whether changes in holdings following IFRS adoption was driven by capital flows from countries that experienced greater reduction in accounting distance. This specification is a direct test of hypothesis 3 and an empirical examination of the downward sloping demand in Figure 2.1, Panel A. Also, the changes specification removes repeated observations in

the time-series eliminating the possibility of inflated significance from time-series correlation in the error term.[35]

I examine the changes specification using the regression model in equation (7).[36]

$$\Delta Holdings_{i,c} = \lambda_0 + \alpha_0 \cdot \Delta MVsource_c + \alpha_1 \cdot \Delta MVdest_i + \beta_0 \cdot \Delta AD_{i,c} + \sum_{n=1}^{N} \gamma_n \cdot controls_{i,c} + \varepsilon_{i,c} \quad (7)$$

where, $\Delta Holdings_{i,c}$ is the changes in average holdings of firm i held by funds from country c two years before and after IFRS adoption. As before, $\Delta MVsource_c$ is changes in the average weight of mutual funds in the fund's country relative to the world two years before and after IFRS adoption and $\Delta MVdest_i$ is changes in the average weight of mutual funds in the firm's country relative to the world two years before and after IFRS adoption. $\Delta AD_{i,c}$ is the difference in accounting distance before and after IFRS adoption for each country-pair, which takes a lower value if there is a *greater* reduction in accounting distance between firm i's country and the investing fund's country c.

Consistent with hypothesis 3, I predict firms to have a greater increase in holdings from countries when adoption of IFRS resulted in greater reduction in accounting distance, i.e, negative β_0. Note that hypothesis 3 reguires to hold changes in common noise

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[35] Since mandatory adoption affects all firms within a country, there remain concerns of correlations in the error term at the country-level. To address this concern, I estimate the sensitivity of the results using the country-mean of all firms as the unit of observation. Refer to Section 5 for details.

[36] The specification is identical to the model used for asset holdings in equation (5). Since the theoretical models do not distinguish between asset holdings and investment flows (Portes and Rey 2005, footnote 15) and the elasticity of cross-border flows with respect to holdings is close to one (Portes and Rey 2005, Section 6), I use identical specification for my test of asset holdings (Section 4.2) and transaction flows (Section 4.3).

constant when examining changes in the idiosyncratic noise changed after IFRS. Empirically, I implement this by including the original measure of accounting distance ($AD_{i,c}$) as a proxy for the changes in common noise from IFRS adoption and also by including country fixed effect for the adopting countries. Also, I include the prior level of holdings (Holdings$_{i,t-1}$) which has been found in the mutual fund literature as the robust predictor of future fund flows (Carhart 1997). All other country-level controls and firm-level controls are specified as changes in the average values two years before and after IFRS adoption. Controls with no time variation are dropped from the estimation.

Table 3.8 shows the estimation results of equation (7). Panel A of Table 3.8 shows that β_0 coefficient is negative and statistically significant for all three measures of AD. This suggests that holdings following IFRS adoption are heavily driven by capital flows from countries that experience a greater reduction in the accounting distance, i.e, greater degree of accounting harmonization. For example, coefficient of model (1) suggests that firms on average experience a 0.23% increase in holdings from a one standard deviation (=0.278) increase in accounting harmonization ($\Delta AD_{i,c}$). Coefficient estimates of $\Delta MVsource_c$ are positive and significant, yet far below the theoretical prediction of 1, perhaps because mutual fund's investment portfolio also includes many other assets not included in this study. Also, the α_1 coefficient on $\Delta MVdest_i$ is negative and statistically significant suggesting that an increase in the market value of the local mutual funds does not lead to additional local investments. This captures the tendency of mutual funds in the sample countries shifting their investment portfolio to foreign assets during the sample period.

4.4 Differential effect of accounting harmonization by level of information barriers

The previous section examines how adoption of IFRS increases cross-border holdings by directly reducing the information processing cost of foreign investors. In this section, I examine another indirect channel through which harmonizing accounting standards increases cross-border holdings, i.e. by reducing the effect of other information barriers. Since differences in accounting standards are likely to have common variations with other barriers to cross-border flows, simply comparing the effect of information barriers before and after IFRS adoption will yield inconclusive results. Hence, I compare the effect a unit reduction in accounting distance has on promoting capital flows from investors in countries with high and low information barriers.[37] In other words, I hold the effect of accounting harmonization constant and compare the changes in holdings of investors who experienced equal reduction in accounting distance but face varying level of information barriers.

Specifically, I compare the effect reducing accounting distance has on capital flows from investors in countries with high and low information barriers. For example, my data shows that Spain experienced similar reduction in accounting distance with both Demark and Australia when it adopted IFRS. However, other private information barriers (i.e., geographic distance) between Spain and Australia are higher than the barriers between Spain and Denmark. I find that harmonizing accounting standards has a stronger effect on

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[37] It is still possible that geographic distance and changes in accounting distance are highly correlated, especially if IFRS adoption is clustered around geographic clusters (Ramanna and Sletten 2009). However, untabulated results show the difference between the mean ΔAD for the sub-sample of nearby investors and the mean ΔAD of distant investors show statistically insignificant differences.

capital flows among countries with high private information barriers (Spain and Australia) than countries with low private information barriers (Spain and Denmark). Empirically, I estimate the following regression model,

$$\Delta Holdings_{i,c} = \lambda_0 + \alpha_0 \cdot \Delta MVsource_c + \alpha_1 \cdot \Delta MVdest_i$$

$$+ \beta_H \cdot I_{High} \cdot \Delta AD_{i,c} + \beta_L \cdot I_{Low} \cdot \Delta AD_{i,c} + \sum_{n=1}^{N} \gamma_n \cdot controls_i + \varepsilon_{i,c} \quad (8)$$

where, I_{High} (I_{Low}) is an indicator equal to 1 if holdings are from a country with information barriers above (below) the firm's median, 0 otherwise. The β_H (β_L) coefficient measures the associations between accounting distance and holdings of investors from countries with high (low) level of information barrier.

Table 3.9 shows the results from estimating equation (9). Panel A uses geographic distance between the two countries to measure information barriers of each country-pair and Panel B uses common language between the two countries as the inverse of the information barriers between the two countries. Coefficient estimates in Panel A clearly show that harmonizing accounting standards has a stronger effect on capital flows for country-pairs that are further away ($\beta_H = -0.0090$, t-stat $=-3.83$) than for country-pairs that are nearby ($\beta_L = -0.0064$, t-stat$=-3.23$). Panel B also shows that countries that use a different language show a stronger effect ($\beta_H = -0.0081$, t-stat$=-3.89$) of accounting harmonization than countries with more information flows ($\beta_L = -0.0025$, t-stat$=-1.04$). This indicates that reducing accounting distance encourages investors to seek remote, less familiar investment opportunities that they would not have pursued if the information were presented under less familiar accounting standards. Hence, accounting

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harmonization has an interactive effect of reducing other investment barriers by reducing

the need to gather other private information.

Chapter 5

Sensitivity Analysis

5.1 Enforcement and changes in holdings following IFRS adoption

Accounting information is a function of both the standards and the reporting behavior of the firm. Thus, the benefit of adopting IFRS is likely to be realized only with the correct implementation and enforcement of the new standards (Holthausen and Watts 2000). Consistent with this argument, prior literature finds that the economic benefit of IFRS adoption is more pronounced in countries where there is strict enforcement (Daske et al. 2008). While the empirical tests so far control for enforcement by focusing on changes in the mix of investors within an adopting firm, the observed effect can be increasing in the level of enforcement. Therefore, I predict that strict enforcement will result in a greater change in the mix of investors by achieving *de facto* accounting harmonization.

Enforcement of accounting standards takes various forms in different countries. Therefore finding an effective way to measure enforcement level across countries is a challenge. I use a measure that directly examines enforcement of accounting standards

(PBT index, Preiato et al. 2009)[38] and other measures that examine enforcement of the general legal environment; the anti-director index (as defined in La Porta et al. 1998, and corrected in Djankov et al. 2007) and the rule of law index (Kaufmann et al. 2003).[39] The PBT index has the advantage of measuring the recent enforcement of accounting standards specifically during the post IFRS period but only available for EU countries. Both the rule of law index and the anti-director index are available for a broader country sample; however, both include other legal environments unrelated to the enforcement of the accounting standards.

Table 3.10 tests the sensitivity of the results to different measures of enforcement. I divide the sample into high vs. low enforcement countries and expand equation (7) to compare coefficients across the sub-sample of strong and weak enforcement countries. I estimate the following model,

$$
\Delta Holdings_{i,c} = \lambda_0 + \alpha_0 \cdot \Delta MVsource_c + \alpha_1 \cdot \Delta MVdest_i + \beta_H \cdot I_{High} \cdot \Delta AD_{i,c}
$$

$$
+ \beta_L \cdot I_{Low} \cdot \Delta AD_{i,c} + \sum_{n=1}^{N} \gamma_{0,n} \cdot \Delta country\ control_c + \sum_{m=1}^{M} \gamma_{1,m} \cdot \Delta firm\ control_i + \varepsilon_{i,c} \quad (9)
$$

where, I_{High} (I_{Low}) is an indicator equal to 1 when firm is from a country with strong (weak) enforcement and 0 otherwise.

Table 3.10 shows the results of estimating equation (9). Panel A uses the PBT index to partition countries into countries with strong and weak enforcement. I find that

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[38] The PBT index (Preiato et al 2009) is a measure of enforcement of accounting standards specifically during the post-IFRS period. It focuses on 1) the legal environment of IFRS implementation 2) the auditing standards and the quality of statutory audits, and 3) the effectiveness of the institutional oversight on financial reporting. The institutional oversight measure is based on the Committee of European Securities Regulators (CESR) country reports and only available for EU countries.
[39] The rule of law index is an assessment of the law and order tradition in the country produced by the country-risk rating agency *International Country Risk* (ICR) between 1982 and 1995.

enforcement of the standards is sufficiently important to curb the benefits of accounting harmonization. The coefficient estimate in model (1) shows that in countries with strong enforcement, a one standard deviation (=0.249) reduction in accounting distance is associated with 0.59% increase $(\beta_H = -0.0238)$ in holdings while countries with weak enforcement show only a 0.09% increase $(\beta_L = -0.0036)$.

However, partitioning the sample based on other measures of investor protection which captures legal enforcement in a broader sense does not necessarily yield the findings of Panel A. Both Panel B (using the rule of law index) and Panel C (using the anti-director index) show that the effect of accounting harmonization is greater in countries with weaker legal enforcement. Hence, adopting international accounting standards can trigger greater fund inflows in countries with weaker investor protection. This suggests that adopting an international accounting standard can also act as an alternative investor protection mechanism from the perspective of foreign mutual fund investors.

5.2 Changes in holdings following IFRS adoption using country aggregate

Finally, I analyze changes in country-level holdings using the mean holdings of all mandatory adopters within an adopting country. Aggregating at the country level filters noise caused by investors disproportionately allocating investments across different firms within a country. In addition, the aggregate approach addresses concerns of inflated significance caused by cross-sectional correlation in the error terms within an adopting country.

Table 3.11 shows the effect of accounting distance on country-level holdings. Aggregate holdings are broken down into bilateral holdings from each source-country. I estimate the following model, which closely follows equation (7).

$$\Delta \text{Aggregate holdings}_{C,c} = \lambda_0 + \alpha_0 \cdot \Delta MVsource_c + \alpha_1 \cdot \Delta MVdest_C$$
$$+ \beta_0 \cdot \Delta AD_{C,c} + \sum_{n=1}^{N} \gamma_{0,n} \cdot control_{C,c} + \varepsilon_{C,c} \quad (10)$$

where, $\Delta \text{Aggregate holdings}_{C,c}$ is the mean holdings of all firms in country C from mutual funds in country c.[40] As before, $\Delta MVsource_c$ is changes in the average weight of mutual funds in the fund's country relative to the world two years before and after IFRS adoption. $\Delta MVdest_C$ is changes in the average weight of mutual funds in the adopting country C relative to the world two years before and after IFRS adoption. $\Delta AD_{C,c}$ is the difference in accounting distance before and after IFRS adoption for each country-pair, which takes a lower value if there is a *greater* reduction in accounting distance between the adopting firm's country C and the investing fund's country c. Since the unit of observation is now the country aggregate, firm-level controls are dropped from the estimation.

Table 3.11 shows that the estimated coefficient on AD is negative, as in equation (7), with reduced significance. However, note that there is less statistical power since the country-level analysis relies on a relatively small number of observations. The result for the

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[40] In untabulated results, I also use value-weighted holdings and median holdings as the method of aggregation. The observed effects are greater using value-weighted holdings due to IFRS adoption having a greater effect on larger firms. Consistent with this, estimations using median holdings also show an increase following IFRS adoption, but with lower magnitude.

country aggregate analysis corroborates the increase in holdings as suggested by the firm-level analysis.

Chapter 6

Conclusion

While capital flows across borders have steadily increased over the past decade, portfolio holdings remain significantly biased toward domestic investments. Information asymmetry has been one explanation for equity home bias, but the nature of the information asymmetry remains less explained. I find that differences in local accounting standards can be a source of the information asymmetry among investors, even for firms that made a good effort to improve their information signals. In particular, I show that recent efforts to harmonize accounting standards have promoted cross-border investments not only by reducing the information processing cost of public financial statements, but also by reducing the effect of other private information barriers.

Figure 2.1: Demand of investors by level of idiosyncratic noise and common noise

(i =firm, j=investor)

Panel A: Demand of investors $E\left(D_i^j\right)$ by level of foreign investor's idiosyncratic noise $\left(\theta^j\right)$
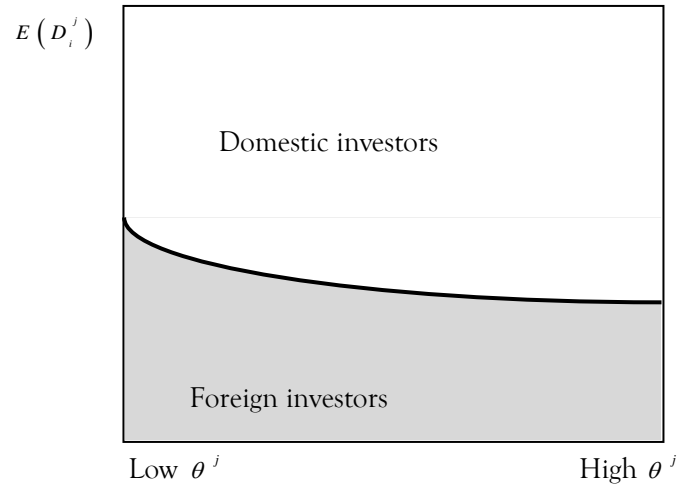
Panel B: Demand of investors $E\left(D_i^j\right)$ by level of common noise $\left(\sigma_i\right)$
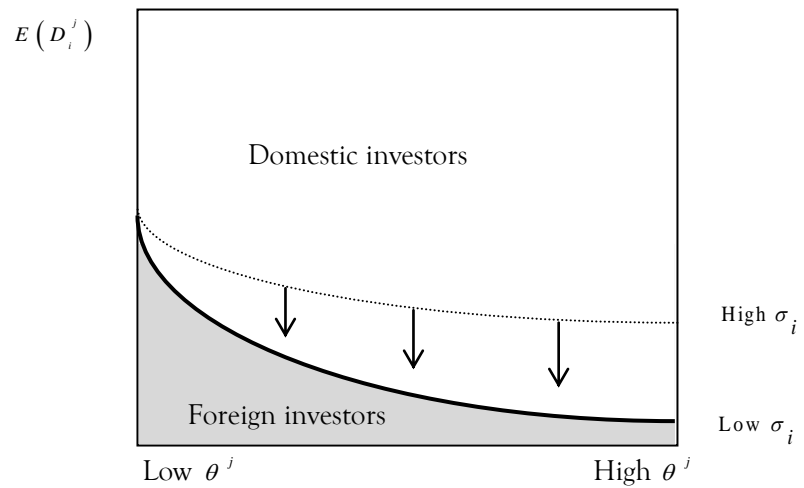
Figure 3.1: Changes in mutual fund holdings before and after adoption of IFRS, 4744 firms from 2000 to 2007
(i=firm, f=fund, t=year)

Panel A: Changes in foreign holdings of different IFRS adopters

$$\text{Mean}_i \left[\text{foreign holdings}_{i,t} \right]$$

Mandatory adopters — Non-adopters — Voluntary adopters
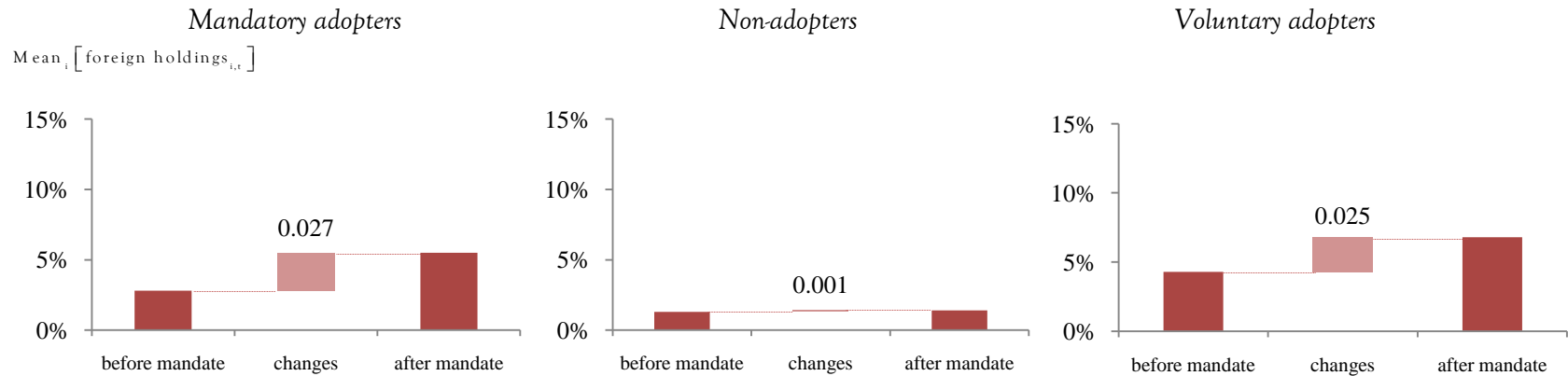
Panel B: Changes in domestic holdings of different IFRS adopters

$$\text{Mean}_i \left[\text{domestic holdings}_{i,t} \right]$$

Mandatory adopters — Non-adopters — Voluntary adopters
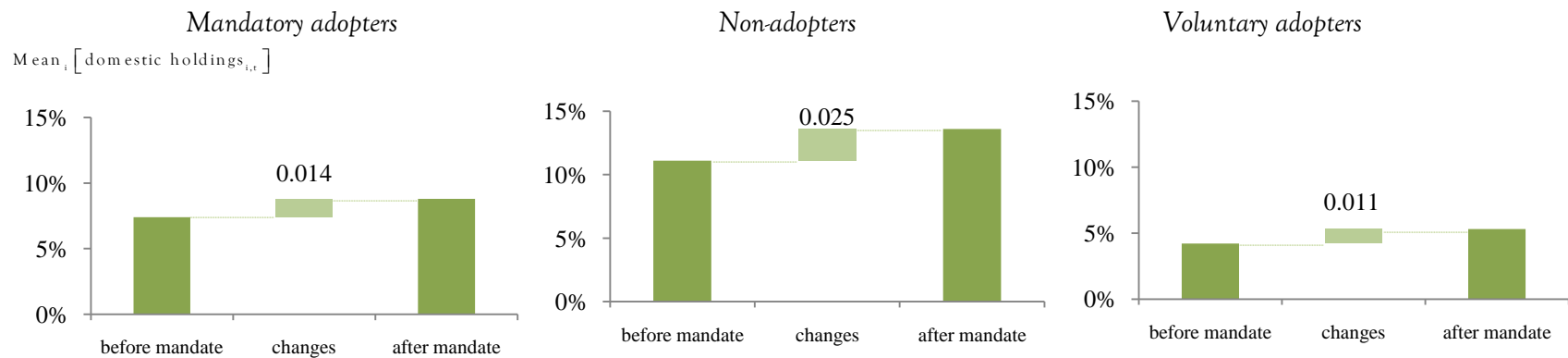
Notes: $\text{Mean}_i \left[\text{foreign (domestic) holdings}_{i,t} \right] = \frac{1}{N} \sum_{i=1}^{N} \left[\sum_{f=1}^{F} \frac{\text{Shares held}_{i,f,t}}{\text{Shares outstanding}_{i,t}} \right]$, $F \in$ all foreign (domestic) mutual funds, $N \in$ all firms. Foreign funds are funds incorporated in a different country from where the firm is located. Domestic funds are funds incorporated in the same country where the firm is located.

Table 3.1 Percentage of firms adopting IFRS and year of mandatory adoption- 28 countries from 2000 to 2007

Year	Australia	Austria	Belgium	Czech Republic	Denmark	Finland	France	Germany	Greece	Hong Kong	Hungary	Ireland	Italy	Luxembourg
2000	1.5%	38.5%	3.6%	20%	8%	3.3%	8%	17.3%	0.7%	1.1%	42.1%	0.0%	81.8%	30.0%
2001	0.9%	38.9%	3.7%	20%	7%	3.4%	8%	20.0%	0.7%	1.9%	48.6%	0.0%	83.4%	29.0%
2002	0.8%	60.7%	3.8%	20%	7%	2.8%	8%	29.8%	1.0%	2.1%	45.5%	0.0%	83.9%	29.0%
2003	0.5%	66.1%	10.6%	19%	5%	3.7%	8%	34.6%	1.7%	2.1%	45.5%	0.0%	85.1%	38.7%
2004	0.7%	69.6%	22.8%	25%	12%	7.8%	9%	42.8%	2.1%	2.2%	48.4%	0.0%	84.9%	48.4%
2005	12.0%	87.5%	89.4%	94%	70%	92%	45%	81.1%	96.9%	2.1%	87.5%	42.2%	96.8%	90.0%
2006	99.8%	92.9%	97.0%	94%	92%	100%	50%	87.6%	100%	98.9%	88.0%	70.0%	99.2%	92.9%
2007	99%	96.3%	98.2%	93%	92%	100%	52%	90.7%	100%	98.5%	90.5%	91.7%	97.9%	89.5%
Announcement	2002	2002	2002	2002	2002	2002	2002	2002	2002	2004	2002	2002	2002	2002
# of firm years	14,429	443	1,163	134	1,366	1,059	3,069	5,169	2,158	5,768	240	393	2,110	231

Year	Netherlands	New Zealand	Norway	Peru*	Philippines	Poland	Portugal	Slovenia	South Africa	Spain	Sweden	Switzerland	United Kingdom	Venezuela	Total
2000	3.1%	2.4%	0.0%	0.0%	0.0%	7.6%	1.4%	0.0%	0.8%	0.0%	1.7%	45.2%	0.1%	0.0%	13%
2001	4.8%	0.0%	0.0%	0.0%	0.0%	7.6%	1.6%	100.0%	1.9%	1.3%	1.7%	49.7%	0.5%	0.0%	17%
2002	4.5%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%	25.0%	2.1%	1.2%	1.5%	53.5%	0.8%	2.7%	17%
2003	4.7%	0.0%	1.5%	0.0%	0.0%	7.4%	3.7%	27.3%	2.8%	1.2%	1.5%	54.6%	1.3%	2.7%	18%
2004	5.1%	0.0%	1.6%	2.1%	2.2%	9.8%	8.7%	33.3%	2.5%	5.3%	2.4%	56.9%	2.3%	2.6%	20%
2005	83.0%	6.1%	88.8%	25.3%	99.3%	78.9%	83.7%	91.7%	20.2%	87.9%	89.7%	75.4%	23.5%	7.3%	61%
2006	91.1%	29.6%	91.3%	95.8%	98.9%	82.6%	94.7%	90.9%	55.6%	96.3%	96.8%	78.0%	59.3%	14.0%	92%
2007	91.2%	100.0%	92.3%	97.9%	99.2%	87.5%	90.9%	90.0%	52.5%	96.0%	97.4%	78.2%	80.8%	17.5%	96%
Announcement	2002	2002	2002	1998*	2003	2002	2002	2002	2003	2002	2002	2002	2002	2004	
# of firm years	986	806	1,046	799	1,841	852	487	66	2707	1,287	2,018	2,372	10824	309	**64,132**

Notes: Light-shaded cells are years after the announcement of IFRS adoption. Dark-shaded cells are year after IFRS was required at the country level. Firms that voluntarily adopt IFRS before IFRS became mandatory at the country level are classified as voluntary adopters. Mandatory adopters are firms that first adopt IFRS within two years IFRS was mandated at the country level. Non-adopters are firms not required to adopt IFRS due to the small-medium firm exemption.

Table 3.2 Characteristics of different IFRS adopters
- 28 countries from 2000 to 2007 (i=firm, t=year)

Panel A   Firm characteristics of different IFRS adopters

	Non-adopters (N=274)			Mandatory adopters (N=3,474)			Voluntary adopters (N=650)		
	Mean	Media	STD	Mean	Media	STD	Mean	Media	STD
Total Assets$_{i,t}$ ('000 USD)	280,199	137,076	1,295,785	1,329,605	154,559	4,300,828	2,225,956	339,858	5,414,628
ROA$_{i,t}$	-0.061	0.008	0.226	0.009	0.041	0.244	0.021	0.034	0.170
ROE$_{i,t}$	-0.073	0.002	0.492	0.019	0.075	0.488	0.028	0.061	0.303
Leverage$_{i,t}$	6.271	0.593	22.974	4.295	0.621	15.813	4.418	0.709	14.638
MB$_{i,t}$	3.096	1.635	6.704	3.442	1.872	6.053	3.170	1.794	5.971
Float$_{i,t}$	0.635	0.630	0.201	0.717	0.723	0.252	0.637	0.605	0.273

Panel B   Distribution of foreign and domestic holdings by different type of IFRS adopters

		# of firms	Mean	STD	Min	Max	P1	P25	P50	P75	P99
Non-adopters	Total holdings$_{i,t}$	274	**0.125**	0.117	0.000	0.571	0.001	0.033	0.086	0.191	0.527
	Domestic holdings$_{i,t}$	274	**0.117**	0.114	0.000	0.568	0.000	0.028	0.081	0.171	0.525
	Foreign holdings$_{i,t}$	274	**0.008**	0.019	0.000	0.131	0.000	0.000	0.000	0.006	0.114
Mandatory adopters	Total holdings$_{i,t}$	3,474	**0.096**	0.095	0.000	0.675	0.000	0.026	0.066	0.135	0.425
	Domestic holdings$_{i,t}$	3,474	**0.071**	0.086	0.000	0.672	0.000	0.010	0.040	0.099	0.385
	Foreign holdings$_{i,t}$	3,474	**0.025**	0.044	0.000	0.520	0.000	0.001	0.008	0.030	0.227
Voluntary adopters	Total holdings$_{i,t}$	650	**0.082**	0.073	0.000	0.455	0.001	0.025	0.064	0.119	0.333
	Domestic holdings$_{i,t}$	650	**0.046**	0.049	0.000	0.343	0.000	0.012	0.030	0.065	0.221
	Foreign holdings$_{i,t}$	650	**0.036**	0.043	0.000	0.406	0.000	0.005	0.019	0.056	0.176

Notes: Refer to Table 3.1 for definitions and country sample of voluntary adopters, mandatory adopters, and non-adopters. *Total Assets$_{i,t}$* is beginning total assets in '000 of US dollars. *ROA$_{i,t}$* is net income before extraordinary items divided by beginning total assets. *ROE$_{i,t}$* is net income before extraordinary items divided by beginning shareholder's equity. *Leverage$_{i,t}$* is total debt divided by ending book value. MB$_{i,t}$ is Year-end closing price divided by common book-value per share. *Float$_{i,t}$* is percentage of total shares in issues available to ordinary investors. Issues available to ordinary investors are number of share less the strategic holdings held by employees, foreign direct investment or government.

$$\text{Total (domestic, foreign) holdings}_{i,t} = \sum_{f=1}^{F} \frac{\text{Shares held}_{i,f,t}}{\text{Shares outstanding}_{i,t}}, f \in \text{all (domestic, foreign) funds.}$$

Domestic funds are funds incorporated in the same country where the firm is located. *Foreign funds* are funds incorporated in a different country from where the firm m is located.
Sources: Thompson International Mutual Fund Database, Thompson Datastream.

Table 3.3 Descriptive statistics of mutual fund holdings
- 28 countries from 2000 to 2007
(i=firm, f=fund, t=year)

Panel A   Percentage of total shares held by domestic and foreign funds

	# of firms	Mean	Std Dev	Min	Max	P1	P25	P50	P75	P99
Total holdings$_i$	4,398	0.096	0.094	0.000	0.675	0.000	0.026	0.067	0.134	0.423
Domestic holdings$_i$	4,398	0.070	0.085	0.000	0.672	0.000	0.011	0.039	0.096	0.382
Foreign holdings$_i$	4,398	0.026	0.043	0.000	0.520	0.000	0.001	0.009	0.032	0.212

Panel B   Number of domestic and foreign funds investing in each firm

	# of firms	Mean	Std Dev	Min	Max	P1	P25	P50	P75	P99
# of total holdings$_i$	4,398	56	169	1	5,317	1	3	12	41	733
# of domestic holdings$_i$	4,398	27	75	0	1,482	0	2	7	24	295
# of foreign holdings$_i$	4,398	28	116	0	4,748	0	1	2	13	466

Notes: $\text{Total(domestic, foreign) holdings}_i = \text{Mean}_t \left[\sum_{f=1}^{F} \frac{\text{shares held}_{i,f,t}}{\text{shares outstanding}_{i,t}} \right], F \in \text{all(domestic, foreign) funds}$

$\text{\# of total(domestic, foreign) holdings}_i = \text{Mean}_i \left[\sum_{f=1}^{F} I_{i,f,t} \right], \text{where } I_{i,f,t} = 1$ if (domestic, foreign) fund f has positive

holdings for firm i in year t, 0 otherwise. $F \in \text{all(domestic, foreign) funds}$. *Domestic funds* are funds incorporated in the same country where the firm is located. *Foreign funds* are funds incorporated in a different country from where the firm is located.

Sources: Thompson International Mutual Fund Database, Thompson Datastream

Table 3.4 Fund holdings following IFRS adoption
- 4,398 firms from 2000 to 2007 (i=firm, t=year)

Model:

$$\text{Holdings}_{i,t} = \alpha_0 + \beta_0 \times D_{\text{Mandatory adopter}} \times D_{\text{Post mandate}} + \gamma_0 \times D_{\text{Non-adopter}} + \gamma_1 \times D_{\text{Non-adopter}} \times D_{\text{Post mandate}} + \delta_0 \times D_{\text{Voluntary adopter}}$$

$$+ \delta_1 \times D_{\text{Voluntary adopter}} \times D_{\text{Post mandate}} + \sum_{n=1}^{N} \lambda_{0,n} \times \text{country control} + \sum_{m=1}^{M} \lambda_{1,m} \times \text{firm control} + \varepsilon_{i,t}.$$

$D_{\text{Mandatory adopter}} = 1$ if firm i is a mandatory adopter, 0 otherwise.

$D_{\text{Voluntary adopter}} = 1$ if firm i is a voluntary adopter, 0 otherwise.

$D_{\text{Post mandate}} = 1$ for years ending on or after the mandatory adoption of firm i, 0 otherwise.

$D_{\text{Non-adopter}} = 1$ if firm i is a non-adopter, 0 otherwise.

Panel A: Percentage holdings and for different type of adopters

		% Total holdings$_{i,t}$		% Foreign holdings$_{i,t}$		% Domestic holdings$_{i,t}$	
		(1)	(2)	(3)	(4)	(5)	(6)
		Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
		(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Intercept	α_0	0.032***	-0.184***	0.035***	-0.068**	-0.003***	-0.117**
		(34.98)	(-3.41)	(40.15)	(-3.08)	(-6.88)	(-2.77)
Mandatory adopter *Post mandate	β_0	0.044***	0.025***	0.027***	0.014***	0.018***	0.011***
		(8.13)	(5.30)	(5.14)	(3.58)	(6.88)	(4.79)
Non adopter	γ_0	-0.039***	-0.020*	-0.008**	0.003	-0.031***	-0.023**
		(-3.95)	(-2.12)	(-2.82)	(1.00)	(-3.72)	(-2.88)
Non-adopter * Post mandate	γ_1	0.028**	0.012	0.001	-0.010**	0.028***	0.022**
		(2.97)	(1.24)	(0.03)	(-3.25)	(3.74)	(2.74)
Voluntary adopter	δ_0	0.023***	0.001	0.016***	0.001	0.006	-0.001
		(3.57)	(0.10)	(3.43)	(0.28)	(1.78)	(-0.13)
Voluntary adopter * Post mandate	δ_1	0.030***	0.028***	0.024***	0.025***	0.005*	0.003
		(7.66)	(7.09)	(6.46)	(7.09)	(1.98)	(1.03)
F- test of [Prob > χ^2]		$\chi^2 =$ [0.135]	$\chi^2 =$ [0.231]	$\chi^2 = 18.63$ [<0.001]	$\chi^2 = 18.04$ [<0.001]	$\chi^2 = 1.77$ [0.184]	$\chi^2 = 2.08$ [0.151]
F- test of [Prob > χ^2]		$\chi^2 =$ [0.032]	$\chi^2 =$ [0.624]	$\chi^2 = 0.247$ [0.705]	$\chi^2 = 4.79$ [0.030]	$\chi^2 = 9.48$ [0.002]	$\chi^2 = 4.79$ [0.003]
Country level controls							
Market Cap	(+)		0.141		0.197		-0.056
			(0.59)		(1.11)		(-0.31)
Mkt Return	(+/-		-0.008		-0.005		-0.003
			(-1.45)		(-1.58)		(-0.74)
GDP	(+)		0.001***		0.001***		0.000**
			(4.76)		(5.34)		(2.68)
Growth	(+)		0.046		-0.018		0.064
			(0.37)		(-0.19)		(1.03)
Turnover	(+)		-0.000***		-0.000		-0.000***
			(-4.94)		(-0.37)		(-5.97)

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Table 3.4 Fund holdings following IFRS adoption (Continued)
- 4,399 firms from 2000 to 2007

		% Total holdings$_{i,t}$		% Foreign holdings$_{i,t}$		% Domestic holdings$_{i,t}$	
		Coeff	Coeff	Coeff	Coeff	Coeff	Coeff
		(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)	(t-stat)
Country level controls (continued)							
Exchange	(+)		0.042***		0.014***		0.028***
			(5.47)		(3.66)		(5.21)
Code law	(+)		-0.014		-0.019***		0.004
			(-1.54)		(-4.07)		(0.62)
SHright	(+)		0.019*		0.011**		0.008
			(2.32)		(2.91)		(1.24)
Enforce	(+)		-0.032***		-0.018***		-0.014**
			(-4.83)		(-5.26)		(-2.99)
Firm level controls							
Size	(+)		0.006***		0.004***		0.002*
			(5.41)		(7.66)		(2.19)
ROA	(+)		0.005		-0.004		0.008*
			(0.90)		(-1.34)		(2.39)
ROE	(+)		0.003		-0.000		0.003*
			(1.55)		(-0.33)		(2.33)
Leverage	(+/-		-0.000		-0.000		-0.000
			(-1.75)		(-1.07)		(-1.32)
MB	(+)		0.000		0.000		-0.000
			(0.48)		(1.95)		(-1.43)
PE	(+)		-0.000		0.000		-0.000
			(-0.49)		(0.89)		(-1.06)
Div. yield	(+)		0.002*		-0.000		0.003***
			(2.53)		(-1.36)		(3.78)
Big 5 audit	(+)		0.006		0.001		0.005
			(1.03)		(0.25)		(1.24)
# Analysts	(+)		0.006***		0.004***		0.002***
			(17.11)		(17.68)		(7.31)
Free float	(+)		0.030***		0.018***		0.012**
			(5.48)		(5.57)		(3.03)
Firm-level controls		No	Yes	No	Yes	No	Yes
Country level controls		No	Yes	No	Yes	No	Yes
Country fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
Country fixed effect		Yes	Yes	Yes	Yes	Yes	Yes
SE cluster country-		Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-sqr		0.175	0.253	0.097	0.200	0.278	0.299
# obs		21,887	21,519	21,887	21,519	21,887	21,519

Notes: $\text{Total (domestic,foreign) holdings}_{i,t} = \sum_{f=1}^{F} \frac{\text{Shares held}_{i,f,t}}{\text{Shares outstanding}_{i,t}}, f \in \text{all (domestic,foreign) funds.}$ *Domestic*

funds are funds incorporated in the same country where the firm is located. *Foreign funds* are funds
incorporated in a different country from where the firm is located. Refer to Table 3.1 for sample of
mandatory, voluntary and non-adopters. Refer to Table 3.5 for definitions of all other variables. *,**,***
denotes significance at the 95%, 97%, and 99% level.

Table 3.5 Determinants of cross-border holdings
(i=firm, c=fund's country, t=year)

Panel A: Definition and sources of each variable

Variable	Name	Measure	Definition	Source
Differences in accounting standards				
Accounting distance	$AD1_{i,c}$	$\dfrac{\overset{21}{\underset{s=1}{\Sigma}} I_{i,c,s}}{21}$	Differences in the local accounting standards between country of firm i and country of investing fund c. Based on a survey examining the extent local accounting standards deviate from IFRS for a list of 21 accounting rules (GAAP 2001).[1] Two rules are considered similar ($I_{i,c} = 0$) when rules of both countries comply with IFRS. When two countries follow local standards non-compliant with IFRS, the two rules are considered similar only if they are from the same legal origin. Higher score implies greater difference.	Bae et al. (2008, Table 3.1) and author's calculation
	$AD2(3)_{i,c}$	$\dfrac{\overset{21}{\underset{s=1}{\Sigma}} I_{i,c,s}}{21}$	Modified measure of AD1. When two rules follow local accounting standards non-compliant with IFRS, the two rules are always considered similar (different).	Bae et al. (2008, Table 3.1) and author's calculation
	$\Delta AD1(2,$	$AD1(2,3)_{i,c}$ $-AD1(2,3)$	Changes in accounting distance following IFRS adoption. Post-IFRS adoption, the accounting distance is recalculated for all country-pairs to reflect changes in the accounting distance metrics. Lower value implies greater reduction in differences in standards.	Bae et al. (2008, Table 3.1) and author's calculation
Determinants of bilateral cross-border holdings (Country level)				
iCAPM	$MVdest_{c,t}$	$\dfrac{MV_{i,t}}{=\Sigma_{c=1}^{C} MV_c}$	Country weight of total mutual fund holdings in firm i's country, relative to the world's mutual fund holdings in year t ($= \Sigma_{c=1}^{C} MV_{c,t}$).	Thompson International Mutual
	$MVsourc$	$\dfrac{MV_{c,t}}{=\Sigma_{c=1}^{C} MV_c}$	Country weight of total mutual fund holdings in the investing fund's country c_i, relative to the world's mutual fund holdings in year t.	Fund Database
Geographic distance	$ldist_{i,c}$	$\log(distanc$	Log of the distance between the capital cities of the firm's country and the investing fund's country c. (in kilometers).	Frankel, Stein and Wei (1995)

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[1] GAAP 2001: A Survey of National Accounting Rules Benchmarked Against International Accounting Standards (IFAD 2001).

Table 3.5 Determinants of cross-border holdings (Continued)

Variable	Var	Measure	Definition	Source
Information flows	$\text{teleph}_{i,c}$	$\dfrac{\text{telephone tr}}{\sqrt{\text{pop}_i \cdot \text{p}}}$	Volume of phone call traffic in minutes from fund's country c to firm i's country scaled by the geometric average of each country's population.	Direction of traffic 1998, International Telecom Union
	$\text{ltrade}_{i,c,t}$	$\log\left(\text{NX}_{i,t}+\right.$	Total net exports between firm i's country and fund's country c during year t (in billion US dollars).	Barbieri et al. (2008) Correlates of War Project's Trade Data
Familiarity	comlang	$I_{i,c}$	Indicator variable set to one when firm i's country and fund's country c use a common language.	Frankel, Stein and Wei (1995)
	$\text{border}_{i,c}$	$I_{i,c}$	Indicator variable set to one when firm i's country and fund's country c share a common border.	Frankel, Stein and Wei (1995)
	$\text{egal}_{i,c}$	$(\text{egal}_i - \text{ega})$	Squared difference between a country-pair on their cultural egalitarianism score based on a survey of urban teachers who teach full range of subjects, lower score implies a more hierarchical culture.	Siegal et al. (2008), Year 2005 release of Schwartz cultural
	$\text{legal}_{i,c}$	$I_{i,c}$	Indicator variable set to one when firm i's country and fund's country c share a common legal origin. Legal traditions of code and common law.	La Porta et al. (1998)
Country level determinants of cross-border holdings				
Market development	Market Cap$_{i,t}$	$\dfrac{\text{MV}_{i,t}}{=\Sigma_{i=1}^{N}\text{MV}_{i,t}}$	Stock market capitalization of firm i's country as a percentage of the world market cap (Datastream: MV of country constituent list)	Aggarwal et al (2005)
	Mkt. Ret$_{i,t}$	$\text{Ret}_{i,t}$	Annual market return of firm i's countrys' equity indices. Zero if country does not have a local stock exchange.	Aggarwal et al (2005)
	GDP$_{i,t}$	Ln(GDP	Log of GDP per capita (in US dollars) of firm i's country	Aggarwal et al (2005)
	ΔGDP$_{i,t}$	%Δ(GD	Growth in GDP per capita of firm i's country	Aggarwal et al (2005)
Barriers to arbitrage & Transaction costs	Turnove r$_{i,t}$	Ln(TO)$_i$	Annual trading volume of local stock exchange of firm i (in thousands) (Datastream: TO of country constituent list)	Blouin et al. (2009)
	Exchang e regime$_i$	I_i	An indicator (1-5) of whether the exchange rate regime is pegged (1), Crawling/moving band pegged/dual exchange (2), limited float (3), managed float (4) or free float (5) as of 2001.	Reinhart and Rogoff (2003)
	Withhol ding tax$_i$	Rate$_i$	Country's withholding tax rate on dividends for non-treaty countries	Worldwide tax summaries (PWC)

Table 3.5 Determinants of cross-border holdings (Continued)

Variable	Var	Measure	Definition	Source
Quality of institutions	Code la	I_i	An indicator value (1-5) of the country's legal tradition: common laws origins France (1), German (2), Scandinavian (3) and code law (4).	La Porta et al. (1998), Djankov et al. (2007)
	SHright	$SHright_i$	The anti-director index for firm i's country. The anti-director index (0-6) is an aggregate measure of shareholder rights defined in La Porta et al. (1998) and corrected in Djankov et al. (2007). Higher score implies better legal protection.	La Porta et al. (1998), Djankov et al. (2007)
	Enforce	$Enforce_i$	The rule of law index (1998) for firm i's country. The index (0-10) is an assessment of the law and order tradition in the country produced by the country-risk rating agency *International Country Risk*. Higher score implies better enforcement.	La Porta et al. (1998)
Firm level determinants of cross-border holdings				
Size	$Size_{i,t}$	$Log(US\$$	Log of total assets (in million US dollars)	
Profitability	$ROA_{i,t}$	$NI_{i,t}/TA_{i,}$	Net income before extraordinary items divided by beginning total asset.	
	$ROE_{i,t}$	$NI_{i,t}/CE_{i,}$	Net income before extraordinary items divided by beginning common equity book value.	
Risk	Leverage$_{i,}$	$TL_{i,t}/TA_{i,}$	Ending total liability divided by ending total assets	
	$MB_{i,t}$	$MV_{i,t}/CE_i$	Year-end closing price divided by common book value per share.	
	$PE_{i,t}$	$MV_{i,t}/NI_{i,}$	Year-end closing price divided by earnings per share. Firms with negative PEs are assumed to have the highest industry-year value.	
	Div. yield$_{i,t}$	$Div_{i,t}/MV_i$	Dividends per share divided by closing market price as of year-end.	
Governance	Big 5	I_i	An indicator equal to one if a firm is audited by a big 5 audit firm.	
	#	$\sum_{n=1}^{N} I_{i,t}^n$	Number of analysts following the firm at year-end.	
	Free float$_{i,t}$	$\#Float_{i,t}/\ddagger$	Percentage of total shares in issues available to ordinary investors. The total number of share less the strategic holdings held by employees, foreign direct investment or government.	Stulz (2009)

Table 3.5 Determinants of cross-border holdings (Continued)
(i = firm, c = fund's country, t = year)

Panel B: Correlation of cross-border holdings and determinants of bilateral cross-border holdings (Pearson\Spearman)

	$MVdest_{i,t}$	$MVsource_{c,t}$	$AD1_{i,c,t}$	$AD2_{i,c,t}$	$AD3_{i,c,t}$	$ldist_{i,c}$	$teleph_{i,c}$	$ltrade_{i,c}$	$comlang_{i,c}$	$border_{i,c}$	$egal_{i,c}$	$legal_{i,c}$	$SHright_i$	$Enforce_i$
$MVdest_{c_i,t}$	1	0.600	-0.051	-0.077	-0.028	-0.085	0.133	-0.011	-0.008	0.017	-0.038	-0.018	0.142	-0.013
$MVsource_{c,t}$	0.037	1	0.013	-0.037	0.031	0.247	0.026	0.075	0.033	-0.166	-0.100	-0.001	0.058	0.003
$AD1_{i,c,t}$	**-0.024**	**0.008**	**1**	**0.899**	**0.856**	**0.372**	**-0.395**	**0.509**	**-0.750**	**-0.568**	**0.108**	**-0.814**	**-0.228**	**0.023**
$AD2_{i,c,t}$	-0.029	-0.018	0.922	1	0.798	0.260	-0.314	0.538	-0.721	-0.435	0.121	-0.616	-0.325	-0.008
$AD3_{i,c,t}$	-0.022	0.029	0.885	0.853	1	0.444	-0.428	0.426	-0.688	-0.602	0.140	-0.681	-0.067	0.017
$ldist_{i,c}$	-0.059	0.216	0.618	0.595	0.671	1	-0.635	0.255	-0.148	-0.745	0.044	-0.208	0.139	0.096
$teleph_{i,c}$	0.088	-0.061	-0.495	-0.512	-0.509	-0.658	1	-0.149	0.280	0.500	-0.061	0.331	-0.020	-0.178
$ltrade_{i,c}$	0.041	0.121	0.598	0.635	0.552	0.567	-0.464	1	-0.426	-0.411	-0.201	-0.407	-0.343	0.183
$comlang_{i,c}$	-0.026	0.084	-0.755	-0.742	-0.690	-0.383	0.352	-0.488	1	0.453	-0.144	0.794	0.148	0.038
$border_{i,c}$	0.029	-0.170	-0.592	-0.495	-0.636	-0.864	0.569	-0.482	0.453	1	-0.033	0.479	-0.156	0.041
$egal_{i,c}$	-0.075	-0.141	0.079	0.098	0.109	0.002	-0.015	-0.189	-0.113	-0.014	1	-0.123	0.235	-0.190
$legal_{i,c}$	-0.035	0.053	-0.813	-0.650	-0.680	-0.406	0.341	-0.448	0.794	0.479	-0.095	1	0.096	0.051
$SHright_i$	0.069	0.024	-0.211	-0.284	-0.061	0.093	0.010	-0.299	0.142	-0.167	0.239	0.104	1	-0.427
$Enforce_i$	0.007	-0.002	-0.014	-0.044	0.004	0.027	0.063	0.057	0.036	0.028	-0.247	0.073	-0.192	1

Table 3.6 Accounting distance and holdings from different countries
-3,474 mandatory adopters from 2000 to 2007
(i = firm, c=fund's country, t = year)

$$Holdings_{i,c,t} = \lambda_0 + \alpha_0 \cdot MVsource_{c,t} + \alpha_1 \cdot MVdest_{i,t} + \beta_0 \cdot AD_{i,c,t} + \sum_{m=1}^{M} \gamma_{1,m} \cdot control_{i,t} + \varepsilon_{i,c,t}$$

		(1) AD1		(2) AD2		(2) AD3	
		Coeff	(t-stat)	Coeff	(t-stat)	Coeff	(t-stat)
iCAPM							
Intercept		0.0678***	(8.82)	0.0671***	(8.99)	0.0727***	0.0678*
$MVsource_{c,t}$	(+)	0.0093**	(3.20)	0.0095**	(3.26)	0.0090**	(3.07)
$MVdest_{i,t}$	(+)	0.0011	(1.50)	0.0015*	(2.08)	0.0006	(0.75)
Accounting distance							
$AD_{i,c,t}$	(-)	**-0.0072***	(-8.57)	**-0.0077***	(-8.53)	**-0.0050***	(-3.84)
Other determinants of bilateral cross-border holdings							
$ldist_{i,c}$	(-)	-0.0017**	(-3.01)	-0.0017**	(-3.07)	-0.0017**	(-2.97)
$teleph_{i,c}$	(+)	0.0001	(1.93)	0.0001	(1.88)	0.0001*	(1.99)
$ltrade_{i,c,t}$	(+)	0.0000**	(2.75)	0.0000**	(2.79)	0.0000**	(2.61)
$comlang_{i,c}$	(+)	0.0036*	(2.14)	0.0030	(1.85)	0.0034*	(2.16)
$border_{i,c}$	(+)	0.0066***	(3.81)	0.0059***	(3.45)	0.0066***	(3.82)
$egal_{i,c}$	(-)	-0.0026	(-1.33)	-0.0025	(-1.30)	-0.0026	(-1.33)
$legal_{i,c}$	(+)	0.0000	(0.02)	0.0010	(0.74)	0.0010	(0.74)
# of obs		61,683		61,683		61,683	
Country-level controls, Table 3.5		Yes		Yes		Yes	
Firm-level controls in Table 3.5		Yes		Yes		Yes	
Industry fixed effect		Yes		Yes		Yes	
Country fixed effect		Yes		Yes		Yes	
SE clustering on country-		Yes		Yes		Yes	

Note: Sample only includes mandatory adopters. $Holdings_{i,c,t}$ is the percentage of firm I's shares held by all funds from country c in year t. All other variables are defined in Table 3.5. *,**,*** denotes significance at the 95%, 97%, and 99% level.

Table 3.7 Accounting distance and holdings for firms with high vs. low common noise - 3,474 mandatory adopters from 2000 to 2007

Model:

$$Holdings_{i,c,t} = \lambda_0 + \alpha_0 \cdot MVsource_{c,t} + \alpha_1 \cdot MVdest_{i,t}$$

$$+ \beta_H \cdot I_{High} \cdot AD_{i,c,t} + \beta_L \cdot I_{Low} \cdot AD_{i,c,t} + \sum_{m=1}^{M} \gamma_{1,m} \cdot control_{i,c,t} + \varepsilon_{i,c,t}$$

Where, $I_{High(Low)} = 1$ if analyst forecast error of firm i is below (above) the country median, 0 otherwise.

		(1) AD1		(2) AD2		(2) AD3	
		Coeff	(t-stat)	Coeff	(t-stat)	Coeff	(t-stat)
iCAPM							
Intercept		0.0680***	(8.77)	0.0673***	(8.95)	0.0727***	(9.27)
$MVsource_{c,t}$	(+)	0.0093**	(3.20)	0.0095**	(3.27)	0.0090**	(3.08)
$MVdest_{i,t}$	(+)	0.0012	(1.56)	0.0016*	(2.14)	0.0006	(0.76)
Accounting distance							
$I_{High} \cdot AD_{i,c,t}$	(-)	-0.0068***	(-8.65)	-0.0074***	(-9.09)	-0.0050***	(-4.48)
$I_{Low} \cdot AD_{i,c,t}$	(-)	-0.0078***	(-6.90)	-0.0083***	(-6.87)	-0.0051**	(-2.73)
F- test of $\beta_H = \beta_L$		$\chi^2(2) = 1.17$		$\chi^2(2) = 1.46$		$\chi^2(2) = 0.001$	
[Prob > χ^2 **]**		[0.2799]		[0.2287]		[0.95]	
Other determinants of bilateral cross-border holdings							
$ldist_{i,c}$	(-)	**-0.0017****	(-3.01)	**-0.0017****	(-3.07)	**-0.0017****	(-2.97)
$teleph_{i,c}$	(+)	0.0001	(1.92)	0.0001	(1.88)	**0.0001***	(1.99)
$ltrade_{i,c,t}$	(+)	**0.0000****	(2.75)	**0.0000****	(2.79)	**0.0000****	(2.62)
$comlang_{i,c}$	(+)	**0.0036***	(2.15)	0.0030	(1.85)	**0.0034***	(2.16)
$border_{i,c}$	(+)	**0.0066*****	(3.82)	**0.0059*****	(3.46)	**0.0066*****	(3.82)
$egal_{i,c}$	(-)	-0.0026	(-1.33)	-0.0026	(-1.30)	-0.0026	(-1.34)
$legal_{i,c}$	(+)	0.0000	(0.02)	0.0010	(0.75)	0.0010	(0.74)
# of obs		61,683		61,683		61,683	
Country-level controls, Table		Yes		Yes		Yes	
Firm-level controls in Table		Yes		Yes		Yes	
Industry fixed effect		Yes		Yes		Yes	
Industry fixed effect		Yes		Yes		Yes	
SE cluster on country-industry		Yes		Yes		Yes	

Notes: Holdings$_{i,c,t}$ is the percentage of firm i's shares held by all funds from country c in year t. Each firm is categorized into firms with low (high) common noise if it's average analyst forecast error during pre-IFRS adoption period is below (above) the country median. Forecast error is the mean absolute deviation of the consensus forecast scaled by actual earnings. For firms with no analyst following, I replace the forecast error with the maximum forecast error in the country-industry. All other variables are defined in Table 3.5. *,**,*** denotes significance at the 95%, 97%, and 99% level.

Table 3.8 Accounting harmonization and changes in holdings from different countries -3,474mandatory adopters 2 years before and after IFRS adoption

(i = firm, c = fund's country, t = year)

Panel A: Harmonization and changes in holdings from different countries

$$\Delta Holdings_{i,c} = \lambda_0 + \alpha_0 \cdot \Delta MVsource_c + \alpha_1 \cdot \Delta MVdest_i + \beta_0 \cdot \Delta AD_{i,c} + \sum_{m=1}^{M} \gamma_m \cdot controls_{i,c} + \varepsilon_{i,c}$$

		(1) AD1		(2) AD2		(2) AD3	
		Coeff	(t-stat)	Coeff	(t-stat)	Coeff	(t-stat)
iCAPM							
Intercept		-0.003	(-0.77)	-0.002	(-0.54)	-0.001	(-0.25)
$\Delta MVsource_c$	(+)	0.019***	(7.84)	0.017***	(7.05)	0.019***	(7.80)
$\Delta MVdest_i$	(+)	0.002	(0.39)	0.003	(0.54)	0.003	(0.49)
Accounting distance							
$\Delta AD_{i,c}$	(-)	-0.0084***	(-3.68)	-0.0085***	(-3.99)	-0.0082***	(-3.85)
Other controls							
$AD_{c,t}$	(+/-)	-0.029***	(-9.56)	-0.031***	(-9.84)	-0.035***	(-10.06)
$Holdings_{i,t-1}$	(+/-)	-0.052*	(-2.18)	-0.058*	(-2.38)	-0.055*	(-2.29)
$\Delta ltrade_{c,t}$	(+)	-0.000***	(-4.52)	-0.000***	(-4.07)	-0.000***	(-4.63)
$\Delta Market\ Cap_{i,t}$	(+)	-0.292	(-1.81)	-0.288	(-1.80)	-0.287	(-1.79)
$\Delta Mkt.\ Ret_{i,t}$	(+)	0.016*	(2.52)	0.017**	(2.66)	0.016*	(2.46)
$\Delta Turnover_{i,t}$	(+)	0.000*	(2.31)	0.000*	(2.22)	0.000*	(2.34)
$\Delta GDP_{i,t}$	(+)	0.000***	(4.09)	0.000***	(4.02)	0.000***	(4.05)
$\Delta GDP\ growth_{i,t}$	(+)	0.150***	(3.68)	0.158***	(3.86)	0.152***	(3.74)
$\Delta Size_{i,t}$	(+)	-0.001*	(-2.50)	-0.001*	(-2.52)	-0.001*	(-2.56)
$\Delta ROA_{i,t}$	(+)	-0.000***	(-3.87)	-0.000***	(-3.87)	-0.000***	(-3.79)
$\Delta ROE_{i,t}$	(+)	0.000	(0.05)	0.000	(0.01)	-0.000	(-0.05)
$\Delta Leverage_{i,t}$	(+)	-0.000	(-0.05)	0.000	(0.02)	-0.000	(-0.07)
$\Delta MB_{i,t}$	(+/-)	-0.000**	(-2.58)	-0.000**	(-2.60)	-0.000*	(-2.45)
$\Delta PE_{i,t}$	(+/-)	0.000	(0.88)	0.000	(0.90)	0.000	(0.92)
$\Delta Div.\ yield_{i,t}$	(-)	-0.000	(-0.93)	-0.000	(-1.05)	-0.000	(-1.07)
$\Delta \#\ Analyst_{i,t}$	(+)	-0.000***	(-6.42)	-0.000***	(-6.47)	-0.000***	(-6.50)
$\Delta Free\ float_{i,t}$	(+)	0.010***	(5.61)	0.010***	(5.40)	0.010***	(5.67)
# of obs		14,693		14,693		14,693	
Industry fixed effect		Yes		Yes		Yes	
Country fixed effect		Yes		Yes		Yes	
SE clustering		Yes		Yes		Yes	

Notes: $\Delta Holdings_{i,c}$ is the changes in average holdings in firm i from country c two years before and after IFRS adoption. All other variables are defined in Table 3.5. All controls are specified as changes in the average values two-years before and after IFRS adoption. Controls with no time-variation are not included in the estimation. *,**,*** denotes significance at the 95%, 97%, and 99% level.

Table 3.9 Differential effect of accounting harmonization for investors with high vs. low information barriers
(i = firm, c = fund's country, t = year)

Model:

$$\Delta Holdings_{i,c} = \lambda_0 + \alpha_0 \cdot \Delta MVsource_c + \alpha_1 \cdot \Delta MVdest_i$$

$$+ \beta_H \cdot I_{High} \cdot \Delta AD_{i,c} + \beta_L \cdot I_{Low} \cdot \Delta AD_{i,c} + \sum_{m=1}^{M} \gamma_{1,m} \cdot control_i + \varepsilon_{i,c}$$

$I_{High}(I_{low}) = 1$ if holdings is from a country with investment barrier above (below) the sample median, else 0.

Panel A: Reducing accounting distance in country-pairs with high vs. low geographic barriers

		(1) AD1		(2) AD2		(2) AD3	
		Coeff	(t-stat)	Coeff	(t-stat)	Coeff	(t-stat)
iCAPM							
Intercept		0.0103***	(4.71)	0.0109***	(5.00)	0.0125***	(5.40)
$\Delta MVsource_c$	(+)	0.0192***	(7.72)	0.0167***	(6.89)	0.0196***	(7.77)
$\Delta MVdest_i$	(+)	0.0029	(0.46)	0.0034	(0.55)	0.0040	(0.64)
Accounting distance							
$I_{High} \cdot \Delta AD_{i,c}$	(-)	**-0.0090***	(-3.83)	**-0.0083***	(-3.64)	**-0.0106***	(-4.39)
$I_{Low} \cdot \Delta AD_{i,c}$	(-)	**-0.0064**	(-3.23)	**-0.0082***	(-4.07)	**-0.0043*	(-2.13)
F- test of $\beta_H = \beta_L$		$\chi^2(2)$ =**4.41**		$\chi^2(2)$ =0.03		$\chi^2(2)$ =**11.95**	
[Prob > χ^2]		[0.036]		[0.564]		[0.005]	
# of obs		14,693		14,693		14,693	
Controls in Table 3.8, Panel		Yes		Yes		Yes	
Industry fixed effect		Yes		Yes		Yes	
Country fixed effect		Yes		Yes		Yes	
SE clustering		Yes		Yes		Yes	

Panel B: Reducing accounting distance in country-pairs with high vs. low information barriers

		(1) AD1		(2) AD2		(2) AD3	
		Coeff	(t-stat)	Coeff	(t-stat)	Coeff	(t-stat)
iCAPM							
Intercept		0.0101***	(4.70)	0.0109***	(5.05)	0.0118***	(5.22)
$\Delta MVsource_c$	(+)	0.0190***	(7.93)	0.0169***	(7.14)	0.0190***	(7.94)
$\Delta MVdest_i$	(+)	0.0026	(0.42)	0.0037	(0.59)	0.0034	(0.54)
Accounting distance							
$I_{High} \cdot \Delta AD_{i,c}$	(-)	**-0.0081***	(-3.89)	**-0.0087***	(-4.16)	**-0.0086***	(-4.12)
$I_{Low} \cdot \Delta AD_{i,c}$	(-)	-0.0025	(-1.04)	**-0.0062**	(-2.78)	-0.0014	(-0.51)
F- test of $\beta_H = \beta_L$		$\chi^2(2)$ =**12.31**		$\chi^2(2)$ =10.70		$\chi^2(2)$ =10.60	
[Prob > χ^2]		[<0.001]		[<0.001]		[<0.001]	
# of firm years		14,693		14,693		14,693	
Controls in Table 3.8, Panel		Yes		Yes		Yes	
Industry fixed effect		Yes		Yes		Yes	
Country fixed effect		Yes		Yes		Yes	
SE clustering		Yes		Yes		Yes	

Notes: Panel A uses geographic distance between the capital cities of the two countries to measure investment barriers. Panel B uses common language indicator as the measure of information flows between the two countries. All other variables are defined in Table 3.5.

Table 3.10 Enforcement and Differential Effect of Accounting Harmonization
(i = firm, c = fund's country, t = year)

Model:
$$\Delta Holdings_{i,c} = \lambda_0 + \alpha_0 \cdot \Delta MVsource_c + \alpha_1 \cdot \Delta MVdest_i + \beta_H \cdot I_{High} \cdot \Delta AD_{i,c} + \beta_L \cdot I_{Low} \cdot \Delta AD_{i,c}$$
$$+ \sum_{m=1}^{M} \gamma_{1,m} \cdot control_{i,c} + \varepsilon_{i,c}$$

$I_{High} (I_{Low}) = 1$ if country rank of the enforcement variable is above (below) the sample mean, 0 otherwise.

Panel A: Accounting law enforcement (PBT index) and differential effect of harmonization

		AD1		AD2		AD3	
		Coeff	(t-stat)	Coeff	(t-stat)	Coeff	(t-stat)
iCAPM							
Intercept		-0.0021	(-0.63)	-0.0015	(-0.43)	-0.0007	(-0.21)
$MVsource_{r}^{c_i}$	(+)	0.0157***	(7.88)	0.0144***	(7.22)	0.0161***	(7.98)
$MVdest_{c_i,t}$	(+)	0.0022	(0.36)	0.0023	(0.37)	0.0026	(0.43)
Accounting distance							
$I_{High} \cdot \Delta AD_i^c$	(-)	**-0.0238***	(-8.85)	**-0.0242***	(-8.82)	**-0.0274***	(-8.27)
$I_{Low} \cdot \Delta AD_i^c$	(-)	-0.0036	(-0.75)	-0.0042	(-0.86)	-0.0018	(-0.31)
F- test of $\beta_H = \beta_L$		$\chi^2(2)$ **=19.12**		$\chi^2(2)$ **=17.28**		$\chi^2(2)$ **=20.27**	
[Prob > χ^2]		[<0.0001]		[<0.0001]		[<0.0001]	
# of firm years		11,915		11,915		11,915	
Controls in Table 3.8,		Yes		Yes		Yes	
Industry fixed effect		Yes		Yes		Yes	
Country fixed effect		Yes		Yes		Yes	
SE clustering		Yes		Yes		Yes	

Panel B: Legal law enforcement (Rule of law index) and differential effect of harmonization

		AD1		AD2		AD3	
		Coeff	(t-stat)	Coeff	(t-stat)	Coeff	(t-stat)
iCAPM							
Intercept		-0.0030	(-0.90)	0.0208**	(3.10)	0.0216***	(3.41)
$\Delta MVsource_{t}^{c_i}$	(+)	0.0187***	(7.80)	0.0167***	(7.03)	0.0187***	(7.84)
$\Delta MVdest_{c_i,t}$	(+)	0.0022	(0.35)	0.0032	(0.51)	0.0028	(0.45)
Accounting distance							
$I_{High} \cdot \Delta AD_i^c$	(-)	**-0.0056*	(-2.07)	**-0.0069*	(-2.51)	**-0.0058*	(-2.04)
$I_{Low} \cdot \Delta AD_i^c$	(-)	**-0.0096***	(-4.22)	**-0.0097***	(-4.20)	**-0.0104***	(-4.12)
F- test of $\beta_H = \beta_L$		$\chi^2(2)$ =64.89		$\chi^2(2)$ =60.75		$\chi^2(2)$ =55.08	
[Prob > χ^2]		[<0.001]		[<0.001]		[<0.001]	
# of firm years		14,693		14,693		14,693	
Controls in Table 3.8,		Yes		Yes		Yes	
Industry fixed effect		Yes		Yes		Yes	
Country fixed effect		Yes		Yes		Yes	
SE clustering		Yes		Yes		Yes	

Table 3.10 Enforcement and Differential Effect of Accounting Harmonization (Continued)

(i = firm, c = fund's country, t = year)

Panel C: Security law enforcement (Anti-director index) and differential effect of harmonization

		AD1		AD2		AD3	
		Coeff	(t-stat)	Coeff	(t-stat)	Coeff	(t-stat)
iCAPM							
Intercept		-0.0013	(-0.41)	-0.0005	(-0.14)	-0.0001	(-0.03)
$\Delta MVsource_{r}^{c_i}$	(+)	0.0175***	(7.40)	0.0155***	(6.69)	0.0171***	(7.27)
$\Delta MVdest_{c_i,t}$	(+)	0.0026	(0.42)	0.0028	(0.44)	0.0034	(0.55)
Accounting distance							
$I_{High} \cdot \Delta AD_{i}^{c}$	(-)	-0.0039	(-1.92)	**-0.0044***	(-2.14)	-0.0037	(-1.80)
$I_{Low} \cdot \Delta AD_{i}^{c}$	(-)	**-0.0262***	(-7.95)	**-0.0270***	(-8.02)	**-0.0310***	(-7.90)
F- test of $\beta_H = \beta_L$		$\chi^2(2) = 1.88$		$\chi^2(2) = 0.81$		$\chi^2(2) = 1.69$	
[Prob > χ^2]		[0.1705]		[0.3671]		[0.1942]	
# of firm years		14,693		14,693		14,693	
Controls in Table 3.8,		Yes		Yes		Yes	
Industry fixed effect		Yes		Yes		Yes	
Country fixed effect		Yes		Yes		Yes	
SE clustering		Yes		Yes		Yes	

Notes: The PBT index (Preiato et al 2009) is a measure of enforcement of accounting standards specifically during the post-IFRS period. It focuses on 1) the legal environment of IFRS implementation 2) the auditing standards and the quality of statutory audits, and 3) the effectiveness of the institutional oversight on financial reporting. The institutional oversight measure is based on the Committee of European Securities Regulators (CESR) country reports and only available for EU countries. Hence, non-EU countries are dropped from Panel A. The rule of law index (0-10) is an assessment of the law and order tradition in the country produced by the country-risk rating agency *International Country Risk* (ICR) between 1982 and 1995. The anti-director index (0-6) is an aggregate measure of shareholder rights defined in La Porta et al. (1998) and corrected in Djankov et al. (2007). All other variables are defined in Table 3.5. *,**,*** denotes significance at the 95%, 97%, and 99% level.

Table 3.11 Changes in accounting distance and aggregate holdings
(i = firm, c = fund's country, t = year)

Model: $\Delta\,\text{Aggregate holdings}_{C,c} = \lambda_0 + \alpha_0 \cdot MVsource_c + \alpha_1 \cdot MVdest_C + \beta_0 \cdot \Delta AD_{C,c} + \sum_{n=1}^{N} \gamma_{0,n} \cdot control_{C,c} + \varepsilon_{C,c}$

		(1) AD1		(2) AD2		(2) AD3	
		Coeff	(t-stat)	Coeff	(t-stat)	Coeff	(t-stat)
iCAPM							
Intercept		**0.006*****	(4.95)	**0.009*****	(5.24)	**0.006*****	(5.26)
$\Delta MVsource_c$	(+)	0.001	(0.74)	0.001	(0.37)	0.002	(1.28)
$\Delta MVdest_i$	(+)	0.002	(1.15)	0.001	(0.81)	0.003	(1.70)
Accounting distance							
$\Delta AD_{c,i}$	(-)	-0.003	(-1.41)	-0.004	(-1.67)	-0.004	(-1.51)
# of firm years		476		476		476	
Country level controls,Table		Yes		Yes		Yes	
Industry fixed effect		No		No		No	
Country fixed effect		No		No		No	
SE clustering		Yes		Yes		Yes	

ΔAggregate holdings$_{C,c}$ is the changes in the equal weighted holdings of all firms in country C. All other variables are defined in Table 3.5. All controls are specified as changes in the average values two-years before and after IFRS adoption. Controls with no time-variation are not included in the estimation. *,**,*** denotes significance at the 95%, 97%, and 99% level.

APPENDIX

This appendix derives the demand function of domestic and foreign investors assuming a negative exponential utility with a risk aversion factor of one. Each investor j is endowed with shares in two risky assets, one domestic and one foreign, and a single global riskless asset, with a normalized price of one. V_i is the value of a risky asset in each country i (i =1,2). The terminal payoffs of both risky assets V_i $(i=1,2)$ are independent and normally distributed with mean μ_i and variance f_i,

$$V \sim \left[\begin{pmatrix} \mu_1 \\ \mu_2 \end{pmatrix}, \begin{pmatrix} f_1 & 0 \\ 0 & f_2 \end{pmatrix} \right].$$

Each investor in country j receives information (Y_i^j) about the value of each asset i, which is used to derive the stochastic demand of each assets. The noise in investors' information has two independent components: a common noise component (ε_i^j) for all investors and an idiosyncratic noise component (δ_i^j) for foreign investors only.

If i = j (domestic investor) $\quad Y_i^j = V_i + \varepsilon_i^j, \text{ where } \varepsilon_i^j \sim N(0,\sigma_i),$

and if i ≠ j (foreign investor) $\quad Y_i^j = V_i + \varepsilon_i^j + \delta_i^j, \text{ where } \delta_i^j \sim N(0,\theta^j).$

Next,

I can derive the investor's demand function by maximizing the expected conditional utility $E\left[U\left(W^j \middle| Y^j\right)\right]$. With negative exponential utility and normally distributed random variables, each investor's demand for the risky asset is derived as the following (Admati 1985):

$$D_i^j = \frac{E\left[V_i^j \middle| Y_i^j\right] - P_i}{Var\left[V_i^j \middle| Y_i^j\right]}.$$

The demand function states that when making investment decisions, each investor compares his expected value to price and weights the difference by his posterior precision. For assets in country 1, the demand function of domestic and foreign investors takes the following form,

$$\text{For domestic investors, } D_1^1 = \left(\mu_1 \cdot f_1^{-1} + Y_1^1 \cdot \sigma_1^{-1}\right) - P_1\left(\sigma_1^{-1} + f_1^{-1}\right)$$

$$(.1)$$

$$\text{For foreign investors, } \quad D_1^2 = \left(\mu_1 \cdot f_1^{-1} + Y_1^2 \cdot (\sigma_1 + \theta^2)^{-1}\right) - P_1\left((\sigma_1 + \theta^2)^{-1} + f_1^{-1}\right).$$

$$(.2)$$

To characterize the equilibrium demand as a function of the information structure, I determine the market-clearing price by equating aggregate demand to aggregate supply Z_i $(i = 1, 2)$. The market-clearing price for each asset can be derived as,

$$P_1^* = \frac{(\mu_1 \cdot f_1^{-1} + Y_1^1 \cdot \sigma_1^{-1}) + \left(\mu_1 \cdot f_1^{-1} + Y_1^2 \cdot (\sigma_1 + \theta^2)^{-1}\right) - Z_1}{(f_1^{-1} + \sigma_1^{-1}) + \left(f_1^{-1} + (\sigma_1 + \theta^2)^{-1}\right)} \qquad (.3)$$

$$P_2^* = \frac{(\mu_2 \cdot f_2^{-1} + Y_2^2 \cdot \sigma_2^{-1}) + \left(\mu_2 \cdot f_2^{-1} + Y_2^1 \cdot (\sigma_2 + \theta^1)^{-1}\right) - Z_2}{(f_2^{-1} + \sigma_2^{-1}) + \left(f_2^{-1} + (\sigma_2 + \theta^1)^{-1}\right)}. \qquad (.4)$$

Finally, I derive the equilibrium demand from the expected demand with market-clearing price. For assets in country 1, I derive the expected demand of domestic investors by taking the expectation of (A.8) after substituting the equilibrium price (A.10) back into the demand function. Thus, the *ex ante* indirect demand function of asset 1 for domestic and foreign investors are given as,

$$\text{domestic investors' demand} \quad E\left(D_1^1\right) = Z_1 \left(\frac{f_1^{-1} + \sigma_1^{-1}}{(f_1^{-1} + \sigma_1^{-1}) + \left(f_1^{-1} + \left(\sigma_1 + \theta^2\right)^{-1}\right)} \right) \quad (.5)$$

$$\text{foreign investors' demand} \quad E\left(D_1^2\right) = Z_1 \left(\frac{f_1^{-1} + \left(\sigma_1 + \theta^2\right)^{-1}}{(f_1^{-1} + \sigma_1^{-1}) + \left(f_1^{-1} + \left(\sigma_1 + \theta^2\right)^{-1}\right)} \right). \quad (.6)$$

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