

## **The Sarbanes-Oxley Act and the Flow of International Listings**

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22 November 2006

The authors wish to thank the Graduate School of Business at the University of Chicago for financial support. We thank Delphine Currie of SJ Berwin LLP and Madhu Kannan of the NYSE for very useful insights on the cross listing process. We acknowledge the able research assistance of Kei Kondo, Ningzhong Li and Patricia Tam.

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### **Abstract**

This paper examines cross-listing behavior onto U.S. and U.K. stock exchanges following the enactment of the Sarbanes-Oxley Act, and tests two propositions. First, has the rate of foreign cross-listings onto U.S. exchanges decreased in the period following the enactment of the Act? Second, are foreign exchanges - in particular, the London Stock Exchange - attracting foreign firms in the post-Act period that would have otherwise listed on a U.S. exchange prior to the enactment of the Act? We find strong evidence that U.S. exchanges have experienced a decrease frequency of foreign listing following the Act. For the NYSE, the decline does not appear to be attributed to listings lost to the LSE's Main Market after the enactment of the Act. In contrast, our evidence suggests that a portion of the decline in foreign listings on the Nasdaq is attributable to firms bypassing a U.S. exchange listing and opting to list on the LSE's Alternative Investment Market following the enactment of the Act. These "lost" listings are composed of firms that are, on average, smaller and less profitable than both the firms predicted to list on the Nasdaq and that the firms that actually listed on the exchange in the post-Sarbanes-Oxley period. Together, these patterns are consistent with Sarbanes-Oxley screening out firms from the left tail of the distribution of likely U.S. listing candidates along the dimensions of firm performance and size. Together, our analysis provides the first evidence (of which we are aware) of how the Sarbanes-Oxley Act has altered the flow of foreign listings across international stock exchanges.

## 1. Introduction

The passage of the Sarbanes-Oxley Act (the Act) dramatically shifted the costs of being a registered U.S. company. The Act, combined with subsequent regulatory pronouncements, mandates that U.S. registered firms adopt stricter governance practices. In response to the Act, U.S. firms have either adopted the stricter regulatory requirements or engaged in a variety of corporate transactions to free themselves from the new regulatory burdens, including going private (Engel, Hayes, and Wang, 2005) and the deregistration of their shares (Leuz, Triantis, and Wang, 2006). Minimal evidence, however, exists on how foreign firms are responding to the heightened U.S. rules.

In this paper, we examine foreign listing behavior on U.S. and U.K. stock exchanges before and after the enactment of the Sarbanes-Oxley Act, and test two propositions. First, has the rate of foreign listings onto U.S. exchanges decreased in the period following the enactment of the Sarbanes-Oxley Act? Second, are foreign exchanges - in particular, U.K. exchanges - attracting foreign firms in the post-Sarbanes-Oxley period that would have otherwise listed on a U.S. exchange prior to the enactment of the Act? And, if such a shift has occurred, what are the characteristics of those firms bypassing U.S. markets following the enactment of Sarbanes-Oxley? The identification of these attributes can help shed light on the economic consequences of regulation in general, and Sarbanes-Oxley in particular.<sup>1</sup>

Anecdotal arguments for such a shift in listing activity abound. Both John Thain (CEO of the NYSE) and Bob Greifeld (CEO of Nasdaq) have expressed concern that foreign firms are bypassing U.S. exchanges as a result of the Sarbanes-Oxley Act. Consistent with these beliefs, a 2005 survey by Mazars, a Paris-based auditing firm, found that 57% of European companies surveyed believe the law's costs will outweigh its benefits (Forbes, 2005). The London Stock Exchange's head of international business development, Tracey Pierce, acknowledged discussion with numerous companies seeking refuge from U.S. regulation stating - "In our discussions with

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<sup>1</sup>This paper fits into a wider literature examining capital market and corporate responses to shifts in regulation, legal enforcement and investor protections.

those companies, the impact of Sarbanes-Oxley is factoring heavily in their decision-making” (Forbes, 2005). Given these concerns, the London Stock Exchange has begun actively promoting its Alternative Investment Market (AIM) as an alternative destination for smaller foreign firms seeking to list their shares on a liquid exchange with strong investor protections, yet wishing to avoid the costly regulatory burdens of Sarbanes-Oxley.

Prior research suggests that historically firms have either cross-listed or directly listed their shares on a foreign exchange to minimize costs created by segmented capital markets (see Karolyi, 1998; 2004). Consistent with the expected reduction in financing costs arising from market segmentation, these listings resulted in greater liquidity for the firm’s shares, lowered the firm’s cost of capital, and gave managers access to greater amounts of capital than were available in the home country (e.g., Errunza and Losq, 1985; Karolyi, 1998; Foster and Karolyi, 1998; Lins, Strickland, and Zenner, 2004). However, as market barriers have fallen over the last two decades resulting in less segmented capital markets, research has examined the legal bonding motivation for foreign listings (Stulz, 1999; Coffee, 1999; 2002). Under the legal bonding hypothesis, high quality firms domiciled in countries with weak institutions can borrow another country’s institutional environment by listing their shares on a foreign exchange, thereby credibly subjecting themselves to the host country’s stricter legal and regulatory requirements. When effective, this bonding process creates a commitment to adopt strong corporate governance practices and credibly separates the listing firm from the remaining firms in their home market, resulting in higher market valuations and lower costs of capital (e.g., Doidge, 2004; Doidge, Karolyi, and Stulz, 2004; Hail and Leuz, 2005). Given the strong legal and regulatory environment characterizing U.S. exchanges, a U.S. listing is seen to serve as a credible bonding mechanism.

A firm choosing to list its shares outside its home country can be expected to trade-off the benefits of the listing to its expected costs. The passage of the Sarbanes-Oxley Act likely shifted both the costs and benefits associated with a U.S. listing. The stricter corporate governance

behavior mandated by the Act should strengthen the credibility of listing on U.S. exchanges as a bonding mechanism, thus marginally increasing the expected benefits of a U.S. listing. However, the Act also increases the expected reporting, regulatory and legal costs of listing on a U.S. exchange. To the extent that this new cost structure subsumes the expected benefits to a U.S. listing, foreign firms may choose to forgo a U.S. cross-listing. Under the maintained assumption that the U.S. market is a firm's first choice from a bonding perspective, the economic consequences of the increased costs under the Sarbanes-Oxley Act are that (a) some foreign firms will simply forgo a foreign listing, while (b) other firms will opt to list their shares on an alternative market offering similarly strong host country institutions. Given the U.K.'s position as the leading, alternative capital market with strong investor protections, yet possessing a flexible approach towards corporate governance under the Combined Code, the London Stock Exchange (LSE) has been identified as a likely recipient of "lost" U.S. listings following the enactment of Sarbanes-Oxley.<sup>2</sup>

We test these arguments by examining U.S. and U.K. foreign listing events between June 1995 and June 2006. First, we find that the frequency of foreign listings on the NYSE and NASDAQ has fallen by nearly 63% in the four-year period following the passage of Sarbanes-Oxley, and that this decline cannot be fully explained by differences in market conditions before and after the Act. In contrast, the frequency of foreign listings on the LSE has more than doubled since the enactment of the Sarbanes-Oxley Act, with the increase being driven by the nearly seven-fold increase in foreign listings on the LSE's AIM. This increase coincides with a concerted marketing effort by the LSE to encourage small foreign firms to list on AIM by highlighting the lower regulatory costs vis-à-vis U.S. exchanges following the enactment of Sarbanes-Oxley.

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<sup>2</sup> The LSE actively promotes the "equivalence" of U.S. and U.K. legal and regulatory institutions. Consistent with those arguments, survey data ranking country-level legal and regulatory institutions suggests that these countries have functionally equivalent institutional arrangements (e.g., LaPorta et al., 1998; 2006).

Second, we find that for those foreign firms which engaged in either a U.S. or U.K. listing, the average probability of a firm listing its shares on a U.S. exchange (versus a U.K. exchange) is significantly lower in the post Sarbanes-Oxley period after controlling for firm, industry, country and exchange-specific factors that should influence listing decisions. This negative fixed effect is strongest among foreign firms choosing between the NASDAQ and the LSE's AIM; in contrast, only limited evidence exists with respect to foreign firms avoiding the NYSE in favor of the LSE's Main Market following the enactment of Sarbanes-Oxley.

Lastly, we use a prediction model based on pre-Sarbanes-Oxley data to predict a firm's exchange listing choice during the period following the enactment of Sarbanes-Oxley. Our prediction models suggest that the firms most likely to have bypassed U.S. exchanges in favor of a U.K. exchange are smaller and less profitable than both (a) the average foreign firm predicted to list in the U.S. absent the impact of Sarbanes-Oxley and (b) the average foreign firm that did actually list in the U.S. following the enactment of Sarbanes-Oxley. This result is consistent with Sarbanes-Oxley screening out firms from the left tail of the distribution of likely U.S. listing candidates along the dimensions of firm performance and size. These 82 firms, in aggregate, account for approximately \$25.7 billion in lost market capitalization. Whether or not this empirical result can be interpreted as Sarbanes-Oxley having successfully screened out marginal foreign firms hinges on whether or not the quality of a listing firm is increasing in these attributes.

Our methodology also identifies a small set of firms that listed on U.S. exchanges following the enactment of Sarbanes-Oxley that were predicted to list on the U.K. exchange based on their firm-specific, industry and home country attributes. These 18 firms are larger and more profitable than the average U.K. listing, and account for approximately \$35.5 billion in aggregate market capitalization. Interestingly, nearly all of these firms are domiciled in emerging economies, consistent with large, high quality firms from countries with weak

institutions being drawn by the enhanced bonding benefits of a U.S. listing following the enactment of Sarbanes-Oxley.

Our results suggest that the passage of the Sarbanes-Oxley Act has had a material impact on the flow of international listings. On one dimension, our results are consistent with Sarbanes-Oxley-related implementation costs deterring a number of small firms (primarily from developed economies) from engaging in a U.S. listing because the direct costs of being a registered firm now exceed the expected benefits. On another dimension, our results are also consistent with the enhanced bonding benefits under Sarbanes-Oxley attracting to the U.S. a set of large, profitable firms from emerging markets, where the likelihood of an agency problem is the strongest and hence the marginal benefits of an exchange listing under Sarbanes-Oxley are greatest. This change in listing behavior is consistent with the hypothesized shift in both the expected costs and benefits of a foreign listing following the enactment of Sarbanes-Oxley. Whether the economic gains associated from these new emerging market listings outweigh the benefits forfeited by the loss of small firms from primarily developed economies is a question for future research.

We caution that our current research design cannot distinguish between the effect of the passage of Sarbanes-Oxley *per se* from the influence of either the corporate events that lead to the creation of the legislation (e.g., Enron, Tyco, WorldCom, Global Crossing, failure of Arthur Andersen, etc.) or correlated time-period specific events that might have led to a decrease in foreign listings. Despite these limitations, a failure to document a change in the trend of foreign listings following the enactment of Sarbanes-Oxley would have cast considerable doubt on the arguments that the Act has shifted the incentives for foreign firms to list on U.S. exchanges. Moreover, by focusing on only those firms that have chosen to list on either a U.S. or London exchange (i.e., observable events), our research design does not identify those firms that would have otherwise listed in the U.S. absent the requirement of the Sarbanes-Oxley Act but instead chose to (1) never list on a foreign exchange, (b) opt for an OTC listing or private placement in lieu of an exchange-based listing, or (c) listed on an alternative, non-U.K., international

exchange, such as Singapore, Hong Kong or Luxembourg.<sup>3</sup> As such, our study likely presents a lower bound on the effect of Sarbanes-Oxley on foreign listing activity.

The remainder of the paper is organized as follows. Section 2 presents background information on the Sarbanes-Oxley Act and discusses the expected impact of the Act on foreign listings. Section 3 outlines our data collection procedure and the research design, while Section 4 provides descriptive evidence of listing patterns over our sample period. Section 5 presents our main empirical results, while section 6 presents our conclusions and limitations.

## **2. Background and motivation**

### ***2.1 Background: Sarbanes-Oxley Act and Foreign Issuers***

The Sarbanes-Oxley Act was signed into law on July 30<sup>th</sup> 2002 and its provisions covered all SEC reporting companies. No exception made for foreign issuers, except companies with Level I and Level IV American Depository Receipts (ADRs), which do not have SEC reporting requirements.<sup>4</sup> During the deliberations leading up to the final passage of the Act, there were some attempts to exempt foreign firms from the provisions of the Act, in keeping with certain historical precedents for foreign firms; however, as implemented, all provisions of the Act are applicable to foreign issuers with SEC reporting requirements.<sup>5</sup>

The Act also does not provide any flexibility for the SEC to interpret legislative intent and to allow exemptions to foreign issuers except in the case of rules relating to the audit committee (Perino, 2003).<sup>6</sup> For example, on August 2<sup>nd</sup>, 2002, the SEC issued its proposed rules – Certification of Disclosure in Companies’ Quarterly and Annual Reports - as required under

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<sup>3</sup> For example, several large Chinese banks engaging in an initial public offering (e.g., Bank of China (June 2006) and the Industrial and Commercial Bank of China (October 2006)) recently opted for a Hong Kong listing.

<sup>4</sup> These companies do not have to comply with mandatory U.S. disclosure rules. Instead, under Rule 12g3-2, these firms are required to file with the SEC the same financial information that they file with their home country regulators or stock exchanges.

<sup>5</sup> For example, foreign reporting entities are exempt from the requirement to file proxy statements, reporting of insider transactions, filing of quarterly reports, or compliance with Regulation FD.

<sup>6</sup> SEC has allowed accommodation of home country regulations that would create audit committees equivalent in independence to that envisaged under the U.S. rules – for instance, German firms are allowed to include labor representatives on the audit committee.

Section 302 of the Act. Consistent with the lack of flexibility, the new rules provided no exemptions for foreign issuers and specifically emphasized that the “no exemption” policy is required under the Act. However, the SEC has retained some flexibility in the timetable to implement the various provisions of the Act. In particular, the SEC first extended the due date for small companies and foreign private issuers for compliance with Section 404 to the first fiscal year ending after July 15, 2005 and subsequently extended it again by another year to the first fiscal year ending after July 15, 2006 (Rouse, 2006); the corresponding compliance date for large U.S companies was the first fiscal year ending after November 15, 2004.<sup>7</sup>

## ***2.2 Expected impact of Sarbanes-Oxley on the costs and benefits of a U.S. listing***

The passage of the Sarbanes-Oxley Act shifted both the expected costs and benefits of a foreign U.S. listing. From a cost perspective, the Act has increased both the expected direct and indirect costs of a foreign listing. Because the implications of the Act for foreign issuers are the same as those for U.S. corporations, many of the concerns raised by foreign issuers have been similar to those raised by U.S. companies. In particular, the requirement for CEO and CFO certification of financial statements (and the attendant civil and criminal liabilities), the internal control requirements under Section 404 (which are considered costly to implement particularly for smaller firms), the prohibition of loans to officers and directors, and the inspection of foreign auditors by the PCAOB have been highlighted as some of the Act’s more onerous provisions for foreign companies (Pozen, 2004). Corporate executives have complained that complying with the Act has diverted top management attention away from business issues and towards compliance with rules and has led to greater risk aversion due to fears of personal liability (Solomon and Bryan-Low, 2004; Thain, 2004). These concerns have prompted the CEOs of both the NYSE (John Thain) and NASDAQ (Bob Greifeld) to voice their concerns about the costs that companies have to bear to comply with the Act and the consequent risk of loss of foreign

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<sup>7</sup> For parsimony, we will forego a discussion of the various provisions of the Act. See Perino (2003) for a good summary of the Act’s key provisions.

listings in the U.S. (Thain, 2004; Greifeld, 2006). If these concerns are valid and the Act has solely raised the cost of a foreign listing, we would expect to see a decline in the number of companies willing to list in the U.S and subject themselves to the provisions of the Act.

Prior research provides evidence that SEC requirements impose costs that deter foreign firms from choosing U.S exchanges as a listing venue. Specifically, Biddle and Saudagaran (1989) and Saudagaran and Biddle (1992; 1995) show that disclosure costs significantly affect firm's choice of foreign listing venues. Biddle and Saudagaran (1989) examine the listing decisions of 207 companies from eight countries. Using a self-constructed measure of required disclosure, they find that their disclosure measure is negatively associated with a company's decision to list in a particular country, consistent with strict disclosure requirements inhibiting cross-border listings. Similarly, Mittoo (1992) surveys Canadian companies and finds that SEC reporting and compliance requirements are considered to be the greatest costs of a U.S. listing.

In the context of Sarbanes-Oxley, however, the incremental costs of the Act may be insufficient to deter a U.S. listing. First, the expected costs of the Act may be exaggerated for foreign firms. For example, Siegel (2004) provides evidence that the SEC and minority investors have not effectively enforced U.S. regulations and laws against cross-listed foreign firms. Second, many of the provisions of the Act are not incremental to existing statutes relating to criminal behavior by corporate executives (Perino 2003). For example, The Foreign Corrupt Practices Act of 1977 requires SEC registrants to maintain a strong internal control system and has been cited in a number of SEC Accounting and Audit Enforcement Releases against companies since 1977 (Rouse, 2006). As such, the expected indirect costs under Sarbanes-Oxley may not be incremental to the existing cost structure in place. Thus, fears of increased legal liability exposure may be unfounded.<sup>8</sup> Third, even though the Act's requirements result in substantial direct costs (such as those involved in the implementation of Section 404), these costs are less significant for the large companies that typically seek a U.S. listing.

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<sup>8</sup> However, enforcement by the SEC may now be more vigorous than before and managers may alter their listing behavior because the expected probability of enforcement action has changed.

Fourth, firms may continue to opt for a U.S. listing because the benefits continue to outweigh these new costs (i.e., the demand for cross listing in the U.S. is inelastic). Pagano, Roell, and Zechner (2002) identify a number of motives for firms to cross-list – to raise capital for investment, to use cross-listed stock as a currency for foreign acquisitions, to facilitate stock sales by existing shareholders, to broaden the shareholder base, to access foreign expertise (such as industry-specific analysts), to demonstrate a commitment to better disclosure and governance standards, to increase share liquidity, to take advantage of relative mispricing, to capitalize on product market reputation, and to strengthen the company’s output market. Through many of these channels, the U.S. listing generates a benefit in the form of a reduced cost of capital and an increased equity valuation (e.g., Stulz, 1999; Karolyi, 1998).<sup>9</sup> Additionally, given that the U.S. product market is one of the largest in the world, the product and labor market benefits of listing in the U.S. will not be available through listing on exchanges in other countries.<sup>10</sup> To the extent that the expected benefits of a U.S. listing continue to exceed the new cost structure under Sarbanes-Oxley, foreign firms may still prefer a U.S. listing after the enactment of the Sarbanes-Oxley Act.

Finally, the benefits of a foreign listing on a U.S. exchange may have actually increased following the enactment of Sarbanes-Oxley. Numerous studies have found that the poor protection of minority shareholders impedes the growth of financial markets (e.g., La Porta et al., 1997; 2000; 2002, among others). Coffee (1999; 2002) and Stulz (1999) suggest that foreign firms can overcome the weakness of home country institutions by listing in the U.S. and using the U.S. legal system to protect minority shareholders. Specifically, listing in the U.S. provides a

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<sup>9</sup> Blass and Yafeh (2001) show that high-tech and fast growing firms from Israel and the Netherlands list exclusively in the U.S as their primary exchange because U.S. investors and analysts possess greater expertise at valuing such companies than their domestic counterparts.

<sup>10</sup> Khanna, Palepu, and Srinivasan (2004) find that firms that have product and labor market interactions with the U.S. (and those that are from countries that have greater product and labor market interactions with the U.S.) behave similar to U.S. firms as measured by their disclosure practices compared to those that do not have such interactions. Those authors interpret such voluntary behavior as resulting from the demand for information from product markets (suppliers, customers) and the labor market (current or potential employees). This effect is incremental to that from a U.S. listing and is similar in magnitude to the effect that arises from a U.S. listing.

commitment mechanism for these companies to bond to a high quality legal and regulatory system. Recent studies provide empirical evidence on the legal bonding hypothesis, and find that foreign firms from countries with weaker legal institutions benefit more than others by a U.S. listing (Doidge, Karolyi, and Stulz, 2004; Doidge, 2004; Hail and Luez, 2005; Lel and Miller, 2006). By raising the level of compliance required, Sarbanes-Oxley may have increased the benefits of a U.S. listing by increasing the credibility of U.S. exchanges as a bonding mechanism.<sup>11,12</sup> Moreover, in the absence of other jurisdictions offering a similar bonding arrangement, companies may not have a choice but to list on U.S. stock exchanges.<sup>13</sup>

### ***2.3 Contribution of paper***

Given the preceding arguments, the net effect of the costs and benefits of the Act, and its impact on foreign listing decisions, remains an empirical issue. To our knowledge, this is the first study to shed light on this issue by examining the flow of foreign listings in the context of the Sarbanes-Oxley Act. Our paper is related to research that examines the impact of the Act on U.S. companies. This research has documented an increase in the number of firms deregistering from the SEC (Leuz, Triantis and Wang, 2006) and an increase in the number of firms going private (Engel, Hayes and Wang, 2005; Block, 2004) following the enactment of Sarbanes-Oxley. Additionally, Kamar, Karaca-Mandic and Talley (2006) examine U.S. acquisition targets and find that a greater propensity for targets to be acquired by private acquirers than by public

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<sup>11</sup> U.S. stock exchanges are also positioning themselves to benefit from this reputation. Nasdaq has newly created, effective July 1<sup>st</sup>, 2006, the Nasdaq Global Select Market for “public companies that meet the highest listing standards in the world” (Nasdaq, 2006). This tier of the Nasdaq imposes higher initial listing standards than that applicable to other Nasdaq companies which will now be in two other tiers – Nasdaq Global Markets (formerly the Nasdaq National Market) and the Nasdaq Capital Market (formerly the Nasdaq SmallCap Market).

<sup>12</sup> Consistent with these arguments, the CEO of WNS (Holdings) Limited, a firm that recently went public on the NYSE, wrote a Wall Street Journal article touting the advantages of a U.S. cross listing and specifically highlighting the advantages of the Act in improving corporate governance (Bhargava, 2006).

<sup>13</sup> Other listing locations offering strong investor protections may provide bonding benefits similar to a U.S. listing. For example, Crawford and Piotroski (2006) find that exchanges other than the U.S. which offer a functionally equivalent improvement in investor protections upon cross-listing are also capable of creating incentives for better financial reporting / governance practices. Thus, firms seeking the benefits of bonding are not necessarily tied to a U.S. listing.

acquirers in the post-Act period. All of these effects are more pronounced for smaller firms. These findings provide evidence consistent with the views of the critics of the Act who have argued that the Act has raised the costs of being public especially for smaller firms (Romano, 2005; Ribstein, 2002).

Contemporaneous research has found similar trends among foreign firms. Marosi and Massoud (2006) find an increase in deregistrations among foreign firms following the enactment of Sarbanes-Oxley. In particular, 96 foreign firms deregistered with the SEC from 2002-2005 while only 22 firms deregistered in all the years from 1990 to 2001. Hostak, Lys and Yang (2006) examine the characteristics of foreign firms that have voluntarily delisted following the enactment of Sarbanes-Oxley, and find that these firms tend to have weaker corporate governance attributes than a control sample.

To examine the impact of the Act on the flow of foreign listings to the U.S., we focus on two questions. First, has the rate of foreign cross-listings onto U.S. exchanges decreased in the period following the enactment of Sarbanes-Oxley? Second, are foreign exchanges - in particular, U.K. exchanges - attracting foreign firms in the post-Act period that would have otherwise listed on a U.S. exchange prior to the enactment of the Act? We examine the London Stock Exchange (LSE) as an alternative to the two U.S. exchanges. The LSE has been highlighted as an alternate destination for companies interested in accessing western capital markets (Karmin and Lucchetti, 2006; McLachlan, 2006). This alternative is attractive to potential U.S. listing candidates because U.K. institutions provide strong investor protections yet offer listing firms flexible corporate governance standards under the Combined Code. Moreover, while companies may have opted for other exchanges such as Luxembourg, or may be accessing stock exchanges in regional financial centers such as Singapore and Hong Kong, London has traditionally been the largest cross-listing center other than the U.S. (Sarkissian and Schill, 2004). Lastly, a recent London Stock Exchange survey of 80 companies that listed on that exchange found that 90% of those companies that contemplated a U.S. listing decided that

Sarbanes-Oxley Act made London more attractive (Review and Outlook, Wall Street Journal, Feb 8, 2006). And, not coincidentally, the LSE's AIM has undertaken extensive marketing efforts aimed at smaller companies and is holding road shows at major U.S. financial centers to attract foreign listings (McLachlan, 2006).

### **3. Sample construction and data sources**

Our sample consists of foreign firms that listed on the NYSE, NASDAQ, and London Stock Exchange between June 1<sup>st</sup>, 1995 and June 30<sup>th</sup>, 2006. We chose June 1995 as the starting point of our sample period because this date marked the launch of London's AIM. To construct our sample, we gathered a list of currently listed foreign companies (including listing date) from each exchange's website. These current lists were then supplemented to identify companies that listed in our sample time period but have subsequently delisted from the exchange (and hence, are not included on the exchange's list of active companies). For both the NYSE and NASDAQ, we supplement their current lists using data provided to us directly by the exchange, as well as ADR data from the Citibank, Bank of New York, and JP Morgan ADR databases. The London Stock Exchange website also provides detailed data on historical listings for its AIM since its inception in June 1995, allowing us to identify delisted firms for the entire sample period. Detailed historical listings data for the London Stock Exchange's Main market are available only from January 1998. In order to identify listings between 1995-1997 that have subsequently delisted, we supplement our 1995-1997 data for the Main market using the new companies list from the Official London Stock Exchange Directory for the relevant historical years, and collect listing dates for these companies from Datastream. Finally, we excluded any foreign company that is either an investment fund or an investment trust for all exchanges in our analysis.

Together, these data collection procedures have allowed us to obtain a fairly comprehensive dataset of foreign listings on these exchanges over our sample period. These procedures identified 1,503 unique listing events undertaken by firms from 82 countries over our

sample period. These listings are split nearly two to one between U.S. (976) and U.K. (527) exchanges. Appendix One tabulates the distribution of the home countries for the full sample of listing events, for the two host countries separately, and for the respective exchanges.

Financial accounting and stock price data for our sample firms are primarily gathered through the Datastream database. For those firms missing price and/or accounting data on Datastream in the year of the listing event, we gather supplemental accounting and price data through Compustat's North American Industrial, Global and Emerging Markets, and Global Issues databases. Due to database limitations, complete financial and stock price data are currently available for only 1,136 of these cross-listing events.<sup>14</sup> Data on stock exchange indices (levels and returns) and market pricing multiples are primarily gathered through Datastream. Data on domestic listing activity are gathered from the respective exchange. Data on the total number of domestic firms listed on a given exchange each year are gathered from the World Federation of Exchanges.

## **4. Descriptive Evidence**

### ***4.1 Descriptive statistics of foreign firms listing on U.S. and U.K. exchanges***

Table 1 presents descriptive statistics for our sample. In terms of financial attributes, the average firm cross-listing onto a U.S. or U.K. exchange over the sample period tends to be large (market capitalization, total assets, and total revenue of \$3.7 billion, \$10.7 billion, and \$2.6 billion, respectively), profitable (median net income as a percent of assets of 2.6 percent), and possessing moderate growth prospects (median book-to-market ratio of 0.418). However, there is considerable variation in these characteristics. For example, for those firms with available financial data, 66.9 percent, 64.2 percent, and 72.2 percent have a market capitalization, total asset base, and total revenue of less than five hundred million dollars (median values of \$321 million, \$295 million, and \$149 million, respectively), while 45.8 percent of the sample is

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<sup>14</sup> We are currently in the process of hand-collecting missing financial data for the remaining firms from their public filings with the US and UK exchanges.

unprofitable in the year of listing. Lastly, 37.5 percent of the listings involved the raising of equity capital; 33.1 percent of these firms raised capital in the host country, while 8.1 percent raised capital in the home markets around the time of the foreign listing.

In terms of home country attributes, 66.4 percent, 29.2 percent, and 4.4 percent of the firms are domiciled in economies with a common law, code law, and socialist/communist legal tradition, respectively, while 42.5 percent of the firms are domiciled in developing economies. The listing companies also display considerable geographic dispersion; for example, 25.8 percent of the sample was domiciled in a member nation of the European Union at the time of the cross-listing, while 10.7 percent, 10.0 percent, 6.2 percent, and 12.6 percent of the sample are from Asia, Africa/Middle East, Latin/South America and Caribbean nations.

Consistent with firm's self-selecting onto exchanges, there is considerable variation in these firms' financial and institutional properties across our four exchanges. As the two premier domestic exchanges, both the NYSE and the LSE's Main Market attract larger and more profitable firms than the NASDAQ and the LSE's AIM, respectively. In contrast, the NASDAQ and AIM attract firms with stronger market valuations and greater expected growth opportunities than the NYSE and Main Market (as implied by the firms' book-to-market ratios). However, despite the broad similarities between NASDAQ and AIM, the NASDAQ attracts substantially larger and relatively more profitable firms than AIM. The median NASDAQ-listed foreign firm has market capitalization, total assets, and total revenue of \$119.3 million, \$110.9 million, and \$47.5 million, respectively, compared to \$51.9 million, \$20.0 million, \$1.9 million respectively for the AIM. Finally, in terms of the influence of home country institutions on listing preferences, firms from emerging markets and socialist/communist legal traditions appear to have a stronger preference for a U.K. listing.

Finally, Panel B presents evidence on the industry affiliations of the cross-listed firms. Interestingly, the NASDAQ and AIM attract firms from very different industries. Over the full sample period, nearly 40 percent of all NASDAQ cross-listings are firms from either

Software/Technology or Biotech/ Pharmaceutical sector, while these same sectors account for less than 15% of all AIM listings. In contrast, nearly 40 percent of all AIM listings occur in the Oil and Gas, Chemicals and Forestry/Mining/Metals sectors, while this sector accounts for only ten percent of NASDAQ listing activity. Lastly, the NYSE and LSE Main Market host more comparable portfolio of firms, with financial service firms (e.g., banks, insurance companies) accounting for the largest portion of total listing for each exchange (18.75% and 25% respectively). Our multivariate tests will control for these industry-level preferences through the use of industry indicator variables.

## ***4.2 Trends in foreign listing activity on U.S. and U.K. exchanges***

### ***4.2.1 Univariate Evidence***

Table 2 presents descriptive evidence on the trends in foreign listing activity over the period June 1995 to June 2006 and for the two sub-periods before and after the enactment of the Sarbanes-Oxley Act. Our pre-Act baseline period (*PreSOX*) spans June 1995 to April 2002. The post Sarbanes-Oxley period (*PostSOX*) consists of the forty-five month period from August 2002 through June 2006. All subsequent tests exclude the three month legislative timeframe of the Act (May 2002 through July 2002).

The first column of each panel presents the aggregate trend in foreign listing activity. Over the entire sample period, an average of 11.30 foreign listings occurred each month onto either a U.S. or U.K. exchange, with 64.9% of those listings occurring on a U.S. exchange (7.34 in U.S. versus 3.96 listings in U.K. per month). In terms of listing trends, there is a decrease in the aggregate listing rate following the enactment of the Sarbanes-Oxley Act: 12.27 listings per month prior to the Act and 9.87 listing per month following the Act. This decline could reflect

both a decrease in the aggregate supply of foreign firms listing onto U.S. exchanges during the post-Sarbanes-Oxley period and the weaker market conditions in the post-Act time period.<sup>15</sup>

The remaining columns present listing trends by host markets and the underlying exchanges. Consistent with arguments that foreign firms avoided the U.S. market following the enactment of the Sarbanes-Oxley Act, monthly listing activity on both the NASDAQ and the NYSE has significantly declined over the last forty-four months compared to the pre-Act period. In contrast, London has experienced a significant increase in foreign listings, fueled by a nearly 775 percent increase in monthly listings on the AIM. These trends have resulted in a dramatic decline in the proportion of observable firms listing on U.S. exchanges: 78.29% before the Act to 35.79% after the Act's enactment. This sudden decline in both the number of U.S. listings and the relative proportion of U.S. listings is consistent with claims that either fewer foreign firms are choosing to list on U.S. exchanges or that foreign exchanges are benefiting from the stricter U.S. regulations. All of these changes are statistically significant at the one-percent level (two-tailed tests).

Interestingly, the LSE's Main Market has also experienced a decreased listing rate during the post-Act period. This decline highlights the importance of considering market conditions and changes in the composition of firms listing over this time period. Additionally, the decline for the LSE's Main Market could represent "lost" LSE Main Market listings during the post-Act period as a result of AIM's recent marketing efforts to attract small growth firms.<sup>16</sup>

#### *4.2.2. Multivariate evidence*

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<sup>15</sup> However, we caution that we can only observe those firms that actively chose to list their shares on either exchange, and cannot observe firms that self-selected out of the cross-listing process entirely or cross-listed on exchanges in other countries. The aggregate supply of firms that would have cross-listed onto the U.S. exchanges absent the requirements of Sarbanes-Oxley Act could have actually exceeded pre-Act period averages.

<sup>16</sup> A similar pattern exists when U.S. (U.K.) firms listing onto a U.K. (U.S.) exchange are excluded from the analysis.

The univariate results could simply reflect time-specific variation in market conditions. In particular, domestic listing activity is influenced by relative market valuations, shifts in expected returns and changes in expectations about the payoffs to future investments (e.g., Pastor and Veronesi, 2005); as such, foreign firms are also expected to be drawn to exchanges offering high valuations and strong recent return performance (as a proxy for these changing expectations). To verify that the preceding U.S. listing trends are not an artifact of changing market conditions, we estimate variations of the following model, by exchange, using our time-series of monthly cross-listing data:

$$\begin{aligned} \text{Log}(1+Nlist_t) = & \alpha + \beta_1 Q1_t + \beta_2 Q2_t + \beta_3 Q3_t + \beta_4 \log(1+IndexReturn_t) + \beta_5 P/E\_Index_t \\ & + \beta_6 \log(1+DomesticList_t) + \beta_7 PostSOX_t + \varepsilon_t \end{aligned} \quad (1)$$

In this model, the dependent variable  $\log(1+Nlist_t)$  is a logarithmic transformation of the raw number of foreign firms listing on a given exchange in month  $t$ . We use a logarithmically transformed measure because the variable  $Nlist$  is right skewed. To capture the effects of seasonality in listing decisions,  $Q1$ ,  $Q2$  and  $Q3$  are indicator variables equal to one if month  $t$  is in the first, second or third calendar quarter, respectively, zero otherwise. To control for market conditions, we include two variables:  $IndexReturn$  and  $P/E\_Index$ . The variable  $Index\_Return_t$  is the preceding twelve-month return to the respective exchange's market index, and is designed to capture the impact of recent changes in market conditions, valuations and discount rates on listing rates. For the two U.S. exchanges,  $IndexReturn$  is measured using the return to the NASDAQ and NYSE composite index, respectively. For the LSE's Main Market and AIM,  $IndexReturn$  is measured using the return to the FTSE-350 and the FTSE AIM-All share index respectively.<sup>17</sup> The second exchange-level variable,  $P/E\_Index$ , is the respective exchange's market-level price-earnings multiple in the month of listing. This variable is designed to capture the relative *level* of market valuations on a given exchange at the time of the listing decision. For the NASDAQ and Main Market,  $P/E\_Index$  is the implied market P/E multiple for the

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<sup>17</sup> Returns to the AIM All-share index are supplemented with the returns to the FTSE Small Cap index prior to December 1996.

Nasdaq composite and the FTSE-350 index, respectively. For the AIM, *P/E\_Index* is the market P/E multiple reported for Datastream's U.K. Small Cap index. Finally, for the NYSE, *P/E\_index* is measured as the weighted average P/E ratio for all listed firms with CRSP data in the listing month. Coefficients from these estimations are presented in Table 3.

Consistent with seasonal patterns in the monthly listing data, listing frequencies tend to be higher (lower) in the fourth (first) calendar quarter. In terms of the influence of market conditions, we find that listing frequencies do not display a reliably positive relation with our two market variables in our exchange level estimations. The lack of a systematic positive relation highlights that foreign listing activity is driven by more than simply relative market valuations. In particular, foreign listings may be insensitive to current market conditions, because under the bonding hypothesis (especially if the listing is not accompanied by capital raising activity), firms are primarily concerned about capturing the reputation benefits provided by the host country's institutional structure. These issues highlight the need to develop a fuller model of exchange choice; as such, our primary empirical tests (in section 5) will focus on firm-specific incentives to list on a given exchange. Finally, it may simply be the case that our measures of market conditions are incomplete, and as such, we have not fully identified all of the market-level forces shaping foreign listings decisions. After controlling for these market valuation variables, we continue to document a significant decrease in listing rates after the enactment of the Sarbanes-Oxley Act on the U.S. exchanges, while the increase in listing frequency on the AIM continues to persist.

As an alternative means of capturing market conditions, we re-estimate our model after including the variable *DomesticList* as an instrument for overall capital market conditions in the home country. *DomesticList* is measured as the number of new domestic listings on the respective exchange in month *t*. To the extent that foreign firms are responding to the same set of economic forces as domestic firms, the number of domestic listings can serve as a reasonable instrument of prevailing conditions influencing foreign firms listing decision. As such,

*DomesticList* can capture exchange or economy-specific factors, such as the heightened marketing efforts of AIM, that are not captured by index returns or pricing variables.

Coefficients from these estimations are presented in Panel B.

Consistent with the impact of the Sarbanes-Oxley Act on domestic firms identified in prior research, trends in domestic listings completely subsume the explanatory PostSOX indicator variable on NASDAQ. This attenuation is expected given that the literature documenting the impact of Sarbanes-Oxley identifies that the impact is greater for smaller firms than for larger firms. In contrast, the shift in domestic listing patterns alone cannot fully explain the decline in NYSE listings following the Act. This is occurring because either an incremental Sarbanes-Oxley-related cost is deterring foreign firms from a NYSE-listing that does not apply to domestic firms, or because foreign firms considering the NYSE have alternatives to listing on a U.S. exchange (such as an ability to access foreign investors through private placements or the London Main Market) that NASDAQ-bound firms do not possess.

## **5 Empirical Results: The Impact of Sarbanes-Oxley on the probability of a U.S. versus U.K. listing**

### ***5.1 Empirical model***

The preceding descriptive evidence, based on monthly listing patterns, suggests that the number of foreign firms listing on U.S. exchanges has decreased following the enactment of the Sarbanes-Oxley Act. One explanation for this decline is that foreign firms may have changed their host exchange preferences following the Act. Alternatively, the decline may reflect a change in the type of foreign firms listing overseas during this time period. In order to assess whether such a change in preferences has occurred, we need to compare listing activity on U.S. exchanges against the activity of an alternative exchange. Given the U.K.'s prominence as a global capital market with strong investor protections and strong, yet flexible, governance requirements, U.K. stock exchanges are a viable substitute to a U.S. exchange listing. We

examine the likelihood of a U.S. listing against the U.K. alternative in the post-Sarbanes-Oxley regime after controlling for other determinants of the listing exchange choice.

Specifically, we estimate variations of the following cross-sectional model:

$$\begin{aligned}
 \text{Prob(U.S. Listing=1)} = & \alpha + \sum_{j=1}^{16} \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} \\
 & + \beta_4 \text{EU} + \beta_5 \text{Emerging} + \beta_6 \text{CommonLaw} + \beta_7 \text{Socialist} \\
 & + \beta_8 \text{Diff\_Index} + \beta_9 \text{Diff\_P/E\_Index} + \beta_{10} \text{Diff\_DomesticList} \\
 & + \beta_{11} \text{Issuance\_Home} + \beta_{12} \text{Issuance\_Host} \\
 & + \beta_{13} \log(\text{Assets}) + \beta_{14} \text{ROA} + \beta_{15} \log(I+BTM) + \beta_{16} \text{Leverage} \\
 & + \beta_{17} \text{PostSOX} + \varepsilon
 \end{aligned} \tag{2}$$

In this model, the dependent variable is an indicator variable equal to one if the event pertains to a foreign listing onto either the NASDAQ or the NYSE, and zero if the firm lists on either the London Stock Exchange's Main Market or AIM.

The independent variables are designed to capture incentives for a given firm to list onto a specific exchange. Prior empirical research provides little guidance on the forces shaping a firm's exchange choice. As such, a notable contribution of this paper to the extant literature is the estimation of an explicit exchange choice model. We incorporate explanatory variables that cover three broad areas: home country attributes, exchange-level attributes, and firm-specific factors.

The first set of explanatory variables capture incentives arising from the firm's home country and related institutions. First, the listing choice may be influenced by proximity and/or economic interdependencies between home and host countries. As noted by Pagano, Roell and Zechner (2002) and Sarkissian and Schill (2004), both geographic and cultural proximity appears to be a key factor influencing cross-listing decisions. To capture these country-level effects, we include three indicator variables, *Canada*, *Ireland* and *Israel*, to capture the idiosyncratic listing tendencies of firms domiciled in Canada, Ireland and Israel, respectively. These three countries are individually identified because (1) these countries provide the largest number of foreign (i.e.,

non-US and non-UK) firms in the sample and (2) each country has strong economic links with either the U.S. (Canada and Israel) or U.K (Ireland). Similarly, the indicator variable *EU* is set equal to one if the firm is domiciled in a country that belongs to the European Union at the time of the listing event. This variable is included to capture any incentives created by the economic links between EU member states and the U.K. Lastly, *Geography* is an array of indicator variables designed to capture three broad geographic regions in our sample: Asia, South America and Caribbean. These indicator variables are designed capture any distinct incentives or preferences arising from geographic or cultural factors in these regions.<sup>18</sup>

Second, the listing choice is likely to be influenced by the firm's home country institutional structure and the resultant legal, political, regulatory and financial reporting incentives these institutions create. Prior research shows that these institutions are correlated with the country's legal tradition, with stronger institutions residing in countries with a common law legal tradition (e.g., LaPorta et al., 1998). Thus, to capture these differential home country institutional effects, we include two indicator variables, *CodeLaw* and *Socialist*, to indicate whether the firm resides in a country with a code law or socialist / communist legal tradition, respectively. Similarly, developing countries (i.e., economies with low levels of financial development and per capita wealth) tend to have weaker institutions and a greater degree of government intervention, corruption and cronyism than developed economies. The indicator variable *Emerging* equals one if the firm's host country is not classified as a developed economy by the World Bank. To the extent that these weak institutions create incentives to avoid regimes with stronger regulatory or investor scrutiny, we expect negative relations between these independent variables and a U.S. listing; in contrast, firms from countries with weak institutions

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<sup>18</sup> Product market relationships between the firm and the host market can also be an important factor driving listing choice. We will attempt to model this economic interaction both at the country level and at the firm level in future versions of the paper.

have the most to gain from a U.S. listing under the bonding hypothesis, which would result in a positive relation between these variables and a U.S. listing.<sup>19</sup>

The second set of explanatory variables capture incentives arising from differences in market conditions and relative stock exchange performance around the time of the listing. We consider three measures of “relative” market conditions: differences in twelve-month index returns, differences in market-level price-earnings multiples, and differences in domestic listing activity. Prior research suggests that domestic equity issuance decisions are tied to shifts in expected returns and market valuations. If similar arguments hold for foreign listing decisions, foreign firms are likely to be drawn to exchanges providing high valuation multiples or strong recent index performance. Recall, for each exchange, we measure the preceding twelve-month return to the respective exchange’s market index ( $IndexReturn_t$ ).  $Diff\_IndexReturn_t$  is the difference in  $IndexReturn_t$  between a given U.S. exchange and the corresponding U.K. alternative. Analogously,  $Diff\_P/E\_Index_t$  is the relative difference in pricing premium, as implied by the exchange’s current pricing multiple  $P/E\_Index_t$ , between a U.S. exchange and the corresponding U.K. exchange.<sup>20</sup> These two variables are designed to capture differences in market momentum and valuation levels prior to the exchange choice. Lastly, Pagano et al. (2002) provide anecdotal evidence that foreign firms are attracted to exchanges experiencing a strong, contemporaneous growth in new domestic listings. The variable  $Diff\_DomesticList_t$  is measured as the difference in the number of new domestic firms listing on a specific U.S. and U.K. exchange ( $DomesticList_t$ ) in the month of the foreign listing. To the extent that foreign and domestic firms respond to similar listing incentives,  $Diff\_DomesticList_t$  will act as an instrument

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<sup>19</sup> Results are also robust to the inclusion of the additional variables to capture potential country-level incentives. For example, we have included an indicator variable if the firm is domiciled in a current or former U.S. territory (i.e., Puerto Rico and the Marshall Islands) to capture the economic links between these economies and the U.S. We also included an indicator variable if the firm is domiciled in a popular off-shore tax haven (Bermuda, the Cayman Islands, the Channel Islands (Guernsey and Jersey) or the Netherlands Antilles). Due to the limited number of observations for these categories, we exclude them from the tabulated results.

<sup>20</sup> Our measure  $P/E\_Index_t$  is measured using a different data source for each exchange (and is potentially computed using different weighting techniques). As such,  $Diff\_IndexReturn_t$  is mean-adjusted when included in our empirical models to better capture time-series variation in relative pricing attributes across exchanges.

for additional exchange-level forces that influence the relative attractiveness of one exchange over another. For all three exchange-level metrics, NYSE and NASDAQ attributes are benchmarked against the return, pricing and listing attributes of London's Main Market and AIM, respectively.<sup>21</sup>

The last set of explanatory variables measure firm-level incentives that influence the manager's choice of a host country. We consider six firm attributes: industry affiliation, size, profitability, growth opportunities, leverage and whether or not the firm raised equity capital around the time of the new foreign listing. Anecdotal evidence suggests that a firm will choose to list onto an exchange that already hosts the firm's competitors or peers, or has a reputation for industry-specific investor interest or expertise. To capture these fixed industry-level preferences, we include an array of seventeen industry indicator variables. Industry affiliation is based on each firm's Datastream industry classification. For those 74 firms that are 'unclassified' on Datastream, classifications are based on current information provided through the firm's own website or Google Finance. In terms of financial attributes, firm size is measured as the log of the total assets (in nominal U.S. dollars) in the year of the listing, profitability is measured as the ratio of net income before extraordinary items in the year of the cross-listing event, scaled by end of the year assets, and leverage is measured as total liabilities over total assets at the end of the year. The firm's market-to-book ratio is included to capture differences in expected growth opportunities (as well as correlated financial distress/risk attributes). Finally, prior research on the bonding hypothesis suggests that foreign listings are motivated by the need to raise equity capital either at home or on the host exchange at favorable rates. We include two indicator variables, *Issuance\_Home* and *Issuance\_Host*, to capture whether the firm raised equity capital

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<sup>21</sup> These pairings are chosen for several reasons. First, our descriptive statistics show that these pairs of exchanges are attracting roughly similar types of firms, as would be expected among competing listing platforms. Second, the exchanges themselves consider the paired exchange to be their primary competitor for foreign listings in this context.

in their home or host market, respectively, in the one month period surrounding the foreign listing event.<sup>22</sup>

In order to implement the model, we delete those events where the choice between a U.S. and a U.K. listing is either mechanical or confounded. First, we eliminate those events where the firm contemporaneously listed shares in both the U.S. and London (13 cases of dual listing events and one instance of different classes of equity shares being issued simultaneously).<sup>23</sup> Second, we eliminate those events where the foreign firm already had shares listed on the alternative exchange at the time of the sample cross-listing event (89 cases). Lastly, we eliminated those firms that were domiciled in the U.S. and the U.K., because these firms are not “foreign” in this analysis, and do not face the same international exchange choice as non-US and non-UK firms.<sup>24</sup> These adjustments result in a final sample of 1,167 unique U.S. and U.K. foreign events between June 1995 and June 2006.<sup>25</sup>

## ***5.2 Evidence on a change in U.S. versus U.K. listing preferences***

Table 4 presents the results of our estimations of equation (2). Due to financial data limitations, we estimate two separate versions of this model: a reduced form model excluding financial data (n=1,167), and the full model (n=948). These models are also estimated with and without the domestic listing variable (due to the likely correlation between the enactment of Sarbanes-Oxley and domestic listing rates in the U.S.).

These estimations produce several key observations. First, the explanatory power of each model (i.e., concordant percentage) is substantially higher than a naïve prediction model, suggesting that our firm-level, exchange-level and country-level explanatory variables are

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<sup>22</sup> Future estimations will consider the interaction of equity issuances with several of our firm, exchange and country-level attributes.

<sup>23</sup> Interestingly, all of the dual listing events in our sample occurred prior to the enactment of Sarbanes-Oxley.

<sup>24</sup> Our current research design eliminates all U.S. and U.K. firms; future drafts will retain those UK firms that engaged in their IPO on a US exchange. The first U.S. firm to IPO on a London Exchange occurred in August 2006.

<sup>25</sup> The current analysis implicitly assumes that all of the firms would have met both US and UK exchange listing requirements.

capable of capturing variation in cross-sectional incentives for a U.S. versus U.K. listing. Second, results not tabulated show that our geographic and industry variables explain a portion of cross-sectional variation in listing choice; coefficients on six of our industry indicator variables and all three of our geographic indicator variables are significant, while Canadian and Israeli (Irish) firms are statistically more likely to list on a U.S. (U.K.) exchange, respectively.<sup>26</sup> Third, firms are more likely to choose a foreign exchange with strong recent performance, consistent with the argument that firms are attracted to markets with the strongest valuations and fundamentals. Fourth, firms from countries with weak institutions (i.e., code law and emerging markets) are more likely to avoid the scrutiny associated with a U.S. listing after controlling for their other attributes. Lastly, U.S. exchanges are more likely to attract larger firms and firms that intend to raise equity in the host market. These relations are fairly robust across all specifications and models.

After controlling for the baseline selection tendencies of the foreign firms that choose to list in one of these two countries, we find that the average probability of a U.S. listing is significantly lower after the enactment of the Sarbanes-Oxley Act in all four models. This negative fixed effect is consistent with arguments that some foreign firm's have begun bypassing U.S. exchanges in the post Act period.

To confirm that these results are not an artifact of a mis-specified logistic model, we also re-estimate these models using an OLS regression. Although OLS estimations with a binary dependent variable are inefficient, they produce unbiased parameter estimates and are not sensitive to the underlying distributional assumptions imbedded in the logistic framework, allowing us to verify the robustness of the economic inferences obtained from our logistic estimation procedures. Coefficients from these estimations are presented in panel B, and support

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<sup>26</sup> Foreign firms from the Software/Technology, Consumer Products, Healthcare, Pharmaceutical, Telecommunications and Transportation industries all displayed a significantly greater likelihood of listing on U.S. exchanges in these estimations.

the basic inference that the likelihood of a foreign U.S. listing has decreased in the period following the enactment of the Sarbanes-Oxley Act.

### ***5.3 Exchange-level tests of a shift in listing preferences following Sarbanes-Oxley***

The preceding analysis suggests that the London Stock Exchange has begun receiving foreign listings that, prior to the enactment of the Sarbanes-Oxley Act, would have been candidates to list on a U.S. exchange. However, it remains unclear which U.S. exchanges are losing these listings, and which U.K. market is benefiting from this increased flow of applicants. The following analysis will begin to shed light on these issues.

Given the financial and industry differences between firms that choose to list on the NYSE and LSE's Main Market vis-à-vis the NASDAQ and AIM, we investigate changes in listing probabilities within these two pairs of exchanges. As discussed earlier, U.S.-based evidence suggests that the costs of Sarbanes-Oxley appear to disproportionately affect smaller firms. If this is true for foreign firms as well, the shift in listing behavior should be concentrated among the NASDAQ-AIM set of foreign listings. Contrarily, if large firms are either less sensitive to the costs of Sarbanes-Oxley or their listing decision is driven more by bonding considerations, the effect should be less pronounced among the NYSE-LSE Main Market set of listings.

Table 5 presents re-estimations of equation (2) for these two pairs of exchanges. Consistent with the preceding arguments, we find a large, significant decrease in the likelihood of a Nasdaq listing (after controlling for firm-level characteristics) in the post-Sarbanes-Oxley period. In contrast, the effect of Sarbanes Oxley on the NYSE-LSE Main Market choice is only marginally negative. The strength of the Nasdaq-AIM results is consistent with the LSE's attempt to capitalize on the burden of current U.S. regulations to attract global listings among small, growth-oriented firms to the AIM.

#### ***5.4 Shift in the determinants of U.S. listings pre versus post Sarbanes-Oxley***

In an effort to better understand how Sarbanes-Oxley has shifted the preferences for a foreign listing on a U.S. exchange, we re-estimate equation (2), absent the *PostSOX* variable, using data before and after the enactment of Sarbanes-Oxley. Similar to the analysis found in Leuz, Triantis and Wang (2006) for SEC deregistration, a comparison of the coefficients under these two regulatory regimes will highlight those incentives that likely changed around this event. Coefficients from these two estimations, along with coefficient differences, are presented in Table 6.

Three discernable trends in the underlying determinants of listing choice exist between these two periods. First, the listing decision has become more heavily influenced by differences in market returns and less influenced by current differences in domestic listing trends, suggesting a greater importance is being placed on valuation-specific, exchange-level factors following the Act. This could be a time-period specific artifact, given the volatile performance of equity returns following the post-bubble market decline of 2000. Second, the probability of listing on a U.S. exchange is more strongly related to firm size following the enactment of Sarbanes-Oxley, consistent with the regulation's implementation costs driving away smaller foreign firms. Similarly, the likelihood of a U.S. listing is decreasing in leverage and book-to-market ratios, suggesting that poor performing, low growth, highly levered firms are more likely to avoid the heightened direct and indirect costs of the Act. Finally, firms issuing capital in their home country are less likely to choose a U.S. exchange as their bonding mechanism. Without needing the direct access to U.S. capital, the reputation benefits of a U.S. listing are now exceeded by the heightened costs imposed by Sarbanes-Oxley, and as such, these home issuers appear to be opting for the U.K.'s strong, yet flexible, governance regime for bonding purposes.

### *5.5 Characteristic of firms that bypassed U.S. and U.K. exchanges following the enactment of Sarbanes-Oxley*

We further examine which foreign firms have been deterred from listing on a U.S. exchange by using coefficients from our fitted pre-Sarbanes-Oxley model to predict the expected exchange choice for those foreign firms that subsequently list on either a U.S. or U.K. exchange after July 2002. This evidence is presented in Table 7.

The first two panels of Table 7 highlight the predicted level of foreign listing activity in the post-Sarbanes-Oxley period. Panel A incorporates all foreign listing observations, while panel B excludes those foreign firms without financial and/or market value data. These statistics yield two important findings. First, after taking into consideration the firm's preferences based on historical determinants of exchange choice, both the number of U.S. listings per month and the percent of firms likely to prefer U.S. exchanges is *expected* to decline in the period following Sarbanes-Oxley among the set of firms that ultimately chose between a U.S. or U.K. listing. In other words, a greater percentage of these foreign firms were expected to have self-selected a U.K. listing irregardless of the change in the U.S. regulatory environment due to their innate attributes. Specifically, the proportion of U.S. to U.K. listings after July 2002 is predicted to be 14.5% lower (15.5% for the reduced sample) than pre-Sarbanes-Oxley levels *given* the economic profile of the listing companies and differences in exchange-level characteristics.

Second, even after controlling for this expected decline in foreign listing activity, we continue to find both a significantly lower listing rate and a smaller percentage of foreign firms selecting U.S. exchanges after the enactment of Sarbanes-Oxley. Depending on the sample exemplified, the proportion of foreign listings choosing a U.S. exchange over a U.K. exchange has fallen between 23% to 27%; this decline is both economically and statistically significant, and is particularly strong given that these estimates are already adjusted to take into account the listing preferences of these firms absent Sarbanes-Oxley. Moreover, we find that among the firms

which appear to have bypassed U.S. exchanges, 81.4% of these companies listed on the LSE's AIM, consistent with the exchange-level evidence presented in Table 5.

Given that there exist a set of firms that appear to have bypassed U.S. exchanges (on the basis of their firm, industry, country attributes, combined with recent market performance), we examine the characteristics of the firms that were predicted by our model to list on the U.S. exchange, those firms that actually listed on the U.S. exchange, and those firms that we identify as having bypassed U.S. exchanges. These characteristics appear in Panel C. Two main observations emerge. First, the foreign firms that actually listed onto the NYSE or NASDAQ following the enactment of Sarbanes-Oxley are larger and more profitable than the average projected firm. Second, the set of firms that bypassed the U.S. exchange are smaller and less profitable than the average projected firm, and are disproportionately domiciled in developed countries. In aggregate, these 82 firms account for approximately \$25.7 billion in "lost" market capitalization. Together, these patterns are consistent with Sarbanes-Oxley screening out firms from the left tail of the distribution of likely U.S. listing candidates along the dimensions of firm performance and size. Whether or not this empirical result can be interpreted as Sarbanes-Oxley successfully screened out marginal foreign firms hinges on whether or not the quality of the listing firms (and related governance practices) are increasing in either or both of these attributes.<sup>27</sup>

Our methodology also identifies a small set of firms that listed on U.S. exchanges following the enactment of Sarbanes-Oxley that were predicted to list on the U.K. exchange based on their firm-specific, industry and home country attributes (panel D). These 18 firms are larger and more profitable than the average U.K. listing following Sarbanes-Oxley, and account for approximately \$35.5 billion in additional market capitalization (in aggregate). Moreover, nearly all of these firms are domiciled in emerging economies, consistent with large, high quality

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<sup>27</sup> For example, Ashbaugh-Skaife, Collins and Kinney (2006) find that small firms, firms with a higher frequency of losses, and firms with a higher probability of financial distress are more likely to have reported an internal control deficiency prior to Sarbanes-Oxley.

firms from countries with weak institutions now deciding to capture the enhanced bonding / reputation benefits of a U.S. listing under Sarbanes-Oxley.

Our results suggest that the passage of the Sarbanes-Oxley Act has had a material impact on the flow of international listings. On one dimension, our results are consistent with Sarbanes-Oxley-related implementation costs deterring a number of small firms (from primarily developed economies) from engaging in a U.S. listing because the direct costs of being a registered firm now exceed the expected benefits. On another dimension, our results are also consistent with the enhanced bonding benefits under Sarbanes-Oxley attracting a set of large, profitable firms from emerging markets, where the likelihood of an agency problem is the strongest and hence the marginal benefits of an exchange listing under Sarbanes-Oxley are greatest. This change in listing behavior is consistent with the hypothesized shift in both the expected costs and benefits of a foreign listing following the enactment of Sarbanes-Oxley. Whether the economic gains associated from these new emerging market listings outweigh the long-run benefits forfeited by the loss of small firms from primarily developed economies is a question for future research.

## **6. Conclusions**

In this paper, we examine cross-listing behavior on U.S. and London stock exchanges following the enactment of the Sarbanes-Oxley Act and test two propositions. First, has the rate of foreign cross-listings onto U.S. exchanges decreased in the period following the enactment of the Sarbanes-Oxley Act? Second, are foreign exchanges - in particular, the London Stock Exchange - attracting foreign firms in the post-Sarbanes-Oxley period that would have otherwise listed on a U.S. exchange prior to the enactment of the Act?

We find strong evidence that U.S. exchanges have experienced a decrease in foreign listings following the enactment of the Act, and that this decline cannot be fully explained by changes in market conditions. We also find evidence that for those foreign firms which engaged in either a U.S. or U.K. listing, the average probability of a firm listing its shares on a U.S.

exchange (versus a U.K. exchange) is significantly lower in the post Sarbanes-Oxley period after controlling for firm, industry, country, and exchange-specific factors that should influence listing decisions. This negative, bypassing effect is strongest among foreign firms choosing between the NASDAQ and the LSE's AIM; in contrast, only limited evidence exists with respect to foreign firms avoiding the NYSE in favor of the LSE's Main Market following the enactment of Sarbanes-Oxley.

Lastly, our prediction models suggest that the firms most likely to have bypassed U.S. exchanges in favor of a U.K. exchange following the enactment of Sarbanes-Oxley are smaller and less profitable than (a) the average foreign firm predicted to list in the U.S. absent the impact of Sarbanes-Oxley and (b) the average foreign firm that did actually list in the U.S. following the enactment of Sarbanes-Oxley. Moreover, our prediction model identifies a small set of large profitable firms from emerging market economies that opted to list on a U.S. exchange following the enactment of Sarbanes-Oxley. Together, these patterns are consistent with Sarbanes-Oxley screening out firms from the left tail of the distribution of likely U.S. listing candidates along the dimensions of firm performance and size, while attracting the right tail of firms from emerging markets along the same dimensions. Whether or not these empirical results can be interpreted as Sarbanes-Oxley both successfully screening out marginal foreign firms and attracting additional high quality foreign firms depends on whether the quality of a listing firm is increasing in these financial attributes.

Our paper provides the first evidence (of which we are aware) that the Sarbanes-Oxley Act has altered the flow of foreign listings across international exchanges. However, by focusing on only those firms that have chosen to list on either a U.S. or London exchange (i.e., observable events), our research design does not identify those firms that would have otherwise listed in the U.S. absent the requirement of the Sarbanes-Oxley Act but instead chose to (1) never list on a foreign exchange, (b) opt for an OTC listing or private placement in lieu of an exchange-based listing, or (c) listed on an alternative, non-U.K., international exchange, such as Singapore, Hong

Kong or Luxembourg. As such, our study likely presents a lower bound on the effect of Sarbanes-Oxley on foreign listing activity. We also caution that our current research design cannot distinguish between the effect of the passage of Sarbanes-Oxley *per se* from the influence of either the corporate events that lead to the creation of the legislation or correlated time-period specific events. Yet despite these limitations, a failure to document a change in the trend of foreign listings following the enactment of Sarbanes-Oxley would have cast considerable doubt on the arguments that the Act has shifted the incentives for foreign firms to list on U.S. exchanges.

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**Appendix 1**  
**Distribution of foreign listing events (June 1995 – June 2006)**

	U.S. Exchanges			U.K. Exchanges			Total
	NASDAQ	NYSE	Total	AIM	Main	Total	
Netherlands Antilles	1	0	1	0	0	0	1
United Arab Emirates	0	0	0	0	1	1	1
Argentina	5	7	12	0	0	0	12
Australia	19	6	25	55	1	56	81
Austria	0	3	3	0	0	0	3
Belgium	3	2	5	1	0	1	6
Bangladesh	0	0	0	1	0	1	1
Bahrain	0	0	0	0	1	1	1
Bahamas	1	1	2	0	0	0	2
Belize	0	0	0	7	0	7	7
Bermuda	33	30	63	27	9	36	99
Brazil	3	34	37	0	0	0	37
Barbados	0	0	0	1	0	1	1
British Virgin Islands	8	0	8	18	0	18	26
Canada	137	96	233	45	6	51	284
Switzerland	3	14	17	0	4	4	21
Chile	0	11	11	0	1	1	12
China	2	17	19	0	6	6	25
Colombia	0	1	1	0	0	0	1
Cayman Islands	32	6	38	16	4	20	58
Cyprus	0	1	1	4	1	5	6
Czech Republic	0	0	0	0	3	3	3
Germany	13	17	30	3	2	5	35
Denmark	2	0	2	1	0	1	3
Dominican Republic	0	1	1	0	0	0	1
Egypt	0	0	0	0	10	10	10
Spain	4	1	5	0	2	2	7
Estonia	0	0	0	0	1	1	1
Finland	2	4	6	0	1	1	7
France	17	19	36	1	3	4	40
Falkland Islands	0	0	0	2	0	2	2
United Kingdom	61	46	107	0	0	0	107
Ghana	0	1	1	0	0	0	1
Greece	3	6	9	0	10	10	19
Gibraltar	0	0	0	1	2	3	3
Guernsey	0	1	1	0	0	0	1
Hong Kong	19	7	26	1	0	1	27
Croatia	0	0	0	0	2	2	2
Hungary	0	1	1	0	4	4	5
Indonesia	1	3	4	0	2	2	6
India	2	11	13	2	20	22	35
Ireland	11	4	15	42	23	65	80
Iceland	1	0	1	0	0	0	1
Israel	81	4	85	18	11	29	114
Italy	3	5	8	4	0	4	12
Jordan	0	0	0	0	1	1	1
Japan	5	9	14	0	9	9	23
Jersey	2	0	2	0	0	0	2

**Appendix 1 (continued)**  
**Distribution of foreign listing events (June 1995 – June 2006)**

	U.S. Exchanges			U.K. Exchanges			Total
	NASDAQ	NYSE	Total	AIM	Main	Total	
Kazakhstan	0	0	0	0	1	1	1
South Korea	8	6	14	0	10	10	24
Lebanon	0	0	0	0	2	2	2
Lithuania	0	0	0	0	1	1	1
Luxembourg	7	3	10	5	2	7	17
Morocco	0	0	0	0	1	1	1
Mexico	3	12	15	0	0	0	15
Marshall Islands	9	0	9	0	1	1	10
Malta	0	0	0	0	1	1	1
Malawi	0	0	0	0	1	1	1
Malaysia	0	0	0	1	0	1	1
Netherlands	14	14	28	6	7	13	41
Norway	2	5	7	1	1	2	9
New Zealand	4	1	5	1	0	1	6
Oman	0	0	0	0	1	1	1
Panama	0	2	2	0	0	0	2
Peru	0	3	3	0	0	0	3
Philippines	1	0	1	0	1	1	2
Papua New Guinea	1	0	1	0	0	0	1
Poland	1	0	1	0	11	11	12
Puerto Rico	0	5	5	0	0	0	5
Portugal	0	3	3	0	0	0	3
Qatar	0	0	0	0	1	1	1
Romania	0	0	0	0	1	1	1
Russia	1	6	7	0	9	9	16
Singapore	6	3	9	1	0	1	10
Sweden	11	2	13	2	0	2	15
Tunisia	0	0	0	0	1	1	1
Turkey	0	1	1	0	9	9	10
Taiwan	4	5	9	0	10	10	19
United States	0	0	0	43	10	53	53
Venezuela	0	2	2	0	0	0	2
South Africa	6	6	12	0	1	1	13
Zimbabwe	0	0	0	0	1	1	1
Total	536	440	976	310	217	527	1,503

**Table 1**  
**Descriptive Statistics**

This table presents descriptive statistics for the sample of 1,503 foreign listing on U.S. and U.K. stock exchanges between June 1995 and June 2006. Panel A presents various firm-level financial characteristics and three exchange-level relative performance measures. *MVE*, *Assets* and *Sales* are the firm's market value of equity, total assets, and total revenue in the year of the listing (in U.S. dollars). *ROA* is defined as net income in the year of the listing, scaled by *Assets*. *BTM* is the firm's book-to-market ratio in the year of the listing, defined as the ratio of total shareholders' equity to *MVE*. If shareholders' equity is negative, *BTM* is defined to be zero. *Leverage* is the ratio of the firm's total liabilities to shareholder's equity. *Issuance\_Home* and *Issuance\_Host* are indicator variables equal to one if the firm raised equity capital in the home or host country in the month around the listing event, respectively. *CommonLaw*, *CodeLaw* and *Socialist* are indicator variables equal to one if the firm's home country has a common law, code law or socialist legal tradition. *EU* is an indicator variable equal to one if the firm is domiciled in a country that belongs to the European Union at the time of the listing. *Diff\_IndexReturn* is the difference in index returns between a given U.S. exchange and the corresponding U.K. exchange for the twelve calendar months preceding the listing event. For the two U.S. exchanges, *IndexReturn* is measured using the return to the NASDAQ and NYSE composite index, respectively. For the two U.K. markets, *IndexReturn* is measured using the return to the FTSE-350 index for the LSE Main Market and the FTSE AIM-All share index for the AIM. *Diff\_P/E\_Index* is differences in the aggregate price-earnings multiple between a given U.S. exchange and the corresponding U.K. exchange in the month of listing. *Diff\_DomesticList* is the difference in the number of new domestic listings between a given U.S. exchange and the respective U.K. exchange in the month of listing. For all three exchange-level metrics, listings on London's Main Market and AIM are benchmarked against the return, pricing and listing attributes of the NYSE and NASDAQ attributes, respectively.

Panel A: Descriptive statistics in the year of cross-listing

		All Firms	Total U.S.	NASDAQ	NYSE	Total U.K.	AIM	Main
MVE <sub>t</sub>	Mean	3,672.91	3,813.80	1,126.63	6,749.42	3,262.15	117.15	6,840.16
	Median	321.27	442.56	119.33	1,803.72	117.33	51.89	977.82
Assets <sub>t</sub>	Mean	10,685.0	10,990.4	1,641.51	21,538.9	9,894.53	72.77	21,693.4
	Median	295.43	534.16	110.96	3,003.44	64.89	20.00	1,040.30
Sales <sub>t</sub>	Mean	2,636.26	2,764.26	380.06	5,459.44	2,299.25	38.57	4,988.43
	Median	149.62	232.62	47.54	1,392.27	23.85	1.88	570.76
ROA <sub>t</sub>	Mean	-0.033	-0.022	-0.089	0.054	-0.064	-0.169	0.062
	Median	0.026	0.030	0.005	0.045	0.012	-0.072	0.052
BTM <sub>t</sub>	Mean	0.575	0.597	0.521	0.680	0.510	0.468	0.562
	Median	0.418	0.419	0.352	0.500	0.414	0.395	0.442
Leverage	Mean	0.469	0.481	0.379	0.596	0.437	0.352	0.539
	Median	0.452	0.470	0.323	0.587	0.365	0.215	0.541
Issuance_Home		0.081	0.078	0.056	0.105	0.085	0.055	0.129
Issuance_Host		0.331	0.325	0.384	0.252	0.342	0.403	0.253
CommonLaw		0.664	0.653	0.774	0.505	0.685	0.890	0.392
CodeLaw		0.292	0.320	0.218	0.443	0.241	0.110	0.429
Socialist		0.044	0.028	0.007	0.052	0.074	0.000	0.180
EU		0.258	0.277	0.271	0.284	0.224	0.223	0.226
Emerging		0.425	0.402	0.386	0.420	0.469	0.316	0.687
Diff_IndexReturns		0.022	0.036	0.028	0.046	-0.005	-0.032	0.033
Diff_P/E_Index		0.479	0.556	0.857	0.188	0.337	0.466	0.153
Diff_DomesticList		0.278	0.542	1.051	-0.077	-0.210	-0.242	-0.164

**Table 1 (continued)**  
**Descriptive Statistics**

Panel B: Industry classifications (percent of total sample)

	All Firms	Total U.S.	NASDAQ	NYSE	Total London	AIM	Main
Industrials/Manufacturing	4.63	4.20	4.35	4.02	5.43	3.55	8.04
Oil, Gas and Chemicals	9.52	8.30	3.44	14.29	11.80	13.87	8.93
Financial Institutions	13.10	10.80	4.35	18.75	17.42	11.94	25.00
Utilities	1.96	2.20	0.36	4.46	1.50	0.32	3.13
Food, Beverage and Tobacco	3.00	3.00	1.45	4.91	3.00	2.26	4.02
Forestry, Mining and Metals	10.56	7.60	5.62	10.04	16.10	24.84	4.02
Construction	1.83	1.30	1.09	1.56	2.81	2.26	3.57
Real Estate	1.43	0.70	0.54	0.89	2.81	3.87	1.34
Software and Technology	16.43	20.20	32.79	4.69	9.36	9.35	9.38
Services	3.52	3.60	4.71	2.23	3.37	4.52	1.79
Retail	1.89	1.90	1.63	2.23	1.87	0.32	4.02
Electronics	3.26	3.30	4.17	2.23	3.18	4.52	1.34
Healthcare	2.09	2.30	2.90	1.56	1.69	2.58	0.45
Consumer Products	2.74	3.60	4.71	2.23	1.12	0.00	2.68
Media	3.72	3.80	4.71	2.68	3.56	4.19	2.68
Pharmaceutical / Biotech	5.02	5.50	7.97	2.46	4.12	5.16	2.68
Mobile Telecommunication	3.00	3.80	3.08	4.69	1.50	0.00	3.57
Fixed-line Telecommunication	5.74	6.70	5.43	8.26	3.93	1.61	7.14
Transportation	3.19	4.20	4.35	4.02	1.31	0.65	2.23
Leisure and Travel	3.39	3.00	2.36	3.79	4.12	4.19	4.02

**Table 2**  
**Distribution of foreign listing activity before and after the enactment of Sarbanes-Oxley**

This table documents the frequency of cross-listing activity on U.S. and U.K. stock exchanges over the period June 1995 to June 2006. The table also provides listing frequency data for the sub-periods before (pre-May 2002), during (May 2002 through July 2002) and after (post-July 2002) the enactment of the Sarbanes-Oxley Act. Differences in the average number of firms listing on a given exchange per month (average *NList*) before and after the adoption of the Act are tested using a two-tailed t-test of means. The column *Percent U.S.* presents the ratio of total U.S. listings to total London listings over a specific time period. The difference in the proportion of U.S. to London listings before and after the adoption of the Act is tested using a binomial test of means.

	U.S. Exchanges			U.K. Exchanges			Percent U.S.	
	Total	NASDAQ	NYSE	Total	AIM	Main		
6/95 – 6/06	1,503	536	440	976	310	217	527	0.6494
Post-May 1995	82	37	28	65	2	15	17	0.7927
1996	200	92	65	157	12	31	43	0.7850
1997	166	75	64	139	5	22	27	0.8373
1998	132	51	43	94	6	32	38	0.7121
1999	120	60	30	90	5	25	30	0.7500
2000	207	107	60	167	10	30	40	0.8068
2001	94	20	51	71	13	10	23	0.7553
2002	65	10	36	46	13	6	19	0.7077
2003	44	9	17	25	13	6	19	0.5682
2004	108	23	17	40	58	10	68	0.3704
2005	190	40	17	57	112	21	133	0.3000
Pre-July 2006	95	13	12	25	61	9	70	0.2632
<i>Total number of listings conditional on the timing of Sarbanes-Oxley:</i>								
Pre-SOX	1,018	445	352	797	54	167	221	0.7829
Transition	21	1	13	14	7	0	7	0.5833
Post-SOX	464	90	75	165	249	50	299	0.3579
<i>Average number of firms listing per month (average Nlist):</i>								
Entire Period	11.30	4.03	3.31	7.34	2.33	1.63	3.96	0.6494
Pre-SOX	12.27	5.36	4.24	9.60	0.65	2.01	2.66	0.7829
Post-SOX	9.87	1.91	1.60	3.51	5.30	1.06	6.36	0.3579
Difference	-2.40	-3.45	-2.64	-6.09	4.65	-0.95	3.70	-0.4250
(t-statistic)	(-1.91)	(-7.31)	(-7.05)	(-9.18)	(6.15)	(-3.81)	(4.37)	(-15.89)

**Table 3**  
**Descriptive evidence on the impact of Sarbanes-Oxley on foreign listing activity after controlling for market conditions**

This table presents coefficients from various exchange-specific estimations of the following model over the 133 month period June 1995 to June 2006:

$$\begin{aligned} \text{Log}(1+Nlist_t) = & \alpha + \beta_1 Q1_t + \beta_2 Q2_t + \beta_3 Q3_t + \beta_4 \log(1+IndexReturn_t) + \beta_5 P/E\_Index_t \\ & + \beta_6 \log(1+DomesticList_t) + \beta_7 PostSOX_t + \varepsilon_t \end{aligned}$$

The model is estimated for two U.S. exchanges (NASDAQ and NYSE) and two U.K. markets (LSE AIM and LSE Main Market) separately using monthly data; coefficients from these exchange-level estimations are presented in the first, second, third and fourth columns, respectively. The dependent variable, *Nlist*, is the number of foreign firms listing onto the specific exchange in month *t*. The indicator variables *Q1*, *Q2* and *Q3* are equal to one if month *t* falls in the first, second or third calendar quarter, respectively, zero otherwise. *IndexReturn<sub>t</sub>* is the preceding twelve-month return to the respective exchange's market index. For the two U.S. exchanges, *IndexReturn* is measured using the return to the NASDAQ and NYSE composite index, respectively. For the two U.K. markets, *IndexReturn* is measured using the return to the FTSE-350 index for the Main Market and the FTSE AIM-All share index for the AIM (supplemented with the returns to the FTSE Small Cap index prior to December 1996). *P/E\_Index* is the exchange's aggregate price-earnings multiple in month *t*. For the NASDAQ and LSE Main Market, this multiple reflects the average P/E multiple for the Nasdaq composite index and FTSE-350 index, respectively. For the AIM, this is the average P/E multiple reported for Datastream's U.K. Small Cap index. For the NYSE, this is the aggregate P/E ratio for all listed firms with CRSP data in month *t*. *DomesticList* is the number of new domestic firms listing onto the specific exchange in month *t*. The indicator variable *PostSOX* is equal to one if month *t* follows the enactment of the Sarbanes-Oxley Act (July 2002), zero otherwise. T-statistics are presented in parentheses.

Panel A: Monthly foreign listing activity after controlling for market indices

	U.S. Exchanges		U.K. Exchanges	
	<u>NASDAQ</u>	<u>NYSE</u>	<u>AIM</u>	<u>Main</u>
Intercept	1.768a (17.40)	1.869a (16.95)	0.608a (5.97)	0.976a (9.37)
Q1	-0.349a (-2.64)	-0.526a (-4.08)	-0.523a (-3.87)	-0.271b (-2.08)
Q2	-0.235c (-1.77)	-0.297b (-2.29)	-0.171 (-1.26)	-0.081 (-0.62)
Q3	-0.253c (-1.90)	-0.170 (-1.31)	-0.134 (-1.01)	-0.257c (-1.96)
IndexReturn <sub>t</sub>	1.086a (7.40)	-0.675 (-1.71)	-0.661a (-3.50)	1.313a (4.12)
P/E_Index <sub>t</sub>	-0.411b (-2.11)	-0.699b (-2.25)	3.323a (8.15)	0.206 (0.66)
PostSOX <sub>t</sub>	-0.803a (-7.87)	-0.818a (-7.43)	1.092a (11.12)	-0.246b (-2.01)
Adjusted R <sup>2</sup>	0.4978	0.3572	0.6032	0.1913

<sup>a,b,c</sup> The coefficient is significantly different than zero at the one, five and ten percent level, respectively, using a two-tailed t-test.

**Table 3 (continued)****Descriptive evidence on the impact of Sarbanes-Oxley on foreign listing activity after controlling for market conditions**

Panel B: Monthly foreign listing activity after controlling for market indices and the monthly rate of new domestic listings in the host country

	U.S. Exchanges		London Exchanges	
	<u>NASDAQ</u>	<u>NYSE</u>	<u>AIM</u>	<u>Main</u>
Intercept	-0.492 (-1.14)	1.639 <sup>a</sup> (6.57)	0.338 (1.09)	-0.195 (-0.74)
Q1	-0.165 (-1.33)	-0.474 <sup>a</sup> (-3.43)	-0.461 <sup>a</sup> (-3.04)	-0.089 (-0.71)
Q2	-0.188 (-1.56)	-0.271 <sup>b</sup> (-2.05)	-0.145 (-1.04)	-0.090 (-0.75)
Q3	-0.208 <sup>c</sup> (-1.72)	-0.129 (-0.95)	-0.124 (-0.93)	-0.116 (-0.94)
IndexReturn <sub>t</sub>	0.045 (0.19)	-0.854 <sup>b</sup> (-1.98)	-0.636 <sup>a</sup> (-3.33)	0.871 <sup>a</sup> (2.83)
P/E_Index <sub>t</sub>	0.289 (1.32)	-0.680 <sup>b</sup> (-2.18)	3.031 <sup>a</sup> (5.86)	0.581 <sup>c</sup> (1.95)
log(1+DomesticList <sub>t</sub> )	0.651 <sup>a</sup> (5.35)	0.094 (1.03)	0.103 (0.92)	0.443 <sup>a</sup> (4.80)
PostSOX <sub>t</sub>	-0.217 (-1.51)	-0.762 <sup>a</sup> (-6.18)	1.025 <sup>a</sup> (8.40)	0.208 (1.41)
Adjusted R <sup>2</sup>	0.5899	0.3575	0.6027	0.3142

<sup>a,b,c</sup> The coefficient is significantly different than zero at the one, five and ten percent level, respectively, using a two-tailed t-test.

**Table 4**  
**Impact of the Sarbanes-Oxley Act on the probability of a U.S. versus U.K. foreign listing**

This table presents select coefficients from various estimations of the following cross-sectional model:

$$\text{Prob(U.S. Listing}=1) = \alpha + \sum_{j=1}^{16} \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} + \beta_4 \text{EU} + \beta_5 \text{Emerging} \\ + \beta_6 \text{CommonLaw} + \beta_7 \text{Socialist} + \beta_8 \text{Diff\_Index} + \beta_9 \text{Diff\_P/E\_Index} + \beta_{10} \text{Diff\_DomesticList} + \beta_{11} \text{Issuance\_Home} \\ + \beta_{12} \text{Issuance\_Host} + \beta_{13} \log(\text{Assets}) + \beta_{14} \text{ROA} + \beta_{15} \log(1+\text{BTM}) + \beta_{16} \text{Leverage} + \beta_{17} \text{PostSOX} + \varepsilon$$

The sample consists of 1,267 unique U.S. and U.K. foreign listings between June 1995 and June 2006. The dependent variable is an indicator variable equal to one if the foreign firm listed onto either the NASDAQ or the NYSE; zero if the foreign firm listed onto either the London Stock Exchanges' Main Market or AIM. The indicator variables *Canada*, *Ireland* and *Israel* are equal to one if the firm is domiciled in Canada, Ireland or Israel, respectively. The array *Geography* is a set of three indicator variables that captures the firm's domicile in three broad geographic regions: Asia, Latin / South America and the Caribbean. *EU* is an indicator variable equal to one if the firm is domiciled in a country that belongs to the European Union at the time of the cross-listing event. All other variables are defined in Table 1.

Panel A: Logistic regressions

	Exclusion of firm-specific data		Inclusion of firm-specific data	
	Baseline	Control for domestic listings	Baseline	Control for domestic listings
Canada	2.065 <sup>a</sup>	2.002 <sup>a</sup>	1.450 <sup>a</sup>	1.218 <sup>a</sup>
Ireland	-3.617 <sup>a</sup>	-3.624 <sup>a</sup>	-3.768 <sup>a</sup>	-3.784 <sup>a</sup>
Israel	1.878 <sup>a</sup>	1.791 <sup>a</sup>	2.026 <sup>a</sup>	1.965 <sup>a</sup>
EU	1.133 <sup>a</sup>	0.961 <sup>a</sup>	0.825 <sup>c</sup>	0.503
Emerging	-1.540 <sup>a</sup>	-1.615 <sup>a</sup>	-1.728 <sup>a</sup>	-1.924 <sup>a</sup>
CodeLaw	-0.291	-0.227	-1.298 <sup>a</sup>	-1.393 <sup>a</sup>
Socialist	0.145	0.147	-0.509	-0.659
Diff_IndexReturns	0.932 <sup>b</sup>	0.188	1.057 <sup>b</sup>	-0.428
Diff_P/E_Index	0.927 <sup>a</sup>	0.546 <sup>b</sup>	1.492 <sup>a</sup>	0.904 <sup>a</sup>
Diff_DomesticList	-	0.507 <sup>a</sup>	-	0.982 <sup>a</sup>
Issuance_Home	-0.033	0.073	-0.227	-0.045
Issuance_Host	0.376 <sup>b</sup>	0.364 <sup>b</sup>	0.814 <sup>a</sup>	0.831 <sup>a</sup>
Log(Assets)	-	-	0.477 <sup>a</sup>	0.563 <sup>a</sup>
ROA	-	-	-0.006	-0.093
Log(1+BTM)	-	-	0.300	-0.202
Leverage	-	-	0.292	0.027
PostSOX	-2.030 <sup>a</sup>	-1.737 <sup>a</sup>	-2.127 <sup>a</sup>	-1.637 <sup>a</sup>
Industry and Geography Indicators	Included	Included	Included	Included
Percent Concordant	88.5%	89.1%	90.8%	94.4%
Number of observations (U.S. / London)	1,267 (817 / 450)	1,267 (817 / 450)	948 (707 / 241)	948 (707 / 241)

<sup>a,b,c</sup> The estimated coefficient is significantly different than zero at the one, five and ten percent level (two-tailed).

**Table 4 (continued)**  
**Impact of the Sarbanes-Oxley Act on the probability of a U.S. versus U.K. foreign listing**

Panel B: OLS regressions

	Exclusion of firm-specific data		Inclusion of firm-specific data	
	Baseline	Control for domestic listings	Baseline	Control for domestic listings
Canada	0.300 <sup>a</sup>	0.288 <sup>a</sup>	0.179 <sup>a</sup>	0.152 <sup>a</sup>
Ireland	-0.522 <sup>a</sup>	-0.507 <sup>a</sup>	-0.509 <sup>a</sup>	-0.460 <sup>a</sup>
Israel	0.343 <sup>a</sup>	0.326 <sup>a</sup>	0.297 <sup>a</sup>	0.265 <sup>a</sup>
EU	0.190 <sup>a</sup>	0.174 <sup>a</sup>	0.130 <sup>b</sup>	0.098 <sup>c</sup>
Emerging	-0.241 <sup>a</sup>	-0.240 <sup>a</sup>	-0.207 <sup>a</sup>	-0.205 <sup>a</sup>
CodeLaw	-0.036	-0.028	-0.130 <sup>a</sup>	-0.130 <sup>a</sup>
Socialist	0.012	0.012	-0.049	-0.063
Diff_IndexReturns	0.101 <sup>b</sup>	0.023	0.120 <sup>a</sup>	-0.005
Diff_P/E_Index	0.101 <sup>a</sup>	0.061 <sup>a</sup>	0.124 <sup>a</sup>	0.062 <sup>b</sup>
Diff_DomesticList	-	0.056 <sup>a</sup>	-	0.096 <sup>a</sup>
Issuance_Home	-0.007	0.004	-0.030	-0.015
Issuance_Host	0.047 <sup>b</sup>	0.043 <sup>c</sup>	0.083 <sup>a</sup>	0.076 <sup>a</sup>
Log(Assets)	-	-	0.051 <sup>a</sup>	0.061 <sup>a</sup>
ROA	-	-	0.011	-0.005
Log(1+BTM)	-	-	0.019	-0.013
Leverage	-	-	0.048	0.028
PostSOX	-0.324 <sup>a</sup>	-0.283 <sup>a</sup>	-0.277 <sup>a</sup>	-0.210 <sup>a</sup>
Industry and Geography Indicators	Included	Included	Included	Included
Adjusted R2	0.3879	0.3959	0.4117	0.4406
Number of observations	1,267	1,267	948	948

<sup>a,b,c</sup> The estimated coefficient is significantly different than zero at the one, five and ten percent level (two-tailed).

**Table 5**  
**Impact of Sarbanes-Oxley on the probability of a foreign U.S. listing**

This table presents select coefficients from various OLS estimations of the following cross-sectional model:

$$\text{Prob(U.S. Listing}=1) = \alpha + \sum_{j=1}^{16} \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} + \beta_4 \text{EU} + \beta_5 \text{Emerging} \\ + \beta_6 \text{CommonLaw} + \beta_7 \text{Socialist} + \beta_8 \text{Diff\_Index} + \beta_9 \text{Diff\_P/E\_Index} + \beta_{10} \text{Diff\_DomesticList} + \beta_{11} \text{Issuance\_Home} \\ + \beta_{12} \text{Issuance\_Host} + \beta_{13} \log(\text{Assets}) + \beta_{14} \text{ROA} + \beta_{15} \log(1+\text{BTM}) + \beta_{16} \text{Leverage} + \beta_{17} \text{PostSOX} + \varepsilon$$

The sample consists of 1,267 unique U.S. and U.K. foreign listings between June 1995 and June 2006. The dependent variable is an indicator variable equal to one if the foreign firm listed onto either the NASDAQ or the NYSE; zero if the foreign firm listed onto either the London Stock Exchanges' Main Market or AIM. The indicator variables *Canada*, *Ireland* and *Israel* are equal to one if the firm is domiciled in Canada, Ireland or Israel, respectively. The array *Geography* is a set of three indicator variables that captures the firm's domicile in three broad geographic regions: Asia, Latin / South America and the Caribbean. *EU* is an indicator variable equal to one if the firm is domiciled in a country that belongs to the European Union at the time of the cross-listing event. All other variables are defined in Table 1.

	NYSE versus LSE Main Market		NASDAQ versus AIM	
	Exclusion of firm-specific data	Inclusion of firm-specific data	Exclusion of firm-specific data	Inclusion of firm-specific data
Canada	2.488 <sup>a</sup>	2.816 <sup>a</sup>	2.120 <sup>a</sup>	1.007
Ireland	-5.052 <sup>a</sup>	-4.249 <sup>a</sup>	-2.004 <sup>c</sup>	-1.390
Israel	0.063	0.814	-1.592 <sup>c</sup>	-1.005
EU	1.057 <sup>a</sup>	0.600	-0.965	-3.358
Emerging	-2.877 <sup>a</sup>	-2.799 <sup>a</sup>	2.340 <sup>a</sup>	2.003
CodeLaw	-0.992 <sup>b</sup>	-1.268 <sup>b</sup>	1.328	2.529
Socialist	-0.150	-0.114	-	-
Diff_IndexReturns	4.199	-0.443	-0.961	-1.725
Diff_P/E_Index	1.410	1.122	1.098 <sup>a</sup>	1.016 <sup>c</sup>
Diff_DomesticList	0.063	0.329	0.746 <sup>a</sup>	1.625 <sup>a</sup>
Issuance_Home	0.411	0.606	-0.459	-0.669
Issuance_Host	0.541 <sup>c</sup>	0.933 <sup>b</sup>	0.542 <sup>c</sup>	1.259 <sup>b</sup>
Log(Assets)	-	0.310 <sup>b</sup>	-	1.060 <sup>a</sup>
ROA	-	2.248	-	-1.601 <sup>c</sup>
Log(1+BTM)	-	0.322	-	-1.149
Leverage	-	0.355	-	-0.528
PostSOX	-0.475	-1.045 <sup>b</sup>	-2.701 <sup>a</sup>	-3.599 <sup>a</sup>
Industry and Geography Indicators	Included	Included	Included	Included
Percent Concordant	91.5%	91.6%	95.5%	98.1%
Number of observations (U.S. / London)	535 (348 / 187)	421 (318 / 103)	732 (469 / 263)	527 (389 / 138)

<sup>a,b,c</sup> The estimated coefficient is significantly different than zero at the one, five and ten percent level (two-tailed).

**Table 6**  
**Determinants of U.S. versus U.K. foreign listing before and after Sarbanes-Oxley**

This table presents select coefficients from various OLS estimations of the following cross-sectional model:

$$\text{Prob(U.S. Listing=1)} = \alpha + \sum_{j=1}^{16} \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} + \beta_4 \text{EU} + \beta_5 \text{Emerging} \\ + \beta_6 \text{CommonLaw} + \beta_7 \text{Socialist} + \beta_8 \text{Diff\_Index} + \beta_9 \text{Diff\_P/E\_Index} + \beta_{10} \text{Diff\_DomesticList} + \beta_{11} \text{Issuance\_Home} \\ + \beta_{12} \text{Issuance\_Host} + \beta_{13} \log(\text{Assets}) + \beta_{14} \text{ROA} + \beta_{15} \log(1+\text{BTM}) + \beta_{16} \text{Leverage} + \varepsilon$$

The sample consists of 948 unique U.S. and London foreign listing events between June 1995 and June 2006 with sufficient financial and market value data to estimate the full model. The dependent variable is an indicator variable equal to one if the foreign firm listed onto either the NASDAQ or the NYSE; zero if the firm listed onto either the London Stock Exchanges' Main Market or AIM. The Pre-Sarbanes-Oxley period captures all foreign listing events between June 1995 and April 2002; the post-Sarbanes-Oxley period captures all foreign listing events between August 2002 and June 2006. All of the independent variables are defined in Tables 1 and 3.

	Pre-Sarbanes-Oxley (June 1995–April 2002)	Post-Sarbanes-Oxley (August 2002–June 2006)	PostSox – PreSox Differences
Industry and Geography Indicators	Included	Included	
Emerging	-2.747 <sup>a</sup>	-1.653 <sup>c</sup>	1.094
CodeLaw	-0.717	-0.213	0.504
Socialist	0.294	-1.187	-1.481
Diff_IndexReturns	-1.591	2.145	3.735 <sup>c</sup>
Diff_P/E_Index	0.308	1.140	0.833
Diff_DomesticList	1.160 <sup>a</sup>	0.360	-0.800 <sup>b</sup>
Issuance_Home	0.290	-2.330 <sup>b</sup>	-2.621 <sup>b</sup>
Issuance_Host	1.243 <sup>a</sup>	0.414	-0.829
Log(Assets)	0.239 <sup>b</sup>	1.174 <sup>a</sup>	0.935 <sup>a</sup>
ROA	0.573	-1.104	-1.679
Log(1+BTM)	0.339	-2.521 <sup>b</sup>	-2.859 <sup>b</sup>
Leverage	1.074	-2.688 <sup>a</sup>	-3.762 <sup>a</sup>
Percent Concordant	92.1%	93.4%	
Number of observations (U.S. / London)	668 (576 / 92)	280 (131 / 149)	

<sup>a,b,c</sup> The difference in the estimated coefficients between the post and pre Sarbanes-Oxley period is significantly different than zero at the one, five and ten percent level using a two-tailed t-test of means.

**Table 7**  
**Trends in listing behavior given the historical determinants of exchange listing choice**

This table presents information about actual and predicted foreign listing activity following the enactment of Sarbanes-Oxley. Panel A provides evidence on the projected and actual listing rates in the post-SOX period, as well as an indication of the expected percentage of U.S. (versus U.S.) listings for the complete sample of 417 foreign firms. Panel B provides similar evidence for the sub-sample of 280 foreign firms with sufficient financial and accounting data. Panel C provides descriptive statistics for our three samples of post-SOX foreign issues. The first column presents average characteristics for the firms predicted to list on a U.S. exchange; the second column presents average characteristics for those foreign firms that did list on a U.S. exchange; the third column presents average characteristics of the firms that likely bypassed the U.S. for a U.K. listing in the post-Sarbanes-Oxley period. All variables are as defined in Table 1.

**Panel A: Projected U.S. listing activity using pre-SOX determinants (all observations)**

U.S. Listing information:	Decline in listing frequencies due to changing composition of foreign firms			Decline in listing frequencies due to change in listing incentives		
	Pre-SOX <u>Actual</u>	Post-SOX <u>Predicted</u>	<u>Difference</u>	Post-SOX <u>Predicted</u>	Post-SOX <u>Actual</u>	<u>Difference</u>
Number of U.S. listings:	797	266	-	266	154	-
Average # monthly listings:	9.60	6.05	-3.55	6.05	3.51	-2.54
Percent U.S. Listings (t-statistic)	0.783	0.638	-0.145 (-5.75)	0.638	0.369	-0.269 (-8.23)

**Panel B: Projected U.S. listing activity using pre-SOX determinants (excluding firms without financial data)**

U.S. Listing information:	Decline in listing frequencies due to changing composition of foreign firms			Decline in listing frequencies due to change in listing incentives		
	Pre-SOX <u>Actual</u>	Post-SOX <u>Predicted</u>	<u>Difference</u>	Post-SOX <u>Predicted</u>	Post-SOX <u>Actual</u>	<u>Difference</u>
Number of U.S. listings:	576	198	-	198	131	-
Average # monthly listings:	6.90	4.21	-2.69	4.21	2.85	-1.36
Percent U.S. Listings (t-statistic)	0.862	0.707	-0.155 (-5.62)	0.707	0.468	-0.239 (-5.76)

**Table 7 (continued)****Trends in listing behavior given the historical determinants of exchange listing choice**

Panel C: Financial attributes of the firms that likely bypassed a U.S. listing (n=82)

	Post-SOX Predicted	Post-SOX Actual	Post-SOX Bypassed
MVE	935.11	1,480.44	313.05
Assets	2,524.40	3,685.34	597.61
Sales	644.93	1,033.02	227.25
ROA	-0.035	0.007	-0.076
BTM	0.504	0.504	0.503
Leverage	0.387	0.423	0.331
Issuance_Home	0.081	0.076	0.081
Issuance_Host	0.424	0.420	0.419
CommonLaw	0.818	0.779	0.837
CodeLaw	0.152	0.176	0.140
Socialist	0.030	0.046	0.023
Emerging	0.480	0.618	0.372

Panel D: Financial attributes of the firms that likely bypassed a U.K. listing (n=18)

	Post-SOX Predicted	Post-SOX Actual	Post-SOX Bypassed
MVE	1,149.95	554.49	1,971.70
Assets	1,055.00	695.02	1,807.70
Sales	812.56	396.91	1,431.74
ROA	-0.077	-0.095	0.071
BTM	0.457	0.478	0.497
Leverage	0.362	0.342	0.378
Issuance_Home	0.098	0.094	0.053
Issuance_Host	0.280	0.349	0.368
CommonLaw	0.780	0.832	0.632
CodeLaw	0.159	0.134	0.263
Socialist	0.610	0.034	0.105
Emerging	0.488	0.362	0.947