

“You Can Enter but You Cannot Leave...” : U.S. Securities Markets and Foreign Firms

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ABSTRACT

Although a number of prior papers have argued the benefits to foreign firms of cross-listing their shares in the U.S., the number of foreign firms exiting U.S. capital markets has been increasing. This has occurred despite the difficulties foreign firms face in deregistering from the Securities and Exchange Commission (SEC). This paper examines the reasons underlying this trend. One of our main findings is that the passage of the Sarbanes-Oxley Act has reduced the net benefits of a U.S. listing and registration, particularly for smaller foreign firms with lower trading volume and stronger insider control.

IN RECENT YEARS NEARLY 150 FOREIGN FIRMS have sought to exit U.S. equity markets. Most of these firms have voluntarily delisted from one of the major U.S. exchanges and announced their intention to deregister from the Securities and Exchange Commission (SEC). Moreover, an increasing number of firms with American Depositary Receipt (ADR) programs are terminating their depository agreements. Once deregistered, foreign firms need not produce U.S. GAAP compliant financial reports and are no longer subject to the governance and disclosure regulations introduced under the Sarbanes-Oxley Act of 2002 (SOX).

While a large number of papers have been concerned with explaining the advantages to foreign firms of issuing securities and cross-listing in the U.S. (e.g., Bailey, Karolyi, and Salva (2006) and Lins, Strickland, and Zenner (2005)), this is the first paper to analyze foreign firms' incentives to reverse this process and deregister from the SEC.¹ Consequently, our findings have implications for the ongoing policy debate on whether SOX has had a negative impact on the

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¹ Karolyi (2006) provides a comprehensive survey of the cross-listing literature. In a concurrent paper Witmer (2006) examines “cross-delistings” using a smaller sample of foreign firms. Whereas our paper focuses on voluntary decisions to deregister, Chaplinsky and Ramchand (2007) follow all U.S. listed foreign firms from their listing decision to their eventual delisting due to mergers, bankruptcy, or other reasons over the period 1961 to 2004. Their sample of firms is dominated

competitiveness of U.S. capital markets (see Zingales (2006), Doidge, Karolyi, and Stulz (2007), and Piotroski and Srinivasan (2007)).

Compared with domestic firms (see, for example, Leuz, Triantis, and Wang (2007) and Marosi and Massoud (2007)), foreign firms find deregistration more difficult. Indeed, some have argued, that foreign firms “can check in, but they can’t check out.” For example, Pozen (2004) notes that “if a foreign company has ever made an SEC-registered public offering of equity securities to American investors, including securities offered as part of an acquisition, it would always be subject to the SEC’s disclosure system and SOX’s requirements so long as it has at least 300 U.S. shareholders.”

Prior to June 4, 2007 (i.e., during our entire sample period 1990 to 2006), a key difference between deregistering domestic firms and foreign firms was the manner in which “shareholders of record” were defined for the purposes of SEC deregistration. Although both foreign and domestic firms were (and domestic firms still are) eligible to deregister if they had fewer than 300 shareholders of record (500 for firms with less than \$10 million in assets), the definition of shareholder of record was fundamentally different between the two groups. Domestic issuers were (and still are) allowed to count “street names” (institutions such as Merrill Lynch holding the shares on behalf of investors) rather than the numerous beneficial owners who hold their shares with these street names.² By contrast, all domestic (i.e., U.S.) beneficial owners had to be included in foreign firms’ count of holders of record.

Note, however, that although the process of deregistration has been more difficult for foreign firms, deregistration has not been impossible. In particular, foreign firms have been able to reduce the number of their U.S. shareholders below 300 by terminating their ADR programs, thereby making it costlier for individual U.S. shareholders to invest in their stocks. Moreover, on March 27, 2007 (after our sample period ends) the SEC announced a new trading volume—rather than holder of record—based rule governing the deregistration of foreign private issuers. The new rule allows a foreign issuer to deregister if, for a recent 12-month period, its U.S. average daily trading volume (ADTV) has been no greater than 5% of its worldwide ADTV. This new rule became effective on June 4, 2007 and is expected to make the deregistration process faster and less onerous for smaller foreign firms.³

The early literature on cross-listing emphasizes the importance of market segmentation and liquidity (Foerster and Karolyi (1998, 1999)) and suggests that benefits include greater risk sharing and lower transaction costs. An alternative explanation is offered by the bonding hypothesis of Coffee (1999, 2002) and Stulz (1999). The authors argue that U.S. listings represent a credible

by involuntary delistings and does not include the two most active years of voluntary delistings: 2005 and 2006. Papers by Li (2006), Litvak (2007), and Smith (2007) focus primarily on cross-listed firms’ stock price reaction to SOX-related announcements.

² For example, a single street name may hold the shares of thousands of beneficial owners.

³ See the SEC’s website for further details: <http://www.sec.gov/rules/final/2007/34-55540.pdf>. Baruch, Karolyi, and Lemmon (2007) find that some cross-listed foreign firms experience low trading volume in the U.S. due to the low number of U.S. peer firms.

commitment by foreign firms to the enhanced minority shareholder protection found in the U.S. The bonding hypothesis suggests that firms from countries with weaker corporate governance regulations benefit more from bonding to stronger governance countries, an implication confirmed by the empirical work of Doidge (2004) and Doidge, Karolyi, and Stulz (2004). A further group of hypotheses focus on corporate goals such as achieving greater visibility, creating a U.S.-traded security that could be used as a takeover “currency,” and/or instituting stock option compensation plans (see, for example, Pagano, Röell, and Zechner (2002) and Burns, Francis, and Hasan (2007)).⁴

A number of recent empirical papers question the strength of the bonding hypothesis. Sarkissian and Schill (2005) find that although investor protection plays a role, the largest benefits arise when cross-listing takes place in foreign markets where these firms are known to investors. Gozzi, Levine, and Schmuckler (2006) argue that the early empirical bonding literature’s focus on cross-sections of firms, rather than firm time series raises endogeneity concerns since higher valued firms may be more likely to cross-list than their lower valued counterparts. Gozzi et al. (2006) focus on the evolution of the firm’s q -ratio and examine whether cross-listing in another country leads to a permanent increase in valuation, as predicted by the bonding hypothesis. They find no evidence of a lasting increase in the q -ratio or an increase in the value of cross-listed firms relative to domestic ones.

However, Doidge et al. (2007) and Hail and Leuz (2006) find support for the bonding hypothesis using panel data and including firm fixed effects to address the issues raised by Gozzi et al. (2006) regarding unobserved firm heterogeneity. Moreover, although most of the empirical bonding literature takes a static view of its nature, bonding itself might actually be a dynamic process involving the building of reputational capital over time. Indeed, Siegel (2005) finds evidence that U.S. listed Mexican firms have built reputational capital over time and thereby increased access to future financing. As will be discussed later in the context of our study, interpreting the concept of bonding as a dynamic reputation-building process plays an important role in explaining foreign firm deregistration decisions as well. For example, when the net benefits of bonding are sufficiently low, some foreign firms will decide that their best option is to deregister.

Given the substantial evidence regarding the net benefits to foreign firms from cross-listing in the U.S. and the difficulties they have faced in deregistering, why should foreign firms voluntarily deregister? The prior literature suggests two major reasons why U.S. listed foreign firms may choose to deregister. The first is related to changes in the net governance benefits of regulatory compliance, which in a U.S. context includes the direct effects of SOX, as well as country- and firm-level governance-related factors such as the level of minority shareholder protection in the firm’s home country and conflicts of interest among claimholders of individual foreign firms. For example, firms

⁴ See also Licht (2003) for a discussion of opportunistic managerial behavior as an alternative explanation to cross-listing.

from countries with poor governance regimes may choose to deregister from the SEC because they face the highest incremental costs of SOX compliance, while insiders may have different incentives to deregister compared with outside claimholders.

The second set of reasons for foreign firm deregistration relate to the economic incentives determined by each firm's ability to bear the costs of and take advantage of cross-listing as a result of its size, growth opportunities, and market liquidity. By economic incentives we mean economic motivations that are not driven primarily by the conflict of interest between inside and outside shareholders. For example, outsiders and insiders may agree that a high q -ratio firm should stay registered. As a result, we include a firm's q -ratio among economic incentives, whereas we include insider ownership among our regulatory and governance-related variables.

In this paper, we employ logistic regression (logit) analysis to evaluate the relative importance of (i) the regulatory and governance-related factors and (ii) the economic factors underlying foreign firms' decisions to deregister. As the holdout sample to the deregistering subsample, we consider the universe of U.S. registered foreign firms that chose not to voluntarily terminate their registration with the SEC over our sample period. Since it could be argued that over our sample period 1990 to 2006, deregistration may have been impossible for the largest foreign firms, we confirm the robustness of our main findings using different matching approaches, including propensity scores.

We find that the decision to deregister has been driven by a combination of regulatory/governance-related factors and economic factors. With respect to governance effects, increased U.S. security market regulation and tighter corporate governance controls since SOX have materially increased the probability of foreign firms, and especially small foreign firms with low U.S. trading volume, deregistering. In addition, foreign firms with higher insider control have also been more likely to deregister. This is consistent with the incentives of insiders to avoid the more rigorous U.S. regulatory oversight since SOX. Interestingly, holdings by U.S. institutional investors have tended to constrain such opportunistic behavior.

With regard to economic incentives, we find that foreign firms with relatively low q -ratios are more likely to deregister, as are those firms from industries in which takeover activity by foreign acquirers of U.S. firms is relatively low. In addition, firms with low (U.S.) stock price momentum are more likely to deregister. In our robustness test, we also examine whether broader macro and capital market trends, such as a downturn in U.S. capital markets, could explain the increase in deregistrations. Although in many cases these measures add explanatory power, the significant effect of SOX and other governance variables on deregistration remains.

In addition to tests of the factors that affect the probability of a foreign firm deregistering, we conduct event study tests of investor reaction to a firm's decision to deregister and find that post-SOX deregistration announcements have a less negative stock price effect than deregistration announcements in the pre-SOX period, consistent with stockholders recognizing the costs of SOX compliance.

Finally, we examine whether those firms that chose to deregister from the U.S. migrated to another foreign market such as London (the LSE). We find limited evidence of such an effect. Thus, consistent with the findings of Doidge et al. (2007), the loss of relative capital market competitiveness due to SOX has been somewhat limited.

The paper is organized as follows. In Section I, we describe the data used in our study. In Section II, we discuss our logit and event study methodologies. Section III presents the empirical results. Finally, Section IV concludes with some implications for U.S. security markets and the regulation of foreign firms.

I. Data

Our sample consists of the universe of U.S. listed foreign firms that decided to delist from major U.S. exchanges and then deregister from the SEC over the period 1990 to 2006. Most foreign firms traded in the United States issue ADRs, managed by a U.S. depositary bank such as the Bank of New York. An ADR is a U.S. security issued by a foreign company in U.S. dollars, backed by local securities in local currencies. For a detailed description of ADRs see Miller (1999).

Historically, the ADR has been an important instrument for foreign firms seeking access to U.S. capital markets. Indeed, in 2006, a record 52.6 billion ADRs valued at \$1.5 trillion were traded on major U.S. exchanges. However, over the period 2001 to 2006, the number of exchange listed ADRs outstanding dropped from approximately 610 to 478.⁵ Over the same period, the number of non-U.S. exchange listed firms worldwide increased from 27,110 to 34,630.⁶

Our sample consists of all foreign firms that voluntarily deregistered. To arrive at this sample, we start with a complete list of active and terminated ADRs that were traded over the period 1990 to 2006. This list was provided by the Bank of New York (BONY). Because not all foreign issuers with U.S. traded equity securities utilize ADR programs (Canadian firms, for example, are able to list their securities directly on U.S. exchanges), we use "CRSP" share codes and delisting codes to identify U.S. listed foreign firms with and without ADR programs. Then, using sources including the Factiva database, firm press releases posted on BONY's web site, and SEC filings ("EDGAR"), we identify all firms that deregistered as a result of bankruptcy or acquisition and exclude them from the sample. An example deregistration is as follows. Biacore International AB of Sweden announced in February 2004 that its board had decided to take steps to delist the company's ADRs from NASDAQ. The company cited the increased costs of maintaining a U.S. listing, the lack of advantages of a dual listing, and the limited number of Biacore ADRs traded

⁵ The data are obtained from the Bank of New York, Depositary Receipt Markets: The Year in Review: 2006.

⁶ The data are obtained from World Federation of Exchanges website: <http://www.world-exchanges.org>.

in the U.S. On December 29, 2004, Biacore filed a Form 15 to deregister from the SEC.

We obtain accounting data from the Compustat database and stock return and trading volume data from Datastream. While Worldscope (closely held shares) is our initial source for insider holdings data, we are able to substantially increase our sample size by hand collecting insider holdings from EDGAR filings and SEDAR filings (Canada's equivalent to the U.S. EDGAR system). Industry-level (two-digit SIC code) mergers and acquisitions data come from the Securities Data Corporation (SDC) database. We obtain institutional holdings data from Thomson Financial's CDA/Spectrum institutional (13f) holdings database.

Table I provides a breakdown of our sample across countries and regions, as well as across time. The number of deregistrations (excluding deregistrations due to acquisitions and bankruptcies) shows an increasing trend over time, with only 10 deregistrations during the period 1990 to 1999 compared with almost three times as many in 2006 alone. Whereas less than 1% of cross-listed firms decided to deregister in 2000 and 2001, this percentage started to increase in 2002 and was approximately 4% of cross-listed foreign firms in both 2005 and 2006. A large proportion of firms that deregistered during the sample period were incorporated either in Europe (69 firms) or Canada (32 firms).

II. Methodology

We first use logit analysis to determine the relative importance of (i) the regulatory and governance-related factors and (ii) the economic factors that have caused foreign firms to deregister. There were 148 deregisterings over the period 1990 to 2006, with the holdout sample comprising the universe of all U.S. registered foreign firms that chose not to voluntarily terminate their registration over the same time period. To reduce the impact of major corporate events, we exclude data from the last fiscal year preceding foreign firm bankruptcies and mergers. In total we have 6,479 firm-year observations for the control group.

Because the deregistration criteria for foreign firms have been more onerous and less clearly defined than those for U.S. registered firms, identifying the set of foreign firms that could potentially deregister (i.e., the holdout sample) is challenging. While all firms can take steps to reduce the number of their U.S. shareholders, it may be difficult for firms to predict whether such steps will enable them to deregister, for example, by pushing their beneficial stockholders below 300. As a result, deregistration may not be a feasible choice for some large U.S. registered foreign firms. To allow for this we perform a number of robustness tests, including propensity score matching and the use of matched control samples that exclude large foreign firms with high U.S. trading volume that may be unable to deregister.

Finally, some deregistering firms may have also delisted from more than one foreign stock exchange (i.e., a foreign firm may have delisted from both the NYSE in the U.S. and the London Stock Exchange). Since such multiple

Table I
Number of Foreign Firms That Deregistered over the Period 1990 to 2006

This table contains the yearly breakdown of foreign firms (ADRs and dual-listed firms) that deregistered from the SEC over the period 1990 to 2006. We exclude all firms that terminated their registration with the SEC as a result of bankruptcy or acquisition. The last two columns report the total active foreign issuers (ADRs and dual-listed shares) and the percentage of deregistrations to active foreign issuers, respectively.

	Total Deregistration	Europe	Asia	Latin America	Canada	Israel	Caribbean	Total Active Foreign Firms	Deregistration/ Active (%)
2006	29	15	7	2	5	0	1	772	3.76
2005	32	14	3	7	5	3	0	819	3.91
2004	28	15	3	3	5	2	0	823	3.40
2003	19	11	3	1	0	2	2	816	2.33
2002	18	7	3	0	6	2	0	861	2.09
2001	5	2	0	2	1	0	0	912	0.55
2000	7	3	0	0	4	0	0	928	0.75
1990 to 1999	10	2	1	0	6	0	1	858 (in 1999)	1.17
Total	148	69	20	15	32	9	3		

delistings may not be related to U.S.-specific developments such as SOX, we repeat our logit tests excluding all six firms that delisted from multiple exchanges as a robustness test.

A. Variables Measuring Governance and Regulator-Related Incentives

As our focus is on the changing trade-off between the benefits and costs of U.S. registration for foreign firms, we identify five major groups of governance-related variables. The five groups we identify are: (i) SOX variables, (ii) country-level shareholder protection variables, (iii) insider holding variables, (iv) institutional investor holding variables, and (v) a Canada dummy variable. We briefly discuss each of these groups below. These variables are also described in the Appendix.

(i) Our SOX-related variables comprise a “Sarbanes-Oxley dummy” variable, which takes the value of one for firm-year observations from the post-SOX period; a “small firm-low volume dummy” variable, which identifies smaller foreign firms with thinly traded U.S. securities; and a “relative trading volume” variable.

We construct four alternative versions of the “Sarbanes-Oxley dummy” using four alternative cut-off dates for determining our “post-SOX” period. There were important SOX-related announcements on all four dates that had a direct impact on foreign firms’ expected cost of compliance. The four dates and announcements are: (i) July 30, 2002—the President signs the bill into law, (ii) October 22, 2002—Rules 404, 406, and 407 are announced by the SEC, with no exemptions for foreign firms, (iii) May 27, 2003—the SEC announces that Section 404 compliance for foreign issuers will only start for fiscal years ending on or after April 15, 2005 (versus June 15, 2004 for U.S. firms), and (iv) March 02, 2005—the SEC announces the first in a series of compliance date extensions for foreign issuers regarding Section 404 requirements.⁷ Thus, the first SOX cutoff date, for example, results in a pre-SOX period of January 1, 1990 to July 30, 2002 and a post-SOX period of July 31, 2002 to December 31, 2006. The first two announcements created the expectation that foreign firms had to comply with SOX on a similar basis to domestic firms whereas the second two announcements offered some relative relief for foreign firms. The sign on these “SOX dummy” variables will depend on the changing trade-off between the costs and benefits of U.S. registration. If the “SOX dummy” is positive over all four alternative cutoff dates, it would be consistent with the SOX legislative program increasing the probability of foreign firm deregistration.

In addition, the evidence suggests that the costs of complying with SOX have significantly and disproportionately affected smaller firms. For example, Eldridge and Kealey (2005) find that the average increase in firms’ audit fees was 67% over the period 2003 to 2004, but that larger companies benefited from economies of scale in audit costs. Thus, smaller foreign firms with lower

⁷ While further extensions were announced in 2006, we focus on the 2005 announcement because it was the first extension announcement and the only one that applied to all foreign firms.

U.S. trading volume are more likely to have perceived the cost of complying with SOX as too high, and are more likely to have deregistered. To examine this conjecture, and to reflect the post-June 2007 change in the deregistration rule for foreign firms with low U.S. trading volume, we examine two additional SOX-related variables: a “small firm–low volume dummy” and a “relative trading volume dummy,” which is equal to one if the ratio of U.S. ADTV to total U.S. plus local ADTV is less than 5%.

(ii) We consider six alternative measures of “foreign country governance” (primarily, measured by the strength of “minority shareholder protection”):

- (1) Our first measure is the “index of ex-post private control of self-dealing,” developed by Djankov et al. (2005). Djankov et al.’s (2005) focus is on the strength of legal protection available to minority shareholders against expropriation via related party transactions. The expected sign on this variable is positive if firms from countries with poor governance are less likely to deregister because bonding or complying with U.S. securities regulation adds value. However, the sign on the self-dealing variable could also be negative if the greater gap between the quality of home country versus U.S. governance leads to higher incremental costs of complying with SOX for foreign firms. Similar arguments about the sign on the country-level governance variable pertain to the alternative measures described below.
- (2) Our second measure is based on an updated version of the original La Porta et al. (1998) anti-director index, which has become a widely used measure of the quality of corporate governance (see Doidge (2004)). Specifically, we use the “anti-director index” as revised by Djankov et al. (2005). The “anti-director index” reflects the laws as they are written, not as they are actually enforced. Therefore, to effectively measure minority shareholders rights, the index is interacted with a measure of how well laws are enforced using the “public enforcement index” of Djankov et al. (2005).
- (3) The third alternative measure of minority shareholder protection is a dummy variable that takes the value of one if, similar to the U.S., the origin of the Company Law or Commercial Code of the home country of the sample firm is English Common Law and zero otherwise (see La Porta et al. (1998)).

We also consider three other foreign country governance measures: (4) the original La Porta et al. (1998) “anti-director index” instead of the revised (Djankov et al. (2005)) index, (5) Spamann’s (2006) revised version of the La Porta et al. (1998) “anti-director index,” and (6) the Djankov et al. (2005) “public enforcement index.”

(iii) Insider holdings are the third group of governance variables. Such holdings may also have an impact on the deregistration decision since the costs and benefits of staying registered in the U.S. are different for corporate insiders versus outsiders. A greater degree of insider control may not only make deregistration easier, but inside shareholders may have more incentive to deregister to

avoid greater disclosure and stricter governance following the passage of SOX. Since insider control is likely to be a more important factor for firms from low minority shareholder protection countries, we complement our primary measure of insider control, “percentage insider holdings,” with a second insider-related variable, the “high insider–low minority protection dummy,” which takes the value of one when insiders hold more than 50% of the shares and the value of the La Porta et al. (1998) anti-director index for the firm’s home country is less than five (i.e., when insiders have majority control “and” the home country’s minority shareholder protection is weaker than that of the U.S.). We expect that insider holding variables will be positively related to the probability of deregistering.

(iv) Two “institutional holdings” measures comprise the fourth group of governance variables. Specifically, we measure institutional holdings using the “percentage of shares held” by U.S. institutional investors as a group, as well as a “U.S. institutional holdings dummy” variable that takes the value of one when institutional holdings are greater than 5% and zero otherwise. These variables capture the impact of monitoring and control over foreign SEC registered firms by large U.S. institutional investors. We expect institutional investor variables to have a negative effect on the probability of deregistration since U.S. institutional holders may pressure foreign firms to stay in the U.S. (see Aggarwal, Dahiya, and Klapper (2005) for evidence that U.S. institutional investors prefer ADRs over locally traded shares).

(v) Finally, we include a “Canadian dummy” since, under the Multi-Jurisdictional Disclosure System (MJDS), cross-listing (and registration) should be less costly for Canadian firms. (As a robustness test, we also repeat our tests excluding Canadian firms.) MJDS allows large Canadian firms to issue securities in the U.S. using a Canadian prospectus (and vice versa for U.S. firms).

B. Variables Reflecting Economic Incentives

We also include in our logit analysis variables that proxy for the importance of economic incentives related to the net benefits of maintaining SEC registration.

- (i) The q -ratio, or the market value of the firm’s assets divided by the book value of assets, measures the firm’s potential growth options. Firms with a high q -ratio may prefer to stay registered in the U.S. since they may be unable to raise the required external financing in their domestic capital markets.
- (ii) “Leverage” is motivated by earlier results from the disclosure literature. In particular, Healy and Palepu (1990) and DeAngelo, DeAngelo, and Skinner (1996) find that highly leveraged firms are more likely to make strategic decisions (here the decision to deregister) to conserve cash.
- (iii) “Cost of debt” is included as another measure related to leverage. It is calculated based on Siegel (2007) as the firm’s interest payments divided by

its total liabilities for a given year. The “cost of debt” could be interpreted as a proxy for foreign firms’ ability to raise outside finance.

- (iv) Merger and acquisition volume: Cross-border M&A activity in the foreign firm’s industry sector may have an impact on the probability of deregistration since foreign firms may be interested in acquiring U.S. firms and/or they may be interested in attracting U.S. acquirers. Burns et al. (2007) show that foreign firms cross-listed in the U.S. benefit from having U.S. traded securities available as an acquisition currency. Consequently, foreign firms may be more inclined to deregister from the U.S. market when the volume of transactions involving foreign acquirers and U.S. target firms is relatively low in their industrial sector. Alternatively, foreign firms may find a U.S. listing beneficial in attracting a “suitor” in the form of a U.S. acquirer (the beauty pageant hypothesis). Both M&A variables are calculated using transactions within each foreign firm’s two-digit SIC code.
- (v) Momentum: Foreign firms may be more reluctant to deregister following a period of strong positive stock price performance in the U.S. markets, since potentially they would have to give up benefits related to a relatively high market valuation. We examine the impact of momentum on the probability of deregistration by including market-adjusted buy-and-hold returns in our logit model. Following Loughran and Ritter (1996), we define buy-and-hold market-adjusted returns for the j^{th} firm in our sample as

$$BHMAR_{j,T_{-310},T_{-61}} = \left[\prod_{t=T_{-310}}^{T_{-61}} (1 + R_{jt}) \right] - \left[\prod_{t=T_{-310}}^{T_{-61}} (1 + R_{mt}) \right], \quad (1)$$

where T_{-310} and T_{-61} are the first and last trading days included in the holding period (i.e., 310 and 61 trading days prior to the deregistration announcement, respectively), R_{jt} is the daily return for sample firm j on date t , and R_{mt} is the return on the relevant country index on the same date.

C. Other Variables

In addition to the main variables discussed above, we introduce additional control variables that may be considered economic incentive as well as governance-related variables.

- (i) Free cash flow: Following Opler and Titman (1993), we define “free cash flow” as operating income before taxes, interest, and depreciation (EBITDA) for the year immediately preceding the year of the deregistration decision, scaled by the market value of assets.
- (ii) The “intangible asset ratio” (the ratio of intangible assets to total assets) is a measure of the degree of asymmetric information between firm insiders and outsiders regarding the value of the firm’s assets.

Table II provides descriptive statistics for the deregistering firms and the matched control group. The table shows that, compared with control firms, deregistering firms are from countries with poorer governance, are significantly smaller, have lower q -ratios, and have higher insider ownership. The Appendix summarizes the variables used in our tests.

III. Empirical Results

A. *Logit Model*

Table III presents the coefficient score results of the unmatched logit analysis together with the elasticity (economic importance) for each of the explanatory variables described above. Following Petersen (2006), we estimate all models using a panel logistic regression, which adjusts standard errors for the impact of firm-level clustering. In Table III, we examine five models, starting with a set of variables for which observations are available for most of the sample (i.e., 5,621 observations). We then introduce additional variables successively according to data availability. Each decline in sample size, from one model to the next, reflects the reduction in the number of available observations resulting from the inclusion of an additional explanatory variable. Also, to avoid inducing collinearity between certain explanatory variables, not all variables are included in the models simultaneously. As a robustness test, we repeat our logit analysis excluding the six “multiple delisting” foreign firms from our sample. Since the results for this sample are virtually identical, we do not include them in our tables.

A.1. *Results: Governance and Regulatory-Related Incentives*

- (i) Sarbanes-Oxley-related variables: The SOX-related dummy variables (the four different SOX dummies, the small firm-low volume dummy, and the below 5% U.S./U.S. plus local) average daily trading volume ratio) are all significant and positive at the 1% level, consistent with an increase in the probability of a foreign firm deregistering after SOX’s passage. (In Table III, for brevity, we only report three of the four SOX dummy results.)⁸ This suggests that the costs and benefits of listing and registering in the U.S. have changed, and the increased post-SOX costs have caused some (especially small, thinly traded) foreign firms to deregister. Although it is possible that the cross-listing benefits were smaller to begin with for the firms that eventually deregistered, if deregistrations were simply driven by the lack of benefits for some firms, then one would expect a greater number of deregistrations in the period before SOX came into effect.

⁸ This holds true both for (i) a dummy indicating a relative U.S. trading volume of less than 5% and (ii) a continuous version of the relative volume ratio. Further, in unreported regressions we find that the coefficient on the SOX dummy variable interacted with the small firm-low volume dummy is also positive and significant. Note that firm size (log of assets), included as a separate variable, has a highly significant negative impact on the probability of deregistration.

Table II
Descriptive Statistics for Deregistering Firms and the Unmatched Control Group, 1990 to 2006

This table reports summary statistics for the 148 foreign firms that chose to deregister from the U.S. over the period 1990 to 2006, of which there are 136 firms with accounting data (Deregistering Sample). The control group includes all foreign firms (ADR or dual listed) that were registered with the SEC over the 1990 to 2006 period. The total number of firm-year observations of the control group is 6,479 (Unmatched Control Sample). We also report the difference in means and its standard error (*SE*). *, **, and *** indicate a *p*-value of 10%, 5%, and 1%, respectively.

	Deregistering Firms				Unmatched Control Sample				Difference in Means		<i>SE</i>
	# Obs	Mean	<i>SE</i>	min	max	# Obs	Mean	<i>SE</i>	min	max	
<i>q</i> -ratio	129	1.63	1.70	0.18	15.41	6,479	2.18	2.45	0.14	30.87	0.22**
Log(assets)	136	6.08	2.33	0.54	11.13	6,479	6.28	2.57	-0.24	14.28	0.22
Intangible asset ratio	135	0.12	0.18	0	0.93	6,469	0.07	0.13	-3.E-03	0.89	0.01***
Leverage	134	0.31	0.98	0	11.34	6,477	0.21	0.20	0	2.06	0.02***
Free cash flow (FCF)	126	0.04	0.12	-0.42	0.35	6,331	0.04	0.12	-2.45	0.90	0.01
Cost of debt	135	0.04	0.07	0	0.67	6,413	0.03	0.05	0	2.15	0.00
SOX dummy (July02)	148	0.79	0.41	0	1	6,479	0.31	0.46	0	1	0.48
SOX dummy (Oct02)	148	0.75	0.43	0	1	6,479	0.29	0.45	0	1	0.46
SOX dummy (May03)	148	0.66	0.47	0	1	6,479	0.21	0.41	0	1	0.45
SOX dummy (March05)	148	0.36	0.48	0	1	6,479	0.07	0.25	0	1	0.29
Canada dummy	116	0.22	0.41	0	1	6,366	0.36	0.48	0	1	-0.14
Insider holdings	136	0.35	0.28	5.E-05	0.99	1,730	0.18	0.24	0	0.97	0.17
Dummy(Insider, Anti-director (98))	126	0.25	0.44	0	1	1,637	0.05	0.21	0	1	0.21
FI holdings (%)	134	0.03	0.09	0	0.50	6,479	0.12	0.19	0	1.20	0.02***
FI holdings dummy	134	0.12	0.33	0	1	6,479	0.41	0.49	0	1	-0.29
Post anti-self-dealing index	141	0.72	0.26	0.08	1	5,361	0.79	0.25	0.08	1	-0.07
Anti-director (98)	135	3.64	1.48	0	5	5,173	4.01	1.31	0	5	-0.37
Anti-director (05) × Enforcement index	141	2.19	1.69	0	5	5,361	2.76	1.73	0	5	-0.57

(continued)

Table III
Logistic Regression of the Probability of Foreign Firms' Deregistration, 1990 to 2006

This table reports our panel logit results. We report the coefficient score results as well as their elasticities for the deregistering foreign firms. The dependent variable is binary and takes the value of one for foreign firms that chose to deregister and zero for control firms. The standard error (SE) is corrected for firm clustering following Peterson (2006) and is reported in parentheses. Elasticity is calculated as $d(\ln F)/d(\ln x)$, where d is the first derivative, $\ln(F)$ is the natural logarithm of the density function and $\ln(x)$ is the natural logarithm of the explanatory variable and is evaluated at the sample means of the explanatory variables. There are 148 foreign firms that chose to deregister from the SEC over the period 1990 to 2006. The control group includes all foreign firms (ADR or dual listed) that were registered with the SEC over the 1990 to 2006 period. *, **, and *** indicate a p -value of 10%, 5%, and 1%, respectively.

Variables	Model 1			Model 2			Model 3			Model 4			Model 5		
	Coeff.	SE	Elast.	Coeff.	SE	Elast.	Coeff.	SE	Elast.	Coeff.	SE	Elast.	Coeff.	SE	Elast.
q -ratio	-0.49	0.15***	-1.05	-0.29	0.14**	-0.63	-0.57	0.17***	-1.17	-0.70	0.17***	-1.50	-0.50	0.18***	-1.12
Log(assets)	-0.11	0.05**	-0.68	-0.16	0.05***	-1.03	-0.25	0.08***	-1.69	-0.49	0.08***	-3.43	-0.30	0.09***	-1.97
Intangible asset ratio	1.52	0.70**	0.12	1.78	0.70***	0.15	1.12	0.80	0.12	0.86	0.83	0.10	0.71	0.87	0.08
Leverage	-0.16	0.85	-0.04	0.27	0.72	0.06	0.51	0.69	0.10	-0.15	0.79	-0.03	0.03	1.04	0.01
Free cash-flow (FCF)	-0.21	0.70	-0.01	-0.47	0.64	-0.02	0.43	1.08	0.02	0.97	1.07	0.04	-0.10	1.09	-4.E-3
Cost of debt	1.73	1.00*	0.06	0.93	1.50	0.03	1.78	1.91	0.05	1.75	2.40	0.05	-0.05	2.03	-2.E-3
SOX dummy (July02)	55.61	1.05***	19.08	39.03	1.05***	14.73	23.20	1.16***	14.73	—	—	—	—	—	—
SOX dummy (May03)	—	—	—	—	—	—	—	—	—	—	—	—	41.44	1.29***	21.74
SOX dummy (March05)	—	—	—	—	—	—	—	—	—	23.11	0.95***	4.98	—	—	—
Canada dummy	-0.48	0.28*	-0.17	—	—	—	—	—	—	—	—	—	—	—	—
Insider holdings	—	—	—	—	—	—	1.42	0.54***	0.24	—	—	—	2.37	0.70***	0.41
Dummy (Insider, La Porta et al. 1998 Anti-director)	—	—	—	—	—	—	—	—	—	2.16	0.45***	0.13	—	—	—
FI holdings (%)	-5.21	1.39***	-0.63	—	—	—	—	—	—	—	—	—	—	—	—
FI holdings dummy	—	—	—	-1.72	0.33***	-0.67	—	—	—	—	—	—	—	—	—
Djankov et al. (2006) Ex-post	—	—	—	-1.30	0.48***	-1.01	—	—	—	—	—	—	—	—	—
Anti-Self-Dealing Index	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(continued)

Table III—Continued

Variables	Model 1			Model 2			Model 3			Model 4			Model 5		
	Coeff.	SE	Elast.	Coeff.	SE	Elast.	Coeff.	SE	Elast.	Coeff.	SE	Elast.	Coeff.	SE	Elast.
Anti-director(05) × Enforcement	—	—	—	—	—	—	—	—	—	—	—	—	—0.17	0.10*	−0.47
English common law dummy	—	—	—	—	—	—	−1.18	0.36***	−0.82	—	—	—	—	—	—
Small firm-low volume dummy	—	—	—	—	—	—	1.41	0.54***	0.07	—	—	—	—	—	—
Relative volume dummy	—	—	—	—	—	—	—	—	—	2.33	0.36***	0.75	1.44	0.39***	0.39
Momentum (U.S.)	—	—	—	—	—	—	−0.38	0.19**	−0.06	−0.29	0.19	−0.04	−0.46	0.26*	−0.09
Foreign acquiring U.S. firms	—	—	—	—	—	—	—	—	—	—	—	—	−0.55	0.28**	−0.72
U.S. acquiring foreign firms	—	—	—	—	—	—	—	—	—	—	—	—	0.18	0.16	0.20
Constant	1.02	−55.94***	—	−39.43	1.14***	—	−22.68	1.40***	—	−21.54	1.14***	—	−41.06	1.63***	—
Time dummies	Yes	—	—	Yes	—	—	Yes	—	—	Yes	—	—	Yes	—	—
Number of observations	5,621	—	—	4,383	—	—	1,113	—	—	1,096	—	—	907	—	—
Pseudo- <i>R</i> ²	0.28	—	—	0.29	—	—	0.28	—	—	0.35	—	—	0.37	—	—
Log likelihood	−370	—	—	−381	—	—	−247	—	—	−217	—	—	−177	—	—

- (ii) **Minority shareholder protection:** The coefficients on the alternative minority shareholder protection variables are all significant and negative, indicating that greater minority shareholder protection in the foreign firm's home country reduces its probability of deregistration. This suggests that the incremental costs of providing additional investor protection through U.S. listing and registration were greater for foreign firms from weak governance countries.⁹
- (iii) **Insider holdings:** We find that the insider holdings variable has had a positive coefficient (significant at the 1% level), implying that greater control by insiders makes a foreign firm more likely to terminate its registration with the SEC. Our results show (see, for example, Model 3) that a 1% increase in insider holdings increases the probability of a foreign firm deregistering by 0.24% (from its mean value). Similarly, the coefficient on the dummy variable indicating firms with high (above 50%) insider ownership and low home country La Porta et al. (1998) anti-director index is also significantly positive, consistent with greater incentives by firm insiders in countries with poor governance to deregister from the U.S.¹⁰
- (iv) **Institutional holdings:** Both of our measures of institutional holdings, the institutional holdings dummy and percentage U.S. institutional holdings, indicate that the greater the investment stake held by U.S. institutional investors, the lower is the probability of deregistration by a foreign firm. That is, foreign firms monitored by U.S. institutional investors with large equity stakes are less likely to terminate their SEC registration.
- (v) **Canada dummy:** The Canadian firm dummy is significant and negative, indicating that Canadian firms have weaker incentives to exit the U.S. capital market.

A.2. Results: Economic Incentive Variables

- (i) ***q*-ratio:** We find that foreign firms with a higher *q*-ratio are less likely to deregister. For example, the results of Model 5 in Table III imply that a 1% increase in the *q*-ratio reduces the probability of deregistration by 1.12% (from its mean value), indicating that firms with valuable growth options are reluctant to give up access to financing in the U.S. capital markets.
- (ii) **"Leverage"** is not statistically significant in any of our models.
- (iii) **"Cost of debt"** is only significant at the 10% level in Model 1 and is insignificant in the other four specifications.
- (iv) **Merger and acquisition volume:** Greater takeover activity by foreign firms ("in the same industry") in the U.S. has had a negative impact on the probability of deregistration, indicating the importance of having U.S. traded shares available as an acquisitions currency. However, we find no

⁹ For brevity we only report three of these measures in Table III.

¹⁰ As an untabulated robustness test, we include the high insider-low anti-director dummy along with the Ex-Post Private Control of Self Dealing Index and the percentage of insiders, and all three remain significant.

support for a “beauty pageant” effect; that is, the volume of acquisitions of foreign firms by U.S. acquirers does not have a statistically significant impact on deregistration decisions.

- (v) Momentum: We find that “U.S. stock price momentum” has a significant negative impact on the probability of foreign firms’ deregistration in two out of three models in Table III (at 5% and 10% in Models 3 and 5, respectively).

We also find that the “free cash flow” variable is insignificant, and the “intangible asset ratio” is positive in two of the five models in Table III.

A.3. Alternative Logit and Robustness Tests

We find similar results when we consider different matching approaches in our logit model (i) by using a matched control sample that excludes control firms that are greater in size, as measured by market capitalization, than the largest deregistering firm in the year prior to their deregistration, and (ii) by using a matched control sample that excludes firm-year observations when an SEC registered foreign firm’s ratio of U.S. ADTV to the sum of U.S. and local ADTV is higher than 5%.¹¹

We also examine the robustness of our results using propensity score matching. According to Drucker and Puri (2005), propensity score matching is superior because it employs fewer restrictions. Conniffe, Gash, and O’Connell (2000), among others, have shown that it is more accurate. To implement this method, we calculate each firm’s propensity score, based on the probability (p) that a foreign firm with given characteristics will deregister from the U.S. market. We use two alternative models to compute the propensity score. Model 1 includes the financial characteristics, namely, “ q -ratio,” “asset size,” “intangible asset ratio,” “leverage,” “free cash flow,” and “cost of debt,” and the time dummies whereas Model 2 is similar to Model 1 but employs 1-year changes (differences) in the above financial characteristics. The latter allows us to compute the propensity score based on the changes in the financial condition of foreign firms. In both models, we restrict foreign firm matching to the same fiscal year. Firms are matched using Leuven and Sianesi’s (2003) propensity score matching procedure at the nearest neighborhood within a 0.1 caliper.

In Table IV, we look at the (paired mean) difference between deregistering and non-deregistering foreign firms, based on both country-level (Panel A) and firm-level (Panel B) variables. The alternative measures of country-level minority shareholder protection in Panel A have significantly lower averages for deregistering firms compared with their matches in both models. These results are consistent with the unmatched logit results in Table III. In addition to our measures of minority shareholder protection, we also include a measure of stock

¹¹ Our results are also robust to the exclusion of all Canadian firms. In addition, we find that foreign firms that have been listed in the U.S. for a longer period of time are just as likely to deregister as their more recently listed counterparts.

Table IV
A Paired Mean Comparison between the Deregistering Firms and Their Propensity Score Matches for the Period 1990 to 2006

This table presents a paired mean comparison between deregistering firms and their propensity score matches with respect to country-level variables and firm-level variables. We present two different estimation models for the *p*-score. Model 1 includes financial characteristics (*q*-ratio, assets, intangible asset ratio, leverage, cash flow, cost of debt, and time dummies). Model 2 is similar to Model 1 but it employs *1-year changes* (differences) in these variables. We restrict the matching to the same fiscal year in both models. The matching for Models 1 and 2 is within the nearest neighborhood of a 0.1 caliper. *, **, and *** indicate a *p*-value of 10%, 5%, and 1%, respectively.

	Model 1 (0.1 Caliper)			Model 2 (0.1 Caliper)		
	No. of Obs.	Diff. in mean	SE	No. of Obs.	Diff. in mean	SE
Panel A: Country-Level Variables						
Djankov et al. (2006) Ex-post Anti-Self-Dealing Index	178	-0.13	0.04***	154	-0.13	0.04***
La Porta et al. (1998) Anti-director Index	162	-0.52	0.23**	144	-0.71	0.23***
Djankov et al. (2006) Anti-director × Enforcement Ind.	178	-1.01	0.25***	154	-0.70	0.26***
Spamann (2006) Anti-director × Enforcement Index	160	-0.78	0.20***	144	-0.53	0.21**
English Common Law Dummy	178	-0.28	0.07***	154	-0.21	0.08***
Djankov et al. (2006) Public Enforcement Index	178	-0.22	0.06***	154	-0.15	0.07**
Listed firms per million population	178	-22.12	5.13***	154	-15.72	5.02***
Panel B: Firm-Level Variables						
Insider holdings	80	0.08	0.07	76	0.08	0.05
Dummy (Insider, La Porta et al. (1998) Anti-director)	68	0.11	0.08	70	0.11	0.09
FI holdings (%)	238	-0.12	0.02***	186	-0.15	0.03***
FI holdings dummy	238	-0.42	0.05***	186	-0.44	0.06***
Small firm-low volume dummy	80	0.15	0.07**	84	0.12	0.08
Relative Volume dummy	80	0.38	0.09***	84	0.45	0.10***
Relative Volume ratio	80	-0.30	0.06***	84	-0.28	0.07***
Momentum (U.S.)	204	-0.52	0.35	162	-0.31	0.10***
Foreign acquiring U.S. firms	146	-0.41	0.21*	106	-0.39	0.19**
U.S. acquiring foreign firms	154	-0.31	0.18*	116	-0.227	0.12*

market development for each country, which is the number of listed firms per million population. Deregistering firms are from countries with significantly fewer listed firms relative to their population.

In general, the results in Panel B of Table IV are also similar to those in the unmatched logit tests, that is, deregistering firms have a lower percentage of U.S. institutional investors and lower “relative trading volume” compared with matching firms.

B. SOX, Compliance Costs, Foreign Firm Exit, and Implications for Bonding

In general, our results confirm the importance of governance and regulatory effects in determining foreign firms’ deregistration decisions. This is indicated by the significantly positive effect of the SOX-related variables (the “SOX dummies,” the “small firm-low volume” variables, and the “relative trading volume dummy”) on the probability of a foreign firm deregistering. In addition, we find a significantly negative effect of the shareholder protection variable on the probability of a foreign firm deregistering. Although large insider holdings increase the probability of deregistration, this has been offset by the presence of U.S. institutional investors.

Overall, the implications of our results regarding the bonding hypothesis are somewhat mixed. The negative relationship between the quality of home country governance and the probability of deregistration seems, at first, inconsistent with the bonding hypothesis, since firms from countries with poor quality governance have the most to gain from bonding to the U.S. This, however, would be based on a somewhat simplistic, largely static, interpretation of the bonding hypothesis. If bonding is interpreted instead as a dynamic process, then one must allow for the possibility that when the net benefits of bonding decline sufficiently, some foreign firms will determine that it is in their (or at the very least their insiders’) best interest to deregister. Thus, the decision of small, low trading volume foreign firms to deregister appears to have been motivated by increased post-SOX compliance costs, rather than the absence of bonding benefits in general. Similarly, the incremental costs of SOX may have been higher for firms from poorer governance countries, which in turn may have prompted these foreign firms to deregister.

C. Event Study Results

In this subsection we examine the impact of deregistration announcements by foreign firms on both their U.S. and local stockholders. Given that many of our sample firms cite limited trading volume as one of the primary reasons for their deregistration, we first focus our event study on the domestically (locally) traded shares of deregistering foreign firms. From our total foreign firm sample of 148, we identify 135 foreign firms that announced planned deregistrations unrelated to bankruptcies, liquidations, or mergers, over the period January 1990 to December 2006 and for which local market (i.e., non-U.S.) stock price data are also available on Datastream.

Since there may be some overlap between firm deregistration event windows, we follow the Seemingly Unrelated Regression approach of Schipper and Thompson (1983) and Binder (1985) to deal with partial clustering, that is, we run cross-sectional time-series regressions with dummy variables representing the event date. For each sample firm, we set the event dummy variable equal to one for every day of the (t_0, t_n) event window, where t_0 (day 0) is the deregistration announcement date (the event date) and t_n indicates the number of days included after the announcement. We examine an array of event windows from (0,1) to (0,5). However, except for Model 1a, which uses the (0,1) window, we only report the coefficients for the (0,5) window in Table V to save space. We choose the longest window because we use U.S. announcement dates but domestic (home market) stock return reaction and thus need to allow for delays due to time zone differences as well as differences in trading days across countries.

We estimate several alternative models. The basic model (Model 1) we consider for sample firm daily returns ($R_{t,j}$) is

$$R_{t,j} = \alpha_j + \beta_{1,j}Dereg(t_0, t_n)_{t,j} + \beta_{2,j}MKT_R_t + v_j + \varepsilon_{t,j}, \quad (2)$$

where $Dereg(t_0, t_n)$ is the deregistration announcement dummy, MKT_R is the return on the country-specific Datastream Total Market Index, subscripts j and t denote sample firms and time, respectively, v_j represents the firm-specific residual, and $\varepsilon_{t,j}$ is the overall error term. To accommodate heteroskedasticity and the possibility of serial correlation in daily returns, we report Newey–West (1987) corrected standard errors using five lags.

In addition to the deregistration dummy and other variables in Model 1, in Model 2 we introduce a “Pre-SOX dummy” variable, which takes the value of one for “each day” of the event window if the deregistration announcement occurs during the pre-SOX period and is zero post-SOX. Using the same four SOX announcement dates discussed in Section II.A, we construct four SOX dummies. Since the compliance cost savings from deregistration for foreign firms should be less in the pre-SOX period compared with the post-SOX period, the expected sign on this dummy variable is negative.

The coefficient on the deregistration announcement dummy ($Dereg$) in Model 1a of Table V is -0.85% , which captures the “average” daily price effect over a 2-day event window and is significant at the 1% level. The magnitude of the coefficient is comparable to the “cumulative” average abnormal returns obtained from an “aggregated” event study, following the traditional methodology over the same event window (see Brown and Warner (1985)). These results indicate that, on average, local stockholders suffered statistically significant wealth losses from local firm announcements of U.S. deregistering over the period 1990 to 2006. We obtain similar results when we repeat our event study using the U.S. market prices of deregistering foreign firms (i.e., home market and U.S. market abnormal returns react similarly).

Overall, we find that pre-SOX deregistration announcements had a more negative stock price effect on local investors than deregistration announcements

Table V
Stock Price Reaction to the Announcement of U.S. Deregistrations by Foreign Firms over the Period January 1990 to December 2006

The table below presents the results of pooled, cross-sectional time-series regressions of 135 sample firms' daily returns on market index returns, deregistration announcement dates, and dummy variables related to the introduction and implementation of the SOX. For each sample firm, Deregistration equals one for all days of the (t_0, t_n) event window. Date 0 is the earlier of a company's Form 15 filing date and its deregistration announcement date. We report Newey–West corrected standard errors using up to five lags. Return data and market index returns for each sample firm are obtained from Datastream. We use the returns of domestically traded stocks. The index used is the DataStream Total Market Index for the home country of our sample firms. These value-weighted indices include all major stocks that Datastream considers representative of a country's stock exchange. *, **, and *** indicate a p -value of 10%, 5%, and 1%, respectively.

Variables (Event window)	Model 1a (0,1)		Model 1b (0,5)		Model 2a (0,5)		Model 2b (0,5)		Model 2c (0,5)		Model 2d (0,5)	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Deregistration (%)	−0.85	(0.32)***	−0.56	(0.16)***	−0.26	(0.16)*	−0.28	(0.16)*	−0.29	(0.18)*	−0.15	(0.18)
Pre-SOX Dummy: July 30, 2002 (%)	—	—	—	—	−1.06	(0.43)**	—	—	—	—	—	—
Pre-SOX Dummy: October 22, 2002 (%)	—	—	—	—	—	—	−0.90	(0.40)**	—	—	—	—
Pre-SOX Dummy: May 27, 2003 (%)	—	—	—	—	—	—	—	—	−0.69	(0.36)*	—	—
Pre-SOX Dummy: March 02, 2005 (%)	—	—	—	—	—	—	—	—	—	—	−0.67	(0.30)**
DataStream Total Market Index	0.72	(0.01)***	0.72	(0.01)***	0.72	(0.01)***	0.75	(0.01)***	0.74	(0.01)***	0.77	(0.01)***
Constant (%)	0.06	(0.01)***	0.06	(0.01)***	0.06	(0.01)***	0.05	(0.01)***	0.04	(0.01)***	0.03	(0.01)***
Number of observations	387,995		387,995		387,995		387,995		387,995		387,995	
F-statistic	3,051.41		3,056.76		2,038.74		2,039.10		2,039.33		2,038.83	

post-SOX. This is consistent with U.S. listing and registration becoming more costly post-SOX and with local investors perceiving potential audit and other cost savings offsetting the perceived benefits of U.S. registration.

D. Market and Macro Effects on the Deregistration Decision

Although our paper has focused on the role of SOX, governance, and firm financial characteristics as the key factors explaining the increased exit of foreign firms from U.S. financial markets, this has in part played out against a backdrop of a U.S. stock market downturn and a macroeconomy emerging from a recent recession (the recession lasted from March 2001 to November 2001 according to the NBER). Such macro effects may well have eroded some of the U.S. growth opportunities available to foreign firms. In addition, they may have had an impact on U.S. market trading volume, analyst coverage, institutional holdings, industry takeover activity, as well as momentum.

To test the impact of market and macro effects, we collect a number of indicators of U.S. capital market and macroeconomic performance over the period 1990 to 2006. Our capital market variable is the difference between annual European versus U.S. market index returns from DataStream while the macroeconomic variables are: (i) the annual change in the U.S. Conference Board's composite index of Leading Economic Indicators (LEI), (ii) the difference between annual changes in the European Union (EU, 15 countries) and the U.S. Composite Leading Indicator (CLI) from the OECD website, and (iii) the annual change in the yield spread (10-year U.S. Treasury bond rate less the 3-month U.S. Treasury bill rate). These variables are entered as alternative controls in our logit analysis. We find that the U.S. "LEI" and "yield spread" both have a significant negative impact on the probability of deregistration.¹² Moreover, the impact of the difference between annual European and U.S. market index returns, as well as the difference between annual changes in EU 15 and U.S. CLI, is positive and significant as might be expected. In addition, a time dummy, indicating the recession year of 2001, is significant and positive. Overall, these results are consistent with an increase in propensity to deregister when market and macroeconomic conditions in the U.S. are relatively weak.

While these market and macroeconomic factors are statistically significant in providing additional explanatory power to our tests, in all cases, our SOX dummy variables and the firm-specific characteristics retain their sign and significance.

E. Foreign Firms Cross-Listing Outside the U.S.

Do foreign firms delisting from U.S. exchanges subsequently cross-list in one of the other major financial centers of the world? For example, the London Stock Exchange (LSE) has been widely suggested as an attractive alternative market to cross-list compared with the U.S. Interestingly, none of the firms in our sample initiated a new cross-listing following its delisting in the

¹² The T-bond–T-bill yield spread tends to widen during economic expansions.

U.S., although nine firms (60% of firms with multiple cross-listings) did remain cross-listed on a non-U.S. exchange after deregistering from the U.S. This suggests that although there has been some loss of U.S. capital market competitiveness post-SOX, its impact has been limited. Interestingly, Doidge et al. (2007) find that cross-listings on the LSE's Alternative Investment Market (AIM) have increased, and that these are largely responsible for the recent increase in London's market share relative to New York. Doidge et al. (2007) argue that based on their small size and other characteristics, the foreign firms listed on AIM would not have been candidates for listing in the U.S. anyway, that is, the foreign firms choosing to cross-list in London may not have been able to cross-list in the U.S. in the first place.

Although deregistering firms do not seem to cross-list in the U.K. instead of the U.S., governance improvements in countries like Mexico, Brazil, and Korea (such as the establishment of the Bovespa's Novo Mercado as a premium market segment of the Brazilian stock exchange; see Gledson de Carvalho and Pennacchi (2005)) may have provided additional impetus to deregister for firms from these countries. However, it is unlikely that this additional incentive to deregister affected our results, given the low number of sample firms originating from these three countries (our deregistering sample contains nine firms from Mexico, one from South Korea, and none from Brazil).

IV. Conclusion

This paper examines the reasons underlying the recent increase in the rate of exit from U.S. public securities markets by foreign firms. We find that the decision to deregister has been driven by a combination of regulatory/governance-related factors and economic factors. One of our major findings is that the passage of SOX appears to have had a positive effect on the probability of foreign firm withdrawal. In particular, we find that small foreign firms with low trading volume have been more likely to choose to exit U.S. markets, a result consistent with the costs of continued U.S. registration outweighing the benefits for these firms.

Indeed, as a reflection of the ongoing concerns about the impact of SOX on smaller foreign firms, the SEC announced a new trading volume- (rather than holder of record-) based rule governing the deregistration of foreign private issuers in March 2007.¹³ This rule became effective in June 2007. Whether this new rule will materially affect foreign firm registrations in the U.S. remains to be tested with the passage of time, in view of the findings of Piotroski and Srinivasan (2007) that foreign firms from developed countries listing on London's AIM have been on average smaller and less profitable than firms listing on U.S. exchanges. Also, any benefits to smaller firms need to be weighed against the cost of having a more complex, two-tiered system.

¹³ Interestingly, despite the impact on small firms identified in this paper, a number of countries, for example the U.K., Canada, South Korea, and the European Union, have introduced bills or are considering adopting SOX-type regulations (see, for example, <http://library.findlaw.com/2004/Oct/27/133621.html>).

Appendix: Logit Variable Index

Financial data are collected from Compustat and Worldscope (depending on availability). Prices and volume are collected from Datastream.

Variables	Description
Binary q -ratio	The dependent variable takes the value of one for the foreign firms that chose to deregister and zero for control firms. A measure based on Chevalier's (2004) Tobin's q measure, that is, the market value of assets divided by the book value of assets. The market value of assets equals the book value of assets plus the market value of common equity, less the book value of common equity.
Log(assets)	The logarithm of the firm's asset value.
Intangible asset ratio	The ratio of the firm's intangible assets to total assets. Intangible assets include: blueprints or building designs, client lists, computer software patent costs, contract rights, costs associated with approved patents, and copyright design costs.
Leverage	Leverage is calculated as the ratio of total debt to assets.
Free cash-flow	A measure based on the Opler and Titman (1993) measure of free cash flow, that is, a firm's cash flow is measured as operating income before taxes, interest, and depreciation (EBITDA). It is expressed as a ratio of the market value of assets. The market value of assets (the sum of the market value of equity plus the book value of liabilities) is equal to the risk-adjusted sum of discounted cash flows. Accordingly, firms with relatively greater cash flow to market value today are expected to have relatively less cash flow growth in the future.
Cost of debt	Based on Siegel's (2007) measure of cost of debt, that is, a firm's interest payments divided by its total liabilities for a given year.
SOX dummies	In our list of SOX dates we focus on events that (i) reveal information about how SOX applies to foreign firms and (ii) reveal information about the compliance dates for Section 404 of SOX, which is considered the most controversial and costly. The major dates that meet these criteria are: 1. July 30, 2002: The President signs the bill into law. At this point it is clear that SOX will apply to foreign firms (see Litvak (2007) for a complete list of July 2002 announcements clarifying that foreign firms would need to comply with SOX). 2. October 22, 2002: SEC Rules 404, 406, and 407, no exemption. Section 404 is seen as the most controversial and costliest requirement of SOX and the related SEC rule contains no significant exemptions for foreign issuers. 3. May 27, 2003: SEC implements internal control provisions of SOX. Foreign issuers will only need to start complying with Section 404 for fiscal years ending on or after April 15, 2005 (versus June 15, 2004 for U.S. firms). 4. March 02, 2005: extension of compliance dates for non-accelerated filers and foreign private issuers regarding internal control (Section 404) over financial reporting requirements. This is the first extension announcement and the only one that applies to all foreign firms.

(continued)

Appendix—Continued

Variables	Description
Canada dummy	For each of the above dates, we create a dummy variable that takes the value of one for firms that deregistered before the passage of SOX and zero otherwise. For the control group, it takes the value of one if the financial data for the firm is from the year before the passage of SOX and zero otherwise.
Insider holdings	This binary variable takes the value of one for Canadian firms and zero otherwise. Represents shares held by insiders. It is obtained from the Worldscope database under the identifier “closely held shares.” It includes shares held by officers, directors and their immediate families, shares held in trust, shares of the company held by any other corporations (except shares held in a fiduciary capacity by banks or other financial institutions), shares held by pension/benefit plans, and shares held by individuals who hold 5% or more of the outstanding shares. It excludes shares under option plans exercisable within 60 days, shares held in a fiduciary capacity, and preferred stock or debentures that are convertible into common shares. While Worldscope is our initial source for insider holdings data, we substantially increase our sample size by hand-collecting insider holdings from EDGAR filings (and SEDAR filings in the case of Canadian firms). (Source: Thomson Financial’s CDA/Spectrum database.)
Dummy (Insider, Anti-director)	This dummy variable takes the value of one when insiders hold more than 50% of the shares and the value of the anti-director index for the firm’s home country is less than five (i.e., when insiders have majority control and the home country’s minority shareholder protection is weaker than that of the U.S.).
Institutional holdings (%)	Measures the proportion of stocks held by financial institutions. The data are obtained from 13f filings by the financial institutions.
Institutional holdings dummy	A dummy equal to one if the sum of institutional holdings is greater than 5%, otherwise it is zero.
Post anti-self-dealing index	A measure based on Djankov et al. (2005). It is an index that is based on the following parameters: disclosure in periodic filings, rights to sue abusive managers, ease in rescinding the transaction, ease of holding managers liable, ease of holding the approving body liable, ease in accessing evidence, and ease in proving wrongdoing.
Anti-director index (98)	This is obtained from La Porta et al. (1998). The index takes on a value between zero and six depending on how many of the following apply to a country’s equity market: (i) the percentage of outstanding shares required to call an extraordinary meeting is less than or equal to 10%, (ii) there is cumulative voting or proportional representation of minority interests on board, (iii) voting by mail is permitted, (iv) mechanisms are in place for oppressed minority investors, (v) preemptive rights exist that can only be waived by a shareholder vote, and (vi) there is protection of shareholders from the requirement that shares be deposited before a shareholder meeting.
Public enforcement index	A measure based on Djankov et al. (2005). It measures whether all disclosure and approval requirements have been met. Ranges from zero to one.
English common law	A measure based on La Porta et al. (1998), which equals one if the origin of the Company Law or Commercial Code of the country is English Common Law and zero otherwise.

Anti-director (05) × Enforcement index	Djankov's et al. (2005) revised anti-director index relates to the laws as they are written, not as they are actually enforced; see, for example, Doidge et al. (2007). To effectively measure the minority shareholders right, this index is interacted with a measure of how well laws are enforced, that is, the public enforcement index.
Anti-director (06) × Enforcement index	Spamann's (2006) recoded anti-director index relates to the laws as they are written, not as they are actually enforced; see, for example, Doidge et al. (2007). To effectively measure the minority shareholders right this index is interacted with a measure of how well laws are enforced, that is, the public enforcement index.
Listed firms per million population	The average ratio of the number of domestic firms listed in a given country to its population (in millions) for the period 1999 to 2003.
Small firm–low volume dummy	A dummy variable that is equal to one when both the relative volume is in the 4 th quantile and the firm's asset size is below the median in a given year. The dummy is zero otherwise.
Relative volume ratio	The ratio of the firm's ADTV (over a period of 250 trading days for a (–310, –61) window) in the U.S. market, divided by the sum of the U.S. plus local daily trading volume.
Relative volume dummy	A dummy variable that is equal to one if the relative volume ratio is less than or equal to 5%, zero otherwise.
Momentum (U.S.)	Following Loughran and Ritter (1996), we define momentum as buy-and-hold market-adjusted returns for the j^{th} firm in our sample as:
	$BHMAR_{j,T-310,T-61} = \left[\prod_{t=T-310}^{T-61} (1 + R_{jt}) \right] - \left[\prod_{t=T-310}^{T-61} (1 + R_{mt}) \right],$
	where T_{-310} and T_{-61} are the first and the last trading days included in the holding period used to calculate buy-and-hold returns (i.e., 310 and 61 trading days prior to the deregistration announcement, respectively), R_{jt} is the daily return for sample firm j on date t , and R_{mt} is the return on country market index. For the control firms we consider a window of 250 days prior to their fiscal year. We compute the firm's momentum in the U.S. market.
Foreign acquiring U.S. firms	A variable that measures the ratio of the number of completed merger/acquisition transactions of foreign firms acquiring U.S. firms during the fiscal year preceding the deregistration year to the number of transactions in the year when the firm cross-listed in the U.S. The ratio includes M&A transactions within each foreign firm's industry/sector (using two-digit SIC codes). Industry-level mergers and acquisitions data are generated from the SDC database.
U.S. acquiring foreign firms	A variable that measures the ratio of the number of completed merger/acquisition transactions of U.S. firms acquiring foreign firms during the fiscal year preceding the deregistration year to the number of transactions in the year when the firm cross-listed in the U.S. The ratio includes M&A transactions within each foreign firm's industry/sector (using two-digit SIC codes). Industry-level mergers and acquisitions data are generated from the SDC database.

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