



Regulation and Bonding: The Sarbanes-Oxley Act and the Flow of International Listings

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Regulation and Bonding:
The Sarbanes-Oxley Act and the Flow
of International Listings
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**Regulation and Bonding:
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**Regulation and Bonding:
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Abstract

In this paper, we examine the economic impact of the Sarbanes-Oxley Act (SOX) by analyzing foreign listing behavior onto U.S. and U.K. stock exchanges before and after the enactment of the Act in 2002. Using a sample of all listing events onto U.S. and U.K. exchanges from 1995-2006, we develop an exchange choice model that captures firm-level, industry-level, exchange-level and country-level listing incentives, and test whether these listing preferences changed following the enactment of the Act. After controlling for firm characteristics and other economic determinants of these firms' exchange choice, we find that the listing preferences of large foreign firms choosing between U.S. exchanges and the LSE's Main Market did not change following the enactment of Sarbanes-Oxley. In contrast, we find that the likelihood of a U.S. listing among small foreign firms choosing between the Nasdaq and LSE's Alternative Investment Market decreased following the enactment of Sarbanes-Oxley. The negative effect among small firms is consistent with these marginal companies being less able to absorb the incremental costs associated with SOX compliance. The screening of smaller firms with weaker governance attributes from U.S. exchanges is consistent with the heightened governance costs imposed by the Act increasing the bonding-related benefits of a U.S. listing.

1. Introduction

The Sarbanes-Oxley Act (the Act or SOX) combined with subsequent regulatory pronouncements mandates that U.S. registered firms adopt stricter governance practices than those required prior to the Act. In this paper, we examine the economic impact of Sarbanes-Oxley by examining listing decisions of foreign companies onto U.S. and U.K. exchanges before and after the enactment of the Act. As discussed in Zingales (2006), listing decisions of foreign companies are a good indicator of the changes in cost and benefits of listing in a specific market because these firms can choose from a wide range of competing alternatives – as such, foreign firms are effectively the “canaries in the mine shaft” when assessing the impact of new regulation. While prior research examines the effect of the Act on U.S. companies (Engel, Hayes, and Wang, 2005; Leuz, Triantis, and Wang, 2006), minimal evidence exists on how foreign firms are responding to the new U.S. rules.

Descriptive evidence shows that the rate of foreign listings onto U.S. exchanges has decreased in the period following the enactment of Sarbanes-Oxley in July 2002. One potential explanation for this decline is that the greater costs imposed by the Act are deterring some foreign firms from pursuing a U.S. exchange listing. To investigate if preferences for a U.S. listing have changed, we examine a foreign firm’s decision to list on either a U.S. or U.K. exchange before and after the Act. To the extent that listing preferences changed, what are the characteristics of firms choosing to list on the London Stock Exchange (LSE) in post-SOX period that otherwise would have listed on a U.S. exchange prior to the Act, and is the observed behavior consistent with the expected incremental costs and benefits of SOX? The answers to these questions will shed light on the economic consequences of the Sarbanes-Oxley Act.

A firm’s foreign listing decision depends on the relative costs and benefits generated by the listing. The Sarbanes-Oxley Act changed both the costs and benefits of a U.S. listing. First, the Act increased the expected reporting, regulatory and legal costs of listing on a U.S. exchange (Ribstein, 2002; Romano, 2005). If these costs are sufficiently high, some foreign firms

contemplating a U.S. exchange listing will opt to list their shares on an alternative exchange offering a similar host country institutional structure, while other firms may forgo a foreign listing altogether.¹ Consistent with this view, both John Thain (CEO of the NYSE) and Bob Greifeld (CEO of Nasdaq) have publicly expressed concern that foreign firms are bypassing U.S. exchanges as a result of the Sarbanes-Oxley Act (Thain, 2004; Greifeld, 2006); similarly, a number of prominent policy reports and the U.S. Treasury Secretary Hank Paulson have expressed concern about the declining competitiveness of U.S. capital markets.²

Second, despite these concerns, the impact of the Act on foreign listings is not clear because Sarbanes-Oxley also changed the expected benefits of a U.S. listing. Under the legal bonding motivation for foreign listing decisions (Stulz, 1999; Coffee, 1999; 2002), high quality firms from countries with weak institutions list their shares abroad to credibly subject themselves to the host country's stricter legal and regulatory requirements. When effective, this bonding process creates a commitment to adopt stronger corporate governance practices and credibly separates the listing firm from other 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). U.S. listings traditionally serve as a credible bonding mechanism given the U.S.'s strong legal and regulatory environment. Stricter corporate governance mandated by the Act should strengthen the credibility of U.S. listings as a bonding mechanism, thus potentially increasing the expected benefits from a U.S. listing.

The response of foreign firms to the Act therefore depends upon the expected net benefits or costs of the Act. If the net benefits under the Act are larger, high quality foreign firms seeking

¹ 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). LSE's head of international business, Tracey Pierce's also referred to companies seeking an alternative to the U.S. - "In our discussions with those companies, the impact of Sarbanes-Oxley is factoring heavily in their decision-making" (Forbes, 2005). The LSE is actively promoting its Alternative Investment Market (AIM) as a 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 SOX.

² For example, see "Sustaining New York's and the US's Global and Financial Services Leadership" by McKinsey & Co commissioned by Michael Bloomberg, Mayor of New York City and Charles Schumer, Senator; Interim Report of the Committee on Capital Markets Regulation; and Report and Recommendations of the Commission on the Regulation of U.S. Capital Markets in the 21st Century by the U.S. Chamber of Commerce.

a bonding platform will have a greater incentive to choose a U.S. exchange listing over credible alternatives following the Act. In contrast, if the new costs subsume the expected benefits, foreign firms may choose to forgo a U.S. exchange listing. The net effect of the Act will thus depend upon the firm's characteristics and the relative attractiveness of alternative listing options at a given point in time, suggesting that any impact will vary across foreign listing candidates.

Many other factors could have led to the observed decline in U.S. listing frequency in the time period following SOX. First, the types of foreign firms seeking exchange listings may have changed. Second, the rise of regional exchanges may have decreased the importance of U.S. exchanges as a listing platform. Third, the growth of the LSE's Alternative Investment Market (AIM) may have increased the attractiveness of a U.K. listing. Fourth, other contemporaneous events, including (but not limited to) Enron, the Global Analyst Settlement, and the E.U.'s mandated adoption of IFRS, may have altered foreign firms preferences for a U.S. exchange listing.

To assess whether listing preferences changed as a result of Sarbanes-Oxley, we need to compare listing activity on U.S. exchanges against the activity of an alternative exchange subject to similar global forces yet not subject to the Act. We select the U.K. as the comparison market and examine U.S. and U.K. foreign listing events between June 1995 and June 2006. Specifically, we model the firm's choice between a U.S. and U.K. exchange listing and examine the likelihood of a U.S. listing against the U.K. alternative in the post-Act regime after controlling for other determinants of the exchange choice. Our research design thus focuses on a firm's exchange choice *given* the firm's decision to list their shares on a high quality exchange. This research design recognizes that managers of foreign firms (defined as non-U.S. non-U.K. firms) choose from a set of competing exchanges while selecting a specific foreign listing venue (or set of venues).

We develop an exchange choice model that utilizes firm, industry, exchange and country-specific factors to explain variation in the foreign firms' listing decisions. The merit of this

design is that by focusing on the exchange choice itself, we are able to identify and measure a broad set of factors that influence listing preferences, including the relative performance of the exchanges, product market incentives, geographical and cultural proximity preferences, industry preferences, and differences in attractiveness of the two exchanges absent the regulatory event, as well as capture the effect associated with possible changes in the characteristics of firms seeking a foreign listing and contemporaneous (with SOX) events that affect the relative attractiveness of U.K. and U.S. exchanges. Importantly, by focusing our analysis on an observable set of listing events, we are able to examine the listing decisions of a set of smaller, Nasdaq-eligible firms through the hand-collection of accounting and stock price data from primary source documents. Prior research finds that the impact of SOX is primarily concentrated among smaller firms (see Kamar et al., 2007 for a survey); hence, any analysis that excludes small firms will miss the set of firms where the effect of SOX is likely to be the strongest. We also hand-collect additional explanatory variables, such as firm-level governance attributes (e.g., use of a high or low quality auditor), that are not readily available through machine-readable databases yet are directly related to both the firm's listing decision and the potential cost of SOX compliance.

We focus on the U.K. alternative because of its position as the leading, alternative capital market for foreign listings.³ Additionally, U.K. exchanges offer investor protections and shareholder rights that compare favorably to the U.S. exchange environment.⁴ Lastly, the LSE has been characterized by both policy makers and the press as a likely recipient of “lost” U.S. listings following SOX, and the LSE actively promotes itself as an alternative listing platform for firms seeking an exchange with strong liquidity and investor protections without the regulatory burdens of Sarbanes-Oxley.

³ The LSE ranks second in number of foreign equity listings behind U.S. exchanges. As of June 30th, 2006, 780 foreign firms were listed on U.S. exchanges (NYSE + Nasdaq), while 591 foreign firms were listed on the London Stock Exchange (Main Market + AIM). (Source: International Federation of World Exchanges).

⁴ 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).

Our exchange choice model captures significant variation in cross-sectional incentives for a U.S. versus U.K. listing. Consistent with prior research, we find that firms are drawn to particular exchanges on the basis of geographic and industrial characteristics. At the exchange level, we find that foreign firms are more likely to choose an exchange that has greater liquidity and higher market valuations at the time of the listing. We also find that U.S. exchanges are more likely to attract larger firms and firms that raise equity in the host market, and are less likely to attract firms from countries with relatively weaker institutions (i.e., code law countries and emerging markets) and firms with weaker governance as reflected by their auditor choice. Finally, we show that time-series variation in the relative attractiveness of U.S. and U.K. exchanges (for example growth in LSE's AIM), explains variation in the U.S. – U.K. listing decision over the time frame of our study.

After controlling for firm characteristics and other economic determinants, our tests produce two main SOX-related conclusions. First, among large foreign firms choosing between a U.S. exchange and the LSE's Main Market, listing preferences did not change following SOX. Thus, for a set of large, foreign firms likely seeking a U.S. listing for bonding purposes, we find that the attractiveness of U.S. markets has not changed (and may potentially have slightly increased) following the enactment of SOX. Specifically, we find no evidence of a change in listing preferences among NYSE-eligible firms, and find a marginal increase in the likelihood of a U.S. listing among firms choosing between the NASDAQ and the LSE's Main Market. This inference and related conclusion is confirmed by Doidge et al. (2007)'s analysis of U.S. listing decisions around SOX for their global sample of similarly-sized foreign firms.

Second, among smaller foreign firms eligible to choose between the Nasdaq and LSE's AIM, we find that the likelihood of a U.S. listing has declined following SOX. This decline exists after controlling for changes in the characteristics of firms seeking foreign listings, changes in relative exchange performance (prices, liquidity, returns) following the Act, changes in the attractiveness of U.S. markets absent the effect of SOX, and changes in the attractiveness

of AIM. Related research by Doidge et al. (2007) does not conduct a Nasdaq – AIM comparison; as such, this analysis, driven by our inclusion of hand collected data for smaller firms, represents a unique contribution of our paper to the literature. The documentation of a negative SOX effect among smaller, Nasdaq-eligible foreign firms is consistent with small, less profitable firms being unable to absorb the incremental costs associated with SOX compliance. Thus, similar to extant research on U.S. companies, (Engel, Hayes and Wang, 2005; Leuz, Triantis and Wang, 2006; Kamar et al., 2007), we find that the adverse effects of SOX on foreign listing decisions is limited to these smaller firms. Whether the loss of these small companies to AIM is economically meaningful is a subjective assessment.

The remainder of the paper seeks to better understand how foreign listing activity has changed in the time period following SOX. Results suggest that the determinants of a U.S. listing (versus the U.K. alternative) have changed. Some of these changes reflect the impact of contemporaneous non-SOX events. For example, E.U. firms have greater likelihood of listing in London in the post-SOX period likely reflecting the mandatory adoption of IFRS in the E.U. which lowered the relative cost of a U.K. listing. Similarly, the growth in AIM reflected in the increase in domestic AIM listings has led to incrementally greater likelihood of a London listing during the post-SOX period. Thus, even absent SOX, U.S. listing activity would have changed. Other changes, such as an increased sensitivity of listing decisions to firm size and a greater likelihood of firms from code law countries listing on U.S. exchanges, are consistent with post-Act listing determinants reflecting a shift in both the expected costs and benefits of a U.S. listing.

To explore the preceding analysis further, we use a prediction model based on pre-SOX data to predict an exchange listing choice after the Act. This analysis reveals three key findings. First, the type of firms seeking listings has changed. Nearly one-half of the observed decline in the mix of U.S. and U.K. listings in the post-SOX period can be explained by firms self-selecting listing venues on the basis of their innate characteristics and pre-Act listing preferences alone.

Second, after controlling for these self-selection tendencies, the foreign firms identified as having bypassed U.S. exchanges in favor of the LSE, and specifically AIM, are smaller and less profitable than the firms that actually listed on comparable U.S. exchanges, are more likely to employ a non-Big 5 auditor, and are disproportionately domiciled in developed countries. These characteristics coincide with the types of foreign firms that are less able to absorb the Act's incremental costs or garner the smallest benefit from a U.S. listing. In aggregate, these firms account for approximately \$36.5 billion in market capitalization.

Third, our methodology also identifies a small set of firms that listed on U.S. exchanges following SOX but were predicted to list in London based on their characteristics. These firms are larger and more profitable than the average U.K. listing and account for approximately \$24.6 billion in additional market capitalization. Moreover, nearly all of these firms are domiciled in emerging markets, consistent with large, high quality firms from countries with weak institutions wanting to capture the enhanced bonding and reputation benefits of a U.S. listing following SOX. Whether the gains from these new emerging market listings outweigh the benefits forfeited by the loss of small firms from primarily developed economies is an open question.

Despite the robustness of our empirical results, we note two caveats. First, inferring causality from an event study of this nature is difficult, due to the likely presence of confounding factors, such as the corporate events that lead to the creation of the legislation and other correlated time-period specific events. To mitigate this concern, our tests include controls for the expected determinants of this listing decision, including a variable correlated with foreign firms' preferences for a U.S. listing absent the effect of SOX (Level I and IV ADR listing rates) and a variable that captures changes in the attractiveness of AIM as a listing venue (growth in domestic AIM listings). However, despite these controls, caution in interpreting our results remains.⁵ Second, we examine the set of firms that have chosen to list on a U.S. or London exchange (i.e.,

⁵ Despite this caveat, a failure to document a change in foreign listing preferences following SOX would have cast considerable doubt on either the arguments that the Act has changed the cost and benefits for foreign firms to list on U.S. exchanges or the validity of the bonding hypothesis as an explanation for cross-listing behavior.

observable events), treating this sample as exogenously determined and focusing our empirical analysis on the exchange choice. Our research design does not identify firms that would have otherwise listed in the U.S. absent the requirements of the Act but instead chose to (a) never list on a foreign exchange, (b) opt for an OTC listing or private placement instead of an exchange listing, or (c) listed on an alternative, non-U.K., international exchange. As such, our study investigates only one channel by which SOX potentially influenced foreign listing activity.

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

2. Background and motivation

2.1 Background: The Sarbanes-Oxley Act and Foreign Issuers

The Sarbanes-Oxley Act was signed into law on July 30th 2002 and its provisions covered all SEC reporting companies. No exception was made for foreign issuers, except companies with Level I and Level IV American Depositary Receipts (ADRs), which do not have SEC reporting requirements.⁶ 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 historical precedents for foreign firms; however, as implemented, all provisions of the Act are applicable to foreign issuers with SEC reporting requirements.⁷

The Act does not provide 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

⁶ 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.

⁷ 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. The lack of exemption for foreign issuers under SOX was not inadvertent – See comments by Harvey Pitt, Chairman SEC at the SEC Roundtables on Auditor Independence and Attorney Conduct, December 17, 2002 (Available at <http://www.sec.gov/news/audindtrans121702.htm#ai>)

(Perino, 2003).⁸ For example, on August 2nd, 2002, the SEC issued its proposed rules – Certification of Disclosure in Companies’ Quarterly and Annual Reports - as required under 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 non-accelerated filers 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 for foreign accelerated filers to the first fiscal year ending after July 15, 2006 and for foreign non-accelerated filers to the first fiscal year ending after July 15, 2007 (SEC release No. 33-618 dated Sept. 22, 2005); the corresponding compliance date for large U.S companies was the first fiscal year ending after November 15, 2004.^{9,10}

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

The passage of the Sarbanes-Oxley Act changed both the expected costs and benefits of a foreign U.S. listing. From a cost perspective, the Act increases 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 are 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

⁸ 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.

⁹ For parsimony, we will forego a discussion of the various provisions of the Act. See Perino (2003), Coates (2007) and Kamar et al. (2007) for a good summary and discussion of the Act’s key provisions.

¹⁰ Non-accelerated filers are essentially firms with market value < \$ 75 Million. For a more complete definition see Exchange Act Rule 12b-2 or footnote 5 of SEC Release No. 33-8618.

auditors by the PCAOB are highlighted as some of the Act's more onerous provisions for foreign companies (Pozen, 2004). Corporate executives complain that complying with the Act diverts 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). If these concerns are valid and the Act solely raises the cost of a foreign listing, we would expect to see fewer firms choosing a U.S. exchange listing and subjecting themselves to the provisions of the Act, especially in the presence of a credible listing alternative.

Prior research suggests that SEC requirements can impose costs that deter foreign firms from choosing U.S exchanges as a listing venue. For example, Biddle and Saudagaran (1989) and Saudagaran and Biddle (1992; 1995) show that mandatory disclosure requirements significantly affect firm's choice of foreign listing venues.¹¹ 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.

However, the incremental costs of the Act may be insufficient to deter a U.S. listing. First, even though the Act's requirements will result in substantial direct costs (for example, the implementation of Section 404), these costs are likely to be economically insignificant for the large companies that typically seek a U.S. listing. Instead, SOX-related compliance costs are expected to be more onerous for small firms and firms with poor internal controls and weak corporate governance practices.

Second, the indirect costs associated with SOX may be immaterial for foreign firms. Siegel (2004) provides evidence that the SEC and minority investors have not effectively enforced U.S. regulations and laws against cross-listed foreign firms. As such, the expected costs of the Act may be lower for foreign firms than their U.S. counterparts. Additionally, many of the provisions of the Act are not incremental to existing statutes relating to criminal behavior

¹¹ For example, 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.

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).¹² As such, the indirect costs under SOX may not be incremental to the existing cost structure in place, and fears of increased legal liability exposure may be unfounded.¹³

Third, firms may continue to opt for a U.S. listing simply because the benefits continue to outweigh any new costs (i.e., the demand for a U.S. listing 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., Karolyi, 1998; Stulz, 1999; Lins, Strickland, and Zenner, 2004).¹⁴ 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.¹⁵ To the extent that the expected benefits of a U.S. listing continue

¹² As illustrated in Coates (2007), the criminal prosecutions in Enron, Tyco and Worldcom enforced laws in place before Sarbanes-Oxley.

¹³ 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.

¹⁴ 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.

¹⁵ Khanna, Palepu, and Srinivasan (2004) find that firms that have product and labor market interactions with the U.S. (and firms 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. That paper interprets 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.

to exceed the new cost structure under Sarbanes-Oxley, foreign firms may continue to prefer a U.S. listing after the Act.

Finally, Sarbanes-Oxley may have actually increased the benefits of a U.S. exchange listing. 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 their home country institutions by listing in the U.S. and using the U.S. legal system to protect minority shareholders. Under the bonding hypothesis, a U.S. exchange listing provides the commitment mechanism for these companies to bond to a high quality legal and regulatory system; this legal bonding results in higher market valuations and lower cost of capital, with the benefits being larger for foreign firms from countries with weaker legal institutions (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 credibility of U.S. exchanges as a bonding mechanism, thereby increasing the expected bonding-related benefits of a U.S. listing.^{16,17} Moreover, in the absence of other jurisdictions offering a similar bonding mechanism, companies may have no choice but to list on U.S. stock exchanges.¹⁸

2.3 Prior research and the contribution of paper

Given that the Sarbanes-Oxley Act likely changed both the costs and benefits of a U.S. listing, the impact of the Act on foreign listing decisions is an empirical issue. Our paper is

¹⁶ U.S. stock exchanges are also positioning themselves to benefit from this reputation. Nasdaq has newly created, effective July 1st, 2006, the Nasdaq Global Select Market for “public companies that meet the highest listing standards in the world” (Nasdaq, 2006). This tier imposes higher initial listing standards than those applicable to the other two tiers – Nasdaq Global Markets (formerly the Nasdaq National Market) and the Nasdaq Capital Market (formerly the Nasdaq SmallCap Market).

¹⁷ 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).

¹⁸ Other locations offering strong investor protections may provide bonding benefits similar to the U.S. 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 capable of creating incentives for better financial reporting and governance practices. Thus, firms seeking bonding benefits are not necessarily tied to a U.S. listing.

closely related to a stream of research examining the impact of the Act on U.S. companies. This research documents 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 SOX. Additionally, Kamar et al., (2006) examine U.S. acquisition targets and find that a greater propensity for targets to be acquired by private acquirers than by public acquirers in the post-Act period. Finally, Kamar et al. (2007) review a number of studies that examine the impact of SOX on U.S. companies and conclude that the costs imposed by SOX are greater for small firms. These findings provide evidence consistent with the views of the critics of the Act that SOX has raised the net costs of being public, with the burden being especially onerous for smaller firms (Romano, 2005; Ribstein, 2002).

Contemporaneous research has found similar effects among foreign firms. Litvak (2007) shows that foreign firms listed in the U.S. experienced a significant negative price reaction to news that the Act would apply to them. Marosi and Massoud (2006) find an increase in deregistrations among foreign firms following 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, Karaoglu, Lys and Yang (2007) examine the characteristics of foreign firms that have voluntarily delisted following the Act, and find that these firms tend to have weaker corporate governance attributes than a control sample.

Our paper is closely related to Doidge, Karolyi and Stulz (2007) (DKS henceforth) who examine U.S. listing patterns between 1990 and 2005. Focusing on a global sample of publicly-traded foreign firms covered by the Worldscope database, DKS confirm one of our principle findings: after controlling for differences in the type of firm seeking a foreign listing, Sarbanes-Oxley did not impact U.S. listing activity among large foreign firms. Consistent with Sarbanes-Oxley not materially changing the net cost/benefit structure of a U.S. exchange listing for these large firms, DKS show that the relative valuation benefits associated with a U.S. listing have not changed following the enactment of SOX.

Unlike DKS, who model the likelihood of foreign firms choosing or not choosing to list on a U.S. exchange, we model the firm choice between alternative exchanges given the decision to engage in a foreign listing. Our approach allows us to consider a more comprehensive set of incentives for a U.S. exchange listing. And, unlike DKS, the approach also allows us to include in our sample small firms that are not present in the Worldscope database. By hand-collecting data on these small firms, we are able to search for the impact of Sarbanes-Oxley among those firms that *ex ante* are most likely to be affected by the incremental costs of the regulation.

More importantly, relative to DKS, our approach is an alternative representation of how SOX impacts firm-level listing decisions. Given the decision to engage in a foreign listing, managers must select a listing venue. This decision will focus on identifying the exchange that offers the largest net benefit to the firm. These benefits could be related to bonding, but could also reflect the desire for a liquid stock market, an informed investor base or product market benefits. These benefits are weighed against the relative costs associated with each respective exchange listing. In the context of this specific decision, we focus on the U.S. versus London listing decision, and seek to determine whether the London Stock Exchange is attracting foreign firms in the post-Act period that would have otherwise listed on a U.S exchange prior to the Act?

We examine the London Stock Exchange (LSE) as an alternative to the two U.S. exchanges because the LSE has been highlighted as an alternate destination for companies interested in accessing western capital markets (Karmin and Lucchetti, 2006; McLachlan, 2006). The LSE is an attractive alternative to potential U.S. listing candidates because U.K. institutions provide strong investor protections (e.g., LaPorta et al. 1998; 2006), yet offer listing firms flexible corporate governance standards under the Combined Code. Moreover, while some companies may have opted for other regional exchanges, London has traditionally been the largest cross-listing destination other than the U.S. (Sarkissian and Schill, 2004). 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). The London Stock Exchange has actively used SOX-related costs to discourage firms from a U.S. listing and highlighted the avoidance of these costs as a reason to choose a U.K. listing; 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).¹⁹ Lastly, the heads of the NYSE and NASDAQ acknowledge that firms choose among global exchanges, and that the loss of foreign listings to alternative exchanges is one likely impact of SOX.

3. Sample construction and data sources

Our sample consists of foreign firms that listed on the NYSE, Nasdaq, and London Stock Exchange between June 1st, 1995 and June 30th, 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 and also CRSP and Bloomberg. The London Stock Exchange website also provides detailed data on historical listings for 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

¹⁹ Our interview with the audit committee chairman of a large Korean cross listed company indicated that SOX weighs heavily on companies' choice between a U.S. and U.K. listing.

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 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, stock price and auditor data are primarily gathered through the Datastream database. For firms with 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. Additional accounting, stock price and auditor data are hand collected from corporate filings with the SEC and LSE in the year of listing. From these various sources, complete financial and stock price data are available for 1,248 cross-listing events. 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 and monthly trading volume 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 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 \$3.3 billion, \$10.9 billion, and \$2.4 billion, respectively), profitable (median net income as a percent of assets of 2.4 percent), and

possessing moderate growth prospects (median book-to-market ratio of 0.404). However, there is considerable variation in these characteristics. For example, for those firms with available financial data, 66.9 percent, 61.9 percent, and 70.8 percent have a market capitalization, total asset base, and total revenue of less than five hundred million dollars (median values of \$219 million, \$248 million, and \$118 million, respectively), while 39.1 percent of the sample is 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 the exchanges. As the two bigger 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. Finally, in terms of home country institutions, firms from emerging markets and socialist/communist legal traditions have a marginally stronger preference for a U.K. listing.

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 10% 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 using industry indicator variables.

4.2 Descriptive evidence on foreign listing activity on U.S. and U.K. exchanges

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-seven month period from August 2002 through June 2006. All analyses exclude the three month legislative timeframe of the Act (May 2002 through July 2002).

The first column of Table 2 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 Sarbanes-Oxley Act: 12.27 listings per month prior to the Act and 9.87 listing per month following the Act.

The remaining columns present listing trends by host markets and the underlying exchanges. Monthly listing activity on the NASDAQ, the NYSE and the LSE's Main Market has significantly declined over the last forty-four months compared to the pre-Act period. In contrast, the LSE's AIM has experienced a nearly 775 percent increase in monthly listings. These time-series trends continue to persist after considering controls for variation in market valuation-related factors over this time period (not tabulated). All of the tabulated changes are statistically significant at the one-percent level (two-tailed tests).

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

5.1 Empirical model

In order to assess whether a change in listing preferences has occurred, we compare listing activity on U.S. exchanges against the activity of an alternative exchange not subject to the Act. As discussed earlier, the U.K.'s prominence as a global capital market makes a listing on the London Stock Exchange a viable substitute to a U.S. listing. We model the firm's choice between a U.S. and U.K. exchange listing, and examine the likelihood of a U.S. listing against the U.K. alternative in the post-Act regime after controlling for other determinants of the listing exchange choice. Specifically, we estimate variations of the following cross-sectional model:

$$\begin{aligned} \text{Prob(U.S. Listing}=1) = & \alpha + \sum_{j=1}^9 \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} + \beta_4 \text{EU} \\ & + \beta_5 \text{Emerging} + \beta_6 \text{CodeLaw} + \beta_7 \text{Socialist} + \beta_8 \text{Diff_Liquidity} + \beta_9 \text{Diff_Index} \\ & + \beta_{10} \text{Diff_P/E_Index} + \beta_{11} \text{Diff_DomesticList} + \beta_{12} \log(1 + \text{NonExchUSList}) \\ & + \beta_{13} \text{Big5} + \beta_{14} \text{Issuance_Home} + \beta_{15} \text{Issuance_Host} + \beta_{15} \text{Diff_Trade} \\ & + \beta_{16} \log(\text{Assets}) + \beta_{17} \text{ROA} + \beta_{18} \log(1 + \text{BTM}) + \beta_{19} \text{PostSOX} + \varepsilon \end{aligned} \quad (2)$$

In this model, the dependent variable is an indicator variable equal to one if the event pertains to a foreign listing onto a U.S. exchange (NASDAQ or NYSE), and zero if the firm lists on the LSE (Main Market or AIM).

The independent variables are designed to capture factors that influence 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 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 captures incentives created by the firm's home country and related institutions. First, the listing choice will 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 are key factors 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.²⁰ *Geography* is an array of indicator variables for three broad geographic regions in our sample: Asia, South America and Caribbean. These indicator variables are designed to capture any distinct preferences arising from geographic or cultural factors in these regions. Lastly, the variable *Diff_Trade* is included to capture relative differences in the level of product market interactions between the firm's home country and the U.S. and U.K. respectively. *Diff_Trade* is measured as the sum of imports and exports between

²⁰ Additionally, the recognition of IFRS by U.K. exchanges coupled with the mandatory adoption of IFRS by the E.U. (adopted 2001; compliance mandated in 2005) could also lead to a shift in listing preferences among E.U. domiciled firms towards a U.K. listing over time.

the home country and the U.S. minus the sum of imports and exports between the home country and the U.K., scaled by the home country's GDP, in the year of listing.²¹

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). So 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 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 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 also have the most to gain from a U.S. listing under the bonding hypothesis, suggesting a positive relation between these variables and a U.S. listing.²²

The second set of explanatory variables captures incentives arising from differences in market conditions and relative attractiveness of a stock exchange around the time of the listing. We consider four exchange level measures: differences in twelve-month index returns, differences in market-level price-earnings multiples, differences in market liquidity, and differences in domestic listing activity. Prior research suggests that domestic equity issuance decisions are influenced by relative market valuations, shifts in expected returns and changes in

²¹ Trade data for the U.S. are from the U.S. Department of Commerce, Bureau of Economic Analysis (www.bea.gov) and for the U.K. are from the Office for National Statistics, (www.statistics.gov.uk).

²² Results are also robust to the inclusion of the additional variables to capture potential country-level incentives. For example, we 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). We also included an indicator variable if the firm is domiciled in an off-shore tax haven (Bermuda, Cayman Islands, Channel Islands (Guernsey and Jersey) or Netherlands Antilles). Due to the limited number of observations for these categories, we exclude them from the tabulated results.

expectations about the payoffs to future investments (e.g., Pastor and Veronesi, 2005). If similar incentives exist for foreign listing decisions, foreign firms are likely to be drawn to exchanges providing strong recent index performance, high valuation multiples and greater liquidity.

For each exchange, the preceding twelve-month return to the respective exchange's market index is measured ($Index_Return_t$). For the NYSE and NASDAQ, $IndexReturn$ is measured using the return to the respective exchange's composite index. 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.²³ $Diff_IndexReturn_t$ 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. 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 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.²⁴ Together, $Diff_IndexReturns$ and $Diff_P/E_Index$ are expected to capture differences in market momentum and valuation levels prior to the exchange choice.

To capture differences in relative market liquidity and trading volume, the variable $Diff_Liquidity$ is measured as the value of shares traded (scaled by the exchange's market

²³ Returns to the AIM All-share index are supplemented with the returns to the FTSE Small Cap index prior to December 1996.

²⁴ 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, $Diff_P/E_Index_t$ is mean-adjusted when included in our empirical models to better capture time-series variation in relative pricing attributes across exchanges.

capitalization) on a specific U.S. exchange less the value of shares traded on the London Stock Exchange in the month of the foreign listing.²⁵

Pagano et al. (2002) provide anecdotal evidence that foreign firms are attracted to exchanges experiencing a strong, contemporaneous growth in new domestic listings. To capture this effect, we include the variable *Diff_DomesticList_t*, 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. We expect *Diff_DomesticList_t* to act as an instrument for omitted exchange-level factors and events that influence the *relative* attractiveness of one exchange over another. This control is critically important given the increased attractiveness of AIM as a listing venue for both domestic and foreign over the last several years of our study.

Finally, we recognize that factors other than Sarbanes-Oxley can alter foreign firms' preferences for a U.S. or U.K. listing over time. First, to control for changes in the attractiveness of U.S. exchanges absent the effect of SOX, we include the variable *NonExchUSList*, which is measured as the number of foreign firms listing in the U.S. via a Level I (OTC listings) or Level IV ADRs (private placements) in the month of the listing event. Because Level I and IV ADR listings are not subject to the provisions of the Act, the rate of foreign non-exchange listings will act as an instrument for omitted time-varying effects influencing foreign listing preferences independent of Sarbanes-Oxley (such as IFRS adoption, shifts in the credibility of U.S. markets, enhanced AIM marketing efforts, the Global Research Analyst Settlement, etc.). Second, as discussed above, we use the variable *Diff_DomesticList* to control for changes in the attractiveness of a UK listing (and AIM in particular) over time.

The last set of explanatory variables measure firm-level incentives that influence the choice of a host country. We consider six firm attributes: industry affiliation, size, profitability, growth opportunities, the use of a high quality auditor and whether or not the firm raised equity

²⁵ For three of our exchange-level metrics, *Diff_IndexReturns*, *Diff_P/E_Index* and *Diff_DomesticList*, NYSE and NASDAQ attributes are benchmarked against the return, pricing and listing attributes of London's Main Market and AIM, respectively. These pairings are chosen since our descriptive statistics show that these pairs of exchanges are attracting roughly similar types of firms.

capital around the time of the new foreign listing.²⁶ A firm may choose to list on an exchange that already hosts the firm's competitors or peers or has a reputation for industry-specific investor expertise. To capture these fixed industry-level preferences, we include an array of nine industry indicator variables.²⁷ Industry affiliation is based on each firm's Datastream industry classification. For those 74 firms that are 'unclassified' on Datastream, classifications are based on descriptive 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 and 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. The firm's market-to-book ratio is included to capture differences in expected growth opportunities (as well as correlated financial distress/risk attributes).

The expected cost of listing on a U.S. exchange is larger if the firm has poor corporate governance. Prior research finds that, in an international context, the use of a high quality auditor is positively related to the quality of corporate governance (Francis, Khurana and Pereira, 2003; Wang, Wong and Xia, 2006). We include the indicator variable *Big5* to capture whether the firm employed a Big 5 auditor around the time of the listing. 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 in their home or host market, respectively, in the one month period surrounding the foreign listing.

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 contemporaneous listings in both the U.S. and London (13 cases of dual listing events and one instance of different

²⁶ All results are robust to the inclusion of leverage in our estimations. Leverage is measured as total liabilities over total assets at the end of the year.

²⁷ The following nine industries are each represented by a unique indicator variable in our tabulated analysis: Oil and Gas, Financial Institutions, Utilities, Forestry, Real Estate, Software and Technology, Pharmaceutical and Biotech, Telecom and Transportation. All results are robust to the inclusion of a finer set of seventeen unique industry indicator variables; however, we report results based on our reduced-form model for parsimony.

classes of equity shares being issued simultaneously).²⁸ Second, we eliminate those events where the foreign firm had a prior listing on the alternative exchange at the time of the sample cross-listing event (89 cases). Third, we eliminated those firms that were domiciled in the U.S. and the U.K., because these firms do not face the same international exchange choice as non-US and non-UK firms. Fourth, we delete those firms with insufficient financial data to estimate our models. Lastly, we delete those firms that do not meet Nasdaq size and profitability listing requirements in the year of listing. These adjustments result in a final sample of 1,021 unique U.S. and U.K. foreign events between June 1995 and June 2006.

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

Table 3 presents the results of our estimations of equation (2) using the complete sample of firm events. These models are estimated with and without our domestic listing variable (due to the likely correlation between the enactment of Sarbanes-Oxley and domestic listing rates in the U.S.) and our non-exchange foreign listing variable (due to the potentially endogenous relation between a foreign firm's exchange and non-exchange listing decision).

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 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 significant cross-sectional variation in listing choice, with coefficients on eight of our nine industry indicator variables and all three of our regional geographic indicator variables being statistically significant. We also find that Canadian and Israeli (Irish) firms are statistically more likely to list on a U.S. (U.K.) exchanges. Third, firms are more likely to choose a foreign exchange with stronger liquidity and higher market valuations. Fourth, firms from countries

²⁸ Interestingly, all of the dual listing events in our sample occurred prior to the enactment of Sarbanes-Oxley.

with relatively weaker institutions (i.e., code law and emerging markets) are more likely to avoid a U.S. listing after controlling for other attributes. Fifth, U.S. exchanges are more likely to attract larger firms and firms that raise equity in the host market, and are less likely to attract firms with weaker governance as reflected by their auditor choice. Finally, both of our instruments for changes in the relative attractiveness of U.S. and U.K. exchanges, *NonExchUSList* and *Diff_DomesticList*, have significant positive relations with U.S. exchange listing choices, consistent with non-SOX related forces impacting listing decisions over this time period. All of these relations are robust across both specifications.

After controlling for these determinants of the U.S.-U.K. listing choice, we find that the average probability of a U.S. listing is significantly lower after the Act in both models. In terms of economic significance, the negative fixed effect implies an approximate 16% decrease in the probability of the average firm listing on a U.S. exchange after the enactment of SOX, consistent with arguments that some foreign firms have begun bypassing U.S. exchanges in favor of the LSE in the post-Act period. As expected, the inclusion of *NonExchUSList* and *Diff_DomesticList* as instruments for non-SOX forces influencing foreign firms' preferences for a U.S. listing attenuates the negative relation between the likelihood of a U.S. listing and *PostSOX*, our post-Act time period indicator variable. More importantly, these positive relations suggest that our instruments are successfully capturing time-varying listing preferences for a U.S. and U.K. exchange listing, respectively, independent of Sarbanes-Oxley. Both a decrease in non-exchange U.S. listing activity and an increase in domestic U.K. listing activity are associated with a reduced likelihood of a U.S. listing; however, after controlling for these effects, the negative relation between *PostSOX* and the U.S. listing choice remains.²⁹

²⁹ To confirm that our inferences 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 of the logistic framework. Coefficients from these estimations (not tabulated) support the inference that the likelihood of a foreign U.S. listing has decreased in the period following the enactment of SOX.

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

The preceding analysis suggests that the *average* likelihood of a U.S. vis-à-vis a U.K. exchange listing has declined in the period following SOX after controlling for other listing determinants. Despite this average decline in our sample, the impact of SOX is not expected to impact exchanges or firms equally. Evidence on domestic U.S. firms suggests that the costs of SOX disproportionately affect smaller firms (Kamar et al. 2007). If this is true for foreign firms as well, the decline in listing behavior should be concentrated among small firms considering a Nasdaq listing versus a NYSE listing. In contrast, the potential net benefits of the Act are likely to be greater for large firms raising equity capital or domiciled in countries with weak institutions. To test for this variation, we examine the impact of SOX on the decision to list on the NYSE and Nasdaq separately.

Our first analysis compares NYSE listings against two sets of U.K. listings: All NYSE-eligible firms and all NYSE-eligible firms that listed on the LSE's Main Market. Coefficients from estimations of equation (2) for these two pairs of listing choices are presented in Table 4. Consistent with the costs of Sarbanes-Oxley being less onerous for large, NYSE-eligible firms, these estimations are unable to document a significant relation between the probability of a NYSE listing and our *PostSOX* indicator variable. These results mirror the results and interpretation in Doidge, Karolyi and Stulz (2007) for their sample of similar sized firms. Thus, for this set of firms, which account for a substantial portion of the sample's market capitalization, we find that Sarbanes-Oxley had no impact to foreign listing preferences. In terms of determinants, the greater sensitivity of the listing decision to the likelihood of raising capital and weak country level institutions in this sample suggests that a tradeoff between *both* the expected benefits (lower cost capital) and expected costs (indirect costs associated with greater investor and regulatory scrutiny) of the listing plays an important role among these firms.

Our second exchange-level analysis compares Nasdaq listings against three sets of U.K. listings: All firms that met Nasdaq listing requirements in the year of listing, all Nasdaq-eligible

firms that listed on the LSE's AIM and all Nasdaq-eligible firms that listed on the LSE's Main Market. Coefficients from estimations of equation (2) for these three pairs of listing choices are presented in Table 5. Similar to our estimations for NYSE-eligible foreign firms, we are unable to document a significant negative relation between the likelihood of a Nasdaq listing and our *PostSOX* indicator variable for the full sample of Nasdaq-eligible firms. The preceding analysis, however, groups together two types of U.K. listings: foreign firms that self-selected between the LSE's Main Market and LSE's AIM. Given the different economic profiles of these two sets of firms, we re-estimate equation (2) after splitting the Nasdaq-eligible U.K. listings on the basis of their actual U.K. exchange destination. This partition generates two key findings.

First, the likelihood of a Nasdaq listing versus an AIM listing is significantly lower in the post-Act period after controlling for other determinants of this listing choice. This negative effect is consistent with the direct compliance costs of SOX deterring smaller foreign firms from listing onto U.S. exchanges and with the LSE's attempt to capitalize on the perceived burden of current U.S. regulations to attract listings from small, growth-oriented firms to the AIM. Economically, this fixed effect implies that the likelihood of a U.S. listing fell by approximately 28% following the enactment of Sarbanes-Oxley among these firms. It is important to recognize that this analysis explicitly excludes AIM firms that do not qualify for a Nasdaq listing based on the exchange's size and performance-related listing standards; as such, the documented effect pertains to AIM-listed firms that were eligible to list on the Nasdaq but did not.

Second, the likelihood of a Nasdaq versus a Main Market listing is marginally higher in the post-SOX period. Economically, this coefficient suggests that the likelihood of a U.S. listing increased by approximately one percent following SOX among these larger Main market firms. This increase in listing frequency, though small, contradicts the basic trends observed in Tables 2 and 3 for U.S. listings and highlights the potential increase in benefits of a U.S. listing following SOX. Given that firms listing on the LSE's main exchange tend to be larger than firms listing on

AIM, this positive relation suggests that there exists a point at which the direct costs associated with the Act can be subsumed by the increased benefits of a Nasdaq listing under SOX.

5.4 Impact of raising capital on listing preferences following Sarbanes-Oxley

The costs and benefits of a foreign listing are expected to vary by whether or not the firm intends to raise equity capital in the host market. We examine whether preferences for a U.S. listing changed differentially depending up whether or not the firm raised capital on the host exchange in the one month period around the listing event. Table 6 presents coefficients from separate estimations of equation (2) (excluding Host_Issuance) for these two samples; two interesting results emerge.

First, the determinants of listing preferences differ depending upon whether or not capital is being raised. Although listing choices for both sets of firms are positively influenced by the firm's size, auditor choice and inversely related to development of their home country, other forces are context specific. Firms domiciled in countries with weak institutions are significantly less likely to list in the U.S. if they are not raising capital; in contrast, home country institutions have no significant impact if the firm is raising capital. This difference is likely due to the fact that absent capital raising benefits, the net regulatory cost for firms from weak institutions to list in the U.S. is prohibitively high. We also find that for those firms not raising capital, listing choices are significantly influenced by relative trade relationships, consistent with these firms listing choices instead being shaped by product market forces. Second, after controlling for these different determinants, we document that the average decline in the likelihood of a U.S. listing in the post-SOX period exists among both sets of firms.

5.5 Summary of conclusions from our exchange choice models

The preceding estimations generate two main conclusions about the impact of Sarbanes-Oxley on foreign listing behavior. First, among large foreign firms choosing between a US

exchange and the LSE's Main Market, listing preferences did not change following the Act. Thus, for a set of large, foreign firms likely seeking a U.S. listing for bonding purposes, we find that the attractive of U.S. markets has not changed (and may potentially have marginally increased) following the enactment of SOX. This conclusion is confirmed by Doidge, Karolyi and Stulz (2007)'s analysis of US listing decisions around Sarbanes-Oxley for their global sample of similarly-sized foreign firms.

Second, among small foreign firms eligible to choose between the Nasdaq and LSE's AIM, we find that the likelihood of a U.S. listing has declined following the Act. This decline exists after controlling for changes in the characteristics of firms seeking foreign listings, changes in relative exchange performance (prices, liquidity, returns) following the Act, changes in the attractiveness of U.S. markets absent the effect of SOX, and changes in the growth of the domestic AIM listings. As mentioned earlier, related research by Doidge et al. (2007) does not conduct a Nasdaq – AIM comparison. Our analysis the Nasdaq-AIM listing decision, through the incorporation of a hand-collected sample of smaller firms, represents a unique contribution of our study.

6. Additional evidence on foreign listing decisions

This section provides additional evidence on foreign listing decisions around the enactment of SOX. Section 6.1 provides evidence on the determinants of a U.S / U.K. listing in the period before and after the Act, while Section 6.2 uses a prediction model to identify the attributes of those firms that were predicted to list on a U.S. or U.K. exchange on the basis of pre-SOX determinants and to examine the attributes of those firms whose ultimate exchange choice does not map into our prediction. By identifying the determinants that have changed and the attributes of those firms that appear to have bypassed their predicted exchange, the analysis sheds light on the costs and benefits of the new regulation.

6.1 Shift in the determinants of U.S. listings pre versus post Sarbanes-Oxley

To better understand how Sarbanes-Oxley has changed the preferences for a foreign listing on a U.S. exchange, we estimate equation (2), without the *PostSOX* variable, for the separate periods before and after the Act. Similar to the analysis in Leuz, Triantis and Wang (2006) for SEC deregistration, a comparison of the coefficients under these two regulatory regimes highlights the incentives that are likely to have changed around this event. Coefficients from these two estimations are presented in Table 7.

Several discernable changes in the underlying determinants of the U.S.-U.K. listing choice exist. First, the probability of listing on a U.S. exchange is more strongly related to firm size following the Act. The greater sensitivity of listing decisions to firm size is consistent with the costs of Sarbanes-Oxley being more onerous for smaller firms. Similar evidence was found in Leuz, Triantis and Wang (2006) for domestic deregistration activity. Second, firms from code law countries are marginally more likely to seek a U.S. listing following the Act, consistent with firms from countries with weak investor protections experiencing the greatest relative increase in U.S. listing benefits under the Act. Third, firms from the E.U. are significantly less likely to list in the U.S. following the Act, consistent with mandatory IFRS adoption requirements reducing the incremental costs of a U.K. listing during the post-Act period. This change highlights the influence of non-Sarbanes-Oxley related forces on listing preferences during the post-Act time period. Finally, the relations between listing preferences, product market interaction and the rate of domestic listing activity are substantially weaker in the post-Act timeframe.

6.2 Characteristics of firms that bypassed U.S. and U.K. exchanges following the Act

We further examine which foreign firms have been deterred from listing on a U.S. exchange by using coefficients from our fitted pre-Act 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 2002.³⁰ This evidence is presented in Table 8.

The first panel of Table 8 highlights the predicted level of foreign listing activity in the post-Act period. These statistics shows that the aggregate decline in U.S. listing activity can be attributed to both SOX and non-SOX factors. First, after taking into consideration the firm's exchange choice preferences based on historical determinants, the percent of firms likely to prefer U.S. exchanges is *expected* to decline in the period following Sarbanes-Oxley. In other words, among those foreign firms that ultimately list on either a U.S. or U.K. exchange, a greater percentage are expected to self-select a U.K. listing based on their innate characteristics regardless of the change in the U.S. regulatory environment. Specifically, the proportion of U.S. to U.K. listings after July 2002 is predicted to be 17.6% lower than the pre-Act levels simply *given* the economic profile of the listing companies and differences in exchange-level characteristics during the post-Act period.

Second, we continue to find both a significantly lower listing rate and a smaller percentage of foreign firms selecting U.S. exchanges post-SOX after controlling for the non-SOX-related decline in foreign listing activity. The proportion of foreign firms choosing a U.S. exchange over a U.K. exchange is nearly 22.1% lower than expected; this decline in U.S. listing activity is both economically and statistically significant. Moreover, we find that among the firms that appear to have bypassed U.S. exchanges, 80.2% of these companies listed on the LSE's AIM, consistent with the exchange-level evidence presented in Table 5.

To assess whether this portion of the decline in listing frequency can be attributed to SOX, we examine the characteristics of listing firms conditional on whether or not they actually listed on the exchange predicted by our baseline model. Descriptive evidence for firms predicted to list on U.S. and U.K. exchanges is presented in Panels B and C, respectively. This approach

³⁰ These predictions are based on the pre-SOX model estimated in Table 7 using all available observations. We were unable to utilize the finer, exchange-level choice models of Table 5 in this section due to a limited number of AIM observations with sufficient accounting and stock price data to estimate those models during the pre-SOX period.

produces three key findings. First, focusing on firms predicted to list onto a U.S. exchange, we identify a set of firms that appear to have bypassed U.S. exchanges in favor of a U.K. listing following the Act. As expected, these firms are smaller and less profitable than the firms that actually listed on U.S. exchanges, have a lower frequency of using a high quality auditor and are disproportionately from developed countries. Smaller and less profitable firms, along with firms using a low quality auditor, are likely to find the Act's costs more onerous, while those firms from developed countries likely garner the smallest benefit from a U.S. listing. In aggregate, these firms account for approximately \$36.5 billion in market capitalization. These patterns are consistent with SOX 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 result can be interpreted as the Act successfully screening out marginal foreign firms hinges on whether or not the quality of the listing firms (and their governance practices) are increasing in either or both of these attributes.³¹

Second, we split these U.K. listings on the basis of their ultimate exchange platform. Consistent with its less restrictive listing requirements, AIM attracted smaller, less profitable firms, with a majority of the firms employing a low quality auditor and domiciled in common law, developed economies. In contrast, the Main Market attracted primarily large, profitable firms domiciled in countries with weak investor protections and low economic development.

Third, focusing on firms predicted to list on U.K. exchanges, our methodology identifies a small set of firms that listed on U.S. exchanges following the Act that were predicted to list on the LSE based on their firm-specific, industry and home country attributes. These firms are larger and more profitable than the average U.K. listing and account for approximately \$24.6 billion in additional market capitalization. Moreover, nearly all of these firms are from emerging

³¹ For example, Ashbaugh-Skaife et al. (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 SOX.

economies, consistent with large, high quality firms from countries with weak institutions capturing the enhanced bonding/reputation benefits of a U.S. listing after the enactment of SOX.

7. Interpretation of the results

In this paper, we find two main results with respect to the impact of SOX on foreign listing decisions. First, among large foreign firms choosing between NYSE and the LSE Main Market, SOX did not influence listing preferences and find a marginal increase in the likelihood of a U.S. listing among firms choosing between the NASDAQ and the LSE's Main Market. Second, among a set of small foreign firms choosing between the NASDAQ and LSE's AIM, the likelihood of a U.S. listings has declined following the Act. These results, particularly with respect to the documented impact of SOX among NASDAQ-AIM firms, are subject to some potential concerns. These issues are discussed below.

7.1 Change the characteristics of listing firms over time

One potential concern is that the characteristics of firms seeking a foreign listing have changed over time. Given that firms are drawn to specific exchanges on the basis of their geographic, industry and firm-level characteristics, our tests and results could be confounded by a fundamental change in the type of firms seeking a foreign listing before and after SOX. To control for these self-selection effects, our exchange choice model explicitly captures the impact of firm characteristics on the foreign listing decisions. These variables are highly significant in most of our models, allowing the predicted likelihood of a U.S. or U.K. listing to change as the underlying characteristics of listing firms change. As a result, our exchange choice models actually predict that the frequency of U.S. listings was expected to decline following the Act simply due to a change in the composition of the firms seeking a U.S. or U.K. listing during this time period. More importantly, after explicitly controlling for these changing attributes, the actual U.S. listing frequency is still lower than expected in the post-SOX period.

7.2 Growth in AIM as a listing venue

We document a decreased likelihood of a U.S. exchange listing among those firms choosing between a NASDAQ and AIM listing in the time period following SOX. One interpretation of this result is that the observed decrease is due to a change in the relative attractiveness of AIM as a listing venue rather than the impact of the new regulation.

To alleviate this concern, we explicitly include the variable *Diff_DomesticList_t* in our exchange choice models. 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, *Diff_DomesticList_t* is expected to act as an instrument for omitted exchange-level factors and events that influence the *relative* attractiveness of one exchange over another. Effectively, we are using domestic listing rates as our proxy for the exchange's attractiveness as a listing venue; this proxy is consistent with the anecdotal evidence in Pagano et al. (2002) that foreign firms are attracted to exchanges experiencing a strong, contemporaneous growth in new domestic listings.

As expected, we find a significant positive relation between *Diff_DomesticList* and the likelihood of U.S. listing; this relation indicates that as growth in domestic NASDAQ listings outpaces (lags) growth in domestic AIM listings, the likelihood of a U.S. listing increases (decreases). After controlling for time-series variation in these domestic listing rates, the decreased likelihood of a NASDAQ listing versus the AIM alternative remains during the post-SOX period.

7.3 Are the firms that list on AIM candidates for a Nasdaq listing?

We have addressed this potential concern in two ways. First, recall that all firms that we include in the Nasdaq-AIM comparison are only those AIM firms that we identify as being eligible for a Nasdaq listing. We conduct a comprehensive hand collection of data and find that only 159 out of the 303 firms that listed on AIM are Nasdaq eligible. Therefore we only include

these 159 firms as our comparison sample.³² Second, the identification of firms that bypassed the U.S. and went to AIM in the post-SOX period is based on a pre-SOX exchange choice prediction model. This model includes size, profitability and book to market among other variables that may predict if a firm will list in the U.S. or the U.K. We apply this model to a pre-SOX data and use that to predict post-SOX outcomes. Hence any firm that is identified as bypassing the U.S. is deviating from this pre-SOX model meaning that these AIM bound firms were predicted as U.S. candidates based on similarity with the characteristics of firms that listed in the U.S. pre-SOX. Hence, while it may be true that many AIM firms are not Nasdaq candidates, the firms that our model identifies as bypassing the U.S. had the characteristics that U.S. bound firms possessed in the pre-SOX time period

7.4 Change in the attractiveness of the U.S. as a listing venue

The observed decline in listing frequency among these smaller firms could also be the result of a decreased attractiveness of a U.S. listing venue for reasons unrelated to SOX. To control for the attractiveness of U.S. exchanges absent the effect of the Act, we include the variable *NonExchUSList*, which is measured as the number of foreign firms listing in the U.S. via a Level I or Level IV ADR in the month of the listing decision. Because these listings are not subject to the provisions of the Act, changes in the rate of these foreign listings will act as an instrument for omitted time-varying effects influencing foreign listing decisions. As expected, we document a significant positive relation between *NonExchUSList* and the likelihood of U.S. listing; this relation indicates that as foreign firms' preferences towards a non-exchange US listing change (i.e., absent the effect of SOX), the likelihood of a U.S. exchange listing changes in the same direction. After controlling for time-series variation in these foreign listing

³² DKS (2007) find data for only 80 of the 258 AIM firms in their sample confirming our concerns that Worldscope does not cover this sample of firms adequately. They find 21 of those 80 firms are eligible to list in Nasdaq. Using more detailed hand collected data we find that 159 out of the 303 AIM firms in our sample are Nasdaq eligible.

preferences, the decreased likelihood of a NASDAQ listing versus the AIM alternative remains during the post-SOX period.

7.5 Is the documented effect due to Sarbanes-Oxley?

We document a decreased likelihood of a U.S. exchange listing among those firms choosing between a NASDAQ and AIM listing in the time period following the enactment of Sarbanes-Oxley Act. In these types of event studies, causality is difficult to infer. However, we believe the evidence is consistent with Sarbanes-Oxley having an impact on this particular set of foreign listing decisions. First, we explicitly control for other time period specific events that change the likelihood of a U.S. or U.K. exchange listing (as discussed above). These control variables have significant explanatory power in most of our models.

Second, we find that the determinants of foreign listing decisions have changed in a manner consistent with the expected incremental costs and benefits of SOX. These effects mirror the conclusions documented in research on deregistration decisions following the enactment of Sarbanes-Oxley (See Leuz, Triantis and Wang, 2006). Third, we find that the characteristics of the new firms repelled from and attracted to U.S. exchanges following SOX are consistent with the types of firms that are likely to incur the greatest cost and derive the greatest benefits respectively under the Act. Finally, the effect only exists among small firms. We are unable to document an adverse effect of Sarbanes-Oxley among other subsets of listing firms, suggesting that our models are not being confounded by a systematic, omitted cross-sectional shock. Instead, the effect is concentrated among those firms where the costs of SOX are expected, *ex ante*, to be the most onerous. Although causality is not possible to determine in this setting, all of our results are consistent with the Act having an impact among small, marginal firms. Our tests, similar to Doidge et al. (2007), are able to reject the hypothesis that Sarbanes-Oxley had an adverse impact on foreign listing activity among large foreign firms; failure to find

this result amongst the smallest, U.S. exchange-eligible foreign firms would have cast considerable doubt on this hypothesis in general.

7.6 Economic significance of the impact of SOX.

Our NASDAQ-AIM tests search for the effect of the Act in the setting where the adverse consequences of the Act are expected to be the most material. Our results confirm that expectation - we document the adverse impact of Sarbanes-Oxley among those firms that *ex ante* face the greatest costs of the Act. In contrast, among large firms eligible for a NYSE listing, we find that Sarbanes-Oxley has no effect. Given that the incremental costs of Sarbanes-Oxley are, *ex ante*, less material for these larger firms and are unlikely to subsume the expected benefits of bonding to the U.S. regime, this lack of effect is to be expected.

Our analyses show that the total market capitalization of foreign firms affected by the Act is significantly smaller than the market capitalization of those firms that are not materially affected by the Act. This finding challenges conventional wisdom that SOX adversely affects the competitiveness of U.S. exchanges; instead, the impact of the Act varies by firm type. In order to fully understand the costs and benefits of regulation, it is useful to know which sets of firms are and are not impacted by the regulation; our paper provides such balanced evidence. Ultimately, whether the loss of ninety small firms with an aggregate market capitalization of \$35 billion is economically significant to U.S. exchanges or the U.S. economy is purely subjective in nature, and the long-run economic impact from the continual loss of such small firms is an open question.³³

8. Conclusions

³³ Various commentators (for example see the report of Committee on Capital Markets Regulation) identify the higher regulatory cost to small firms as a significant concern for a few reasons. Venture capital investors are adversely affected by a loss of liquidity due to reduced exit opportunities. Moreover around 40% of employment in publicly traded companies is in firms once funded by VC investors. Higher regulatory costs drive smaller firms to non-exchange venues (such as the OTC market) with weaker disclosure requirements making it harder for smaller investors to invest in such companies.

In this paper, we examine the economic impact of the Sarbanes-Oxley Act of 2002 by examining foreign listing behavior on U.S. and U.K. stock exchanges before and after the enactment of the Act. We use a sample of all listing events on U.S. and U.K. exchanges from 1995-2006, and document that the rate of foreign listings onto U.S. exchanges relative to the U.K. benchmark has declined in the post-Act period. To examine if listing preferences have changed over time, we examine if the London Stock Exchange is attracting foreign firms in the post-Act time period that would otherwise have listed on a U.S. exchange prior to the Act.

Our analysis examines the effect of SOX after taking into account changes over time in the types of foreign firms seeking exchange listings, decline in the importance of U.S. exchanges as a listing platform, the growth of the LSE's AIM as an attractive listing option, and other contemporaneous events that may have altered foreign firms preferences for a U.S. exchange listing, including (but not limited to) scandals such as Enron, the Global Analyst Settlement and the E.U.'s mandated adoption of IFRS.

Our first result challenges the conventional wisdom that SOX adversely affected competitiveness of U.S. exchanges. Among larger firms eligible for a NYSE and Nasdaq listing and choosing between the U.S. exchanges and a London Stock Exchange Main Market listing, we find that SOX has no effect. This lack of effect is expected because the direct costs of the Act are relatively smaller for larger firms and bonding related benefits are expected to be greater for such firms, especially for those firms domiciled in countries with weaker institutions. We also find that nearly half of the post-Act decline in U.S. listings (relative to U.K. listings) can be explained by the changing attributes of foreign firms seeking listings. Thus, pre-SOX self-selection tendencies alone, when combined with the types of firms seeking foreign listing, would have predicted a material decline in U.S. listings during the post-SOX period.

However, our second result confirms the concerns of the critics of the Act. After controlling for self-selection tendencies, we find that among smaller foreign firms choosing between the NASDAQ and LSE's AIM, 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 Act period. In other words, the adverse impact of SOX is concentrated among those smaller firms that *ex ante* face the greatest costs of the Act. This is the first evidence (of which we are aware) that the Sarbanes-Oxley Act has altered the flow of foreign listings across international exchanges.

Lastly, our prediction model suggests that the set of firms most likely to have bypassed U.S. exchanges in favor of a U.K. listing following SOX are mainly composed of AIM-listed firms that are smaller, less profitable and more likely to use a lower quality auditor than foreign firms that actually listed on U.S. exchanges. Our prediction model also identifies a small set of large, profitable firms mainly from emerging markets that choose to list on U.S. exchanges following the enactment of SOX despite being predicted to list in the U.K., consistent with greater expected benefits from a U.S. listing for these firms.

Together, these characteristics coincide with the types of foreign firms that are unable (able) to absorb the Act's incremental costs or garner the smallest (largest) benefit from a U.S. listing bypassing (being drawn towards) a U.S. listing. The evidence is consistent with a change in both the expected costs and benefits of a U.S. listing following the enactment of SOX. The better separation in the type of firms listing on U.S. and U.K. exchanges is consistent with higher governance costs increasing the bonding related benefits of a U.S. listing.

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Appendix 1

Distribution of foreign listing events (June 1995 – June 2006)

| | U.S. Exchanges | | | U.K. Exchanges | | | Total |
|------------------------|----------------|-------------|--------------|----------------|-------------|--------------|-------|
| | <u>NASDAQ</u> | <u>NYSE</u> | <u>Total</u> | <u>AIM</u> | <u>Main</u> | <u>Total</u> | |
| 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 |
|------------------|----------------|-------------|--------------|----------------|-------------|--------------|-------|
| | <u>NASDAQ</u> | <u>NYSE</u> | <u>Total</u> | <u>AIM</u> | <u>Main</u> | <u>Total</u> | |
| 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. *Big5* is an indicator variable equal to one if the firm employed a high quality Big 5 auditor around the listing event. *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. *Diff_Trade* is the difference in the value of imports plus exports between the home country and the US and UK respectively, scaled by home country GDP, in the year of the foreign listing. *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_Liquidity* is the difference in share turnover between a given U.S. exchange and the London Stock Exchange in the month 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. *NonExchUSList* is the number of foreign firms that issued Level I and IV ADRs in the month of the listing.

Panel A: Descriptive statistics in the year of foreign listing

| | | All Firms | Total U.S. | NASDAQ | NYSE | Total U.K. | AIM | Main |
|---------------------|--------|-----------|------------|----------|----------|------------|--------|----------|
| MVE _t | Mean | 3,348.91 | 3,585.79 | 1,034.61 | 6,512.10 | 2,733.78 | 87.188 | 6,694.28 |
| | Median | 219.27 | 367.84 | 85.703 | 1,579.95 | 76.39 | 26.08 | 818.25 |
| Assets _t | Mean | 10,997.3 | 10,504.4 | 1,528.16 | 21,028.3 | 12,037.53 | 76.583 | 29,844.9 |
| | Median | 248.53 | 465.06 | 103.54 | 2,975.70 | 51.52 | 19.53 | 1,020.27 |
| Sales _t | Mean | 2,433.33 | 2,636.51 | 355.550 | 5,311.64 | 1,987.77 | 41.838 | 4,716.43 |
| | Median | 118.99 | 203.14 | 45.07 | 1,367.05 | 21.57 | 2.68 | 477.34 |
| ROA _t | Mean | -0.039 | -0.027 | -0.097 | 0.055 | -0.065 | -0.144 | 0.052 |
| | Median | 0.024 | 0.030 | 0.006 | 0.044 | 0.008 | -0.065 | 0.049 |
| BTM _t | Mean | 0.565 | 0.571 | 0.510 | 0.642 | 0.547 | 0.545 | 0.552 |
| | Median | 0.404 | 0.401 | 0.340 | 0.485 | 0.407 | 0.390 | 0.436 |
| Big5 | | 0.817 | 0.912 | 0.885 | 0.945 | 0.641 | 0.536 | 0.790 |
| 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 |
| Diff_Trade | | 0.256 | 0.241 | 0.192 | 0.300 | 0.287 | 0.375 | 0.161 |
| 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_Liquidity | | 2.599 | 2.817 | 4.219 | 1.110 | 2.081 | 2.762 | 1.108 |
| 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 |
| NonExchUSList | | 7.465 | 8.082 | 8.354 | 7.752 | 6.321 | 5.229 | 7.880 |

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 foreign 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.

| | Total | U.S. Exchanges | | | U.K. Exchanges | | | Percent U.S. |
|--|---------|----------------|---------|---------|----------------|---------|--------|--------------|
| | | NASDAQ | NYSE | Total | AIM | Main | Total | |
| 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
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:

$$\begin{aligned} \text{Prob(US. Listing=1)} = & \alpha + \sum_{j=1}^9 \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} + \beta_4 \text{EU} + \beta_5 \text{Emerging} \\ & + \beta_6 \text{CodeLaw} + \beta_7 \text{Socialist} + \beta_8 \text{Diff_Liquidity} + \beta_9 \text{Diff_IndexReturns} + \beta_{10} \text{Diff_P/E_Index} + \beta_{11} \text{Diff_DomesticList} \\ & + \beta_{12} \log(\text{NonExchUSList}) + \beta_{13} \text{Big5} + \beta_{14} \text{Issuance_Home} + \beta_{15} \text{Issuance_Host} + \beta_{16} \text{Diff_Trade} \\ & + \beta_{17} \log(\text{Assets}) + \beta_{18} \text{ROA} + \beta_{19} \log(1 + \text{BTM}) + \beta_{20} \text{PostSOX} + \varepsilon \end{aligned}$$

The sample consists of 1,021 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. All other variables are defined in Table 1.

| | Baseline | Controls for Domestic Listing Rates and Level I and IV ADRs |
|-----------------------------------|---------------------|---|
| Canada | 1.524 ^a | 1.356 ^a |
| Ireland | -3.713 ^a | -3.745 ^a |
| Israel | 1.857 ^a | 1.716 ^a |
| EU | 0.801 ^c | 0.534 |
| Emerging | -1.516 ^a | -1.715 ^a |
| CodeLaw | -1.109 ^a | -1.159 ^a |
| Socialist | -0.490 | -0.640 |
| Diff_Liquidity | 0.344 ^a | 0.248 ^c |
| Diff_IndexReturns | 1.038 ^c | -0.319 |
| Diff_P/E_Index | 0.585 | 0.319 |
| Diff_DomesticList | - | 0.892 ^a |
| NonExchUSList | - | 0.471 ^b |
| Big5 | 1.483 ^a | 1.596 ^a |
| Issuance_Home | -0.442 | -0.228 |
| Issuance_Host | 0.764 ^a | 0.750 ^a |
| Diff_Trade | 0.143 | 0.167 ^c |
| Log(Assets) | 0.404 ^a | 0.423 ^a |
| ROA | 0.292 | 0.299 |
| Log(1+BTM) | -0.095 | -0.031 |
| PostSOX | -1.959 ^a | -1.312 ^a |
| Industry and Geography Indicators | Included | Included |
| Chi-squared: Log Likelihood Ratio | 531.2 ^a | 577.9 ^a |
| Percent Concordant | 91.1% | 92.5% |
| Number of observations | 1,021 | 1,021 |
| (U.S. / London) | (758 / 263) | (758 / 263) |

^{a,b,c} The estimated coefficient is significantly different than zero at the one, five and ten percent level (two-tailed).

Table 4
Impact of Sarbanes-Oxley on the probability of a foreign listing on the NYSE

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

$$\begin{aligned} \text{Prob(US. Listing=1)} = & \alpha + \sum_{j=1}^9 \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} + \beta_4 \text{EU} + \beta_5 \text{Emerging} \\ & + \beta_6 \text{CodeLaw} + \beta_7 \text{Socialist} + \beta_8 \text{Diff_Liquidity} + \beta_9 \text{Diff_IndexReturns} + \beta_{10} \text{Diff_P/E_Index} + \beta_{11} \text{Diff_DomesticList} \\ & + \beta_{12} \log(\text{NonExchUSList}) + \beta_{13} \text{Big5} + \beta_{14} \text{Issuance_Home} + \beta_{15} \text{Issuance_Host} + \beta_{16} \text{Diff_Trade} \\ & + \beta_{17} \log(\text{Assets}) + \beta_{18} \text{ROA} + \beta_{19} \log(1 + \text{BTM}) + \beta_{20} \text{PostSOX} + \varepsilon \end{aligned}$$

The sample consists of all NYSE and U.K. foreign listings between June 1995 and June 2006 where the foreign firm met NYSE listing requirements in the year of listing. The dependent variable is an indicator variable equal to one if the foreign firm listed onto the NYSE; zero if the foreign firm listed onto either the LSE's Main Market or AIM. The first estimation includes all foreign firms that met NYSE listing requirements, regardless of UK exchange choice; the second estimation restricts the UK sample to the LSE Main Market. The indicator variables *Canada*, *Ireland* and *Israel* (coefficients not presented) 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. All other variables are defined in Table 1.

| | NYSE vs. All NYSE-Eligible UK Listings | NYSE vs. LSE Main Market |
|-----------------------------------|---|-----------------------------|
| EU | 0.088 | 0.364 |
| Emerging | -2.996 ^a | -2.975 ^a |
| CodeLaw | -1.515 ^a | -1.439 ^b |
| Socialist | -0.256 | -0.220 |
| Diff_Liquidity | -1.242 | 0.426 |
| Diff_IndexReturns | 3.019 | 3.816 |
| Diff_P/E_Index | -2.028 ^c | -0.001 |
| Diff_DomesticList | 0.528 ^b | 0.284 |
| NonExchUSList | -0.740 | -0.444 |
| Big5 | 0.979 ^c | 0.990 ^c |
| Issuance_Home | 0.534 | 0.465 |
| Issuance_Host | 1.233 ^a | 1.170 ^a |
| Diff_Trade | -0.218 | -0.418 |
| Log(Assets) | 0.152 | 0.125 |
| ROA | 0.854 | 1.102 |
| Log(1+BTM) | 0.613 | 0.666 |
| PostSOX | -1.246 | -0.625 |
| Industry / Geography Indicators | Included | Included |
| Chi-squared: Log Likelihood Ratio | 193.8 ^a | 181.4 ^a |
| Percent Concordant | 91.1% | 91.1% |
| Number of observations | 426 | 416 |
| (U.S. / London) | (333 / 93) | (333 / 83) |

^{a,b,c} 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 listing on the Nasdaq

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

$$\begin{aligned} \text{Prob(US. Listing}=1) = & \alpha + \sum_{j=1}^9 \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} + \beta_4 \text{EU} + \beta_5 \text{Emerging} \\ & + \beta_6 \text{CodeLaw} + \beta_7 \text{Socialist} + \beta_8 \text{Diff_Liquidity} + \beta_9 \text{Diff_IndexReturns} + \beta_{10} \text{Diff_P/E_Index} + \beta_{11} \text{Diff_DomesticList} \\ & + \beta_{12} \log(\text{NonExchUSList}) + \beta_{13} \text{Big5} + \beta_{14} \text{Issuance_Home} + \beta_{15} \text{Issuance_Host} + \beta_{16} \text{Diff_Trade} \\ & + \beta_{17} \log(\text{Assets}) + \beta_{18} \text{ROA} + \beta_{19} \log(1 + \text{BTM}) + \beta_{20} \text{PostSOX} + \varepsilon \end{aligned}$$

The sample consists of all Nasdaq and U.K. foreign listings between June 1995 and June 2006 where the foreign firm meet Nasdaq listing requirements in the year of listing. 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 LSE's Main Market or AIM. The first estimation includes all foreign firms that met Nasdaq listing requirements, regardless of UK exchange choice; the second estimation restricts the UK sample to the LSE Alternative Investment Market; the third estimation restricts the UK sample to the LSE Main Market. The indicator variables *Canada*, *Ireland* and *Israel* (coefficients not presented) 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. All other variables are defined in Table 1.

| | NASDAQ vs. All Nasdaq-Eligible UK Listings | NASDAQ vs. LSE AIM | NASDAQ vs. LSE Main Market |
|-----------------------------------|--|-----------------------|-------------------------------|
| EU | 0.016 | -2.316 | 0.857 |
| Emerging | 0.900 | 2.623 ^c | -0.596 |
| CodeLaw | -0.740 | 2.050 | -0.889 |
| Socialist | -1.436 | 11.715 | -1.079 |
| Diff_Liquidity | 1.858 ^a | -0.232 | 2.666 ^b |
| Diff_IndexReturns | -0.665 | -1.772 | 3.143 |
| Diff_P/E_Index | -0.124 | 1.212 ^b | -0.513 |
| Diff_DomesticList | 2.007 ^a | 1.338 ^a | 2.139 ^c |
| NonExchUSList | 1.231 ^a | 0.923 ^b | 2.347 |
| Big5 | 2.247 ^a | 2.146 ^a | 2.229 |
| Issuance_Home | -0.997 | -0.753 | -2.260 |
| Issuance_Host | 0.988 ^b | 0.952 ^c | 0.052 |
| Diff_Trade | 0.221 | 0.217 | 0.075 |
| Log(Assets) | 0.168 | 0.660 ^a | -1.540 |
| ROA | -0.333 | -1.031 | 0.756 |
| Log(1+BTM) | 0.191 | 0.108 | 0.173 |
| PostSOX | 1.647 | -3.994 ^a | 2.023 ^c |
| Industry / Geography Indicators | Included | Included | Included |
| Chi-squared: Log Likelihood Ratio | 667.2 ^a | 516.1 ^a | 523.8 ^a |
| Percent Concordant | 97.6% | 98.3% | 99.2% |
| Number of observations | 688 | 584 | 529 |
| (U.S. / London) | (425 / 263) | (425 / 159) | (425 / 104) |

^{a,b,c} The estimated coefficient is significantly different than zero at the one, five and ten percent level (two-tailed).

Table 6
Impact of Sarbanes-Oxley on the probability of a foreign listing conditional on raising capital in the host country

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

$$\begin{aligned} \text{Prob}(\text{U.S. Listing}=1) = & \alpha + \sum_{j=1}^9 \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} + \beta_4 \text{EU} + \beta_5 \text{Emerging} \\ & + \beta_6 \text{CodeLaw} + \beta_7 \text{Socialist} + \beta_8 \text{Diff_Liquidity} + \beta_9 \text{Diff_IndexReturns} + \beta_{10} \text{Diff_P/E_Index} + \beta_{11} \text{Diff_DomesticList} \\ & + \beta_{12} \log(\text{NonExchUSList}) + \beta_{13} \text{Big5} + \beta_{14} \text{Issuance_Home} + \beta_{15} \text{Diff_Trade} \\ & + \beta_{16} \log(\text{Assets}) + \beta_{17} \text{ROA} + \beta_{18} \log(1+\text{BTM}) + \beta_{19} \text{PostSOX} + \varepsilon \end{aligned}$$

The sample consists of 1,021 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 first (second) estimation includes all foreign firms that raise (did not raise) capital in the host market in the one month period surrounding the listing date. The indicator variables *Canada*, *Ireland* and *Israel* (coefficients not presented) 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. All other variables are defined in Table 1.

| | Equity Issuance | No Equity Issuance |
|-----------------------------------|---------------------|---------------------|
| EU | 1.207 | 0.635 |
| Emerging | -1.991 ^a | -1.784 ^a |
| CodeLaw | -0.871 | -1.767 ^a |
| Socialist | 14.508 | -2.386 ^a |
| Diff_Liquidity | 2.943 ^a | -0.052 |
| Diff_IndexReturns | 3.293 | -0.432 |
| Diff_P/E_Index | -1.842 | 0.441 |
| Diff_DomesticList | 0.771 | 1.001 ^a |
| NonExchUSList | 1.463 ^a | 0.312 |
| Big5 | 2.319 ^b | 1.276 ^a |
| Issuance_Home | 1.877 | -0.790 |
| Diff_Trade | 0.149 | 0.301 ^b |
| Log(Assets) | 1.508 ^a | 0.350 ^a |
| ROA | 1.816 | -0.165 |
| Log(1+BTM) | -0.166 | -0.080 |
| PostSOX | -2.057 ^b | -1.681 ^a |
| Industry / Geography Indicators | Included | Included |
| Chi-squared: Log Likelihood Ratio | 281.6 ^a | 389.9 ^a |
| Percent Concordant | 98.2% | 92.5 |
| Number of observations | 353 | 668 |
| (U.S. / London) | (272 / 81) | (486 / 182) |

^{a,b,c} The estimated coefficient is significantly different than zero at the one, five and ten percent level (two-tailed).

Table 7
Determinants of U.S. versus U.K. foreign listing before and after Sarbanes-Oxley

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

$$\begin{aligned} \text{Prob(US. Listing=1)} = & \alpha + \sum_{j=1}^9 \gamma_j \text{Ind}^j + \sum_{k=1}^3 \lambda_k \text{Geography}^k + \beta_1 \text{Canada} + \beta_2 \text{Ireland} + \beta_3 \text{Israel} + \beta_4 \text{EU} + \beta_5 \text{Emerging} \\ & + \beta_6 \text{CodeLaw} + \beta_7 \text{Socialist} + \beta_8 \text{Diff_Liquidity} + \beta_9 \text{Diff_IndexReturns} + \beta_{10} \text{Diff_P/E_Index} + \beta_{11} \text{Diff_DomesticList} \\ & + \beta_{12} \log(\text{NonExchUSList}) + \beta_{13} \text{Big5} + \beta_{14} \text{Issuance_Home} + \beta_{15} \text{Issuance_Host} + \beta_{16} \text{Diff_Trade} \\ & + \beta_{17} \log(\text{Assets}) + \beta_{18} \text{ROA} + \beta_{19} \log(1 + \text{BTM}) + \beta_{20} \text{PostSOX} + \varepsilon \end{aligned}$$

The sample consists of 1,021 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) | Difference PostSox - PreSox Chi-Squared (p-value) |
|-----------------------------------|--|--|---|
| Industry / Geography Indicators | Included | Included | |
| EU | 1.287 ^b | -2.090 ^c | 7.230 (0.007) |
| Emerging | -2.547 ^a | -1.718 ^b | 0.873 (0.350) |
| CodeLaw | -1.193 ^b | 0.614 | 3.073 (0.079) |
| Socialist | -0.421 | -0.127 | 0.020 (0.888) |
| Diff_Liquidity | 0.203 | 0.237 | 0.004 (0.953) |
| Diff_IndexReturns | -1.580 | 1.312 | 1.834 (0.176) |
| Diff_P/E_Index | 0.364 | 0.559 | 1.074 (0.300) |
| Diff_DomesticList | 1.275 ^a | 0.467 | 3.999 (0.046) |
| NonExchUSList | 0.125 | 0.504 ^c | 0.668 (0.414) |
| Big5 | 1.908 ^a | 1.441 ^a | 0.333 (0.564) |
| Issuance_Home | -0.075 | -1.235 | 1.501 (0.221) |
| Issuance_Host | 1.283 ^a | 0.644 | 1.278 (0.258) |
| Diff_Trade | 0.810 ^a | 0.079 | 6.487 (0.011) |
| Log(Assets) | 0.247 ^a | 0.765 ^a | 8.271 (0.004) |
| ROA | 0.655 | 0.426 | 0.038 (0.846) |
| Log(1+BTM) | -0.034 | -0.175 | 0.055 (0.816) |
| Chi-squared: Log Likelihood Ratio | 275.2 ^a | 209.1 | |
| Percent Concordant | 93.3% | 91.7% | |
| Number of observations | 703 | 318 | |
| (U.S. / London) | (610 / 93) | (148 / 170) | |

^{a,b,c} The estimated coefficient is significantly different than zero at the one, five and ten percent level (two-tailed).

Table 8
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 for the sub-sample of firms with sufficient financial data to estimate and utilize the full pre-SOX prediction model. 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 sample of 318 foreign firms with sufficient financial data. Differences in monthly listing rates are tested using a t-test of means; differences in the percent of U.S. listings are tested using a binomial test of means. Panel B presents average characteristics for foreign firms predicted to list on U.S. exchanges post-SOX, conditional on their actual exchange choice. Panel C presents average characteristics for foreign firms predicted to list on U.K. exchanges post-SOX, conditional on their actual exchange choice. All variables are defined in Table 1.

Panel A: Actual and projected U.S. listing activity using pre-SOX determinants

| | 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> |
| U.S. Listing information: | | | | | | |
| Total Foreign Listings: | 703 | 318 | - | 318 | 318 | - |
| Number of U.S. listings: | 610 | 218 | - | 218 | 148 | - |
| Number of U.K. listings: | 93 | 100 | - | 100 | 170 | - |
| Percent U.S. Listings (t-statistic) | 0.862 | 0.686 | -0.176 (-6.89) | 0.686 | 0.465 | -0.221 (-5.45) |

Panel B: Characteristics of foreign firms predicted to list on U.S exchange post-Sarbanes-Oxley partitioned by actual exchange choice

| Actual Listing: | Predicted U.S. Listing | | Specific U.K. Exchange | |
|------------------------|-------------------------------|---------------------|-------------------------------|----------|
| | U.S. Listing | U.K. Listing | AIM | Main |
| MVE | 1,283.66 | 425.15 ^a | 139.50 | 1,639.29 |
| Assets | 2,766.47 | 762.01 ^c | 108.53 | 3,414.36 |
| Sales | 865.26 | 327.33 ^b | 33.14 | 1,486.78 |
| ROA | -0.008 | -0.044 | -0.066 | 0.045 |
| BTM | 0.494 | 0.544 | 0.558 | 0.486 |
| Big5 | 0.955 | 0.826 ^a | 0.797 | 0.941 |
| Issuance_Home | 0.083 | 0.058 | 0.058 | 0.059 |
| Issuance_Host | 0.470 | 0.430 | 0.420 | 0.471 |
| Diff_Trade | 1.028 | 0.887 | 0.857 | 1.008 |
| CommonLaw | 0.795 | 0.779 | 0.855 | 0.471 |
| CodeLaw | 0.159 | 0.186 | 0.145 | 0.353 |
| Emerging | 0.606 | 0.384 ^a | 0.333 | 0.588 |
| Number of listings: | 132 | 86 | 69 | 17 |

^{a,b,c} The difference in mean characteristic between firms that listed on the predicted exchange and those firms that did not is significantly different than zero at the one, five and ten percent level using a two-tailed t-test of means.

Table 8
Trends in listing behavior given the historical determinants of exchange listing choice

Panel C: Characteristics of foreign firms predicted to list on U.K exchange post-Sarbanes-Oxley partitioned by actual exchange choice

| Actual Listing: | Predicted U.K. Listing | | Specific U.S. Exchange | |
|---------------------|------------------------|-----------------------|------------------------|-----------|
| | U.K. Listing | U.S. Listing | NASDAQ | NYSE |
| MVE | 549.24 | 1,537.35 ^c | 238.17 | 3,022.13 |
| Assets | 503.64 | 8,136.26 ^a | 343.34 | 18,155.73 |
| Sales | 402.56 | 1,728.23 ^b | 258.75 | 3,617.56 |
| ROA | -0.140 | 0.114 ^b | 0.122 | 0.103 |
| BTM | 0.566 | 0.471 | 0.464 | 0.480 |
| Big5 | 0.393 | 0.750 ^a | 0.777 | 0.714 |
| Issuance_Home | 0.107 | 0.063 | 0.111 | 0.000 |
| Issuance_Host | 0.298 | 0.313 | 0.444 | 0.143 |
| Diff_Trade | -0.220 | 0.117 ^c | 0.167 | 0.052 |
| CommonLaw | 0.857 | 0.438 ^a | 0.444 | 0.429 |
| CodeLaw | 0.119 | 0.438 ^a | 0.556 | 0.286 |
| Emerging | 0.381 | 0.938 ^a | 1.000 | 0.857 |
| Number of listings: | 84 | 16 | 9 | 7 |

^{a,b,c} The difference in mean characteristic between firms that listed on the predicted exchange and those firms that did not is significantly different than zero at the one, five and ten percent level using a two-tailed t-test of means.