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John Ammer

Sara B. Holland

David C. Smith

Francis E. Warnock

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## Why Do U.S. Cross-Listings Matter?

John Ammer  
Sara B. Holland  
David C. Smith  
Francis E. Warnock \*

Abstract: This paper investigates the underlying determinants of home bias using a comprehensive sample of U.S. investor holdings of foreign stocks. We document that U.S. cross-listings are economically important, as U.S. ownership in a foreign firm roughly doubles upon cross-listing in the United States. We explore the cross-sectional variation in this “cross-listing effect” and show that increases in U.S. investment are largest in firms from weak accounting backgrounds and in firms that are otherwise informationally opaque, indicating that U.S. investors value the improvements in disclosure associated with cross-listing. We confirm that relative equity valuations rise for cross-listed stocks, and provide evidence suggesting that valuation increases are due in part to increases in U.S. shareholder demand and in part to the fact that the equities become more attractive to non-U.S. shareholders.

Keywords: Home Bias, Portfolio Choice, Financial Disclosure, Corporate Governance

JEL Classification: G11, F21, C35

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\* Ammer is a Senior Economist in the Division of International Finance of the Board of Governors of the Federal Reserve System. Holland is a Ph.D. candidate at the Haas School of Business, University of California at Berkeley, Smith is at the McIntire School of Commerce, University of Virginia, and Warnock is at the Darden Graduate School of Business Administration, University of Virginia. Previous versions of this paper were titled “Look at Me Now: What Attracts U.S. Shareholders?” The authors thank Mark Carey, Laura Field, Charles Hadlock, Andrew Karolyi, Christian Leuz, Ross Levine, Michelle Lowry, Darius Miller, Greg Nini, Bent Sorensen, Mark Spiegel, Michael Weisbach, an anonymous referee, and seminar participants at the 2004 EFA Meetings, 2006 AFA Meetings, Binghamton University (SUNY), College of William and Mary, European Central Bank, Federal Reserve Board, Federal Reserve System SCIEA Meetings, ISCTE Business School, Michigan State University, NYSE, Penn State University, Stockholm Institute for Financial Research, Universidad Catolica Portuguesa, Universidade do Porto, University of Houston, University of Minnesota, and University of Virginia for helpful comments. Nathanael Clinton and Alex Rothenberg provided exceptional research assistance. The views expressed in this paper are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or of any other person associated with the Federal Reserve System. The statistical analysis of security-level data on U.S. investors’ holdings reported in this study was conducted at the International Finance Division of the Board of Governors of the Federal Reserve System under arrangements that maintained legal confidentiality requirements.

## 1. Introduction

This paper uses a comprehensive dataset to examine the characteristics that make foreign stocks attractive to U.S. investors. Such a study is important because researchers continue to puzzle over the fact that U.S. stockholders exhibit a strong “home bias” for investing in U.S. firms. Recent theories favor three explanations for the home bias: (1) Investors demand a level of informational transparency, including high-quality accounting standards, beyond that of the typical non-U.S. stock; (2) Investors value the strong legal protections provided by U.S. securities regulations and law; or (3) Investors are inhibited from trading across borders because of high transactions costs. We present evidence that strongly supports the first explanation, i.e., that it is transparency that is most important to U.S. investors.

Our dataset is derived from security-level U.S. Treasury/Federal Reserve Board surveys of foreign equity holdings of U.S. residents, which contains snapshots of *all* U.S. portfolio holdings of foreign equities at specific points in time. We match holdings data from the 1994 and 1997 surveys to firm-specific information on publicly traded firms from Worldscope and Datastream, resulting in information on 12,236 companies domiciled outside of the United States. Using these data, we examine the connection between a foreign firm’s decision to cross list on a U.S. stock exchange, U.S. investor interest in holding that firm’s stock, and the value of the stock following cross-listing.

Consistent with findings in other recent papers, we show that U.S. investors sharply increase their holdings in foreign stocks that cross-list on a U.S. exchange, a phenomenon we term the “cross-listing effect.”<sup>1</sup> After a variety of controls for selection bias—important because certain characteristics of a firm might make it both more likely to choose to cross-list and more likely to

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<sup>1</sup> Bradshaw, Bushee, and Miller [2004], Edison and Warnock [2004], Aggarwal, Klapper, and Wysocki [2005], and Leuz, Lins, and Warnock [2008] also observe that U.S. investor holdings are larger for cross-listed stocks.

be held by U.S. investors—we demonstrate that U.S. investors double their holdings in foreign stock once the stocks are listed on either the NYSE or NASDAQ. Moreover, as in previous studies, we show that cross-listing firms experience large and statistically significant increases in equity value upon cross-listing; our estimates imply a 21.4 percent increase, measured relative to historical cost.

The main contribution of our paper is to investigate the determinants of the cross-listing effect, and to relate observed increases in U.S. holdings to changes in the value of the cross-listing stocks. We motivate our investigation with the following intuition: If cross-listing reduces impediments to U.S. investment, then firms with the greatest impediments prior to listing should experience the largest jump in U.S. investment. Likewise, reductions in trading related impediments should translate to a lower cost of capital, which in turn raises the equity value of those firms benefiting most from the cross-listing.

Our primary finding is that firms that rely on relatively weak accounting practices prior to cross-listing experience a statistically larger cross-listing effect than do firms from strong accounting backgrounds. These firms also experience larger valuation gains upon cross-listing. These results are consistent with the idea that requisite reconciliations to U.S. GAAP, along with other mandated disclosures, make cross-listing firms more attractive to U.S. investors, and also increase the value of these firms upon cross-listing.<sup>2</sup>

By contrast, the increase in holdings by U.S. investors associated with cross-listing on a U.S. exchange is less for firms from countries with weak investor protection. Furthermore, these firms experience statistically larger increases in value than cross-listing firms from countries with

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<sup>2</sup> Foreign firms listed on U.S. exchanges are required to annually file SEC form 20-F, which contains a reconciliation of the firm's net income and shareholders' equity figures with U.S. GAAP. Researchers have questioned the value of these reconciliations relative to the reporting of U.S. firms (e.g., Rees and Elgers [1997], Pownall and Schipper [1999], and Lang, Ready, and Wilson [2006]), but have generally found the reporting of cross-listed firms to be more informative than that of their non cross-listed peers (e.g., Lang, Raedy, and Yetman [2003], Lang, Lins, and Miller [2003], Leuz, Nanda, and Wysocki [2003], and Barth, Landsman, Lang, and Williams [2006]).

legal systems that provide stronger shareholder rights. Indeed, U.S. investment actually increases more upon cross-listing for firms from countries with strong shareholder laws, as if U.S. investors viewed a cross-listing as a complement to other protections for minority shareholders, rather than a substitute.<sup>3</sup> Our findings related to shareholder protection laws has interesting implications for “bonding” theories of cross-listing (Stulz [1999] and Coffee [1999, 2002]), which we return to below.

We also demonstrate that cross-border trading costs cannot explain differences in U.S. interest across foreign stocks. U.S. investors hold about the same proportion of foreign stocks that are traded over-the-counter (OTC) in the United States as they do in peers not traded in the United States. Foreign firms that trade over the counter are interesting because they save U.S. investors the cost of a cross-border transaction but are not required to register with the SEC or reconcile financials with U.S. GAAP. Even more compelling, we find that U.S. investors acquire a majority of their shares in cross-listed firms *directly* in the firm’s home market, rather than through purchases of American Depositary Receipts (ADRs) on a U.S. exchange. Thus, the availability of foreign shares for trading within U.S. borders, by itself, is neither necessary nor sufficient for explaining the cross-listing effect.

Finally, we explore the relation between U.S. investor interest in a cross-listing stock and the value of that stock. Controlling for the endogeneity inherent in relating changes in holdings to changes in values, we estimate that an increase of 10 percentage points in U.S. holdings share is associated with an increase of 3 percent in market-to-book values of equity. We also find that changes in U.S. holdings and a cross-listing dummy independently impact valuation changes, suggesting that while U.S. investment in cross-listed shares is a significant driver of increases in

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<sup>3</sup> Our results do not imply that American investors favor companies with poor firm-level investor protections. Indeed, Leuz, Lins, and Warnock [2008] show that where country-level investor protections are poor, U.S. holdings are lower in companies with poor corporate governance.

equity value, U.S. cross-listings also make foreign equities more attractive to shareholders residing outside of the United States.

Our paper is related to recent work examining the decision to cross-list and the benefits that accrue from cross-listing. Lang, Lins, and Miller [2003] document increases in forecast accuracy and analyst coverage of firms following a cross-listing and show that these firms are valued more highly, on average, than their non cross-listed peers. They attribute the valuation gains to the improved information environment following the cross-listing.<sup>4</sup> Doidge, Karolyi, and Stulz [2004] study cross-listed firms' market-to-book ratios and find the valuation changes around a U.S. cross-listing to be higher for firms domiciled in countries with weak investor protections. They argue that the higher valuations are a result of improved legal protections. Doidge [2004] studies changes in control premiums around U.S. cross-listings and attributes a decline in the average premium to reductions in private benefits of control associated with improved legal protections.<sup>5</sup> In contrast to these studies, our paper focuses on *holdings* of foreign stocks and changes in the quantity of holdings around a cross-listing, which can yield insights unavailable from stock price data alone. Moreover, we are able to take the earlier studies a step further by relating changes in the value of cross-listed firms to observed changes in holdings.

The paper most closely related to our own is Bradshaw, Bushee, and Miller [BBM, 2004]. BBM use U.S. institutional holdings of foreign companies as reported in SEC 13(f) filings to examine the relation between investor interest in foreign companies and accounting choice.

Utilizing both cross-sectional and time-series methods, they find that foreign firms with greater

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<sup>4</sup> See also Foerster and Karolyi [1999], Miller [1999], and Errunza and Miller [2000], who document positive stock price reactions to firms that cross-list on a U.S. exchange.

<sup>5</sup> Gozzi, Levine, and Schmukler [2008] question the relation between stock valuations and motivations for cross-listing, with a particular emphasis on interpretations related to legal protections. They show that the increases in valuation occur well before the cross-listing and decline in the year after the cross-listing and find no relation between valuation changes around cross-listing and country-level investor protections. They argue that the observed pattern is more consistent with valuation increases leading to corporate expansions through cross-listing than changes in legal protections.

conformity to U.S. GAAP attract more U.S. institutional interest. Our paper departs from BBM in three important ways. First, our sample is drawn from a survey covering *all* U.S. portfolio holdings of foreign equities. By contrast, SEC 13(f) requires only the reporting of U.S. holdings in foreign securities that trade on U.S. exchanges. This excludes holdings in all non cross-listed stocks as well as in the home-traded stocks underlying cross-listed ADRs. Thus, the BBM sample covers only a small segment of the securities available to U.S. investors and understates U.S. holdings in the firms covered in their sample. Second, by considering effects on valuation as well as on U.S. holding shares, we also gain some insight into what matters to non-U.S. outside shareholders. Third, our investigation attempts to disentangle the information-transparency explanation for U.S. investor interest from competing (but correlated) explanations of the home bias. Specifically, our paper distinguishes between two dimensions of the theory popularly known as the “bonding” hypothesis (Stulz [1999]; Coffee [1999, 2002]).

Bonding theories assert that international firms can improve their corporate governance standards by cross-listing in the United States in order to bond themselves to U.S. accounting, disclosure, and legal practices. The first dimension of the bonding hypothesis relates to the perception that accounting and disclosure practices within the United States provide valuable information to investors at a lower cost than systems in other countries (Ball [2001]; Bushman, Piotrowski, and Smith [2004]). The second dimension is associated with the relatively strong legal protections investors receive in the United States through the enforcement of corporate and securities laws that protect minority investors. These laws are also backed by extensive property rights and contract law (Coffee [2002]; Levine [2005]). The two dimensions are likely to be correlated because countries with sound accounting and disclosure systems are likely to also have strong legal institutions in place to enforce compliance with the systems. However, valuable

information production does not require strong legal backing; competitive concerns or reputation may be incentive enough to maintain compliance with a given level of reporting standards (Ball, Robin, and Wu [2003]; Leuz, Nanda, and Wysocki [2003]; Siegel [2005]). Our results suggest that U.S. investors value the production of high-quality information without necessarily putting weight on explicit protections provided through the U.S. legal system.

## **2. Data**

### *2.1 Benchmark Survey Data*

Our investigation begins with comprehensive security-level data on U.S. holdings of foreign stocks as of March 1994 and December 1997, obtained confidentially through benchmark surveys conducted jointly by the U.S. Treasury Department and the Federal Reserve Board. The survey must be completed by all U.S. financial institutions, both within the United States and abroad, that are entrusted with the management or safekeeping of client equity holdings. Institutions covered include all U.S. custodian banks, other commercial and investment banks, mutual funds, pension funds, insurance companies, endowments, and foundations. Respondents are required to report the foreign stock and bond holdings of all their clients that are U.S. residents, and are subject to penalty under law for noncompliance.<sup>6</sup>

The survey is the source for official U.S. data on cross-border portfolio investment.<sup>7</sup> It is designed to pick up all recorded U.S. resident portfolio holdings of foreign equities. The only portfolio investments missed by the survey are “uncountable” holdings – i.e., those that evade

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<sup>6</sup> Custodians are the main source of information, covering 97 percent of the market value of the securities in the 1997 survey. Institutional investors report in detail on their ownership of foreign securities only if they do not entrust the safekeeping of these securities to U.S.-resident custodians. If they do use U.S.-resident custodians, institutional investors report only the names of the custodians and the amounts entrusted.

<sup>7</sup> “Portfolio investments” exclude holdings for control purposes, defined to be individual holdings of 10 percent or more of shares outstanding. Excluding these large holdings is likely to have little impact in our sample because it is relatively uncommon for a single U.S. investor to hold more than 10 percent of a publicly traded foreign company. Grier, Lee, and Warnock [2001] provide a primer on the survey. Complete details of the 1997 survey, including forms, instructions, and data, are available from <http://www.ustreas.gov/tic/fpis.html>.



detection because the U.S. resident used a foreign custodian, provided a foreign home address, or instructed the custodian not to employ a U.S. sub-custodian. Federal Reserve cross-checks with non-U.S. data collectors suggest that the number of uncountable holdings is small.

Other data sources are necessarily more limited. For example, data on U.S. institutional investors' holdings as reported to the SEC on Form 13(f), and used by BBM, exclude holdings in securities that do not trade in U.S. markets and in foreign securities that underlie ADRs. Only a small fraction of publicly traded firms domiciled outside of the United States actually trade in U.S. markets (3.5 percent in 1997, according to the U.S. Treasury/Federal Reserve survey), and, as we will show below, among those that do trade within U.S. borders U.S. investors hold more than half of their ownership in the underlying security, not through ADRs. Thus, Form 13(f) filings cover only a small segment of the securities available to U.S. investors and underestimate U.S. holdings in the firms covered in their sample. By simple comparison, 13(f) data appear to suggest that U.S. investors have holdings in only 5 percent of non-U.S. firms (see Table 2 of BBM), whereas our data registers U.S. ownership in over 70 percent of non-U.S. firms. An additional problem with the 13(f) data is that holdings of foreigners can be intermingled with U.S. holdings because the SEC permits (but does not encourage) institutions to consolidate their 13(f) holdings across subsidiaries, including foreign ones.

## *2.2 Sample Selection*

We limit our investigation to U.S. holdings of non-U.S. companies tracked by Worldscope. This enables us to utilize the company financial and accounting information reported in Worldscope and provides us with International Securities Identification Numbers (ISINs) for each of the company's outstanding securities. Obtaining the ISINs allows us to link more easily with

other electronic databases, such as Datastream. We use the May 1999 release of Worldscope, which contains 1997 data on 13,445 non-U.S. companies domiciled in 52 different countries.

In our tests, we normalize firm-level U.S. holdings by measures of the market capitalization (market value of equity) of the company. Datastream, which provides the broadest international coverage of market price data, is our primary source for firm-level market capitalizations. When a value is missing in Datastream, we turn to reports from Morgan Stanley, which provide reliable market data for companies included in the MSCI All-country World index, or Worldscope, which provides December market capitalizations for those companies that complete their fiscal year at the calendar year-end. We also use Morgan Stanley and Worldscope to cross-check the Datastream numbers for recording errors. In total, we are able to calculate market capitalization figures for 12,236 of the original 13,445 Worldscope firms.

We define two different measures of firm-level U.S. investor holdings. The first measure is constructed as the ratio of dollar holdings in a stock to the firm's market capitalization, and is thus equivalent to the proportion of shares held by U.S. residents. Our second measure uses a different denominator, an estimate of the stock's "market float," the market value of shares that are not closely held by insiders. Dahlquist, Pinkowitz, Stulz, and Williamson [2003] argue that closely held shares are unlikely to be made available to outside investors because insiders receive benefits from control that are not reflected in a stock's price. We calculate market float by scaling market capitalization down by the figure given in Worldscope's "closely held share" field, which reports the fraction of equity owned by corporate officers, directors and their family members, individual shareholders with more than 5 percent holdings, other corporations, and by the firm's own pension funds and trusts. However, we first adjust these Worldscope figures to exclude the value of depositary institution holdings, which are sometimes mistakenly counted in the closely

held fields.<sup>8</sup> Because of missing data on insider holdings, we can calculate market float for only 8,528 of our original observations.

### *2.3 Summary Statistics*

Table 1 reports the aggregate U.S. holdings share for firms in each of the 46 countries represented in our sample.<sup>9</sup> Even at the national level, U.S. holdings shares vary considerably. As of the end of 1997, U.S. investors owned nearly a quarter of the market capitalization of Argentine firms, and about a fifth of the market in Finland, Ireland, the Netherlands, Hungary, and Mexico.<sup>10</sup> Meanwhile, Americans held just 9 percent of the market capitalization for the 46 countries in aggregate, and less than 5 percent of Belgium, Greece, China, Colombia, and Taiwan. U.S. investor holdings also were relatively dispersed within the 46 countries, with non-zero stakes in 8,785 of the 12,236 stocks in the sample, ranging from very small firms to the world's largest non-U.S. companies.

Table 2 reports summary statistics for our market capitalization and market float samples. The Worldscope-based sample of 12,236 firms had an end-1997 market capitalization of \$11,080 billion, representing more than 90 percent of the value of all non-U.S. equity (International Finance Corporation, [1998]). U.S. investors' \$1,020 billion stake in these companies accounted for 88 percent of total U.S. foreign equity holdings and 9.2 percent of the market capitalization of the companies. On a market float-adjusted basis, U.S. investors held 13.5 percent of the

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<sup>8</sup> Specifically, we exclude holdings by the Bank of New York, Morgan Guarantee Trust, and Citibank, because these shares are likely to be holdings for ADR programs, and the New Zealand Central Securities Depository. There are other reasons to believe that the Worldscope measure of insider holdings contains measurement error. Worldscope coverage of the "closely held shares" field is uneven, and reporting requirements differ across countries. Moreover, it is unclear whether the classifications within Worldscope of what constitutes a closely held share conform well to theory on who gains private benefits from control and who would be willing to sell to a U.S. investor. For example, the measure includes holdings of large, unaffiliated blockholders.

<sup>9</sup> We exclude six countries with some Worldscope coverage but minimal U.S. holdings: Egypt, Jordan, Morocco, Slovakia, Sri Lanka, and Zimbabwe. Worldscope has 1997 data for a total of 42 firms from these countries.

<sup>10</sup> Countries that have a high share of U.S. ownership tend to have more cross-listed firms (Ahearne, Grier, and Warnock [2004]) and less pervasive insider holdings (Kho, Stulz, and Warnock [2006]).

Worldscope companies. As noted by Dahlquist, Pinkowitz, Stulz, and Williamson [2003], the market-float adjustment can account for part of the observed home bias in U.S. holdings.

Table 2 also breaks down the sample according to whether or not the sample firms are cross-listed on a U.S. exchange, defined to include both direct listings and ADRs listed on the New York Stock Exchange (NYSE), NASDAQ, or American Stock Exchange.<sup>11</sup> Of the 12,236 sample firms, 498 were cross-listed on a U.S. exchange at the end of 1997. U.S. investors held an (equal-weighted) average of 17.5 percent of the market capitalization (26.3 percent of market float) of these firms, compared to an average stake of just 2.9 percent (5.6 percent of market float) of the 11,738 foreign companies that were not cross-listed. This large difference in U.S. holdings of cross-listed and non cross-listed foreign firms forms the basis for what we term the “cross-listing” effect.

Among cross-listed firms, U.S. investors held the bulk of their holdings (11.1 percent of market capitalization) in the underlying security purchased in the foreign home market. This fact has an important implication. ADRs enable U.S. investors to forego concerns about trading in other currencies, dealing directly with foreign regulatory authorities, and potentially high execution costs on foreign stock markets. If investors were responding merely to the convenience of being able to trade these stocks in the United States, we would expect most of the cross-listed holdings to be in the form of ADRs. In contrast, most U.S. holdings in cross-listed firms are in the underlying foreign security.

The bottom of Table 2 includes information on U.S. ownership in foreign equities that trade as Level I ADRs. These shares are traded in dollars in the United States, but over-the-

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<sup>11</sup> An ADR is a traded financial claim backed by a set number of equity shares in the underlying company. ADRs are created when firm initiates a relationship with a broker that buys the firm’s shares and instructs a U.S. financial institution, called a “depository,” to hold the shares in custody and issue negotiable securities backed by the shares, the “receipts,” to an interested investor. Only “Level II” and “Level III” ADRs list and trade on one of the major U.S. stock exchanges.

counter. Because they are not listed on a major U.S. exchange, Level I ADRs are not required to reconcile financial statements with U.S. GAAP or to disclose regularly with the SEC, and they are not liable under most U.S. securities laws. For much of our analysis, we treat these firms as non cross-listed firms. U.S. investors do hold a greater proportion of shares in a Level I ADR-firm (8.1 percent of market capitalization, 14.6% of market float) than in the average foreign firm not traded in the United States, mostly in the form of the underlying foreign security. However, most of the difference between the holdings of foreign companies with Level I ADRs and non U.S.-traded foreign companies can be explained by selection bias.<sup>12</sup>

### **3. Unconditional cross-listing effect**

The difference between the 17.5 percent that U.S. investors hold of the average cross-listed firm and their average 2.9 percent stake in other foreign firms may overstate the ownership effect of cross-listing for at least two reasons. First, the causality might flow in the other direction -- the firm's managers may choose to cross-list in order to accommodate existing U.S. shareholders. Second, certain characteristics of a firm might make it both more likely to choose to cross-list and more likely to be held by U.S. investors.

We generate a consistent estimate of the average cross-listing effect using the “difference-in-differences” estimator (Heckman and Robb [1985]; Heckman, LaLonde, and Smith [1999]).<sup>13</sup> This estimator requires holdings observations on cross-listed firms prior to their cross-listing. For

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<sup>12</sup> Specifically, using selection-bias estimators we found (but do not report) that U.S. investors would have held between 5 and 6 percent of the shares in Level 1 ADR-firms even without the Level 1 program, implying a modest “Level 1” effect of 2 to 3 percent of market capitalization. It is not surprising that sample selection adjustments account for most of the increased holdings in the Level I ADRs, as many Level I ADR programs have been initiated by U.S. investors or depository banks, not by the foreign companies themselves.

<sup>13</sup> In earlier versions of this paper, we employed two other methods to correct for selection bias, a classic parametric Heckman (1979) correction and a probability-matching method (Heckman, Ichimura, and Smith, 1997). Our findings were consistent and robust across the methodologies. For purposes of brevity, we dropped these results. They are available upon request.

this, we draw upon U.S. holdings data from the earlier March 31, 1994 survey. The difference-in-differences estimator compares the change in holdings of a firm that was not cross-listed in 1994 but cross-listed by 1997 to firms that remained non cross-listed between 1994 and 1997. That is, the cross-listing effect is given by

$$E(H_i^L | X = 1) - E(H_i^L | X = 0) = (\bar{H}_i^{L,1997} - \bar{H}_i^{U,1994}) - (\bar{H}_j^{U,1997} - \bar{H}_j^{U,1994}), \quad (1)$$

where  $i$  indexes a firm that cross-lists between the 1994 and 1997 surveys,  $j$  indexes a firm that remains non cross-listed in both surveys, and bars over the variables reflect sample means across the  $i$  and  $j$  categories.

Table 3 reports U.S. holdings in the 132 sample firms that were not cross-listed in March 1994 but that cross-listed by December 1997. U.S. investors held 8.6 percent of the market capitalization in these firms. By adding the 0.6 percentage increase in the holdings of non cross-listed firms over the period 1994-1997, we estimate U.S. holdings in these firms if they remained non cross-listed ( $E(H_i^L | X = 0)$ ) to be 9.2 percent of the firms' market capitalization. Note that the estimate of 9.2 percent is much higher than the unconditional estimate of the 2.9 percent holding in non cross-listed firms reported in Table 2. The higher holdings estimate reflects the selection bias adjustment; U.S. investors are already predisposed to invest more in the types of firms that choose to cross-list on a U.S. exchange. Nonetheless, with U.S. investors actually holding 17.1 percent of these firms by the end of 1997, the difference-in-difference estimator still implies a near doubling in investment, i.e., an average cross-listing effect of 7.9 percent.<sup>14</sup>

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<sup>14</sup> In our sample, 23 of the firms that cross-listed between the two survey dates also undertook seasoned equity offerings (SEOs). It is plausible that the combination of a SEO and cross-listing has different implications for U.S. holdings than a cross-listing alone, particularly if the issue targets U.S. investors. However, when we compare the change in U.S. holdings for cross-listing stocks with and without these SEOs, we find no statistically significant difference. Accordingly, we do not treat cross-listing firms that raise public equity differently from other cross-listing firms. For further evidence on the capital-raising behavior of cross-listed firms, see Reese and Weisbach [2002] and Henderson, Jegadeesh, and Weisbach [2004].

#### 4. Conditional cross-listing effect

We investigate what drives the effect of cross-listing on the U.S. holdings shares by exploring what sorts of firm characteristics are associated with a larger cross-listing effect. We conjecture that firms experiencing the largest cross-listing effect are those for which cross-listing most sharply reduces frictions to investment. If theories linking the importance of cross-listing to improved information flow and protection under U.S. laws are to have some descriptive power, then the largest cross-listing effect should be experienced by firms that (i) have weak accounting standards prior to cross-listing, or are financially opaque, and (ii) poorly protect outside investors, or are from countries with weak investor rights protections. To explore these implications, we explore regressions of firm-level measures of the cross-listing effect on proxy measures for information quality, accounting quality, and investor protection.

To undertake this analysis, we regress the 1994 to 1997 change in holdings of stocks that were not cross-listed in 1994 on a cross-listing dummy, its interactions with instruments measured as of 1994 and 1997, and the change in the value of instruments over the 1994 to 1997 period,

$$\Delta H_i = \alpha_D + X_i \gamma_D + X_i \mathbf{Z}_i^{1994} \boldsymbol{\beta}_D + (\mathbf{Z}_i^{1997} - \mathbf{Z}_i^{1994}) \boldsymbol{\theta}_D + \mathbf{Z}_i^{1994} \boldsymbol{\varphi}_D + \varepsilon_i^D, \quad (2)$$

where  $X_i$  equals one if the firm cross-lists in 1997, and zero otherwise. We include changes and first-period levels of the instruments in the regression as controls for changes in firm characteristics and in U.S. investor preferences, respectively. This is essentially a conditional differences-in-differences approach.

The instruments that we use to explain variation across firms in the cross-listing effect are listed in Table 4. U.S. investors may want fundamental information about a foreign stock before deciding to purchase it. The ability to obtain information about a company will depend, among other things, on the accounting and disclosure practices of the company. Therefore, U.S. investors

may favor companies that provide an accurate and timely accounting of their financial performance (Leuz and Verrecchia [2004]; BBM), and may be attracted to foreign stocks domiciled in countries with forthright accounting practices (Lang, Lins, and Miller [2003]).

To measure these effects, we first consider five proxies for information transparency. The first proxy is the logarithm of total (book) assets. Larger firms are generally believed to be more transparent than smaller firms, in part because they tend to get more coverage both from the press and from securities analysts. The second is a financial firm dummy. Financial firms hold leveraged balance sheets that could be more difficult for outside investors to evaluate than the earnings of non-financial firms, are subject to more regulatory, rather than public disclosure, and may view public information disclosures as potentially risky to their business.<sup>15</sup> Third, we add a Canada dummy. Institutional similarities and ties within North America may make Canadian firms more transparent to U.S. investors *ex ante*. And, probably more important, Canadian firms are not required to reconcile to U.S. GAAP or increase disclosures as much upon cross-listing. Fourth, we include a MSCI member dummy. MSCI index members are selected in part on the basis of secondary market liquidity. Illiquidity can reflect asymmetric information (e.g., Easley and O'Hara [2004]) that would put U.S. investors at a disadvantage. Our fifth proxy is an English home language dummy. U.S. investors may find it easier to process information from companies that are guaranteed to disclose information in English.

As more direct measures of the ability to obtain information about a company, we include two measures of accounting quality. The first measure is the national accounting quality index compiled by the Center for Financial Analysis and Research (CIFAR). As reported by Bushman, Piotroski, and Smith [2004], the index averages across firms within a given country the number of items, out of a possible maximum of 90, that are included as part of a firm's financial statements.

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<sup>15</sup> For evidence on the opaqueness of financial firms, see Morgan [2002].



The second measure is a firm-level accounting quality index, constructed as the sum of four indicator criteria, measured on an annual basis. The first criterion takes the value of one if a company uses a Big Six auditor. The second criterion equals one if the company received a clean audit report. The third takes a value of one if the firm used international accounting standards or U.S. GAAP. And the fourth equals one if the firm reported consolidated statements. This variable measures variation in firm-specific accounting quality not picked up by the national accounting quality variable.

U.S. investors may also be concerned about the safety of their investment in the hands of managers who operate outside U.S. borders. LaPorta, Lopez-de-Silanes, Shleifer, and Vishny [1999, 2002] have documented substantial cross-country variation in how well legal systems protect outside shareholders from expropriation by firm insiders. Durnev and Kim [2005], among others, show that the quality of corporate governance within a country can vary greatly across firms. Thus, U.S. investors could tilt their investments toward countries with strong legal protections of minority investors and seek out firms with a reputation for good corporate governance. We include the country's shareholder rights index to capture governance and legal issues.<sup>16</sup> As a robustness check, we rerun all our regressions using the Dyck and Zingales [2004] country-level estimates of the "average control premium" as an independent measure of country-level shareholder protection. Although we do not report the results, all estimates are similar to those with the La Porta, et al. [1998] measure.

Table 5 reports the results from regressions using the difference-in-differences setup to generate firm-level estimates of the cross-listing effect on the U.S. holdings share. For brevity, we report only the interaction estimates ( $\beta_D$ ) in Table 5 that identify the marginal influence of the

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<sup>16</sup> See La Porta, Lopez-de-Silanes, Shleifer, and Vishny [1998].

instruments on the cross-listing effect. Overall, the results are consistent with the notion that improvement in the availability and quality of value-relevant information about a firm is a key aspect of cross-listing in U.S. markets. For example, we obtain negative and statistically significant coefficient estimate for the firm-level accounting quality index. The estimates imply that U.S. investors increase their ownership in a cross-listing firm by 3 percentage points for every unit decline in the firm's accounting quality index. Overall, the estimates imply that improved accounting practices linked to cross-listing spurs U.S. investment in firms with previously weak accounting standards.

We further explore the impact of firm-level disclosure choices in the second specification reported in the table, which allows three of the four elements of the Aggarwal-Klapper-Wysocki accounting quality index to enter the regression equation independently.<sup>17</sup> Note that only three of the cross-listed firms in our sample used an international standard prior to cross-listing. We find a large and statistically significant negative coefficient for the consolidated accounting interaction, suggesting that a lack of consolidated financial reports was a significant deterrent to U.S. investors. Although the reported coefficient for IAS or U.S. GAAP accounting is nearly as large, it is too imprecisely estimated to be statistically significant. Finally, in contrast to results reported by BBM for the portfolios of a particular set of institutional investors, we do not find evidence here that, all else equal, use of an auditor outside the Big Six was a significant deterrent to U.S. portfolio investors in aggregate.

Additional evidence for the importance of transparency comes from the smaller estimated cross-listing effect for Canadian firms. Because Canadian firms are not required to reconcile to U.S. GAAP or increase disclosures as much upon cross-listing, cross-listing should have less

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<sup>17</sup> We omit the "clean audit" component of the index, because all of the cross-listed firms in our regression sample were given a clean audit report in the earlier period.

impact on U.S. investors' willingness to hold Canadian stocks. We also find U.S. holdings react less to cross-listing by firms from other English-speaking countries, for which information in English is likely more readily available at low cost. One further bit of indirect evidence favoring an information explanation is the reduced listing effect for the more liquid stocks that are included in the MSCI World index. To the extent that illiquidity reflects asymmetric information between company insiders and other potential traders, as in the models of Diamond and Verrecchia [1991] and Easley and O'Hara [2004], the enhanced disclosure requirements associated with cross-listing will tend to matter more for less liquid stocks.

With a positive coefficient estimated for the interaction term between the cross-listing dummy and the shareholder rights index, we do not find that U.S. investors respond to the enhanced protections of U.S. securities laws in the manner that has been suggested by some of the proponents of the investor-protection hypothesis. In particular, all else equal, cross-listing has a smaller impact on U.S. investors' holdings for firms from countries with weaker shareholder protection. Our result here does *not* imply that U.S. investors fail to value shareholder protection provided by other countries' legal systems, but is consistent with cross-listing *complementing* such legal rights. In fact, to the extent that cross-listing in the United States makes a firm more transparent, legal protections provided to minority shareholders in the home country may become more effective. (Furthermore, the disclosure requirements accompanying a U.S. listing typically include information about home-country legal risks that may leave some U.S. investors better informed about their rights.) What our results *do* suggest is that cross-listing in the United States is not a substitute for adequate protection of minority shareholders under the home-country legal system.

## 5. Effect of Cross-Listing on Market Valuation

Ultimately, foreign firms considering whether to cross-list in the United States probably care more about the impact of the decision on their cost-of-capital than on the composition of their shareholders. To explore valuation effects associated with cross-listing and shifts in shareholder composition, Table 6 reports the results of several regressions with the change in the natural log of the Q ratio as the dependent variable. Relative to the rest of the sample, we find from a regression of the change in Q on the cross-listing dummy that cross-listing is associated with a Q ratio that is on average 21.4 percent higher ( $e^{0.194} = 1.214$ ) at the end of 1997. In addition, we estimate that an increase of 10 percentage points in the U.S. holdings share is associated with an increase of about 3 percent in the Q ratio. When both are included in the regression, we find that cross-listing and U.S. holdings have significant independent effects on Q. Furthermore, the effect of cross-listing in the United States on Q is almost as high after controlling for the effect on Q of the change in the U.S. holdings share. These results suggest that not only does attracting U.S. shareholders raise the valuation of the firm, but that cross-listing in the United States also makes the stock significantly more attractive in the eyes of non-U.S. shareholders.

Finally, we consider which ex ante firm characteristics matter for the impact of cross-listing on a firm's market valuation. Table 7 shows the results of regressions similar to those reported in Table 5, but with the change in the natural log of the Q ratio as the dependent variable. We estimate statistically significant negative coefficients for the interaction of the cross-listing dummy with each of three variables associated with a foreign firm's transparency (before cross-listing): the log of total assets, the national accounting quality index, and the Canada dummy. Thus, all else equal, the impact of cross-listing on firm valuation appears to be less for firms that

were already relatively transparent. These results amount to further evidence that the most important effect of cross-listing is to promote transparency.

Lastly, the residual from the holdings share equation impacts  $Q$  with a positive sign, and the magnitude of this parameter estimate again associates an increase of 10 percentage points in the U.S. holdings share with an increase of about 3 percent in the  $Q$  ratio. At first blush, this result suggests that an exogenous increase in U.S. investor interest (i.e., not associated with any implications about firm fundamentals) raises market valuations, as if the ex-U.S. supply curve of the stock were upward sloping. However, the positive coefficient is also broadly consistent with market valuation and the U.S. holdings share both rising in response to all manner of changes (including those associated with cross-listing) that alleviate the concerns of outside shareholders. To the extent that these factors are not captured completely by the instruments we include in our regression equations, we expect the sign on this coefficient to be positive.

## **6. Conclusion**

We use comprehensive surveys of U.S. investor holdings in non-U.S. companies to document that cross-listing on a U.S. exchange substantially increases U.S. investor holdings of a foreign stock, a phenomenon we term the “cross-listing effect.” Our selectivity-corrected estimates imply that firms can increase their U.S. holdings by about 8 percent of their market capitalization by cross-listing in the United States, roughly doubling the amount prior to cross-listing. In addition, cross-listing typically adds about 20 percent to the value of a firm, as measured by the  $Q$  ratio. Of course, this does not imply that every firm in the world could obtain a cross-listing effect of this magnitude, but the observable characteristics of our sample firms suggest that our estimates were applicable to at least several hundred more firms that were not yet

cross-listed.

We find a *smaller* U.S. holdings increase from cross-listing for firms with more transparent financial accounting. This result is consistent with requisite financial disclosure being a key element of cross-listing, from the point of view of U.S. investors. We do not find strong evidence that adopting U.S. legal protections is an important aspect of a U.S. listing, but this may be because variation in shareholder protection is more difficult to measure in our cross-section of firms than variation in transparency. However, our findings are generally consistent with Siegel [2005], who shows that, in practice, U.S. securities law enforcement does not extend to cross-listed companies, and Gozzi, Levine, and Schmukler [2008], who demonstrate that cross-listing does not improve the valuation of companies from poor investor-protection countries.

Our analysis also has policy implications. Firms that voluntarily commit to increased disclosure appear to attract more outside investment and raise market valuations, and governments can promote and enforce disclosure to attract capital flows to their countries. Accordingly, the U.S. cross-listing effect should diminish for firms from countries that improve disclosure standards for publicly traded firms.<sup>18</sup> Our results also suggest that legal protections for small shareholders may be more effective in an environment that also ensures transparency.

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<sup>18</sup> Similarly, Armstrong et al. [2006] find that European markets reacted positively to events associated with the 2005 adoption of International Financial Reporting Standards (IFRS) in Europe.

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**Table 1: U.S. Holdings by Country, December 31, 1997**

The table shows the proportion of market capitalization held by U.S. investors and the number of firms with positive U.S. holdings among the 12,236 non-U.S. stocks in our sample, sorted by country. Data on the value of U.S. holdings are from the U.S. Treasury/Federal Reserve Board survey of U.S. holdings of foreign securities. Market capitalization data are from Worldscope.

Country	Percent of Market Capitalization Held by U.S. Investors	Number of Firms with Positive U.S. Holdings	Country	Percent of Market Capitalization Held by U.S. Investors	Number of Firms with Positive U.S. Holdings
Argentina	24	38	Korea	10	248
Australia	10	268	Luxembourg	8	8
Austria	8	54	Malaysia	5	348
Belgium	4	66	Mexico	19	83
Brazil	13	128	Netherlands	19	136
Canada	11	484	New Zealand	14	47
Chile	7	63	Norway	13	120
China	4	85	Pakistan	12	42
Colombia	4	17	Peru	18	20
Czech Republic	5	41	Philippines	9	96
Denmark	8	88	Poland	17	39
Finland	21	74	Portugal	13	50
France	11	403	Russia	9	20
Germany	6	271	Singapore	7	162
Greece	4	64	South Africa	5	150
Hong Kong	7	332	Spain	11	104
Hungary	21	19	Sweden	14	153
India	6	186	Switzerland	11	144
Indonesia	8	107	Taiwan	1	174
Ireland	21	56	Thailand	9	192
Israel	11	49	Turkey	9	77
Italy	10	143	United Kingdom	10	1,446
Japan	6	1,876	Venezuela	14	14
			Total	9	8,785

**Table 2: Summary Statistics for Sample, December 31, 1997**

The table reports aggregate U.S. holdings, the number and market capitalization of the sample firms, and U.S. holdings in cross-listed and non cross-listed firms. Data on the value of U.S. holdings are from the U.S. Treasury/Federal Reserve Board survey of U.S. holdings of foreign securities. Market capitalization figures and are from Worldscope. We calculate market float by scaling market capitalization down by the figure given in Worldscope's "closely held share" field. We label a non-U.S. firm as cross-listed if its shares are listed on the NYSE, AMEX, or NASDAQ. Level I ADRs trade only on over-the-counter markets and are not considered to be cross-listed on a U.S. exchange.

	Firm Market Capitalization Available (46 countries)	Firm Market Float Available (46 countries)
Number of Firms Available	12,236	8,528
Total market value of equity (billions of US\$)	\$11,080	\$5,927
Value of U.S. holdings (billions of US\$)	\$1,020	\$802
Implicit share held by U.S. investors	9.2%	13.5%
Firms Cross-Listed on a U.S. Exchange	498	293
Average share held by U.S. investors	17.5%	26.3%
Average share held in ADR form	6.4%	12.4%
All Firms Not Cross-Listed on U.S. Exchange	11,738	8,235
Average share held by U.S. investors	2.9%	5.6%
Memo:		
Firms underlying Level I ADRs	672	524
Average share held by U.S. investors	8.1%	14.6%
Average share held in ADR form	1.7%	2.8%

**Table 3: Average Cross-Listing Effect on the U.S. Holdings Share**

The table reports estimates of the average cross-listing effect on the proportion of a foreign firm owned by U.S. investors, using a “differences-in-differences” approach on U.S. holdings data for March 31, 1994 and December 31, 1997. The sample is restricted to stocks that were not cross-listed in U.S. markets in the earlier period, with the columns distinguishing between stocks that cross-listed before the second period and those that did not. The standard error is shown in parentheses.

	Stocks Cross-listed on U.S. exchange by December 1997	Stocks not Cross-listed on U.S. exchange by December 1997
6. Holdings: March 31, 1994	8.6	2.3
7. Holdings: December 31, 1997	17.1	2.9
8. Change in holdings (1994-1997)	8.5	0.6
<b>9. Difference-in-differences estimate of cross-listing effect</b> $E(H_i^L   X = 1) - E(H_i^L   X = 0)$		<b>7.9</b> <b>(0.5)</b>
10. Number of Observations	132	9469

**Table 4: Variable Definitions for Conditional Cross-Listing Effect**

This table provides definitions and sources for the variables used in the empirical analysis.

Variable	Definition
Total assets	Logarithm of the 1997 book value of a firm's assets from Worldscope, included as a measure of firm size.
Financial firm dummy	Dummy variable that takes on the value of one when a firm is identified by Worldscope as belonging to industry SIC Codes 60-69 in 1997.
Canada dummy	Dummy variable set equal to one for Canadian firms.
Firm-level accounting quality index	Index ranging from zero to four, calculated using criteria from Aggarwal, Klapper, and Wysocki [2003]. Four components takes a value of one if the firm (1) used a BigSix auditor, (2) received a clean audit report, (3) used international accounting standards or US GAAP, and (4) reported consolidated statements. The index is the sum of the four components.
MSCI index membership dummy	Dummy variable equal to one when a firm is included as a member of the MSCI All-country World index at the end of 1997.
National accounting quality index	Values for 1995 reported by Bushman, Piotroski, and Smith [2004]. Compiled by the Center for Financial Analysis and Research, the index averages across firms within a given country the number of items, out of a possible maximum of 90, that are included as part of a firm's financial statements.
Shareholder rights index	Calculated by La Porta, Lopez-de-Silanes, Shleifer, and Vishny [1998]. Index takes on a value between 0 and 6 depending on how many of the following applies to a country's equity market: percentage of outstanding shares required to call an extraordinary meeting less than or equal to 10 percent, cumulative voting or proportional representation of minority interests on board, voting by mail permitted, mechanisms in place for oppressed minority investors, preemptive right that can only be waived by a shareholder vote, and protection of shareholders from requirements that shares be deposited before a shareholder meeting.
English home language dummy	Dummy variable that equals one if the company's domicile is a country in which English is an official language.
Q ratio (natural log)	$\ln[1 + (\text{Market Equity} - \text{Book Equity}) / (\text{Total Assets})]$ , as in Doidge, Karolyi, and Stulz [2004].

**Table 5: Determinants of the Cross-Listing Effect on the U.S. Holdings Share**

The table reports coefficient estimates from a regression of the change in U.S. holdings (as a percentage of market capitalization) between March 31, 1994 and December 31, 1997 on a cross-listing dummy interacted with 1994 values of the instruments listed in the table. The sample is restricted to stocks that were not cross-listed in U.S. markets in the earlier period. A dummy variable for cross-listing between 1994 and 1997, first-period values of the instruments, and changes in the instruments (between the first and second period) are included as control variables in both equations. P-values (for a null hypothesis of a zero coefficient) are shown in parentheses.

cross-listing dummy interacted with:	(1)	(2)
Financial firm dummy	-4.762 (0.014)	-5.377 (0.006)
Canada dummy	-5.916 (0.007)	-4.899 (0.030)
Log <sub>2</sub> of total assets	-0.556 (0.018)	-0.452 (0.059)
National accounting quality index	-0.021 (0.872)	0.101 (0.492)
MSCI member dummy	-2.968 (0.050)	-2.762 (0.068)
Shareholder rights index	3.382 (0.000)	3.297 (0.000)
Firm-level accounting quality index	-3.014 (0.033)	
Consolidated accounting dummy		-7.620 (0.001)
IAS or U.S. GAAP standard dummy		-5.818 (0.129)
Big-Six auditor dummy		1.758 (0.424)
English home language dummy	-7.115 (0.006)	-7.551 (0.005)
Number Not Cross-Listed	6,945	6,945
Number Cross-Listed	89	89
Adjusted R-squared	0.044	0.045

**Table 6: Effect of Cross-Listing on the Q Ratio**

The table reports coefficient estimates from a regression of the change in the natural log of the Q ratio between 1994 and 1997 on a dummy for cross-listing between 1994 and 1997 and on the change in U.S. holdings (as a percentage of market capitalization) between March 31, 1994 and December 31, 1997. The sample is restricted to stocks that were not cross-listed in U.S. markets in the earlier period. P-values (for a null hypothesis of a zero coefficient) are shown in parentheses.

	(1)	(2)	(3)	(4)
Dependent variable is:	Change in ln(Q), 1994-1997			Residual from regression (2)
Intercept	-0.103 (0.000)	-0.103 (0.000)	-0.105 (0.000)	-0.002 (0.597)
Cross-Listing dummy	0.194 (0.000)		0.181 (0.000)	0.179 (0.000)
Change in U.S. holdings share		0.003 (0.000)	0.002 (0.001)	
Number Not Cross-Listed	6,945	6,945	6,945	6,945
Number Cross-Listed	89	89	89	89
Adjusted R-squared	0.004	0.002	0.005	0.003



**Table 7: Determinants of the Cross-Listing Effect on the Q Ratio**

The table reports coefficient estimates from a regression of the change in the natural log of the Q ratio between 1994 and 1997 on a cross-listing dummy interacted with 1994 values of the instruments listed in the table. The sample is restricted to stocks that were not cross-listed in U.S. markets in the earlier period. A dummy variable for cross-listing between 1994 and 1997, first-period values of the instruments, and changes in the instruments (between the first and second period) are included as control variables in both equations. P-values (for a null hypothesis of a zero coefficient) are shown in parentheses.

cross-listing dummy interacted with:	(1)	(2)
Financial firm dummy	0.115 (0.318)	0.108 (0.353)
Canada dummy	-0.325 (0.013)	-0.348 (0.010)
Log <sub>2</sub> of total assets	-0.029 (0.039)	-0.028 (0.050)
National accounting quality index	-0.016 (0.045)	-0.018 (0.041)
MSCI member dummy	-0.068 (0.452)	-0.068 (0.449)
Shareholder rights index	0.023 (0.584)	0.027 (0.529)
Firm-level accounting quality index	0.026 (0.757)	
Consolidated accounting dummy		0.023 (0.863)
IAS or U.S. GAAP standard dummy		0.159 (0.486)
Big-Six auditor dummy		-0.014 (0.913)
English home language dummy	0.240 (0.120)	0.268 (0.091)
Residual from holdings share equation	0.003 (0.000)	0.003 (0.000)
Number Not Cross-Listed	6,945	6,945
Number Cross-Listed	89	89
Adjusted R-squared	0.114	0.117