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Has New York Become Less Competitive in Global Markets? Evaluating Foreign Listing Choices over Time

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Abstract

We study the determinants and consequences of cross-listings on the New York and London stock exchanges from 1990 to 2005. This investigation enables us to evaluate the relative benefits of New York and London exchange listings and to assess whether these relative benefits have changed over time, perhaps as a result of the passage of the Sarbanes-Oxley Act of Congress (SOX) in 2002. We find that cross-listings have been falling on U.S. exchanges as well as on the Main Market in London. This decline in cross-listings is explained by changes in firm characteristics rather than by changes in the benefits of cross-listing. We show that, after controlling for firm characteristics, there is no deficit in cross-listing counts on U.S. exchanges related to SOX. Investigating the valuation differential between listed and nonlisted firms (the "cross-listing premium") from 1990 to 2005, we find that there is a significant premium for U.S. exchange listings every year, that the premium has not fallen significantly in recent years, that it persists when allowing for unobservable firm characteristics, and that there is a permanent premium in event time. In contrast, there is no premium for listings on London's Main Market for any year. Crosslisting in the U.S. leads firms to increase their capital-raising activity at home and abroad while a London listing has no such impact. Our evidence is consistent with the theory that an exchange listing in New York has unique governance benefits for foreign firms. These benefits have not been seriously eroded by SOX and cannot be replicated through a London listing.

Keywords: cross-listing, exchange listing, Sarbanes-Oxley Act, SOX, London stock exchange, New York stock exchange.

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1. Introduction

In 1998, the major New York exchanges, the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), and NASDAQ, collectively attracted 31% of all the foreign listings in the world, the London Stock Exchange's (LSE) Main Market and Alternative Investment Market (AIM) had 16%, and no other exchange had more than 7%.[1] In recent years, London's market share of foreign listings has increased while the market share of the U.S. has fallen. It is now almost conventional wisdom in policy circles and in the financial press that London has become more competitive in attracting foreign listings than New York.[2] In this paper, we investigate how and why the flow of listings on the New York and London stock exchanges has evolved as it has and whether one should infer from this evolution that foreign corporations now find a New York exchange listing less attractive.

A popular explanation for the decrease in foreign listings on the exchanges in New York is that the passage of the Sarbanes-Oxley (SOX) Act of Congress in 2002 has made U.S. listings significantly less attractive to foreign companies – so much so, it is argued, that many listed firms would delist and deregister if it were easy to do so.[3] The argument is that SOX makes a U.S. listing less advantageous because it imposes severe costs on companies and their managers, especially through the compliance requirements of Section 404, which aims to reduce the market impact of accounting "errors" from fraud, inadvertent misstatements, or omissions, by assuring effective management controls over reporting, and which, in turn, creates significant legal exposures for companies as well as for executives.

A number of observers have taken the view that a decrease in the flow of new listings in New York and an increase in the flow of new listings in London is, in and of itself, evidence that New York has

[1] Technically, the listings of foreign firms are cross-listings of their existing shares in home markets. It has become common to refer to listings by foreign firms as foreign listings. In this paper, we use the term "foreign listing" to denote a cross-listing of the home-market shares of a firm in a market abroad.

[2] See, for example, the Interim Report of the Committee on Capital Market Regulation (November 30, 2006) and several related news reports, such as "London calling" *Forbes* (May 8, 2006); "Wall Street: What went wrong?" *The Economist* (November 25, 2006); "Is a U.S. listing worth the effort?" *Wall Street Journal* (November 28, 2006); "Is Wall Street losing its competitive edge?" *Wall Street Journal* (December 2, 2006); and "In call to deregulate business, a global twist" *Wall Street Journal* (January 26, 2007).

[3] See, among others, Berger, Li, and Wong (2005), Chaplinsky and Ramchand (2007), Hostak, Lys, and Yang (2006), Li (2006), Litvak (2007a, 2007b), Marosi and Massoud (2006), Piotroski and Srinivasan (2007), Smith (2006), Witmer (2006), Woo (2006), and Zingales (2007).

become less attractive.[4] A listing has both costs and benefits. If all firms for which it is advantageous to list in New York are already listed there and nothing else changes, we would not expect new listings in New York. In this case, this dearth of new listings in New York would not be evidence that New York has become less competitive. It would just be evidence that all firms that can benefit from a New York listing already have one. For the purpose of our analysis, we regard New York as having become less competitive if it no longer attracts listings it would have attracted in the past – say, for example, during the 1990s.

A London listing is not the same as a New York listing; each listing location offers a unique bundle of attributes. For a firm to choose to cross-list when it was not cross-listed before, the attractiveness of a listing must have changed. The attractiveness of a listing to a firm can change because the bundle of attributes of the listing location has changed or because the firm itself changed so that a different bundle of attributes has become more attractive. Consequently, London listings could have become more attractive even if the bundle of attributes of a listing in New York did not change. After all, changes in firm characteristics may have rendered London listings more valuable for firms that did not yet have a listing. To use an analogy, an increase in Nice's market share of the tourism market compared to St. Moritz's does not necessarily mean that St. Moritz has become less competitive – it could just mean that the season has changed. Similarly, it could be that the firms that did not list in the U.S. in the 1990s have characteristics that now make a London listing advantageous compared to a U.S. listing. Such an outcome could be possible even if the New York exchanges are as competitive as ever in attracting listings from the types of firms that found these listings valuable in the 1990s.

As reviewed in Karolyi (2006), there are many benefits to listing. In particular, through cross-listing, firms can access new investors, can have their stock traded on a more efficient market, can overcome

[4] The CEOs of both the NYSE and NASDAQ have also voiced their concerns about the costs that foreign companies have to bear to comply with SOX and the implications of these costs for the flow of listings. See articles by John Thain, "The price of Sarbanes-Oxley", *Wall Street Journal* (May 27, 2004) and by Bob Greifeld, "It's time to pull up our SOX", *Wall Street Journal* (March 6, 2006). See also "Taking their business elsewhere: Foreign companies are spurning U.S. exchanges" *BusinessWeek* (May 22, 2006).

barriers to international investment, and so on. However, much of the recent literature on cross-listings has emphasized the governance benefit of cross-listing on a major U.S. exchange. By the term "governance benefit," we mean the fact that firms that list on a U.S. exchange benefit from opting into the U.S. regulatory environment, which includes securities laws and regulations, regulatory oversight and enforcement by the Securities and Exchange Commission (SEC), and monitoring by "gatekeepers" such as analysts and institutional investors. We focus on this benefit because it crucially distinguishes among different types of listings and because the benefit of listing that most financial economists focused on in the past – namely, overcoming barriers to international investments – is losing its relevance in an increasingly global financial marketplace.[5]

The typical foreign firm has a controlling shareholder and comes from a country where controlling shareholders have more of an opportunity to make themselves better off at the expense of minority shareholders compared to the U.S. There is a governance benefit from cross-listing on a U.S. exchange because listing reduces controlling shareholders' ability to extract private benefits from the corporations they control (see, e.g., Doidge, 2004, for empirical evidence). Some controlling shareholders are willing to bear the cost of better governance because it enables them to raise capital on better terms to fund their firm's growth opportunities. Consequently, controlling shareholders trade off the cost of cross-listing, defined by the improved governance systems which reduce their private benefits, against the benefit of cross-listing, captured by their ability to fund growth opportunities on better terms. Only firms for which the benefit more than offsets the cost will list in the U.S. As a result, U.S. cross-listed firms are worth more because they have better growth opportunities and better governance – we use the short-hand of "cross-listing premium" to denote the greater value of U.S. cross-listed firms (Doidge, Karolyi, and Stulz, 2004). It will always be the case that many firms will choose not to list in the U.S. as long as, by not

[5] The bonding hypothesis, originally proposed by Coffee (1999, 2002) and Stulz (1999), predicts that, after listing on a U.S. stock exchange, foreign firms become subject to more stringent investor protections and it becomes more difficult for insiders to expropriate from minority shareholders. Benos and Weisbach (2004) and Karolyi (2006) provide comprehensive surveys of the cross-listing literature and, in particular, of the emergence of corporate governance explanations of the cross-listing phenomenon.

doing so, controlling shareholders have more freedom to run their corporations to benefit themselves at the expense of minority shareholders.

For a listing on a U.S. exchange to have become less attractive, it has to be that the net benefit from such a listing for a firm with given characteristics has fallen. The net benefit from a listing on a U.S. exchange that is relevant for the listing decision is the gain made by the controlling shareholder of a corporation from listing in New York rather than listing in London or not listing at all. If the costs for the controlling shareholder of a U.S. exchange cross-listing rise or if the benefits fall, there will be fewer new listings and the value of firms with listings will fall relative to the value of firms without listings.

To examine if cross-listings on the major exchanges in New York have become less attractive, we first evaluate aggregate evidence on the market share of foreign listings in New York and London. Strikingly, the market share of the NYSE, AMEX, and NASDAQ increased from 1998 to 2005 relative to the market share of the LSE's Main Market. However, once the LSE's Alternative Investment Market is taken into account, the picture changes and London's market share increased relative to New York's. Though the number of foreign listings in New York and on London's Main Market has fallen in recent years, the total number of foreign listings in London has increased because of the increase in foreign listings on AIM. The number of listings on AIM has increased most dramatically in recent years: foreign listing counts increased from only 2 within one year of its launch in 1995 to 220 at the end of 2005.

We show that, though the success of AIM is impressive, it is critical to understand that the typical firm that lists on AIM is a small firm that would not have listed on a U.S. exchange, either in the 1990s or in more recent years. Consequently, it is simply wrong to interpret the success of AIM and the resulting growth in market share of London as evidence of a decline in the attractiveness of U.S. exchanges. However, U.S. exchanges could have become less attractive because they no longer attract new listings that they would have attracted in the 1990s. We therefore examine next whether a firm with given characteristics is less likely to list on a major exchange in New York now than it would have been in the 1990s. We find little evidence to support such a conclusion. In particular, we find that firm attributes that

affect the listing decision are mostly the same now as they were then. Further, we find that the number of listed firms is not smaller than that we would have expected based on how firms made the choice to cross-list in the pre-SOX period before 2002.

If New York has become less attractive, we would expect the cross-listing premium to decrease, everything else remaining constant. We investigate this hypothesis in several steps. We first estimate the listing premium on U.S. exchanges every year from 1990 to 2005. Not only is this premium significantly positive every year, there is no convincing evidence in our data that it has fallen in recent years. Next, we test and confirm that there is no evidence that the listing premium in New York decreased relative to the listing premium in London. In fact, we show that there is no listing premium in London over the 1990 to 2005 period. Consequently, firms that list in London do so for reasons other than for a governance benefit. Our conclusions on the listing premium hold using several different estimation approaches, including an approach that allows for unobservable firm characteristics to influence the valuation of firms. Thus, the listing premium in our approach does not inadvertently proxy for such characteristics. Finally, we show that the listing premium on U.S. exchanges has a permanent component.

It is surprising that we find no evidence of a cross-listing premium in London, but this result is fully consistent with our evidence on the actions of firms following a listing. Earlier work by Reese and Weisbach (2002) shows that, following a U.S. cross-listing, firms raise more funds, both in their home market and abroad, than firms without such a listing because investors believe that they are better protected when investing in such firms. We build on the work of these authors by investigating the security-issuance behavior of firms cross-listed in New York compared to firms cross-listed in London. We provide evidence that firms listed in New York raise more funds after the listing (including in the home, U.S., and other markets) than firms that list in London, so that there is more evidence of a benefit of listing for firms that list in New York than for firms that list in London.

The paper proceeds as follows. In Section 2, we introduce our data and show the evolution of the number of listings over time across types of listings in New York and London. We compare the

characteristics of new cross-listings in New York and London in Section 3. We then examine in Section 4 the determinants of the listing decision in New York and London and investigate whether there are fewer New York listings in recent years than we would expect given how firms made their listing decision in the 1990s. In Section 5, we report evidence on the listing premium over time across types of listings. In Section 6, we show the capital raising activities of firms before and after listings in New York and London. We conclude in Section 7.

2. The evolution of cross-listings in New York and London over time

Before we commence with a detailed examination of the cross-listing flows in New York and London over time, it is useful first to show the importance of New York and London in the world of cross-listings with data from the World Federation of Stock Exchanges (WFE). These data rely on reports from member exchanges of the Federation and include companies which have shares listed on a specific exchange, excluding investment funds and unit trusts. Companies with multiple classes of shares are counted once. The Federation reports separately data for major exchanges, for markets specifically designed for small and medium sized enterprises (such as London's AIM), and other markets (such as affiliated and correspondent exchanges that are not members).

Figure 1 shows that New York and London have attracted the lion's share of foreign listings during the past decade relative to the other exchanges that are members of the Federation. In 1998 (Figure 1a), the LSE's 466 foreign listings together with AIM's 21 listings constituted 16% of the 2,978 foreign listings around the world, and those on the three major exchanges in New York totaled 894, or 30% of the total. The next three largest exchanges in terms of the global market share of foreign listings in 1998 were the Luxembourg exchange (7%), Deutsche Börse (7%), and the Swiss Exchange (6%). By 2005, London's Main Market and AIM increased their global market share to 19% thanks to the growth of AIM (220 listings, or 8% global market share). The New York-based exchanges together maintained their 30% market share (884 listings out of the 2,929 globally). Both the Deutsche Börse and the Swiss Exchange

lost market share (4%) and, though Euronext (a consolidation of the former Paris, Amsterdam, Brussels, and Lisbon bourses) emerged as the next largest with a 10% global market share, its market share was actually lower than what it would have been in 1998 (15%).[6]

Figure 1b shows that, by 2005, the AMEX, NASDAQ, and NYSE had increased their market share relative to London's Main Market. In 1998, the New York exchanges had 92% more foreign listings than London. But, by 2005, the New York exchanges had 165% more foreign listings than London's Main Market. However, when we include the foreign listing counts on AIM in addition to the LSE's Main Market, the NYSE, AMEX and NASDAQ had only 60% more foreign listings than London in 2005. The growth of the share of foreign listings in London is fully due to a dramatic increase in AIM listings that offsets a decrease in foreign listings on London's Main Market. Over the period from 1998 to 2005, the Main Market's foreign listings dropped from 466 to 334, while those on AIM jumped from 4 to 220.

The data from the WFE cannot be used to assess whether London's increased market share relative to New York's implies that New York is now less attractive. The WFE provides aggregate data only, which makes it impossible to track the characteristics of listed firms by type of listing and to evaluate the success of New York and London in attracting new listings and retaining existing listings. It could be then that London was more successful in attracting new listings on the Main Market than were the exchanges in New York, but this increased competitiveness of London is not discernible with aggregate data on listing counts. The WFE data also ignores foreign listings that do not take place on the exchanges but are important in the U.S.: namely, SEC Rule 144a private placements and OTC listings. For our analysis, it is therefore necessary for us to construct a database that tracks listings at the firm-level and distinctly by listing type. Before we turn to the construction of that database, however, we review the types of listings available in New York and in London and the implications of these types of listings for corporate governance.

[6] Of course, this decline may be over-estimated because the sum of foreign listings of the Paris, Brussels, Amsterdam, and Lisbon stock exchanges in 1998 ignores double-counting of cross-listings among the four exchanges, which would not have been included in the 2005 Euronext count.

2.1. Regulatory and listing requirements for foreign listings in New York and London

To understand the corporate governance and regulatory implications of listing in New York and London, it is important to make a distinction between listing rules required by the exchanges, the laws and regulations that listed firms must satisfy, and, most importantly, the specific combination of listing rules, laws, and regulations that apply to foreign listed firms.

Firms that list in the U.S. via SEC Rule 144a or in the OTC market are exempt from SEC registration and many disclosure requirements and therefore face very few additional obligations when they list.[7] In contrast, foreign firms that list on U.S. exchanges, such as the NYSE and NASDAQ, have to register with the SEC and become subject to U.S. securities laws. These laws not only increase disclosure and financial reporting requirements (e.g. reconciliation of financial accounts with U.S. GAAP and other disclosures), but also reduce agency costs and restrain controlling shareholders by imposing substantive obligations on them.[8] Since 2002, foreign firms listed on U.S. exchanges have been subject to some of the provisions of the Sarbanes-Oxley Act.[9] In addition to the SEC's requirements, foreign firms also have to satisfy the listing requirements and governance standards of the individual exchanges, although the exchanges can waive some of the governance standards on a case-by-case basis. In general, whether they list on the NYSE or NASDAQ, firms are subject to SEC oversight, they are exposed to class action lawsuits, and face additional monitoring by market participants, such as analysts and institutional investors. The bottom

[7] We include in OTC listings both Pink Sheet and OTC Bulletin Board issues. Prior to April 1, 1998, foreign equities and ADRs did not need to be registered with the SEC under Section 12 of the Exchange Act to be quoted on the OTC Bulletin Board (operated by NASDAQ). After 1998, unregistered securities were no longer eligible for quotation on the OTCBB. Most unregistered foreign issuers were removed from the OTCBB and moved to the National Quotation Bureau's Pink Sheets.

[8] Because the regulatory and listing requirements for U.S. listings have been discussed extensively in the literature, our discussion of these requirements does not detail all of the specific rules. We refer readers to papers by Coffee (1999, 2002, 2007), and Greene, Beller, Rosen, Silverman, Braverman, and Sperber (2000) for a more complete discussion.

[9] Actually, registered foreign companies initially were expected to comply with the internal control reporting provisions of Section 404 in connection with their fiscal years ending on or after June 15, 2004. On February 24, 2004, the SEC, in recognizing the importance of these provisions and the time needed to implement them properly, extended these compliance dates to fiscal years ending July 15, 2005. The deadlines were extended a second time on March 2, 2005 and a third time on September 22, 2005 for fiscal years ending July 15, 2007. See SEC Release No. 33-8618 (Sept. 22, 2005) [70 FR 56825] at www.sec.gov.

line is that controlling shareholders of foreign firms that list on a U.S. exchange face more constraints and obligations than controlling shareholders of similar firms that are not listed.

In London, firms can list on the Main Market as a Depositary Receipt (DR) or ordinary issue or they can list on the Alternative Investment Market. There are different requirements for each listing type.[10] Firms that list as ordinary issues must be admitted to listing by the U.K. Listing Authority (UKLA), part of the Financial Services Authority (FSA), and then be admitted to trading by the LSE. Most foreign firms that list as ordinary issues in London seek a "secondary" listing (the "primary listing" being the home market – foreign firms typically do not incorporate in the U.K.). In general, the provisions of the UKLA's listing rules that seek to protect minority investors do not apply to foreign firms with a secondary listing (Coffee, 2007).[11] For example, the Combined Code on Corporate Governance applies only to companies incorporated in the U.K., which means that firms with foreign listings are not required to comply with the code.[12] Moreover, these firms are not required to explain why they have chosen not to comply. The main requirement for firms with ordinary listings on the Main Market is to file financial information prepared in accordance with U.K. or U.S. GAAP or International Accounting Standards (IAS), although exceptions are made to this requirement in some cases. For example, the UKLA will accept local accounting standards from Japanese firms. The requirements for firms that list on the Main

[10] See "Listing in London: Listing depositary receipts" (2000, 2003); "Listing in London: Listing shares" (2000), "How to Join the London Markets" (2001); "A guide for Japanese companies listing on the London Stock Exchange" (2003); "London Stock Exchange Admission and Disclosure Standards" (2005); and "Joining AIM: A Professional Handbook" (2005), all published by the London Stock Exchange. Additional details on the listing and reporting requirements of the U.K. Listing Authority can be found in the "Index to Listing, Disclosure and Prospectus Rules" (particularly LR 18.1 – 18.4 and 19.1 – 19.3) at the U.K. Financial Services Agency website (http://fsahandbook.info/FSA/html/handbook/D85).

[11] See MacNeil and Lau (2001) for further details on listing requirements. They conclude that the considerable exceptions from the listing rules made for foreign firms suggests a deliberate policy of competing for foreign listings and that bonding is not the main explanation for London's success in attracting foreign listings.

[12] The Cadbury Report, published in 1992 included a "Code of Best Practice". In 1998, the Hampel Report led to the publication of the Combined Code of Corporate Governance ("Combined Code"). The Combined Code, which is annexed to the UKLA's listing rules, contains two sections, "Principals of good governance" and "Code of best practice." In 2003, the code was further revised.

Market via DRs are less demanding than those for ordinary listings in that financial information need not be prepared in accordance with IAS, U.K., or U.S. GAAP.[13]

Firms listing in London can also choose to list on AIM. AIM was established by the LSE in 1995 as a junior market to provide capital for small, fast growing firms. It is well-known that listing requirements on AIM are minimal – there is no prior trading requirement, prior shareholder approval for transactions is not required, admission documents are not pre-vetted by the exchange or by the UKLA, there is no minimum market capitalization, and there is no minimum public float requirement. In fact, all that is required for a firm to be admitted to AIM is that it has the support of a nominated advisor ("Nomad") and subsequently the firm has to satisfy only the exchange's weak disclosure obligation. AIM rules impose a "general duty of disclosure requiring information which it (the issuer) reasonably considers necessary to enable investors to form a full understanding of the financial position of the applicant."

Although there is a common belief that listing in London provides a certain level of good governance, firms with foreign listings in London generally need only comply with the governance rules of their home country. That is, firms with foreign listings in London are subject to a "light touch" approach to regulation. Recently, institutional investors expressed concerns to the FSA about the governance standards of foreign firms listing in the U.K. In April 2007, the FSA announced a plan to review the rules which apply to foreign listings and to consider stricter rules for foreign listings on the LSE.[14]

2.2. Data sources on foreign listings in New York and London

To conduct our study, we construct a dataset that contains information on firms' listing decisions, firm characteristics, as well as home country characteristics. Our first step is to construct a list of firms that have foreign listings in the U.S. or in the U.K. for the end of each year from 1990 through 2005. Firms can cross-list in the U.S. by means of a Rule 144a private placement, an OTC listing as Bulletin

[13] Most firms issue Global Depositary Receipts (GDRs), which cannot be traded by ordinary retail investors. Recently, the LSE introduced Retail Depositary Receipts (RDRs). Because these can be traded by all investors, the listing requirements are more stringent and are similar to those for ordinary issues. To date, few firms have chosen to list RDRs.

[14] See "Firms list in UK to avoid tough US standards" *Reuters News* (February 3, 2006); "FSA to act on foreign IPO concerns" *FT.com,* (April 5, 2007); and "Regulator to review London listings for foreign firms" *The Guardian* (April 5, 2007).

Board (OTCBB) or Pink Sheet issues, or on the AMEX, NASDAQ, or NYSE. We keep track of listings on U.S. exchanges that are created as direct listings, New York Registered Shares, or as Level II or Level III (capital raising) ADR programs. Firms can cross-list in the U.K. on the Main Market via depositary receipts or an ordinary listing. Starting in 1995, firms could also choose to list on AIM.

Information on foreign listings comes from a variety of sources, including the Bank of New York, Citibank, JP Morgan, the NYSE, NASDAQ, the London Stock Exchange, the OTCBB, end-of-year editions of the National Quotation Bureau's Pink Sheets, the Center for Research on Security Prices (CRSP), firms' annual reports, SEC Form 20-F filings, and Factiva searches. Information from the various datasets is manually cross-checked and verified. The data provided by Citibank and CRSP allows us to keep track of both active and inactive issues for U.S. listings, which mitigates concerns about survivorship bias. However, a limitation of the data provided by the London Stock Exchange is that the earliest information on Main Market listings we are able to obtain is from 1997. Further, that list contains only firms that were listed as of 1997. As such, we are unable to verify that we have the complete list of U.K. listings prior to that year. Our list in 1997 and later years is complete, however.

In addition to listing dates, we also keep track of changes in firms' foreign listing status, either through upgrades, downgrades, or delistings. If a firm upgrades from a Rule 144a private placement or OTC listing to a U.S. exchange listing, the upgrade is counted as a new U.S. exchange listing and as a delisting from the Rule 144a or OTC markets. Firms that change their listing location are assigned to a listing type according to their status as of December 31 of the year, regardless of when the change took place during the year. Firms' foreign listings are frequently terminated and we keep track of the dates on which a firm delists. For firms that delist from a U.S. stock exchange or from an ordinary listing in the U.K., we also record the reason for delisting. A delisting is classified as "voluntary" if a firm is in compliance with an exchange's listing standards and voluntarily takes steps to delist its shares or depositary receipts. Firms are also delisted when they are acquired and these cases are classified as a "merger/acquisition." The final category is "other." This includes cases where firms are delisted when

they fail to meet their exchange's listing requirements, when firms are bankrupt, in financial distress, or are undergoing some kind of restructuring or liquidation.

2.3. The time-series of listings: levels and flows

Table 1 provides summary statistics for the total number of cross-listings from 1990 to 2005 in the U.S. (separately by Rule 144a, OTC, and exchange listings) and in the U.K. (separately by AIM, DRs, and ordinary shares).[15] The number of exchange listings in the U.S. peaks in 2000 at 960. The number of exchange listings increases each year before the peak and falls in all years afterwards except 2004. By 2005, the number of listings had fallen by 94 from its peak, standing at 866. The number of OTC listings peaks in 2002 at 993. Though the number of OTC listings increases monotonically from 1990 to 2002, it falls by 98 listings in 2003 and then stays close to that number until 2005. Finally, the number of Rule 144a issues reached its peak of 312 in 2005, but there is little variation in the number of Rule 144a issues from 1999 to 2005.[16] In the U.K., there has been a steady decline in DR and ordinary listing counts since 1997 from a peak of 491 to only 327 in 2005. AIM listings jumped dramatically in 2004 and 2005 to 242 following a slow, steady increase over the 1995 to 2003 period. So, foreign listing counts have been steadily decreasing on the major exchanges in New York since 2001 and the Main Market in London since 1998. The listing counts on the Rule 144a and OTC markets in the U.S. have held steady and those on AIM in London have been increasing, especially in 2004 and 2005.

Table 2 presents the *flows* of new listings and delistings that correspond to the listing counts in Table 1. These data are again reported by year for New York and London and by type of listing. The biggest

[15] The exchange listing counts are almost identical to those reported in the WFE statistics (the Rule 144a and OTC counts are not reported by WFE). The LSE Main Market counts are very similar to those reported by the Exchange to WFE, although the differences widen for 1995. As noted earlier, we were unable to obtain annual listing counts directly from the LSE prior to 1997.

[16] There are challenges in precisely measuring the size of the 144a market. Some data sources, such as Dealogic used in Zingales (2007, his Figure 4) report that the size of the market is much larger than what we report. For example, in 2005, Dealogic lists 186 Rule 144a issuances constituting $82 billion in new capital raised. Our count is only 25 which represent less than $10 billion in new capital raised (according to Citibank's Universal Issuance Guide, http://wwss.citissb.com/adr/www/brokers/index.htm). One potential explanation for this discrepancy is that some firms that raise capital in their home markets may apply to the NASD, which oversees the PORTAL market where Rule 144a issues trade, for the right to a private resale to qualified institutional buyers on PORTAL, but they may not exercise it at the time of the issue. One source may count it as capital raised via this market, others may not.

years on record for new listings on U.S. exchanges were 2000 (164), which coincides with the peak foreign listing count, as well as 1996 and 1997. The new listings have slowed since 2000. Interestingly, the pace of delistings rose from a level that averaged 25% of new foreign listings to 50% between 1998 and 2000, and, finally, to a level over 100% of new foreign listings after 2001. New foreign listings on the OTC market peaked in 2001 (205 in total) and in only one year (2003) has the pace of OTC foreign delistings exceeded that of new listings. Similarly, there have been only two years (2001-2002) in which foreign delistings from the Rule 144a market have exceeded those of new listings, but the delisting rate has distinctly risen since 1999. The annual rates of new foreign listings in London on the Main Market have slowed since 1996 for DRs and since 2000 for ordinary shares. Like the New York exchange listings, the pace of delistings in London has increased since 1999 to the point where the delisting rate exceeds (and often more than doubles) the rate of new listings in each year. The AIM market represents a distinct exception with few delistings relative to the high rate of new listings.

Table 3 breaks out the cumulative count of new listings over the period from 1990 to 2005 by country. Canadian and U.K firms dominate the new OTC and exchange listings in New York. Together, they comprise 28% and 10%, respectively. India, Taiwan, Mexico, and South Korea have the greatest number of listings on the Rule 144a market. For ordinary listings on the LSE's Main Market, Irish firms are well represented (58 firms), as well as those from Canada, Japan, and the United States.[17] As noted by Salva (2003), firms from developed countries are more likely to have an ordinary listing, while firms from emerging markets, such as India, Poland, South Korea, and Taiwan, dominate the DR market. Finally, Australian, Canadian, Irish, and U.S. firms dominate the AIM sample of new listings, constituting together over 61% of the total.

Most delistings on the exchanges in New York and London over the 1990 to 2005 period are due to either mergers/acquisitions or for other reasons such as distress, restructuring, or failure to comply with

[17] There are also a substantial number of ordinary listings from tax-haven countries such as Bermuda and the Cayman Islands. The raw data on foreign listings provided by the LSE contains investment funds and trusts and we include these in our listing counts. These mainly affect the listing counts from tax-haven countries, such as the Cayman Islands, where almost all of the foreign listings are funds or trusts.

the exchange's listing standards. Table 4 presents the annual delisting flows for exchange listings in New York and for ordinary listings in London separately for voluntary, merger/acquisition, and other reasons. Overall, voluntary delistings represented only 13% (95 of 726 total delistings) in New York and 33% (105 of 317 total delistings) in London.[18] If we include delistings by firms with DRs in London, the count of voluntary delistings in London is even higher. It is noteworthy that the rise in delisting activity since 2000 has been mostly voluntary in nature. But, the salient fact is that the increase in annual delisting activity in recent years, measured as a fraction of the respective total number of outstanding foreign listings, has been somewhat greater in London than in New York (around 2% per year in New York and around 4% per year in London).

What, then, can we learn from this analysis of listing counts and flows about the competitiveness of New York's markets relative to London? Foreign listings increased sharply in both markets in the 1990s, but, after 2000, the numbers fell on the main exchanges both in London and in New York, as well as on the OTC market in the U.S. The shift resulted from both a decrease in the number of new listings and an increase in the number of voluntary delistings. In comparing the magnitudes of the new listings and delistings in both markets, there is no evidence that New York is losing market share of foreign cross-listings to London. The growth and pace of the AIM market in the past decade, however, tilts the market share toward London. At first glance, the firms that are attracted to AIM appear to be those that are also attracted to the major exchanges in New York and London, at least in terms of their home markets. But, in order to judge the success of AIM as evidence of a potential decline in U.S. market competitiveness, we need to understand whether the typical firm that lists on AIM has similar characteristics to a firm that

[18] Classification of voluntary and involuntary delistings can be complex. For example, our count of 95 voluntary delistings from U.S. exchanges risks overstating the number of "true" voluntary delistings. Many delisting firms are often close to financial distress so that what appears to be a firm's choice may, in fact, simply be a pre-emptive action of an inevitable involuntary delisting by the exchange. We identify 14 (out of 95) cases, where the delisting is announced as voluntary, but coincides with financial difficulties, cost-cutting, or restructuring programs. For example, Germany's Lion Bioscience delisted its ADRs from NASDAQ on December 22, 2004 at the same time when it forecasted operating losses, announced management changes, reductions in staff by half, and a major board restructuring. The U.K.'s Mid-States PLC simultaneously announced in July 1997 lower profits, restructured cash-management activity, and cost-cutting programs, including a delisting from NASDAQ. Chaplinsky and Ramchand (2007) use a conservative classification approach and uncover only 48 voluntary delistings from U.S. exchanges over the 1961-2004 period.

would have listed on a U.S. exchange in the 1990s. One of the goals of the next section is to answer this question.

3. The characteristics of foreign listings in New York and London over time

If New York has become less competitive, some firms that would have listed in New York in the 1990s would not do so today. Consequently, we would expect the characteristics of firms that list to be different in recent years than they were in the 1990s. Previous research has established that larger, more profitable, and faster-growing firms from countries with better-developed financial and legal institutions and economies are more likely to pursue U.S. listings, in the first place, and to do so on major exchanges rather than OTC or Rule 144a private placements, as predicted by theory (Reese and Weisbach, 2002; Pagano, Roell, and Zechner, 2002; Doidge, Karolyi, and Stulz, 2004). Less is known about the attributes of firms that pursue U.K. listings (Baker, Nofsinger, and Weaver, 2002; Salva, 2003). In this section, we investigate whether the characteristics of listing firms have changed over time and how these characteristics differ between firms that list in London versus those that list in New York. We also divide our sample into listings that took place before the end of 2001 and listings that were made after that year. During the first subperiod, listing counts on U.S. exchanges increase and then reach a plateau. In the second subperiod, delistings outpace new listings both in New York and in London (from Table 1, there are 960 listed firms on U.S. exchanges in 2000 and 950 in 2001). The choice of subperiod also corresponds roughly to a pre-SOX and a post-SOX period.

Our data source for firm characteristics such as Tobin's q, sales growth, total assets, ownership, leverage, and SIC (Standard Industrial Classification) codes is Thomson Financial's Worldscope database. Therefore, we match our sample of foreign listings to Worldscope. Worldscope covers companies in more than 50 developed and emerging markets, representing more than 96 percent of the market value of the world's publicly traded companies. Although the Worldscope database provides the broadest available coverage of international companies, not all firms in our lists are covered by

Worldscope and many of the smaller countries listed in Table 3 (e.g., the Bahamas, Bahrain, Barbados, among others) are not covered at all.

Following the literature, we use Tobin's *q* as our valuation measure and compute it as follows. For the numerator, we take the book value of total assets, subtract the book value of equity, and add the market value of equity. For the denominator, we use the book value of total assets. All variables are in local currency, although it makes no difference if we use local currency or U.S. dollars since the numerator and denominator are denominated in the same currency. Sales growth is measured as the two-year geometric average of annual inflation-adjusted growth in sales, where inflation is computed using its own country-level consumer price index. Sales growth is winsorized at the 1st and 99th percentiles to reduce the impact of outliers. Total assets are measured in millions of U.S. dollars and leverage is defined as total debt divided by total assets. Ownership is the data item "Closely-held shares." Worldscope defines closely-held shares as shares held by insiders, which include senior corporate officers and directors, and their immediate families, shares held in trusts, shares held by another corporation (except shares held in a fiduciary capacity by financial institutions), shares held by pension/benefit plans, and shares held by individuals who hold five percent or more of shares outstanding. In Japan, closely-held shares represent the holdings of the ten largest shareholders. For firms with more than one class of shares, closely-held shares for each class are added together. The ownership measure is far from perfect since it relies on information disclosed by firms and this disclosure is often voluntary and difficult to check.

We also use a number of country-level variables in our analysis. For each country in each year, we obtain a measure of inflation from Datastream, which is the change in the CPI provided by the IMF. We adjust sales growth and total assets for inflation. We also use a number of variables to proxy for country characteristics. We use the anti-director rights variable from Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2007) as a measure of shareholder rights. Another proxy for home country investor protection is legal origin, from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998). We construct a dummy variable, "Common", that equals one for firms from countries with a common law tradition and equals

zero for firms from countries with a civil law tradition. The rule of law index is a measure of enforcement and is obtained from La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), although this variable is not available for China, Hungary, Poland, or Russia. We obtain values for the rule of law for these countries from Pistor, Raiser, and Gelfer (2000). As other authors before us, we define the variable "Legal" as the product of the anti-director and the rule of law indices. Stock market capitalization divided by GDP (Gross Domestic Product) and Gross National Product (GNP) per capita is from the World Bank's *World Development Indicators* database.

Table 5 reports summary statistics on each of these characteristics for listed firms by type of listing in New York and London in the listing year and for non-listed firms over the full period. Panels a and c present results for the whole period (1990 – 2005) and panels b and d present results by subperiod (1990 – 2001 or "Pre-SOX" versus 2002 – 2005 or "Post-SOX" periods). The count of firms and the medians of these attributes are reported as well as Wilcoxon rank-sum statistics, which test whether two different samples are from the same distribution across listing types or across subperiods. The tests across different listing types always compare attributes relative to the sample of U.S. exchange listed foreign firms. Panels a and b present the statistics for the entire sample of new cross-listings by non-U.S. firms that are in the Worldscope database whereas, in panels c and d, the statistics are reported for the subset of new cross-listings by non-financial, non-U.S., non-U.K. firms that are in the Worldscope database with available data on firm characteristics a given year. To make firms comparable across countries, we exclude financial firms and require that firms have total assets of at least $100 million (in 1990 dollars). We also tried using a size cutoff of $10 million and find that our results are similar and this is true for all subsequent tables as well. Firms from tax-havens, such as Bermuda and the Cayman Islands, are excluded because, though they are foreign-domiciled firms, they typically have their primary listing in New York or London rather than a secondary cross-listing and are foreign firms only for tax purposes. U.S. and U.K. firms are excluded because they are domiciled in the target host markets for foreign listings.

Panel a of Table 5 confirms the fact that, in the listing year, the foreign firms attracted to the exchanges in New York and London are large (median total assets between $600 and $700 million for U.S. exchange-listed firms and for London ordinaries), fast growing with trailing two-year annualized sales growth figures in excess of 14%, moderately leveraged (less than 20% of debt to total assets), and have somewhat concentrated ownership structures.[19] There are mostly statistically significant and economically large differences in size, sales growth, and leverage between U.S. and U.K. exchange-listed firms and their counterparts on the Rule 144a/OTC markets in New York and AIM listings (median size of only $11.5 million, sales growth of 10%, and median leverage of 0%). The differences in size between firms listing on U.S. exchanges and those listing on AIM are striking. Only 11% of the firms listing on AMEX, 5.5% of firms listing on NASDAQ, and none of the firms listing on the NYSE had total assets less than the median total assets of firms listing on AIM.

In our analysis, we do not regard AIM as a potential substitute for NASDAQ. A legitimate concern is whether this is justified. Obviously, the firms cross-listed on AIM are small compared to those on NASDAQ. However, it could still be the case that the firms that cross-list on AIM are firms that could have cross-listed on NASDAQ. To examine this possibility, we determine how many firms in our sample of 258 AIM listings would meet the listing standards of NASDAQ (either their Global Market or Capital Market as of May 2007). Thirty firms are from the U.S. and eight of these are in Worldscope. Of the remaining non-U.S. firms, only 80 have data on Worldscope, despite the fact that the database covers 33,300 currently active and 20,000 inactive companies as of March 2007. We do not have data to examine whether a firm satisfies all listing criteria of NASDAQ, but we find that 21 of the 80 non-U.S. firms and only one of eight U.S. firms, or about 25% of the firms for which we have data, meet the criteria that we can check. It is therefore not the case that AIM is a close substitute for NASDAQ.

[19] Doidge, Karolyi, Lins, Miller, and Stulz (2007) show that more shares are held by controlling shareholders in firms that are not cross-listed than in firms that are cross-listed. The data used in their study uses ownership by controlling shareholders, so it is not directly comparable to the closely-held blocks of shares data we use.

The firms that are attracted to the U.S.'s Rule 144a market and LSE's DR market are larger firms than those that cross-list on U.S. exchanges or as ordinaries in the U.K., have notably higher fractions of closely-held shares, and are also more likely to come from less-developed countries with lower GNP per capita, lower market capitalization-to-GDP ratios, and lower scores on legal protections of minority shareholders. Finally, there are statistically significant differences in Tobin's *q* valuation ratios not only between U.S. exchange listings and Rule 144a/OTC firms (median ratios of 1.56 versus 1.35), but also between AIM firms and London's Main Market listings (median of 2.01 versus 1.35 for DRs and ordinary shares). A striking result is that AIM firms have extremely large *q* ratios in the listing year, compared to those that choose any other way to cross-list. However, these are small firms concentrated in a few high *q* industries. Panel c, which repeats the analysis of panel a with more stringent data requirements, tighter size screens, and without U.K. and tax-haven-domiciled firms, indicates that the valuation difference between AIM and Main Market firms disappears as firm size becomes more comparable.[20] Finally, in the listing year, the valuation of London-listed firms is indistinguishable from the valuation of U.S. exchange listed firms.

Both panels a and c show that non-listed firms are quite different from U.S. exchange-listed firms. Not surprisingly, the number of non-listed firms (actually, firm-year counts) is extremely large compared to the total number of newly listed firms. The median total assets of non-listed firms correspond to less than 20% of the median total assets of U.S. exchange-listed firms. In fact, the median total assets of non-listed firms are much smaller than the median total assets for all firms with a listing except relative to AIM firms which are one-tenth of the median total assets of non-listed firms. Non-listed firms have low sales growth, low Tobin's *q* ratios, and high insider ownership compared to U.S. exchange-listed firms or even compared to other listed firms.

[20] No doubt that much of any statistical precision is lost because so many of the AIM firms are excluded by the data and country screens (80 AIM firms in panel a reduce to only 5 AIM firms in panel c). Panel a shows that the median total assets of AIM firms is only $11.5 million and recall from Table 3 that 39 firms on AIM (18% of the sample) firms are from Bermuda and the Cayman Islands.

The differences in listing year firm characteristics between the pre-SOX 1990-2001 and post-SOX 2002-2005 periods are neither statistically nor economically large. Panel b shows that there are negligible differences in total assets (in constant 1990 dollars), leverage, ownership, sales growth, and even Tobin's *q* ratios across the two subperiods. There are exceptions in the U.S. markets: foreign firms listing on the OTC market and on the major exchanges were smaller, had slightly lower sales growth, and less leverage in the post-SOX period. There is also some evidence that foreign firms on AIM were drawn from industries with higher median Tobin's *q* ratios and from countries with better economic and financial development (GNP per capita and market capitalization/GDP ratios) after SOX. However, panel d with its more stringent data screen shows again that these differences disappear. Of course, one has to be cautious about interpreting changes across subperiods for AIM as there are so few listings before 2002.

While the characteristics of newly listed firms on U.S. exchanges do not appear to change much from before to after SOX, the characteristics of non-listed firms change significantly. In particular, the typical non-listed firm has much smaller size in total assets and its Tobin's *q* ratio falls. Though sales growth increases for non-listed firms, it is still very small compared to the sales growth of listed firms. As non-listed firms change, it is not surprising that their appetite for listings might change also.[21]

Put together, this evidence on firm characteristics across listing types and across pre/post-SOX periods reveals that (a) the firms that are attracted to the major exchanges in New York and London are not very different, (b) the firms that are attracted to the Rule 144a/OTC markets in New York and AIM in London, however, are different from those that pursue exchange listings, and (c) little about these characteristics changes between the pre- and post-2001 periods, especially in the U.K. The evidence on the changes in characteristics of non-listed firms shows that the characteristics of these firms have changed. This evidence suggests that costs and benefits of listings have not changed and points to a

[21] In addition to the possibility of changes in the characteristics of non-listed firms, it is also interesting to note that the number of non-listed firms (that is, those that are listed only domestically) is declining recently. According to the World Federation of Stock Exchanges, the number of domestically-listed companies in 69 major stock markets around the world increased from around 26,000 stocks in 1995 to a peak of almost 40,000 stocks in 2002 and has receded in count to 37,000 in 2005.

decrease in the number of firms with characteristics that make listing attractive as the explanation for the decrease in the number of listings. However, simply looking at comparisons of medians is not convincing evidence. The next step in our analysis is to calibrate the new listing activity over time in Section 2 with the firm characteristics presented in this section using models of firm listing choices to see if the determinants of the listing choices are different across listing types and whether they have changed structurally over time.

4. The determinants of listing choices

If the rising-then-falling pattern of foreign listings on U.S. exchanges is explained by a decrease in the competitiveness of these exchanges, we would expect that firms make their listing decisions differently now than they used to. That is, a firm with characteristics that made it likely to list in the past would be less likely to list now. In this section, we first examine the determinants of firms' decisions to cross-list in the U.S. or U.K. using a competing-risks hazard model. Specifically, we estimate a model that simultaneously considers the determinants of listings in both the U.S. and the U.K. This allows us to test whether the factors that affect these listing choices differ. This first step helps us to understand which characteristics influence the different types of foreign listing outcomes in the U.S. and U.K. markets during the overall 1990-2005 period. Next, in order to evaluate the decline in the competitiveness of U.S. markets, we examine whether the propensity of firms with given characteristics to list in the U.S. and U.K. changed after 2001.

4.1. Competing risks models for New York and London listings

The competing risks model we estimate extends the standard Cox (1972) proportional-hazard model developed for single-event data to multiple-event data. Although previous papers have estimated single-event Cox models to investigate the factors that affect firms' foreign listing decisions, they do not distinguish among different types of listings (Pagano, Roell, and Zechner, 2002; Doidge, Karolyi, Lins, Miller, and Stulz, 2007). Pagano, Roell, and Zechner (2002) model separately the probability of a

European firm cross-listing in another European country or one of the U.S. exchanges or both in a year *t*, given that the firm has not yet listed. Other listing choices are not considered and after a firm lists abroad on one market or another, it is excluded from the model estimation because it is no longer "at risk" of listing. The key point is that the listing location choices are modeled with separate Cox models. With a competing risks model where listing choices include both the U.S. and the U.K., a firm that lists in the U.S. is no longer "at risk" of listing in the U.S., but it is still "at risk" of listing in the U.K. Similarly, a firm that lists in the U.K. would continue to be at risk of listing in the U.S. In other words, the listing location choices are modeled in the same Cox model.

There are several variations of competing risks hazard models and the specific choice depends on the nature of the data being analyzed (Cleves, 1999; Box-Steffensmeier and Zorn, 2002). The case we analyze is sometimes referred to as "unordered failure events of different types" and the model we estimate is referred to as a stratified proportional hazard model. In our application, there are two possible failure events, cross-listing in the U.S. or in the U.K., and the listings can occur in either order. For each firm *j*, the model is specified as:

$$h\left(t \mid \mathbf{x}_{jk}\right) = h_{0k}(t)\exp\left(\boldsymbol{\beta}_k' \mathbf{x}_{jk}\right),$$

where $h_{0k}(t)$ is the baseline hazard for the k^{th} event, $\boldsymbol{x}_{jk}$, is a vector of independent variables for the k^{th} event, and $\boldsymbol{\beta}_k$ is a vector of parameters to be estimated. Therefore, the model allows both the baseline hazard and the parameter estimates to differ for U.S. and U.K. listings.

To estimate this model, we follow the procedure outlined in Cleves (1999) and Lunn and McNeil (1995). Lunn and McNeil show that by augmenting the data using a duplication method, Cox models can be adapted to take account of multiple failure types. In our case, there are two failure types, given by δ equal to 0 or 1. The first failure type is listing in the U.S. ($\delta = 0$) and the second is listing in the U.K. ($\delta = 1$). Because there are two failure types, each firm-year observation in the dataset should be duplicated once. For each pair of observations, the first observation is associated with U.S. listings and the second observation is associated with U.K. listings. Each year, each firm is at risk for both types of listings.

However, if a firm lists in the U.S. (U.K.) it is no longer at risk for a U.S. (U.K.) listing and future observations associated with U.S. (U.K.) listings are removed from the dataset. However, the firm is still at risk for a U.K. (U.S.) listing so those observations remain in the dataset. If the firm later lists in the U.K. (U.S.), then any future observations for that firm would be removed from the dataset.

We use this augmented dataset to estimate a stratified proportional-hazard model, with the stratification variable being δ (listing type) and the covariates being $\boldsymbol{x}$ for U.S. listings, together with their interactions, $\boldsymbol{\delta' x}$ for U.K. listings. While estimating this model is equivalent to estimating proportional-hazard models separately for each listing type (treating the other listing type as censored data), this approach allows us to test whether the estimated parameters for each listing type are different.

In this "event time" experiment, we consider firms over the period from 1991 to 2005. The firm-level and country-level explanatory variables we use are given in Table 5, although we lag all variables by one year since we are trying to explain why a firm with specific characteristics at the end of one year chooses to list during the following year. Because variables are lagged by one year, we cannot use new listings in 1990. We also remove from the sample firms that have a U.S. and U.K. listing prior to 1991. We report the coefficients in exponentiated form. The advantage of exponentiated coefficients is that they can be interpreted as the effect of a unit change in the explanatory variable on the baseline hazard. For example, an exponentiated coefficient of 1.2 (0.8) implies that a one unit increase (decrease) in the explanatory variable increases (decreases) the probability of cross-listing by 20 percent relative to the baseline hazard. The standard errors are adjusted for firm-level clustering, so that we assume errors are independent across firms, but not across time.

In Table 6, we report the results. The first two models include all types of listings in the U.S. and U.K. and provide a broad comparison of firms that choose to list in each market. The next two models focus only on exchange listings in the U.S. and ordinary listings in the U.K. We focus on ordinary listings in the U.K. as they are the most comparable type of listing in London to exchange listings in New York. This choice should make it more difficult to find differences between New York and London listings,

because the majority of firms that list as ordinaries in London are from developed markets. Models (1) and (3) report results that exclude the ownership variable and models (2) and (4) report results that include the ownership variable. Requiring data on lagged ownership imposes a tight constraint on the dataset, which is why we report both sets of results. In model (1), there are 573 new listings by firms in the U.S. and 39 new listings in the U.K. that have all the required data available and have total assets of at least $100 million (in 1990 dollars). In model (2), there are 425 new listings by firms in the U.S. and 30 new listings in the U.K. By focusing only on exchange listings in models (3) and (4), the number of "failure" events is approximately halved.

Overall, we find that large firms with positive sales growth in industries with high Tobin's *q* ratios and from countries with better legal regimes for minority investors are more likely to cross-list in the U.S. and the U.K. markets. There are some differences in the exponentiated coefficients between the U.S. and U.K. listings, but none of them are statistically significant (likely a lack of precision due to so few U.K. listing events). For example, leveraged firms are less likely to pursue a U.S. listing and the larger positive coefficients on Log(Assets) and Legal for U.S. listings suggests a notably stronger bias for large firms and those from better legal regimes to list there. In model (2), the coefficient on ownership is significantly below one for U.S. listings and not for U.K. listings, indicating that closely-held foreign firms are less likely to pursue a U.S. listing.

When we replicate the competing risks estimation for exchange listings in New York and ordinary share listings in London, the important differences noted above widen and some even become statistically significant. For example, the positive coefficients on Legal widen further and the negative coefficient on ownership for U.S. listings in model (4) is significantly different from that for U.K. listings indicating that it is the major exchanges in New York, rather than the Rule 144a and OTC listings, that represent the primary deterrent for closely-held firms from poorer legal regimes at home. In fact, U.K. ordinary listings do not deter such firms at all. This latter result is important as it is consistent with the findings in Doidge, Karolyi, Lins, Miller, and Stulz (2007) and with the idea that U.S. listing choices tend to be significantly

associated with a governance benefit. That is, if foreign firms with closely-held shares are, in fact, controlled by a dominant shareholder and if they come from a country where it is easier for the controlling shareholders to expropriate firm assets at the expense of minority shareholders, they are less likely to seek a listing on a U.S. exchange since the additional scrutiny of regulatory institutions, like the SEC, and more rigorous monitoring by various capital market participants makes it harder for them to run the corporations they control for their own private gain.

4.2. Changing firm characteristics and the propensity to list in New York and London

If New York has become less competitive in attracting foreign listings since 2001, perhaps because of the passage of SOX in 2002, the actual number of listing firms would have declined relative to what would have been expected based on information of how firms made listing choices before 2001. The expected number of listing firms is jointly a function of the propensity to list given certain firm characteristics and the changing characteristics of the eligible set of firms. We next estimate logistic regression models separately for U.S. and U.K. listings for the pre-SOX period (1990-2001) and then apply these estimated models to the pool of firms available in Worldscope in the post-SOX period to estimate the expected fraction of these firms that would have listed had firms made listing decisions post-SOX in the same way that they made these decisions pre-SOX.[22] We perform this analysis not only on the *stock* of listings in the U.S. and U.K. markets in a given year but also on the *flows* of new listings each year. Since the models are estimated in the 1990s, variation in the expected fraction of listed firms after 2001 is due to the changing characteristics of sample firms. We then use the difference between the expected fraction of existing or newly-listed firms and the actual fraction to measure the change in the propensity to list in these markets. A decline in the competitiveness of the U.S. market for foreign listings should result in a smaller fraction of actual relative to the expected number of existing and new listings predicted by our model. As before, we focus only on exchange listings in the U.S. and ordinary listings on

[22] This approach is similar to the approach used by Fama and French (2001) to evaluate whether the propensity to pay dividends has declined.

the Main Market in the U.K. as these are the primary competing venues that would have been affected by the changes due to SOX.

We estimate separate regressions for (a) the probability that a firm is listed ("listing stock") and (b) the probability that a firm will list given that it has not yet done so ("listing flow"). The listing stock regressions take into account the fact that firms that were listed can stop being listed for a variety of reasons. However, these regressions are subject to the criticism that, while firms that cross-list in the U.S. on an exchange can easily delist, they face considerable obstacles in deregistering their shares.[23] The listing flow regressions estimate the probability that a firm will acquire a new listing and is not subject to this concern, but they ignore delisting.

Table 7 shows estimates of logit regressions that document the relation between the probability that a firm is listed or lists and the firm's sales growth, global industry Tobin's *q*, size as Log(Assets), leverage, ownership, and the country variables Legal, Log(GNP), and the Stock market cap/GDP ratio. We estimate the listing stock and flow regressions for the periods 1990-2001 and 2002-2005 using two different approaches. For the first approach, we estimate the probability that a firm is listed or would list using logit regressions year-by-year as in Fama and French (2001) and, in the spirit of Fama and MacBeth (1973), compute the time-series means of the coefficients. For the second approach, we use a pooled logit regression with standard errors clustered by firm. The problem with the Fama-MacBeth approach is that precision is limited because there are so few new cross-listings in the U.K. in many years and in the U.S. for select years after 2001. The small number of new cross-listings in the U.K. even offers challenges for precision with a pooled regression for 2002-2005 (in total, there are five firms with new listings that have sufficient data in these years). Consequently, we only report pooled logit regressions for consistency in

[23] Delisting from a U.S. exchange eliminates the obligation to meet the exchange's listing requirements, but it does not eliminate SEC registration requirements. It has been difficult for foreign firms to meet the SEC's deregistration requirements, especially so for large firms with broad share ownership in the U.S. In fact, until recently the rules governing deregistration were more arduous for foreign firms than they were for U.S. firms. See Leuz, Triantis, and Wang (2006) and Chaplinsky and Ramchand (2007) for further details on the specific requirements for delisting and for deregistering. On March 21, 2007, the SEC adopted amendments to the deregistration rules which eases the process for foreign firms.

Table 7 and do not report any results for the U.K. for 2002-2005. Where both methods could be estimated, fully consistent results obtain.

The slopes from the regressions confirm our inferences about the roles of sales growth, size, and leverage from the competing risks Cox models in Table 6. U.S. exchange listings attract larger firms with positive sales growth, lower leverage, and less-closely-held ownership structures in industries with high median Tobin's *q* ratios and from countries with stronger legal traditions. As in Table 6, the coefficients on sales growth are positive for U.S. exchange listings if we estimate the regression for the whole sample period (not reported) as well as for the 1990-2001 period. Surprisingly, the coefficient turns negative in the 2002-2005 period for the listing stock regressions, although it is still positive and significant in the listing flow regressions. The sales growth coefficient is negative for the U.K. for the listing stock regression for the whole period (not reported) and negative but insignificant for the 1990-2001 period. By contrast, it is positive and significant for the listing flow regression for the 1990-2001 period. The average pseudo-R^2s are similar for the models estimated in the post-SOX period compared to the pre-SOX period for both U.S. and U.K. listings. Overall, these findings offer little evidence of changes in the characteristics of listing firms from the pre- to post-SOX period.

Section 2 showed that there has been a decline in the number of new listings on the exchanges in New York and on the Main Market in London in the past several years. If the propensity to list given certain firm characteristics has not changed as Table 7 indicates, the decline is due to the changing characteristics of firms. That is, fewer large firms with large asset size, positive sales growth, low leverage, less closely-held ownership in high Tobin's *q* industries are available in the population of firms to seek out U.S. or U.K. listings. We observed in Table 5 that there was precisely such an evolution in the population of non-cross-listed firms. Table 8 shows the expected percent of U.S. and U.K. foreign listings for 2002 to 2005 using the regression models estimated for 1990-2001. We compute the expected and actual fraction of U.S. and U.K. listings for both the listing stock and flow regressions. The expected percent of firms with an existing listing (listing stock) or a new listing (listing flow) is computed by applying the logit

coefficients for 1990 to 2001 (from the corresponding models in Table 7) to the values of the explanatory variables for each firm each year between 2002 and 2005. We obtain the predicted probability that a firm has an existing exchange listing or a new listing each year, sum the predicted probabilities over firms each year, and divide by the number of firms in the sample that year to compute an expected percent. We also report the actual percent of existing listings and new listings in those years for comparison.

We first consider the results obtained for the probability of existing listings from the estimates of the listing stock regressions. Strikingly, the actual listing percents are higher than expected for the U.S. exchange listings, while those for the U.K. listings are lower than expected. For example, in 2002 on the major U.S. exchanges, there were 343 listings, or 7.24% of 4,738 eligible firms in the Worldscope database (nonfinancial firms with over $100 million in assets and available data, from non-U.K., non-tax-haven countries) while the logit models would have predicted 3.81% U.S. exchange listings. The economic magnitude of this difference is large: in terms of total firm counts, there are about 163 fewer expected listings than actual listings. The differences between actual and expected listing propensities for U.K. listings are smaller than those for U.S. listings; for example, there were 78 ordinary listings on the Main Market in 2005, 1.63% of the 4,708 eligible firms, but 3.11% were expected based on the propensity to list during the 1990-2001 period. Finally, it is interesting to note that the proportion of firms expected to be listed is very low in 2002 compared to the 1990s, but it increases thereafter. Perhaps not surprisingly, the economic difficulties of the early 2000s had an impact on the demand for listings – in particular, they reduced growth opportunities and firms are more likely to list when they have good growth opportunities.

We investigated further whether our inferences about the U.S. and U.K. expected listing counts in the post-SOX period are sensitive to the base period chosen to estimate the logit models which predict the expected percent of listed firms. If we use two recent subperiods, 1995-2001 or 1997-2001, instead of the full period, 1990-2001, the expected percent of U.S. listed firms does increase in the post-SOX period. The surplus of U.S. listed firms in 2002-2005 using the full-period logit model becomes a small deficit

(0.27%) of listed firms in 2005 using 1995-2001 as the base period for estimation and a larger deficit for 2004 (0.52%) and 2005 (1.31%) using the 1997-2001 base period. However, as we use these more recent periods, the deficit of listed firms in London increases as well. Consequently, using a different base period does not change the conclusion that SOX did not make London more attractive relative to the U.S. exchanges for firms wishing to list on a foreign exchange.

It is worth dwelling a bit more on these results. If firms could easily exit from the U.S. exchanges by delisting and deregistering and if the competitiveness of the U.S. exchanges has declined, we would observe missing listings. That is, firms predicted to have been listed based on their characteristics would not have been listed. Table 8 shows no missing listings. In fact, each year, there are more firms listed than predicted. One might argue that this reflects the difficulty that firms listed on U.S. exchanges face in removing themselves (technically, by terminating their registration with the SEC) from the obligations they are subject to from the time they list in a way that makes a delisting worthwhile. This may well be true. However, none of our evidence is consistent with the claim that London has become more competitive relative to New York. If London has become more competitive, we would expect that London would have more foreign listings compared to the number expected by extrapolating from the behavior of firms in the 1990s. Exactly the opposite is true.

Another way to address concerns about the difficulty of the deregistration process in the U.S. is to focus only on newly-listed firms after the passage of SOX in 2002. In Table 8, we also compare the predicted and actual *new* listings over the 2002-2005 period using the corresponding logit regressions in Table 7 of the probability to newly list (listing flows) in the U.S. and U.K. markets. Not surprisingly, the number of new listings is small, especially in the U.K. However, no consistent pattern of a new listing deficit emerges from our regressions in either market. In fact, whereas we find that cumulatively there are more new listings in the U.S. than we would have expected based on the 1990-2001 regression model estimates, there are actually fewer new listings in the U.K. than we would have expected.

5. The valuation premium for New York and London listings over time

The governance benefit for a foreign firm listing on a U.S. exchange arises because controlling shareholders of such firms face more constraints on their ability to extract private benefits at the expense of public shareholders due to the U.S. investor-protection apparatus. For firms with valuable growth opportunities, the lower private benefits for controlling shareholders are more than offset by the fact that firms are now able to raise funds from public investors on better terms to finance these growth opportunities. As a result, U.S. cross-listed firms should be worth more because (1) they have better growth opportunities, (2) by cross-listing they can take advantage of growth opportunities that they could not have taken advantage of without a listing, and (3) a smaller fraction of the cash flows generated by the firms are expropriated as private benefits by insiders (Doidge, Karolyi, and Stulz, 2004; Hail and Leuz, 2006). As firms take advantage of growth opportunities, we expect their Tobin's *q* ratios to fall (see, for instance, Li, Livdan, and Zhang, 2007). So, the first source of the valuation effect of a listing does not persist. However, the second and third sources of the valuation effect persist. Consequently, on theoretical grounds, part of the high Tobin's *q* ratios of firms at the time they list is temporary, but part is not.

In this section, we investigate whether and how the relative valuation of listed firms has changed over time and across listing venues. If the net benefits for shareholders of a listing on a New York exchange has fallen, we would expect to see a decrease in the listing premium in New York, or at least a decrease in that premium relative to London. We therefore estimate cross-listing premiums from annual regressions of Tobin's *q* on control variables based on firm characteristics and country-level factors each year from 1990 to 2005. Our approach controls for proxies for a firm's growth opportunities, so that if we were completely successful in doing so, the cross-listing premium would only measure the contribution to firm value of cross-listing, but most likely we capture only part of a firm's growth opportunities. Previous research by Doidge, Karolyi, and Stulz (2004) established that there is premium, but their analysis focuses on U.S. listings in 1997 only. To our knowledge, no study has tested for the existence of a premium for

U.K. foreign listings.[24] Because we have panel data, we can use firm fixed-effects to account for unobservable firm characteristics. We expect that a permanent benefit accrues to firms cross-listed on U.S. exchanges. We therefore investigate our premise that there is a permanent premium associated with U.S. exchange listings. Finally, we perform a subperiod analysis of the cross-listing premium comparing the pre-SOX 1990-2001 and post-SOX 2002-2005 periods.

5.1. The cross-listing premium in New York and London over time

Table 9 reports regression results of Tobin's *q* on different dummy variables associated with various types of U.S. and U.K. listings as well as a set of firm characteristics, including sales growth, the median Tobin's *q* of the global industry to which the firm belongs, log of total sales (in U.S. dollars) as size proxy, and country dummy variables.[25] The regressions are estimated using OLS and the standard errors are clustered on countries – that is, observations are assumed to be independent across countries, but not within countries.[26] Panel a presents the regression results year-by-year across the 1990-2005 period and panel b provides panel data results using Fama and MacBeth (1973) methods, pooled OLS with firm-level clustering to compute the standard errors, and pooled OLS with firm fixed effects. The sample includes, as before, all non-financial, non-U.S., non-U.K. and non-tax-haven-country firms with available data in Worldscope with assets over $100 million (the results are similar when we add back the U.K. firms or if we use a $10 million size screen). The size of this sample ranges from 2,764 firms in 1990 to 7,302 firms in 2005. The dummy variable associated with a given type of listing requires at least 10 listings with

[24] Baker, Nofsinger, and Weaver (2002) uncovered an insignificant negative abnormal share price reaction to foreign listings in London following a sizeable pre-listing run-up in returns (8.7% over the pre-listing year), but mostly in conjunction with increases in analyst coverage and media attention for those firms. Salva (2003) found a significant 3.78% abnormal return for foreign listing announcements, but only for DR listings on the Main Market. A recent 2006 study by Oxera, a U.K.-based consultancy, argues that "a listing in London may deliver higher valuations and a lower cost of equity" than comparable listings in other markets, but provides no estimates other than discounts on IPOs (10-15% abnormal first-day returns), listing fees, and trading cost quotations.

[25] The listing dummies equal one in all years a firm has a listing of a given type. If a firm has both a U.S. listing and a U.K. listing, both dummies equal one in the relevant years. If we exclude firms with listings in the U.S. and in the U.K., our results are unchanged.

[26] An alternative approach would be to estimate a country random-effects model following La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002). However, Hausman (1978) tests indicate that the assumptions of the model are not met in all years.

available data for *q* ratios as well as the independent variables, so, for example, Rule 144a listings are not considered until 1992, U.K. DR listings until 1996, and U.K. AIM firms until 2005.

Panel a shows that the cross-listing premium for U.S. exchange listings is large, positive, and statistically significant in each year from 1990 through 2005. The magnitude and precision of the premium is weaker in the first three years of the sample period, but it averages around 0.24 for the remainder of the sample period. Even after controlling for firm and country characteristics, the premium is economically large: compared to the average Tobin's *q* ratios of firms that are not cross-listed, our estimates imply that firms listed on U.S. exchanges are worth about 17% more. There is no statistically significant cross-listing premium for U.S. Rule 144a private placements, except marginally so in the very early years of the program (1992-1993). Interestingly, there is a premium for OTC cross-listings in many years (12 of 16 years), although the overall magnitude averages around 0.13, which is about half that of cross-listings on the exchanges. This is consistent with the findings of Doidge, Karolyi, and Stulz (2004).[27] Most surprisingly, there is no discernible premium for U.K. cross-listings in any year of the sample period for any of the three types of listings (AIM, DR, or ordinary shares). In fact, the ordinary share and DR listings actually have cross-listing discounts (though insignificant) in 13 of the 16 years. The adjusted R^2's are higher than those in previous studies likely because of the use of country dummy variables to account for cross-country variation. The firm-level control variables are also important with reliably positive coefficients on sales growth and global industry median Tobin's *q*. Log(Sales) is a weaker control with a negative coefficient in the first seven years of the period and positive in more recent years.

The results in Table 9 provide a first opportunity to assess whether the premium for a U.S. exchange listing has declined since the passage of SOX in 2002. Figure 2 presents another perspective in which we compare the valuation premium of cross-listed firms to the average *q* ratios of non-cross-listed firms.

[27] One possible explanation for the OTC premium is that the market participants anticipate that these companies will upgrade to an exchange listing. We re-estimated our fixed-effects regression in panel b of Table 9 separating out the 38 OTC listings that upgraded during the period of analysis from those that remained so. The coefficient on the upgraded OTC listings is positive but not significant and that for the remaining OTC listings is unchanged.

When we use the U.S. exchange coefficients from Table 9 and compute the percentage valuation difference relative to the average *q* of firms that are not cross-listed each year, we find that from 1990-2001, U.S. exchange listed firms are worth an average of 17.5% more than firms that are not listed. From 2002-2005, U.S. exchange listed firms are worth 14.3% more.[28] A *t*-test for the equality of means (unreported) indicates that the difference between 17.5% and 14.3% is not significant (*p*-value equals 0.49). If we exclude 1999, which is arguably an anomalous year in terms of valuations, U.S. listed firms are worth 15.4% more in the 1990-2001 period. This initial test suggests that the U.S. listing premium has not significantly declined after the passage of SOX.

Firms are more likely to list if they have better growth opportunities. This means that firms with higher *q* ratios are more likely to list. The endogeneity of this firm choice leads to a "self-selection" problem that can, in turn, lead to econometric problems that induce an upward bias in our estimate of the valuation premium. This is mainly a concern for U.S. exchange listings because these are the only listings that have a positive and statistically significant premium each year. Previous studies of the valuation of cross-listed firms (e.g., Doidge, Karolyi, and Stulz, 2004) handle this problem by estimating selection models (Heckman, 1979), which specify a separate selection (cross-listing) decision equation in addition to the observation (valuation) equation. In unreported tests, we investigated how our inferences about the valuation premium in panel a of Table 9 change when we employ a selection model. Our model (like that in Doidge, Karolyi, and Stulz, 2004) employs country variables like the market-capitalization-to-GDP ratio, log of GNP per capita, and Legal as well as the firm's log of sales. The premium remains positive in each of the 16 years of our sample period and remains statistically significant in all but four years.

The estimates over the entire period from 1990-2005 are presented in panel b. The first set of results uses the method of Fama and MacBeth (1973). We average the coefficients from the annual regressions of panel a and perform inference tests on the time-series means and standard deviations. The advantage of

[28] For example, in 1997, the coefficient in Table 9 is 0.22 and the average *q* of firms that are not cross-listed is 1.30. Therefore, in 1997, after controlling for firm and country characteristics, firms listed on U.S. exchanges are worth 16.9% more.

this procedure is that it incorporates unknown cross-correlation structure in residuals.[29] The estimates confirm the reliably positive and significant valuation premiums for U.S. OTC (0.12) and exchange listings (0.22) seen in panel a, the insignificant coefficients for U.S. Rule 144a private placements and U.K. DR listings, and a statistically significant discount (-0.05) for U.K. ordinary listings. The pooled OLS estimation (with standard errors adjusted for clustering on firms) with country and year fixed effects are almost identical to those of the Fama-MacBeth regressions. Finally, while the firm fixed-effects regressions (no country fixed effects, but year fixed effects retained) confirm the positive valuation premiums for U.S. OTC and exchange listings, they are much smaller in magnitude at 0.05 and 0.08, respectively, although the difference between them is still statistically different at the 1% level. We also observe now a reliably large negative premium for U.K. listings. The advantage of using firm fixed-effects is that we control for unobserved firm-level heterogeneity (not captured by our control variables), but the finding for U.K. listings is surprising and raises potential concerns about using fixed-effects.[30] We do not include a dummy variable for AIM listings in these regressions because we can only include the dummy for 2005.

Table 9 confirms that a U.S. cross-listing premium exists every year from 1990 to 2005 for exchange-listed firms. We also have shown that there is a smaller premium for U.S. OTC listings, but this premium does not exist every year. Finally, there is no premium for U.S. Rule 144a listings or Main Market listings on the LSE, either DRs or ordinary listings. Moreover, we find no evidence that the premium for U.S. exchange listed firms has disappeared since SOX or that a premium has emerged in the U.K. The coefficient on AIM for the one year available (2005) is positive and large in magnitude, but it is not

[29] The *t*-statistics are adjusted for first order serial correlation. If we do not make this adjustment, the *t*-statistics are higher in all cases.

[30] A major concern with firm fixed effects is that, in de-meaning the dependent and independent variables in the regression, it is forced to measure only firm-specific time-variation in the premium and it ignores all cross-sectional variation across firms (for related arguments, see Zhou, 2001). For our analysis, many firms never cross-list on a U.S. or U.K. market so what little time-series variation in mean-adjusted Tobin's *q* ratios or other control variables that might be identified for the cross-listing firms might be overwhelmed by the absence of it for the non-cross-listing firms.

significant. There are simply too few firms listing on AIM that are not small firms to make much of the valuation of firms on AIM.

5.2. Is the cross-listing premium permanent or transitory?

We interpret part of the premium to reflect a permanent benefit that accrues to firms that list on U.S. exchanges. Recent literature raises concerns about such an interpretation. In an event-time analysis, Gozzi, Levine, and Schmukler (2007) show that Tobin's *q* valuation premiums for their "internationalized" firms disappear beyond the two years following the internationalization event. However, their internationalization events include other cross-listings besides U.S. exchange cross-listings and hence include cross-listings for which a valuation premium is not predicted by theory. Sarkissian and Schill (2007) examine long-run abnormal returns using standard event-study methods for 1,256 cross-listings in 24 host countries around the world, including the U.S. (323 listings) and U.K. (191 listings). They conclude that the negative post-listing abnormal returns for foreign listings in the U.S. markets, first observed by Foerster and Karolyi (2000), eliminate and outweigh the positive valuation gains achieved in the pre-listing and listing periods to render a net negative valuation impact.[31]

In Table 10, we re-examine whether the valuation premiums for U.S. exchange listings are transitory. In order to facilitate comparisons, we follow the panel regression methodology of Gozzi, Levine, and Schmukler as exhibited in their Figure 2 and Table 7. They estimate pooled OLS regressions of Tobin's *q* with country and year fixed effects on a variety of control variables and dummy variables equal to one for firms in years with "internationalization" events, and separately within three years of such events. Their internationalization events, of course, are not directly comparable to our analysis of foreign listings in the U.S. and U.K., as they include international cross-listings in major financial centers (which include the U.S., U.K., and others like Frankfurt and Hong Kong) as well as global equity capital raising events through private or public placements. Panel a of Table 10 shows the count of the number of cross-listing firm observations in each of the three years around the listing events and separately for Rule 144a private

[31] One of the earliest studies to uncover the increases and then decreases in valuation ratios around U.S. cross-listings is actually by Sundaram and Logue (1996), which pre-dates the current studies by a decade.

placements, OTC, and exchange listings in the U.S. and for DRs and ordinary listings on the LSE. Given that our horizon of analysis begins in 1990, there are many firms that listed prior to that date, which is why we have so many observations in the "> 3 years after listing" category. The sample grows, as expected, over the course of the six-year event period as more firms cross-list on one of the two markets in one form or another over the 1990 to 2005 period. It should also be noted that the regressions include a benchmark sample of all non-cross-listing firms.

Panel b presents the estimation results. In each Tobin's *q* regression, the type of U.S. or U.K. cross-listing event is examined one at a time relative to the benchmark of non-cross-listing firms. There are several important findings. First, for each type of listing and in both markets, there is a significant increase in the Tobin's *q* valuation premiums in the years leading up to the listing and a decrease in the premiums in the years following the listing. Second, the increase arises for all three types of U.S. listings and DRs in London, but not for ordinary shares in London. More importantly, however, the magnitude of the increase in the premium during the pre-listing period is considerably greater for the U.S. exchange listings than for any other type of foreign listing. The average premium for U.S. exchange-listing firms three or more years before the listing is positive (0.07), but is small and is statistically insignificant. It increases to a statistically significant 0.59 in the year before listing. The premium for DR listings in London also increases to a comparably large 0.65 in the year before listing while those for Rule 144a private placements (0.23) and OTC listings (0.14) in the U.S. are smaller. There is no detectable premium for ordinary listings in London any time around the listing event. Third, the premium declines in the years following the listing event (although as noted earlier, this is expected). This is mostly consistent with the findings of Gozzi, Levine, and Schmukler, as well as indirectly with those of Sarkissian and Schill, except in the most critical dimension: the cross-listing premium for firms listing on major U.S. exchanges remains positive and statistically significant even beyond three years following the listing. Further, the *F*-statistics indicate that the coefficients for ">3 years after listing" (0.21) and for "3 years after listing" (0.28) are significantly greater than the coefficients for ">3 years before listing" (0.07) and for "3 years

before listing" (0.11). There is no permanent valuation increase for U.K. DR listings or for U.S. Rule 144a private placements. Firms with U.S. OTC listings have a positive and significant coefficient for ">than 3 years after listing" (0.09), although this coefficient is significantly lower than the coefficient for ">3 years before listing" (0.13). In contrast to our results for U.S. exchange listings, Gozzi, Levine, and Schmukler (Table 7) show that there is a Tobin's *q* premium of -0.02 more than three years after internationalization for all internationalizing firms.

In summary, we find that there is a pre-listing increase and a post-listing decline in valuations for cross-listing firms, in a way similar to related papers, but, unlike these other studies, we find that a component of the premium persists *permanently* beyond three years following the listing on a U.S. exchange. Why are our results so different from those of Sarkissian and Schill and Gozzi, Levine, and Schmukler? We can think of at least two different reasons. First, these studies employ different methodologies. It is difficult to compare our analysis to the long-run event-study analysis of Sarkissian and Schill. Second, the events under investigation are different. While the paper by Gozzi, Levine, and Schmukler represents the analysis closest to our work in terms of methodology, they focus on a broad range of "internationalization" events. Their analysis does break down the valuation analysis into just exchange listings (which include U.S., U.K. and other markets) and just U.S. listings (including Rule 144a private placements and OTC listings) in their Table 7, but we have shown that the results are very different for U.S. exchange listings than for other types of U.S. listings and even for U.K. exchange listings. Our evidence is consistent with the theory presented in Doidge, Karolyi, and Stulz (2004). With this theory, it is inappropriate to mix cross-listings on exchanges in different countries or to mix U.S. exchange listings with Rule 144a private placements or OTC listings because the governance constraints imposed by U.S. exchange listings are not imposed by other forms of listings.

5.3. The cross-listing premium before and after 2001

Has there been a decline in the valuation premium for U.S. exchange listings in the aftermath of the passage of the SOX Act in 2002? If U.S. capital markets have become less competitive in the market for

foreign listings, even if we have not seen a change in the propensity to list in U.S. or U.K. markets or a change in the characteristics of the firms choosing to list in one market or the other, the net benefits for foreign firms from being listed on U.S. exchanges may still have declined. Our valuation analysis up to this point suggests that the valuation premium for U.S. exchange listed firms is permanent and is significant in all sample years. We did report, however, that, from 1990-2001, the average valuation premium was 17.5% compared to 14.3% from 2002-2005. Recent studies by Zingales (2007) and Litvak (2007b) examining Tobin's *q* and market-to-book valuation ratios also suggest that the premium may be lower since 2002.[32] Zingales shows that the decline in the Tobin's *q* valuation premium for cross-listed firms following the passage of SOX (his subperiods are 1997-2001 for pre-SOX versus 2003-2005 for post-SOX) is concentrated in firms from countries with better legal protections of minority shareholders (as measured by the average control premiums paid in large block transactions in various countries – see Dyck and Zingales, 2004). Similarly, Litvak (2007b) shows that the largest declines in valuation premiums arise for firms with the highest pre-SOX disclosures. That is, the companies cross-listed in U.S. markets with higher quality corporate governance were the most adversely affected by the passage of SOX.

We investigate whether the cross-listing premium changes after SOX in Table 11. We compute the valuation premiums for the firms that list on U.S. exchanges as in our panel regressions from panel b of Table 9. We estimate the regressions with OLS and include country and year dummy variables, as well as our usual set of firm-level control variables (sales growth, global industry q, log(sales)) – that is, we investigate whether the premium has declined post-SOX, after controlling for firm and country characteristics. We add a dummy variable for the passage of SOX for the U.S. exchange listings ("U.S. Exchange × Post SOX"). This dummy variable equals zero for exchange listings in the period from 1990

[32] These two studies are distinct from the returns-based event-study papers of SOX and firm valuations using cross-listed firms by Berger, Li, and Wong (2005), Li (2006), Litvak (2007a), and Smith (2006). The results vary across the various studies in terms of the implications of SOX, but this is not surprising given that they employ different event dates surrounding the passage of SOX, the announcement dates of delistings or other types of events, and given that they utilize different sets of benchmark firms.

to 2001 and one for the post-SOX period from 2002 to 2005. In model (1) we estimate the model with all non-financial firms with our usual data constraints related to Worldscope and $100 million or more in total assets, while in model (2) we further exclude firms from the U.K. In both specifications, the coefficient for the U.S. exchange-listed valuation premium is statistically significant and large (0.25 and 0.23, respectively) as before, and the interactive coefficient on the post-SOX dummy variable is positive, but statistically insignificant.[33] These results suggest that SOX had no effect on the cross-listing premium for U.S. exchange listings, on average. But, it is legitimate to be concerned as to whether our findings result from an "averaging" effect since we include together firms from countries with better and worse legal protections. Models (3) and (4) perform the same regressions as in models (1) and (2), but include an additional interaction variable, "U.S. exchange × Post SOX × Low legal", where Low legal is a dummy variable that equals one for countries with below-median scores on Legal (anti-director × rule of law) and zero, otherwise. Based on Zingales (2007) and Litvak (2007b), we would expect to see a statistically significant and positive coefficient on this interactive dummy. We do not. In fact, the coefficient is negative, though statistically insignificant.[34] It is also possible that we observe no change in the valuation premium around SOX because a potentially positive valuation impact of newly-listed firms after 2002 offsets a potentially negative valuation impact for listings in existence prior to 2002. We omit the former in models (1) to (4) and find no difference (not reported).

We have failed to find evidence that is supportive of the hypothesis that the U.S. exchanges are losing their competitive edge in attracting foreign listings. Not only are we unable to discern any major changes in the flows of listings to the U.S. and U.K. markets (with a special recognition of the growth of the AIM

[33] If we exclude the year dummies, the coefficient for U.S. exchange × Post SOX becomes negative (between -0.02 and -0.04), but is still statistically insignificant (*t*-statistic is between -0.47 and -1.20).

[34] Zingales (2007) uses the Dyck and Zingales (2004) control premiums (which are available for 36 of the 55 countries in our sample) to score good/poor governance countries instead of our Legal variable. When we substitute this alternative interaction variable for the smaller sample of countries, we also find it to be negative and statistically insignificant. Our results may also differ from those of Zingales because we use a different approach. Rather than using year-by-year country-level averages, which gives equal weight to each country each year, regardless of how many non-listed and cross-listed firms are from that country, our approach uses firm-level data and controls for firm and country characteristics. We are unable to perform a direct comparison with Litvak (2007b) who focuses on valuations in 2001 and 2002 using a matched-firm sample analysis for her benchmarking approach.

market in the U.K.) that would be consistent with a loss of competitiveness, but also the characteristics of the firms pursuing these listings have changed very modestly and the valuation premiums typically ascribed to those listings continue. The governance benefits of listing on a U.S. exchange appear as important as they once were and have not diminished in recent years. In the next section, we pursue one more line of inquiry related to the governance benefit of U.S. listings beyond just the flow of listing activity, the characteristics of the cross-listing firms, and their valuations; namely, the capital raising activity around the listings.

6. Capital raising activity around U.S. and U.K. cross-listings

La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) and Reese and Weisbach (2002) argue that a useful way to test the effectiveness of a legal system and its ability to enforce any financial contract is to focus on the ease with which a firm can raise external capital. La Porta, Lopez-de-Silanes, Shleifer, and Vishny show that, in countries where legal protections are weak, it is considerably more difficult for firms to raise external financing than for firms in countries that protect minority interests well. Coffee (1999) and Stulz (1999) point out that foreign firms that cross-list effectively borrow some of the legal protections of the U.S. regulatory environment bond themselves to protect the interests of their minority stockholders better. This is what we refer to as the governance benefit. Reese and Weisbach test, and provide evidence in support of, the bonding hypothesis by showing that foreign firms that cross-list on U.S. exchanges increase the number of equity issues after the listing, that the increase is larger for firms from countries with weak protections and, most interestingly, that the increase arises for equity issues in their home market as well as in the U.S. market, the original target market for the listings. In other words, the desire to protect shareholder rights appears to be such an important reason for why foreign firms cross-list in the U.S. that their doing so enhances their ability to raise capital not only in the U.S., but at home and elsewhere. Since we fail to find evidence that U.K. listings have a governance benefit, we

would expect that firms that list on U.S. exchanges raise more equity after listing, but firms that list on the Main Market in the U.K. do not.

In this section, we extend the experiment of Reese and Weisbach (2002) and measure the extent of equity issuance activity of firms listing on U.S. exchanges and firms listing on the Main Market in the U.K. in the years before and after their listing over the period of analysis from 1990 to 2005. We examine whether they raise equity in the U.S. or U.K. markets, in their home market, or in other markets. To the best of our knowledge, no study has yet examined the consequences of a foreign listing in the U.K. for capital raising activity at home or outside the U.K. If the governance gain is exclusively attributable to U.S. exchange listings, then we would expect no major changes in equity issuance activity for those firms following their listing in the U.K. markets.

Information about the capital raising activity for our foreign firms comes from a number of data sources, including Securities Data Corporation (SDC) and the London Stock Exchange. SDC contains the date of issue, the market (country) in which the security was issued, and the proceeds from each issue. We compare the issuance dates from SDC with the cross-listing dates drawn from the sources described above in order to determine whether they took place up to three years before or within three years after the listing (therefore we consider new cross-listings from 1993-2002). We apply the usual screens to focus our analysis on non-financial, non-U.S., and non-U.K. firms with available data in the Worldscope database and with total assets of at least $100 million (in 1990 dollars) in a given year. For U.K. listings, the SDC data is supplemented with international issuance data directly from the London Stock Exchange. These data include the issuance date, the issue type, sector, price, the proceeds of the issue, and the underwriter name and its country of origin.[35] Unfortunately, the LSE data begins only in 1998. To ensure

[35] The authors are grateful to Matthew Leighton in the Market Information and Analysis division of the London Stock Exchange for his help and for supplying the data. We performed extensive cross-checking of the SDC and LSE information and always supplemented SDC in favor of the LSE data when in doubt. We also evaluated how much our Worldscope, sector, and asset-size constraints are binding on the size of the issuance sample of firms and how much they issue.

that we do not exclude any relevant capital raising activity on the Main Market in the U.K., we include both DRs and ordinary listings in our analysis.

Table 12 presents the results. We report the issuance activity by market location including the number of capital raising events and the dollar amount both before and after a cross-listing and separately for U.S. exchange listings and Main Market listings in the U.K. Overall, we identify 61 (12%) of the 530 firms with U.S. cross-listings with equity issues before the listing and 157 (30%) with issues after the listing. Among the 119 U.K. cross-listing firms, 7 (6%) have equity issues before the listing and 30 (25%) afterward. The increase in the number of issues around the listing events is similar in the two cross-listing markets. However, the dollar magnitudes are not. Total equity raised among the U.S. cross-listing firms increases from $29 billion to $151 billion over the listing period – a statistically significant difference for the mean listing firm – while that for the U.K. cross-listing firms increased modestly from $8 billion to almost $13 billion.

Another important result in this table is that there is a significant increase in the dollar magnitude of equity issuance around U.S. cross-listings not just in the U.S. markets (which represents a statistically significant increase from $3 billion to $17 billion), but also in the home markets ($15 billion to $79 billion) and other markets ($10 billion to $55 billion). Each of these increases is statistically significant for the typical firm. This result can be interpreted in a way that is consistent with that of Reese and Weisbach (2002). Though they only examine post-listing equity issuances, they find that firms from countries with poor legal protections in the home market raise a higher fraction of capital in their home markets and in other markets than firms from countries with good legal protections. We find no similar changes around U.K. exchange-listings. There is an increase in equity issuances in the home market (from $5 billion to $7 billion), in other markets ($2 billion to $5 billion) and certainly in the target U.K. market (up to $1 billion), but none of these changes are statistically significant.

One possible problem we face with this analysis is that some firms from around the world cross-list on both London and New York. If a firm cross-lists in London after having already listed on a U.S.

exchange, the firm may not realize any incremental governance gain as a result or, worse, it may appear to do so, but it would be falsely associated with a London listing (especially if the two listing events occur close in calendar time). To address this potential problem, we repeat the analysis, but exclude all firms with exchange listings in both London and New York. The number of firms is much smaller, especially for London, but our inferences are very similar to those above.

These results reaffirm the role of a governance gain for foreign firms listing on U.S. exchanges. Firms that list on U.S. exchanges increase their equity issuance activity following the listing, at home, and in other markets in ways that firms that pursue listings in the U.K. do not.

7. Conclusions

In this paper, we investigate the evolution of cross-listings in the U.S. and the U.K. over time. We find that the number of cross-listed firms in the U.S. and on the LSE's Main Market in London follows a similar pattern, increasing from 1990 to 1999, with a peak around the turn of the century, and then a steady decline thereafter. The fact is that listing counts have been falling in London as well as in New York. This broader phenomenon makes it difficult to explain the decrease in New York alone using an argument that New York is becoming less competitive, perhaps because of SOX and other regulatory changes. It is true that the number of listings on AIM in London has grown dramatically since 2001, but most firms that list on AIM are small firms that would have been unlikely candidates to cross-list on the U.S. exchanges.

The argument that the U.S. exchanges have become less competitive only makes sense if some firms that would have listed in New York in the 1990s would no longer do so. We investigate this proposition and find no support for it. The characteristics of listing firms have not significantly changed since the adoption of SOX. There is little evidence that firms have been making listing decisions differently in recent years from how they made them from 1990 to 2001. If anything has changed in the aftermath of SOX, it is that the non-listed firms have become smaller and are therefore less likely to list on the U.S.

exchanges or the Main Market in London. The changing composition of firms that are not listed implies that there were actually *more* listed firms than one would expect based on the listing decision patterns from 1990 to 2001.

To ascertain further whether the benefits and costs of listing on the U.S. exchanges have changed over time, we conduct the most complete analysis of the relative valuation of U.S. listed firms to date. We use several distinct approaches to measure the cross-listing premium: cross-sectional regressions, Fama-MacBeth regressions, pooled regressions with firm fixed-effects, and event-time regressions. With each approach, we find that there is a listing premium for firms that list on U.S. exchanges but that there is no listing premium for firms that list in London. The listing premium is robust: it exists every year and it is permanent in event time. We find no evidence that the listing premium falls after 2001, even for listed firms from countries with good investor protection.

All of our evidence is consistent with the theory that there is a distinct governance benefit for firms that list on the U.S. exchanges. This benefit is not shared by firms that list in the U.S. outside the exchanges or in London. There is no evidence in our data that this benefit has weakened over time.

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Figure 1. The distribution of foreign listings in 1998 and 2005.
This figure shows the number of foreign listings in various host markets in 1998 and 2005. The data are from the World Federation of Stock Exchanges (www.world-exchanges.org). The Federation reports data for major exchanges, for markets specifically designed for small and medium sized enterprises, and other markets.

Figure 1a: 1998

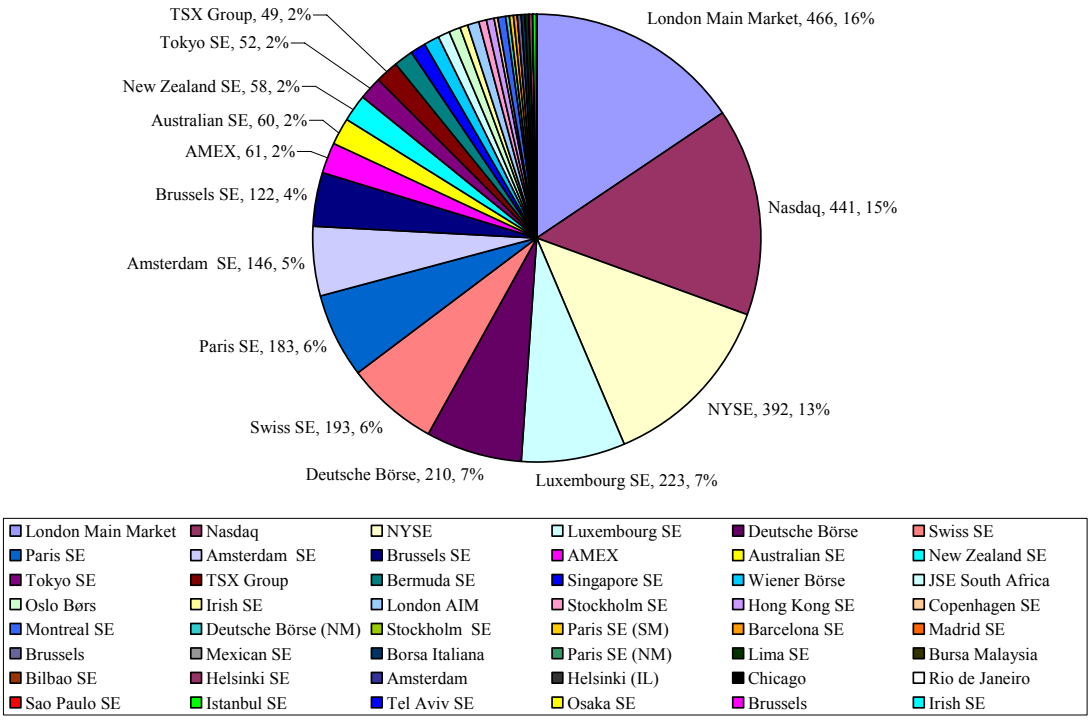

Figure 1b: 2005

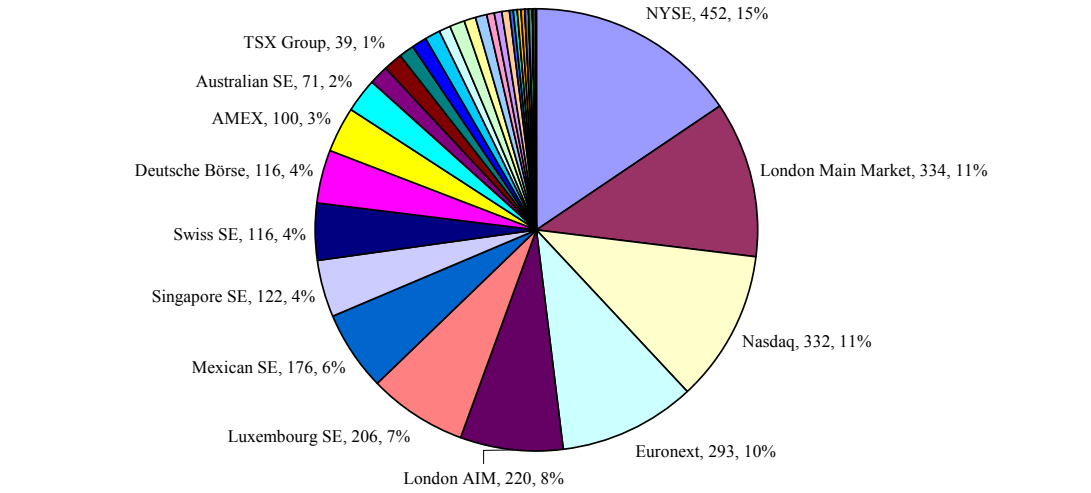

Figure 2. The U.S. cross-listing premium, 1990 to 2005.
This figure shows average *q* of non-cross-listed firms each year, as well as the premium for U.S. exchange-listings. The premiums are the estimated coefficients for U.S. exchange listings from Table 9 and control for firm and country characteristics.

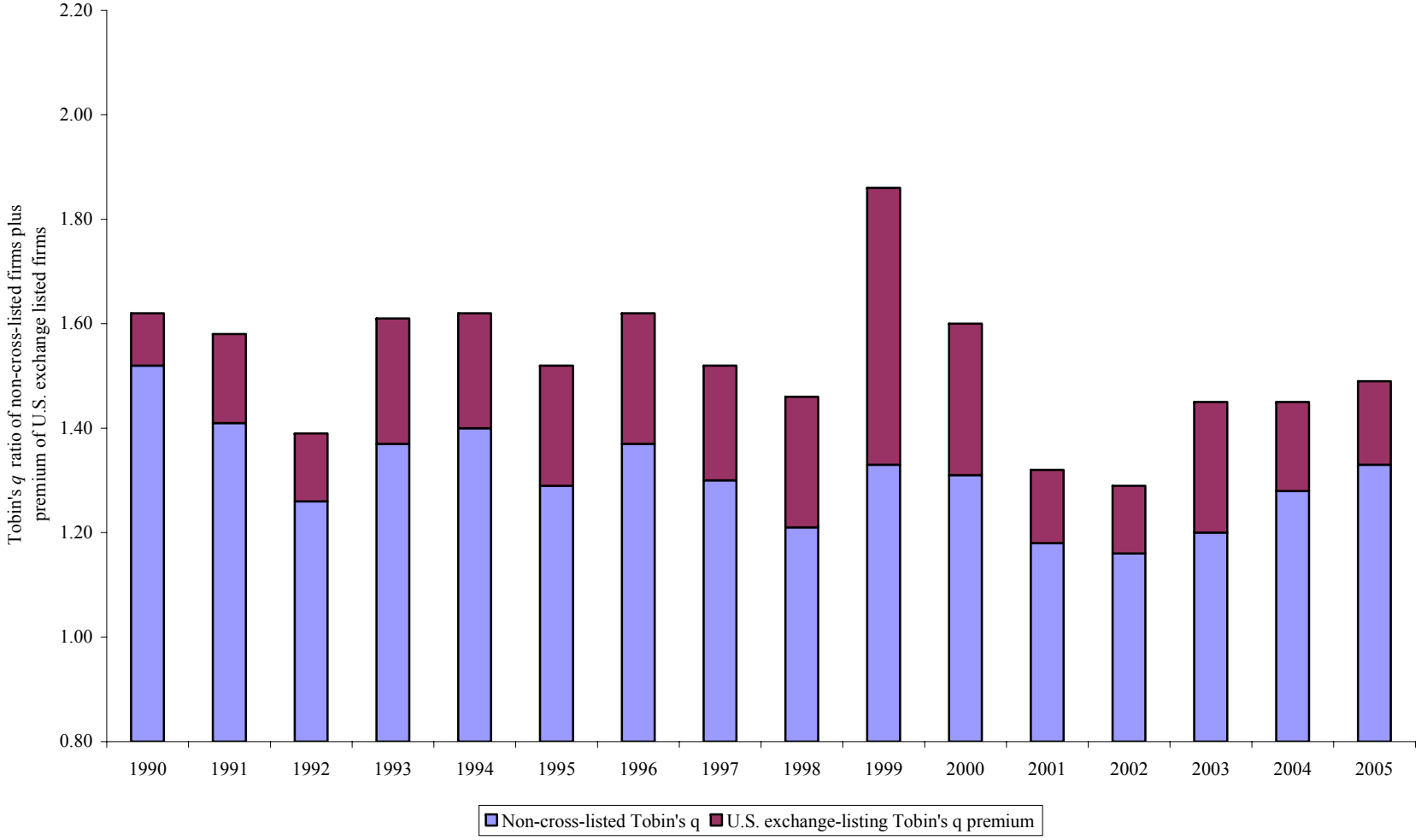

Table 1. Summary statistics for the total number of cross-listings each year.
This table shows the total number of firms cross-listed in either the U.S. or the U.K., each year from 1990-2005. The table includes all cross-listings in the U.S. and the U.K. in a given year. Information on cross-listings comes from the Bank of New York, Citibank, JP Morgan, the NYSE, NASDAQ, the LSE, the OTCBB, the Pink Sheets, CRSP, firms' annual reports, 20-Fs, and Factiva searches. Firms can cross-list in the U.S. via Rule 144a, over-the-counter as OTCBB or Pink Sheet issues, or on the AMEX, NASDAQ, or NYSE. Firms can cross-list in the U.K. via the Alternative Investment Market (AIM), or on the Main Market via depositary receipts or an ordinary listing.

	U.S. cross-listings			U.K. cross-listings		
Year	Rule 144a	OTC	Exchange	AIM	Depositary receipts	Ordinary listings
1990	15	139	328	0	3	333
1991	21	180	343	0	3	350
1992	35	226	387	0	3	361
1993	57	281	460	0	3	367
1994	144	380	538	0	9	378
1995	172	449	606	2	27	394
1996	221	510	722	10	52	418
1997	261	570	809	12	76	415
1998	281	632	851	18	98	391
1999	297	730	876	20	111	372
2000	296	764	960	29	122	363
2001	285	938	950	44	117	327
2002	283	993	902	55	115	291
2003	297	895	881	70	110	265
2004	298	901	883	131	108	241
2005	312	909	866	242	111	216

Table 2. New cross-listings and delistings: 1990 to 2005.
This table shows the total number of new cross-listings and delistings, in either the U.S. or the U.K., each year from 1990 to 2005. The table includes all cross-listings in the U.S. and the U.K. in a given year. Information on cross-listings comes from a variety of sources described in Table 1. Firms can cross-list in the U.S. via Rule 144a, over-the-counter as OTCBB or Pink Sheet issues, or on the AMEX, NASDAQ, or NYSE. Firms can cross-list in the U.K. via the Alternative Investment Market (AIM), or on the Main Market via depositary receipts or an ordinary listing. All delistings are included in the counts, regardless of the reason for delisting. If a firm upgrades from a Rule 144a or OTC listing to a U.S. exchange listing, the upgrade is counted as a new U.S. exchange listing and as a delisting from the Rule 144a or OTC market.

	U.S. cross-listings						U.K. cross-listings					
	Rule 144a		OTC		Exchange		AIM		Depositary receipts		Ordinary listings	
Year	New listings	Delistings	New listings	Delistings	New listings	Delistings	New listings	Delistings	New listings	Delistings	New listings	Delistings
1990	15	6	40	29	32	9	0	0	0	0	29	0
1991	13	6	47	6	31	17	0	0	0	0	17	0
1992	17	1	47	1	54	10	0	0	0	0	11	0
1993	27	3	63	3	90	17	0	0	0	0	8	2
1994	97	6	107	6	103	26	0	0	6	0	11	0
1995	35	6	79	8	94	29	2	0	18	0	17	1
1996	58	7	79	16	142	25	8	0	25	0	26	2
1997	45	4	97	33	129	41	5	3	24	0	12	18
1998	29	8	76	14	95	55	6	0	22	0	10	34
1999	28	11	122	22	91	65	4	2	14	1	15	39
2000	18	17	52	18	164	81	11	2	13	2	22	32
2001	9	20	205	31	70	81	16	1	3	8	10	51
2002	7	9	70	14	46	94	12	1	3	5	3	40
2003	20	6	69	166	38	58	18	3	1	6	5	37
2004	20	18	46	35	62	52	62	1	3	5	6	33
2005	25	11	45	34	58	66	114	2	11	8	4	28
Total	463	139	1244	436	1299	726	0 258	15	143	35	206	317

Table 3. New cross-listings by country: 1990 to 2005.
This table shows the total number of new cross-listings, in either the U.S. or the U.K., by country over the period from 1990 to 2005. It includes all cross-listings in the U.S. and the U.K. in a given year. Information on cross-listings comes from a variety of sources described in Table 1. Firms can cross-list in the U.S. via Rule 144a, over-the-counter as OTCBB or Pink Sheet issues, or on the AMEX, NASDAQ, or NYSE. Firms can cross-list in the U.K. via the Alternative Investment Market (AIM), or on the Main Market via depositary receipts or an ordinary listing.

	U.S. cross-listings			U.K. cross-listings		
Country	Rule 144a	OTC	Exchange	AIM	Depositary receipts	Ordinary listings
Argentina	11	8	18	0	1	0
Australia	7	105	33	49	0	2
Austria	2	20	1	0	0	0
Bahamas	0	0	4	0	0	0
Bahrain	0	0	0	0	1	0
Bangladesh	0	0	0	1	0	0
Barbados	0	0	0	1	0	0
Belgium	2	2	5	1	0	1
Belize	0	0	1	3	0	0
Bermuda	1	6	43	25	0	21
Bolivia	0	5	0	0	0	0
Brazil	13	48	38	0	1	0
British Virgin Islands	0	0	13	12	0	1
Canada	0	319	399	40	0	7
Cayman Islands	2	0	24	14	0	18
Chile	4	2	25	0	1	0
China	7	22	24	1	2	3
Colombia	6	4	1	0	0	0
Croatia	3	0	0	0	2	0
Cyprus	0	0	0	4	1	0
Czech Republic	3	1	0	0	3	0
Denmark	2	1	5	1	0	0
Dominican Republic	0	1	1	0	0	0
Ecuador	2	2	0	0	0	0
Egypt	10	3	0	0	11	0
Estonia	2	0	0	0	1	0
Falkland Islands	0	0	0	2	0	0
Finland	5	4	8	0	0	1
France	10	20	39	1	0	3
Germany	6	32	33	3	0	4
Ghana	1	0	1	0	0	1
Gibraltar	0	0	0	1	0	2
Greece	4	6	9	0	7	2
Hong Kong	2	118	34	1	0	0
Hungary	6	3	1	0	4	0
India	79	1	14	1	25	0
Indonesia	3	4	4	0	2	0
Ireland	0	13	20	37	0	58
Israel	2	14	108	16	3	7
Italy	13	4	16	3	0	0
Jamaica	0	4	0	0	0	0
Japan	6	32	19	0	0	17
Jersey	0	0	1	0	0	0
Jordan	1	0	0	0	2	0
Kazakhstan	3	1	0	0	1	0

Table 3, continued.

Country	U.S. cross-listings			U.K. cross-listings		
	Rule 144a	OTC	Exchange	AIM	Depositary receipts	Ordinary listings
Latvia	1	0	0	0	1	0
Lebanon	3	0	0	0	2	0
Lithuania	2	0	0	0	1	0
Luxembourg	2	2	15	4	1	6
Malawi	0	0	0	0	1	0
Malaysia	0	14	0	1	0	0
Malta	1	0	0	0	1	0
Marshall Islands	0	0	2	0	0	0
Mauritius	0	0	0	0	0	4
Mexico	31	49	39	0	0	0
Morocco	1	0	0	0	0	1
Netherlands Antilles	0	0	1	0	0	3
Netherlands	3	16	44	1	1	7
New Zealand	0	3	10	1	0	0
Nigeria	1	0	0	0	0	0
Norway	5	9	10	1	0	3
Oman	1	0	0	0	1	0
Panama	0	2	3	0	0	0
Papua New Guinea	0	2	0	0	1	0
Pakistan	3	0	0	0	0	0
Peru	3	4	4	0	0	0
Philippines	7	6	1	0	0	0
Poland	12	3	1	0	13	0
Portugal	4	4	4	0	0	1
Puerto Rico	0	0	3	0	0	0
Qatar	1	0	0	0	1	0
Romania	1	0	0	0	1	0
Russia	12	56	6	0	7	0
Singapore	2	24	10	1	0	0
Slovakia	0	1	0	0	0	0
Slovenia	2	0	0	0	2	0
South Africa	10	46	14	0	2	7
South Korea	29	5	15	0	14	0
Spain	3	5	4	0	0	0
Sri Lanka	1	0	0	0	0	0
Sweden	4	11	13	1	0	3
Switzerland	3	12	16	0	0	5
Taiwan	56	0	9	0	14	0
Thailand	2	15	0	0	0	0
Trinidad	0	1	0	0	0	0
Tunisia	1	0	0	0	1	0
Turkey	16	7	1	0	9	0
United Emirates	0	0	0	0	1	0
United Kingdom	17	122	129	0	0	0
Ukraine	0	9	0	0	0	0
Uruguay	1	0	0	0	0	0
United States	0	0	0	31	0	17
Venezuela	3	11	3	0	0	0
Zimbabwe	1	0	0	0	0	1

Table 4. The type and frequency of delistings: 1990 to 2005.
This table shows the number of delistings from U.S. stock exchanges (AMEX, NASDAQ, or the NYSE) and from ordinary listings on the Main Market in the U.K. over the period from 1990 to 2005. Information on cross-listings comes from a variety of sources described in Table 1. A delisting is classified as "Voluntary" if a firm is in compliance with an exchange's listing standards and voluntarily takes steps to delist its shares or depositary receipts. Firms are also delisted when they are acquired and these cases are classified as "Merger / acquisition". Finally, firms are delisted for other reasons, most often by the exchanges when they fail to meet listing standards, when a firm is bankrupt, in financial distress, or undergoes restructuring. The first number for each category is the number of delistings of that type. The second number is the number of delistings as a % of the total number of listings that year.

	U.S. exchange delistings						U.K. ordinary delistings					
Year	Voluntary		Merger/acquisition		Other		Voluntary		Merger/acquisition		Other	
1990	1	0.30%	2	0.61%	6	1.83%	0	0.00%	0	0.00%	0	0.00%
1991	1	0.29%	3	0.87%	13	3.79%	0	0.00%	0	0.00%	0	0.00%
1992	0	0.00%	2	0.52%	8	2.07%	0	0.00%	0	0.00%	0	0.00%
1993	1	0.22%	7	1.52%	9	1.96%	1	0.27%	1	0.27%	0	0.00%
1994	1	0.19%	7	1.30%	18	3.35%	0	0.00%	0	0.00%	0	0.00%
1995	0	0.00%	17	2.81%	12	1.98%	0	0.00%	1	0.24%	0	0.00%
1996	1	0.14%	14	1.94%	10	1.39%	1	0.21%	0	0.00%	1	0.21%
1997	3	0.37%	17	2.10%	21	2.60%	3	0.61%	8	1.63%	7	1.43%
1998	4	0.47%	31	3.64%	20	2.35%	5	1.02%	22	4.50%	7	1.43%
1999	0	0.00%	32	3.65%	32	3.65%	3	0.62%	25	5.18%	11	2.28%
2000	6	0.63%	39	4.06%	36	3.75%	5	1.03%	20	4.12%	7	1.44%
2001	5	0.53%	42	4.42%	34	3.58%	12	2.70%	26	5.86%	13	2.93%
2002	19	2.11%	24	2.66%	51	5.65%	18	4.43%	7	1.72%	15	3.69%
2003	17	1.93%	22	2.50%	19	2.16%	24	6.40%	10	2.67%	3	0.80%
2004	15	1.70%	17	1.93%	20	2.27%	18	5.16%	7	2.01%	8	2.29%
2005	21	2.42%	33	3.81%	13	1.50%	15	4.59%	8	2.45%	5	1.53%
Total	95		309		322		105		135		77	

Table 5. Characteristics of newly cross-listed firms.

This table compares the characteristics of firms with new cross-listings in a given year and firms that are not cross-listed over the period from 1990 to 2005. Firms can cross-list in the U.S. via Rule 144a, over-the-counter as OTCBB or Pink Sheet issues, or on the AMEX, NASDAQ, or NYSE. Firms can cross-list in the U.K. via the Alternative Investment Market (AIM), or on the Main Market via depositary receipts or an ordinary listing. Information on cross-listings comes from a variety of sources described in Table 1. In panels a and b, the sample includes all new cross-listings by non-U.S. firms that are in the Worldscope database in a given year. In panels c and d, the sample includes all new cross-listings by non-financial, non-U.S., non-U.K. firms that are in the Worldscope database and have total assets of at least $100 million (in 1990 dollars) in a given year. Firms from Bermuda and the Cayman Islands are excluded. The median value for a given characteristic is computed for firms with new cross-listings. For firms that are not cross-listed, the median is computed over all firm-year observations. For the common law dummy, the percentage of firms with new cross-listings from common law countries is reported. Tobin's *q* is computed as ((Total Assets – Book Equity) + Market Value of Equity) / Total Assets (all variables are in local currency). Sales growth is inflation adjusted two-year sales growth (winsorized at 1% and 99% tails), global industry *q* is the median global industry *q*, total assets is in $ millions, adjusted for inflation, leverage is defined as total debt divided by total assets, and ownership is the data item "closely-held shares" from Worldscope. Common law is a dummy variable that equals one if a country's legal origin is based on common law. Legal is anti-director × rule of law, from Djankov et al. (2007) and La Porta et al. (1998). Log of GNP per capita ($) and stock market capitalization to GDP are from the World Bank WDI Database. The tests at the bottom of each panel report *p*-values from Wilcoxon rank-sum tests, which test the hypothesis that two samples are from populations with the same distribution. In panels a and c, the characteristics of firms with new U.S. exchange listings are compared to the characteristics of firms with other new cross-listing types and with firms that are not cross-listed. In panels b and d, the characteristics of new cross-listings and firms that are not cross-listed are compared before and after SOX (the period from 1990 to 2001 vs. 2002 to 2005).

Panel a.	q		Sales growth		Global industry q		Total assets		Leverage		Ownership		Common Law	Anti-director	Legal	GNP/ capita	Market cap /GDP
	N	Median	N	Median	N	Median	N	Median	N	Median	N	Median	Percent	Median	Median	Median	Median
1990 – 2005																	
U.S. Rule 144a	276	1.35	193	0.12	303	1.19	303	994.54	303	0.23	185	0.43	26	3.0	20.9	4635	0.40
U.S. OTC	858	1.25	636	0.08	937	1.16	937	275.4	935	0.19	616	0.40	68	4.0	40.0	21000	0.99
U.S. Exchange	751	1.56	497	0.15	822	1.27	822	654.6	821	0.19	493	0.38	55	4.0	40.0	20250	0.80
U.K. AIM	80	2.01	32	0.10	84	1.43	84	11.5	83	0.00	63	0.35	96	4.0	40.0	22890	1.04
U.K. DR	89	1.35	54	0.14	92	1.15	92	1290.0	91	0.17	55	0.55	23	3.0	18.7	4210	0.33
U.K. Ordinary	93	1.34	76	0.14	105	1.16	105	689.5	105	0.15	88	0.41	57	4.0	31.2	21730	0.67
Not listed	194061	1.10	174404	0.03	219975	1.12	219843	113.8	218936	0.20	155296	0.50	40	3.5	31.4	20470	0.71
Rule 144a vs. Exchange		0.00		0.00		0.00		0.00		0.00		0.07	0.00	0.00	0.00	0.00	0.00
OTC vs. Exchange		0.00		0.00		0.00		0.00		0.43		0.98	0.00	0.00	0.00	0.95	0.00
AIM vs. Exchange		0.02		0.18		0.00		0.00		0.00		0.52	0.00	0.15	0.00	0.00	0.00
DR vs. Exchange		0.00		0.65		0.00		0.00		0.87		0.00	0.00	0.00	0.00	0.00	0.00
Ordinary vs. Exchange		0.01		0.64		0.00		0.74		0.35		0.71	0.74	0.03	0.00	0.09	0.06
Not listed vs. Exchange		0.00		0.00		0.00		0.00		0.00		0.00	0.00	0.00	0.00	0.00	0.04

Table 5, continued.

Panel b.	q		Sales growth		Global industry q		Total assets		Leverage		Ownership		Common Law	Anti-director	Legal	GNP/ capita	Market cap /GDP
	N	Median	N	Median	N	Median	N	Median	N	Median	N	Median	Percent	Median	Median	Median	Median
1990 – 2001																	
U.S. Rule 144a	215	1.37	149	0.10	252	1.22	252	999.4	252	0.22	139	0.47	25	3.0	20.9	4430	0.56
U.S. OTC	690	1.23	493	0.08	747	1.16	747	341.7	746	0.20	485	0.40	69	4.0	40.0	20560	0.99
U.S. Exchange	609	1.53	414	0.16	674	1.28	674	729.6	673	0.21	383	0.39	52	4.0	40.0	24560	1.04
U.K. AIM	16	2.32	4	-0.04	16	1.15	16	6.39	16	0.04	16	0.45	94	4.0	40.0	20030	0.81
U.K. DR	81	1.38	47	0.12	84	1.18	84	1290.0	83	0.17	52	0.55	22	3.0	18.7	4260	0.32
U.K. Ordinary	85	1.33	69	0.14	96	1.16	96	701.2	96	0.16	80	0.43	54	4.0	31.2	21370	0.67
Not listed	123581	1.11	107121	0.03	143111	1.13	142999	138.72	142223	0.21	104875	0.50	40.2	3.5	31.4	20110	0.67
2002 – 2005																	
U.S. Rule 144a	51	1.32	44	0.20	51	1.08	51	990.4	51	0.29	46	0.40	33	3.0	20.9	13736	0.36
U.S. OTC	168	1.42	143	0.06	190	1.16	190	81.25	189	0.15	131	0.46	65	4.0	40.0	24560	1.04
U.S. Exchange	142	1.77	83	0.11	148	1.25	148	215.4	148	0.08	110	0.34	71	4.0	35.0	20000	0.77
U.K. AIM	64	1.94	28	0.17	68	1.52	68	12.16	67	0.00	47	0.32	97	4.0	40.0	25700	1.20
U.K. DR	8	1.16	7	0.18	8	1.04	8	2463.4	8	0.27	3	0.43	38	4.0	19.1	1990	0.55
U.K. Ordinary	8	2.15	7	0.15	9	1.28	9	689.5	9	0.13	8	0.27	63	4.0	35.7	24560	0.84
Not listed	70480	1.08	67283	0.04	76864	1.10	76844	79.49	76713	0.19	76713	0.49	59.8	3.5	31.4	24560	0.80
Rule 144a: pre / post SOX		0.51		0.00		0.00		0.74		0.19		0.46	0.23	0.09	0.38	0.82	0.00
OTC: pre / post SOX		0.00		0.05		0.64		0.00		0.02		0.04	0.43	0.00	0.07	0.00	0.06
Exchange: pre / post SOX		0.17		0.02		0.83		0.00		0.00		0.37	0.00	0.27	0.01	0.00	0.00
AIM: pre / post SOX		0.27		0.69		0.00		0.14		0.25		0.33	0.52	0.56	0.31	0.00	0.00
DR: pre / post SOX		0.62		0.29		0.01		0.78		0.66		0.74	0.38	0.12	0.94	0.21	0.37
Ordinary: pre / post SOX		0.22		0.69		0.24		0.87		0.98		0.27	0.73	0.42	0.03	0.26	0.55
Not listed: pre / post SOX		0.00		0.00		0.00		0.00		0.00		0.00	0.00	0.00	0.00	0.00	0.00

Table 5, continued.

Panel c.	q		Sales growth		Global industry q		Total assets		Leverage		Ownership		Common Law	Anti-director	Legal	GNP/ capita	Market cap /GDP
	N	Median	N	Median	N	Median	N	Median	N	Median	N	Median	Percent	Median	Median	Median	Median
1990 – 2005																	
U.S. Rule 144a	93	1.35	93	0.14	93	1.21	93	1255.7	93	0.29	93	0.39	23	3.5	23.1	12070	0.55
U.S. OTC	270	1.25	270	0.08	270	1.20	270	1113.9	270	0.23	270	0.45	47	4.0	31.4	21530	0.67
U.S. Exchange	207	1.44	207	0.13	207	1.24	207	2132.9	207	0.23	207	0.40	32	3.5	31.4	22100	0.67
U.K. AIM	5	1.33	5	0.18	5	1.48	5	146.0	5	0.29	5	0.15	100	4.0	40.0	23610	1.04
U.K. DR	22	1.41	22	0.16	22	1.15	22	1425.3	22	0.29	22	0.51	25	3.5	18.7	7355	0.35
U.K. Ordinary	38	1.47	38	0.14	38	1.23	38	2954.3	38	0.23	38	0.45	36	3.5	31.2	24515	0.88
Not listed	57421	1.13	57421	0.03	57421	1.15	57421	391.3	57421	0.26	57421	0.49	30	3.5	31.4	26960	0.67
Rule 144a vs. Exchange		0.05		0.95		0.00		0.05		0.15		0.74	0.12	0.39	0.00	0.00	0.01
OTC vs. Exchange		0.00		0.02		0.00		0.00		0.44		0.03	0.00	0.00	0.21	0.09	0.98
AIM vs. Exchange		0.97		0.97		0.81		0.00		0.77		0.02	0.00	0.09	0.00	0.50	0.09
DR vs. Exchange		0.30		0.83		0.07		0.15		0.50		0.13	0.54	0.79	0.00	0.00	0.00
Ordinary vs. Exchange		0.61		0.88		0.81		0.76		0.76		0.35	0.56	0.40	0.08	0.85	0.51
Not listed vs. Exchange		0.00		0.00		0.00		0.00		0.07		0.00	0.00	0.00	0.02	0.00	0.36

Table 5, continued.

Panel d.	q		Sales growth		Global industry q		Total assets		Leverage		Ownership		Common Law	Anti-director	Legal	GNP/ capita	Market cap /GDP
	N	Median	N	Median	N	Median	N	Median	N	Median	N	Median	Percent	Median	Median	Median	Median
1990 – 2001																	
U.S. Rule 144a	60	1.35	60	0.10	60	1.25	60	1387.9	60	0.22	60	0.43	22	3.5	22.41	11355	0.35
U.S. OTC	214	1.23	214	0.09	214	1.21	214	1359.8	214	0.25	214	0.44	51	4.0	31.6	21530	0.67
U.S. Exchange	165	1.44	165	0.13	165	1.25	165	2456.7	165	0.24	165	0.40	28	3.5	31.2	21810	0.67
U.K. AIM	1	1.20	1	0.95	1	0.91	1	111.37	1	0.29	1	0.04	100	4.0	40.0	22100	0.99
U.K. DR	20	1.34	20	0.16	20	1.15	20	1651.9	20	0.25	20	0.52	15	3.5	18.7	9900	0.35
U.K. Ordinary	34	1.43	3	0.11	33	1.25	34	2954.3	34	0.22	34	0.44	33	3.5	31.2	23875	0.88
Not listed	39636	1.15	39636	0.03	39636	1.18	39636	411.5	39636	0.27	39636	0.50	30	3.5	31.4	27730	0.66
2002 – 2005																	
U.S. Rule 144a	33	1.33	33	0.23	33	1.12	33	603.9	33	0.32	33	0.38	24	3.0	25.6	13476	0.99
U.S. OTC	56	1.33	56	0.08	56	1.14	56	736.4	56	0.19	56	0.51	31	3.5	30.0	23750	0.67
U.S. Exchange	42	1.53	42	0.12	42	1.16	42	1376.4	42	0.21	42	0.43	48	4.0	31.5	22660	0.79
U.K. AIM	4	1.62	4	0.00	4	1.59	4	217.58	4	0.24	4	0.16	100	4.0	40.0	24560	1.12
U.K. DR	2	1.59	2	0.45	2	1.08	2	398.5	2	0.33	2	0.39	100	5.0	20.9	620	0.56
U.K. Ordinary	4	2.65	4	0.23	4	1.22	4	3030.9	4	0.29	4	0.51	25	3.75	35.7	28345	0.79
Not listed	17785	1.10	17785	0.04	17785	1.12	17785	350.9	17785	0.24	17785	0.48	22	3.5	31.4	24330	0.76
Rule 144a: pre / post SOX		0.97		0.00		0.00		0.01		0.10		0.50	1.00	0.78	0.25	0.37	0.00
OTC: pre / post SOX		0.68		0.43		0.01		0.06		0.06		0.05	0.00	0.00	0.00	0.47	0.91
Exchange: pre / post SOX		0.51		0.68		0.50		0.03		0.06		0.72	0.02	0.21	0.68	0.50	0.35
AIM: pre / post SOX		0.48		0.16		0.16		0.48		1.00		0.48	1.00	1.00	1.00	0.18	0.48
DR: pre / post SOX		0.57		0.49		0.30		0.17		0.65		0.36	0.04	0.06	0.41	0.11	0.25
Ordinary: pre / post SOX		0.10		0.32		0.89		0.48		0.49		0.96	0.61	0.88	0.21	0.81	0.83
Not listed: pre / post SOX		0.00		0.00		0.00		0.00		0.00		0.00	0.00	0.00	0.00	0.00	0.00

Table 6. Competing risks models of the determinants of the listing decision.

The Cox proportional hazard models estimate the probability of listing in the U.S. or in the U.K. in year *t*, given that the firm does not yet have a listing of that type, over the period from 1991 to 2005. The sample includes all non-financial, non-U.S., non-U.K. firms that are in the Worldscope database and have total assets of at least $100 million (in 1990 dollars) in a given year. Firms from Bermuda and the Cayman Islands are excluded. Information on cross-listings comes from a variety of sources described in Table 1. Models (1) and (2) include all types of listings in New York and London, while Models (3) and (4) include only exchange listings in New York and ordinary listings in London. Sales growth is inflation adjusted two-year sales growth (winsorized at 1% and 99% tails), global industry *q* is the median global industry *q*, total assets is in $ millions, adjusted for inflation, leverage is defined as total debt divided by total assets, and ownership is the data item "closely-held shares" from Worldscope. Legal is anti-director × rule of law, from Djankov et al. (2007) and La Porta et al. (1998). Log of GNP per capita ($) and stock market capitalization to GDP are from the World Bank WDI Database. All independent variables are lagged by one year. The hazard ratios for U.S. exchange listings and U.K. ordinary listings are estimated jointly, but are allowed to vary across outcomes and the baseline hazard for each listing choice is assumed to be different. The model does not estimate a constant. The table reports hazard ratios (i.e., $exp(\beta_x)$, not β_x). The *t*-statistics test the null hypothesis that the hazard ratio is equal to one. The *t*-statistics are adjusted for clustering on firms – they are computed assuming observations are independent across firms, but not across time. The column, "Test" tests whether the hazard ratios for U.S. listings are different from U.K. listings. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	All listing types in the U.S. and U.K.						U.S. exchange listings and U.K. ordinary listings					
	(1)			(2)			(3)			(4)		
	U.S. hazard ratios	U.K. hazard ratios	Test	U.S. hazard ratios	U.K. hazard ratios	Test	U.S. hazard ratios	U.K. hazard ratios	Test	U.S. hazard ratios	U.K. hazard ratios	Test
Sales growth	1.09	1.08	0.27	1.11	0.59	0.40	1.11	1.09	0.09	1.12	0.78	0.25
	(7.11)***	(2.46)**		(5.77)***	-(0.53)		(7.18)***	(2.58)**		(4.85)***	-(0.34)	
Global industry q	4.56	5.57	0.23	4.22	5.63	0.36	7.64	6.05	0.20	8.65	4.63	1.01
	(11.50)***	(4.18)***		(9.14)***	(3.65)***		(11.7)***	(3.86)***		(11.9)***	(2.51)**	
Log(Assets)	1.88	1.64	1.49	1.91	1.68	0.94	2.04	1.87	0.35	2.12	1.85	0.96
	(18.90)***	(4.56)***		(16.8)***	(4.12)***		(15.00)***	(4.87)***		(12.9)***	(4.75)***	
Leverage	0.46	1.00	0.82	0.32	1.32	1.88	0.38	0.94	0.59	0.15	1.29	2.40
	-(3.36)***	(0.00)		-(4.23)***	(0.27)		-(2.90)***	-(0.05)		-(4.65)***	(0.19)	
Ownership				0.35	0.68	0.76				0.20	1.12	4.70**
				-(4.38)***	-(0.53)					-(4.07)***	(0.17)	
Legal	4.23	2.57	1.16	4.49	3.32	0.34	5.51	2.04	2.26	5.45	2.98	0.77
	(11.2)***	(2.09)**		(9.98)***	(2.35)***		(8.21)***	(1.18)		(6.64)***	(1.68)*	
Log (GNP)	0.84	0.91	0.21	0.84	0.92	0.26	1.04	0.93	0.41	1.04	0.85	0.73
	-(3.93)***	-(0.64)		-(3.21)***	-(0.46)		(0.59)	-(0.36)		(0.45)	-(0.74)	
Stock market cap / GDP	0.73	0.65	0.14	0.74	0.59	0.30	0.56	1.02	2.96*	0.51	0.86	1.33
	-(3.34)***	-(1.40)		-(2.99)***	-(1.37)		-(2.99)***	(0.07)		-(2.41)**	-(0.43)	
Number of failures	573	39		425	30		266	24		183	20	
Number of observations		145,061			118,109			136,059			110,583	
Log likelihood		-6050.18			-4367.82			-2731.71			-1849.64	
$\chi 2$		760.71			593.13			615.48			483.49	
Prob > $\chi 2$		0.0000			0.0000			0.0000			0.0000	

Table 7. Logit regressions of the characteristics of exchange-listed firms.

This table analyzes the characteristics of firms that cross-list on a U.S. stock exchange (AMEX, NASDAQ, or the NYSE) and on the LSE (ordinary listings) over the period from 1990 to 2005. The sample includes all non-financial, non-U.S., non-U.K. firms that are in the Worldscope database and have total assets of at least $100 million (in 1990 dollars) in a given year. Firms from Bermuda and the Cayman Islands are excluded. Information on cross-listings comes from a variety of sources described in Table 1. Firms with other types of cross-listings (Rule 144a or OTC in the U.S. and AIM or depositary receipts in the U.K.) are excluded. Sales growth is inflation adjusted two-year sales growth (winsorized at 1% and 99% tails), global industry *q* is the median global industry *q*, total assets is in $ millions, adjusted for inflation, leverage is defined as total debt divided by total assets, and ownership is the data item "closely-held shares" from Worldscope. Legal is anti-director × rule of law, from Djankov et al. (2007) and La Porta et al. (1998). Log of GNP per capita ($) and stock market capitalization to GDP are from the World Bank WDI Database. Year dummies are included, but not reported. A logit regression is estimated over the periods from 1990 to 2001 (pre-SOX) and from 2002 to 2005 (post-SOX). In the columns, "Listing stock", the dependent variable equals one if a firm is cross-listed in the U.S. or in the U.K., in any year. In the columns "Listing flows", the dependent variable equals one in the year that a firm cross-lists. Results for listing flows are not reported for 2002-2005 for U.K. ordinary listings (in total, only five new listings). The *t*-statistics are adjusted for clustering on firms – they are computed assuming observations are independent across firms, but not across time for each firm. Pseudo-R^2 is a goodness-of-fit measure based on the difference between unrestricted and restricted likelihood functions. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	U.S. exchange listings				U.K. ordinary listings			
	Listing stock		Listing flows		Listing stock		Listing flows	
	1990-2001	2002-2005	1990-2001	2002-2005	1990-2001	2002-2005	1990-2001	2002-2005
Constant	-9.02	-11.57	-13.47	-17.17	-8.83	-12.50	-20.51	.
	-(11.65)***	-(17.23)***	-(12.32)***	-(6.57)***	-(8.17)***	-(11.14)***	-(7.34)***	.
Sales growth	0.93	-0.42	1.32	1.73	-0.38	-1.28	0.92	.
	(7.73)***	-(1.93)*	(7.25)***	(4.32)***	-(1.44)	-(2.06)**	(1.75)*	.
Global industry q	1.52	2.32	1.97	3.01	0.68	1.26	1.28	.
	(8.30)***	(10.11)***	(7.85)***	(6.08)***	(2.34)**	(3.06)***	(1.96)**	.
Log(Assets)	0.80	0.87	0.86	0.64	0.96	0.93	1.12	.
	(17.65)***	(20.48)***	(13.97)***	(5.32)***	(13.54)***	(11.71)***	(7.49)***	.
Leverage	-1.46	-1.21	-1.82	-2.78	-3.33	-1.21	-3.33	.
	-(4.98)***	-(3.53)***	-(3.94)***	-(2.67)***	-(7.11)***	-(2.17)**	-(2.85)***	.
Ownership	-2.35	-2.33	-1.85	-1.55	-3.81	-3.10	-1.03	.
	-(9.45)***	-(9.33)***	-(4.69)***	-(1.99)**	-(10.24)***	-(7.23)***	-(1.52)	.
Legal	0.08	0.05	0.05	0.07	0.04	0.03	-0.07	.
	(7.06)***	(5.15)***	(3.04)***	(2.30)**	(3.04)***	(2.13)**	-(1.86)*	.
Log (GNP)	-0.81	-0.63	-0.66	-0.33	-0.83	-0.54	-0.25	.
	-(13.72)***	-(9.69)***	-(8.15)***	-(1.62)	-(9.84)***	-(5.05)***	-(1.21)	.
Stock market cap / GDP	-0.11	0.12	0.05	-0.46	0.21	0.06	0.78	.
	-(1.20)	(1.61)	(0.34)	-(1.46)	(1.75)*	(0.34)	(2.41)**	.
Number of observations	45,176	19,840	43,302	18,256	44,315	18,844	39,220	.
Average Pseudo R^2	0.2273	0.2646	0.1910	0.1874	0.2807	0.2474	0.2158	

Table 8. The propensity to cross-list on major exchanges over time.
This table examines whether the propensity to cross-list on a U.S. stock exchange (AMEX, NASDAQ, or the NYSE) and on the LSE (ordinary listings) has declined since 2001. The sample includes all non-financial, non-U.S., non-U.K. firms that are in the Worldscope database and have total assets of at least $100 million (in 1990 dollars) in a given year. Firms from Bermuda and the Cayman Islands are excluded. Information on cross-listings comes from a variety of sources described in Table 1. Firms with other types of cross-listings (Rule 144a or OTC in the U.S. and AIM or depositary receipts in the U.K.) are excluded. A logit regression is estimated over the period from 1990 to 2001. In the columns, "Listing stock", the dependent variable equals one if a firm is cross-listed in the U.S. (Panel a) or in the U.K. (panel b), in any year. In the columns, "Listing flows", the dependent variable equals one in the year that a firm cross-lists. In each regression, the explanatory variables are sales growth, global industry *q*, log of total assets, leverage, ownership, legal, log of GNP, stock market capitalization to GDP, and year dummies. "Firms" is the number of firms in the sample for a given year. "Listed" is the number of firms with a cross-listing in a given year. "New listings" is the number of firms listing in a given year. "Actual %" is the percent of firms with a cross-listing. "Expected %" is computed by applying the average logit coefficients for 1990 to 2001 (Table 7) to the values of the explanatory variables for each firm each year between 2002 and 2005, obtaining the predicted probability that a firm has a listing each year, summing the predicted probabilities over firms each year, dividing by the number of firms, and multiplying by 100.

Panel a. U.S. exchange listings.

	Listing stock					Listing flows				
Year	Firms	Listed	Actual %	Expected %	Expected - Actual	Firms	New listings	Actual %	Expected %	Expected - Actual
1990 – 2001 (average)	3,765	170	4.515			3,609	14	0.388		
2002	4,738	343	7.239	3.811	-3.428	4,395	21	0.476	0.064	-0.412
2003	4,939	322	6.519	4.197	-2.322	4,617	3	0.065	0.080	0.015
2004	5,189	347	6.687	4.905	-1.762	4,843	11	0.227	0.108	-0.119
2005	4,974	344	6.916	5.664	-1.252	4,630	6	0.130	0.140	0.010

Panel b. U.K. ordinary listings.

	Listing stock					Listing flows				
Year	Firms	Listed	Actual %	Expected %	Expected - Actual	Firms	New listings	Actual %	Expected %	Expected - Actual
1990 – 2001 (average)	3,693	99	2.690			3,542	2	0.057		
2002	4,494	99	2.201	2.253	0.052	4,396	1	0.023	0.021	-0.001
2003	4,708	91	1.933	2.572	0.639	4,618	1	0.022	0.033	0.011
2004	4,934	91	1.844	2.817	0.973	4,846	3	0.062	0.049	-0.013
2005	4,708	78	1.657	3.112	1.455	4,630	0	0.000	0.057	0.057

Table 9. Regression analysis of the valuation of cross-listed firms: 1990 to 2005.

Panel a presents the cross-sectional regression estimates of the valuation differential of cross-listing in the U.S. or in the U.K, each year from 1990 to 2005. The sample includes all non-financial, non-U.S., non-U.K. firms that are in the Worldscope database and have total assets of at least $100 million (in 1990 dollars) in a given year. Firms from Bermuda and the Cayman Islands are excluded. Information on cross-listings comes from a variety of sources described in Table 1. The dependent variable in each regression is Tobin's *q*, computed as ((Total Assets – Book Equity) + Market Value of Equity) / Total Assets (all variables are in local currency). U.S. Rule 144a, U.S. OTC, U.S. Exchange, U.K. AIM, U.K. DR, and U.K. Ordinary are dummy variables that equal one if a firm has a cross-listing of that type in a given year. Cross-listing dummies of a given type are excluded if there are less than 10 listings in a year. Sales growth is inflation adjusted two-year sales growth (winsorized at 1% and 99% tails), global industry *q* is the median global industry *q*, and sales is in $ millions, adjusted for inflation. All regressions include country dummies (not reported). The *t*-statistics, in parentheses are adjusted for clustering on countries – they are computed assuming observations are independent across countries, but not within countries. *t*-statistics greater than 1.65, 1.96, and 2.55 are significant at the 10%, 5%, and 1% levels, respectively. Panel b presents results from panel data regressions. The regressions are estimated three ways: 1) Fama-Macbeth, 2) pooled OLS with the standard errors corrected for clustering on firms, and 3) with firm-fixed effects. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel a.	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Constant	2.14	1.62	0.60	0.35	0.26	-0.12	0.11	-0.01	-0.42	-0.43	-0.55	-0.71	-0.36	-0.22	-0.18	-0.02
	(5.09)	(4.72)	(2.41)	(1.16)	(0.81)	-(0.34)	(0.28)	-(0.04)	-(2.29)	-(2.16)	-(1.36)	-(3.70)	-(1.51)	-(1.74)	-(1.00)	-(0.19)
U.S. Rule 144a	.	.	0.24	0.22	0.09	0.15	0.10	0.04	0.01	0.07	-0.03	0.00	-0.01	0.00	-0.04	-0.02
	.	.	(1.84)	(1.78)	(1.22)	(1.46)	(0.95)	(0.37)	(0.13)	(0.47)	-(0.29)	-(0.05)	-(0.19)	(0.07)	-(0.57)	-(0.20)
U.S. OTC	0.14	0.06	0.09	0.14	0.15	0.17	0.18	0.17	0.14	0.18	0.18	0.08	0.04	0.09	0.09	0.12
	(1.47)	(1.12)	(1.29)	(2.08)	(3.02)	(4.13)	(3.26)	(4.06)	(3.16)	(5.01)	(3.10)	(2.27)	(1.12)	(3.07)	(2.18)	(2.63)
U.S. Exchange	0.10	0.17	0.13	0.24	0.22	0.23	0.25	0.22	0.25	0.53	0.29	0.14	0.13	0.25	0.17	0.16
	(1.88)	(2.29)	(1.90)	(3.32)	(5.25)	(5.08)	(5.02)	(4.81)	(5.08)	(5.51)	(2.96)	(2.51)	(2.76)	(6.15)	(3.50)	(3.75)
U.K. AIM	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	0.27
	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	(1.04)
U.K. DR	.	.	.	.	.	.	-0.15	0.08	0.07	0.18	0.00	0.09	-0.03	-0.05	-0.04	-0.14
	.	.	.	.	.	.	-(1.48)	(0.39)	(0.57)	(0.59)	(0.03)	(0.87)	-(0.40)	-(0.79)	-(0.58)	-(2.45)
U.K. Ordinary	0.14	0.05	-0.05	-0.03	-0.13	-0.12	-0.19	-0.14	-0.05	-0.01	-0.06	-0.01	0.01	-0.08	-0.06	-0.09
	(1.50)	(0.49)	-(0.66)	-(0.49)	-(1.74)	-(1.28)	-(1.67)	-(1.72)	-(0.73)	-(0.07)	-(0.70)	-(0.08)	(0.12)	-(1.27)	-(0.89)	-(0.92)
Sales growth	0.10	0.11	0.26	0.62	0.39	0.29	0.47	0.54	0.52	0.79	0.52	0.39	0.32	0.35	0.50	0.35
	(1.88)	(2.67)	(2.72)	(3.73)	(2.66)	(2.32)	(3.14)	(4.87)	(5.25)	(4.20)	(4.88)	(3.44)	(5.52)	(4.58)	(3.61)	(4.38)
Industry Q	0.30	0.54	0.70	0.98	1.08	1.09	0.99	0.92	1.02	1.01	1.09	1.08	0.89	0.78	0.83	0.84
	(2.44)	(8.96)	(5.62)	(5.07)	(6.92)	(4.73)	(4.88)	(5.20)	(5.45)	(8.36)	(7.73)	(15.24)	(11.34)	(8.89)	(13.59)	(18.07)
Log (Sales)	-0.09	-0.05	-0.01	-0.03	-0.03	-0.01	-0.01	0.01	0.02	0.01	0.03	0.04	0.03	0.02	0.02	0.02
	-(2.28)	-(2.06)	-(1.10)	-(2.44)	-(2.58)	-(1.38)	-(1.35)	(0.78)	(1.28)	(0.63)	(1.10)	(2.79)	(1.73)	(1.96)	(1.50)	(1.59)
Observations	2764	3066	3418	3807	4186	4619	4811	5062	5403	5497	6029	6067	6572	6891	7292	7302
Adjusted R^2	0.3397	0.2733	0.1755	0.2324	0.2076	0.1954	0.1739	0.2329	0.2665	0.2959	0.1676	0.1921	0.2233	0.2484	0.2077	0.2115

Table 9, continued.

Panel b.	Fama-Macbeth	Pooled OLS	Firm fixed effects
Constant	0.13	-0.29	0.73
	(0.52)	(3.31)***	(11.65)***
U.S. Rule 144a	0.06	0.04	-0.02
	(1.89)*	(0.79)	-(0.64)
U.S. OTC	0.12	0.12	0.05
	(8.83)***	(4.10)***	(2.86)***
U.S. Exchange	0.22	0.25	0.08
	(7.72)***	(7.54)***	(4.22)***
U.K. DR	0.00	-0.03	-0.21
	(0.03)	-(0.37)	-(3.15)***
U.K. Ordinary	-0.05	-0.09	-0.26
	-(2.12)*	-(1.97)**	-(6.68)***
Sales growth	0.41	0.46	0.31
	(7.66)***	(22.58)***	(33.44)***
Global industry q	0.88	1.02	0.94
	(12.73)***	(23.60)***	(57.35)***
Log(Sales)	-0.00	0.01	-0.05
	-(0.17)	(2.04)**	-(10.78)***
Country dummies	yes	yes	no
Year dummies	no	yes	yes
Number of observations	82,786	82,786	82,786
Number of groups	.	.	10,946
R^2	0.2277	0.1645	0.1016

Table 10. Valuation changes around cross-listings: 1990 to 2005.
This table presents regression estimates of valuation changes around cross-listings in the U.S. or in the U.K. that took place between 1990 to 2005 The sample includes all non-financial, non-U.S., non-U.K. firms that are in the Worldscope database and have total assets of at least $100 million (in 1990 dollars) in a given year or in the year of listing. Firms from Bermuda and the Cayman Islands are excluded. Information on cross-listings comes from a variety of sources described in Table 1. For each type of cross-listing (in the U.S., Rule 144a, OTC, or Exchange; in the U.K., Depositary receipt, or Ordinary listing), an "event time" dummy variable is created, where year 0 is the cross-listing year for a given firm. The dummy variable, "> 3 years before listing" equals one for years prior to year -3 and is zero in all other years; "3 years before listing" equals one in year -3; "2 years before listing" equals one in year -2, etc. Panel a shows the counts for each dummy variable by type of cross-listing. Panel b shows the regression results. The dependent variable in each regression is Tobin's *q*, computed as ((Total Assets – Book Equity) + Market Value of Equity) / Total Assets (all variables are in local currency). Sales growth is inflation adjusted two-year sales growth (winsorized at 1% and 99% tails), global industry *q* is the median global industry *q*, and sales is in $ millions, inflation adjusted. Each regression includes country and year dummies (not reported). The *t*-statistics, in parentheses are adjusted for clustering on firms – they are computed assuming observations are independent across firms, but not across time for each firm. F-test 1 tests the hypothesis that the coefficient on the dummy for "3 years after listings" is equal to the coefficient on the dummy for "3 years before listing". F-test 2 tests the hypothesis that the coefficient on the dummy for ">3 years after listings is equal to the coefficient on the dummy for ">3 years before listing". *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel a.	U.S. cross-listings			U.K. cross-listings	
	Rule 144a	OTC	Exchange	Depositary receipts	Ordinary listings
> 3 years before listing	147	634	577	23	39
3 years before listing	64	195	156	13	16
2 years before listing	82	236	196	14	21
1 year before listing	119	277	238	18	26
Listing year	158	325	311	36	43
1 year after listing	189	352	389	43	56
2 years after listing	209	344	421	59	59
3 years after listing	216	349	429	64	63
> 3 years after listing	1,197	1,932	2,979	289	1,584

Table 10, continued.

Panel b.	U.S. cross-listings			U.K. cross-listings	
	Rule 144a	OTC	Exchange	Depositary receipts	Ordinary listings
Constant	-0.37	-0.38	-0.28	-0.37	-0.38
	-(4.18)***	-(4.28)***	-(3.23)***	-(4.20)***	-(4.30)***
> 3 years before listing	0.04	0.13	0.07	0.38	0.23
	(0.35)	(2.10)**	(1.11)	(1.43)	(0.98)
3 years before listing	0.12	0.17	0.13	0.57	0.04
	(1.28)	(2.71)**	(2.07)**	(2.54)**	(0.18)
2 years before listing	0.22	0.14	0.30	0.54	0.16
	(2.72)***	(2.27)**	(3.55)***	(2.54)**	(0.31)
1 year before listing	0.23	0.14	0.59	0.65	0.41
	(3.04)***	(2.49)**	(5.67)***	(3.05)***	(1.95)*
Listing year	0.28	0.13	0.46	0.29	0.07
	(4.20)***	(2.52)**	(5.75)***	(1.68)*	(0.56)
1 year after listing	0.21	0.09	0.33	0.21	0.13
	(3.26)***	(2.02)**	(5.52)***	(1.39)	(1.05)
2 years after listing	0.10	0.05	0.26	0.05	0.06
	(1.65)*	(1.48)	(5.14)***	(0.37)	(0.55)
3 years after listing	-0.03	0.02	0.28	0.04	-0.03
	-(0.58)	(0.65)	(5.63)***	(0.48)	-(0.36)
> 3 years after listing	-0.04	0.09	0.21	-0.07	-0.01
	-(0.93)	(2.61)***	(5.93)***	-(1.02)	-(0.17)
Sales growth	0.45	0.25	0.43	0.45	0.42
	(22.27)***	(3.05)***	(17.54)***	(22.41)***	(13.10)***
Global industry q	1.05	1.08	1.03	1.05	1.06
	(23.92)***	(23.59)***	(23.59)***	(23.90)***	(23.92)***
Log(Sales)	0.02	0.02	0.01	0.02	0.02
	(4.29)***	(4.01)***	(1.57)	(4.33)***	(4.45)***
Number of observations	82854	83,003	82,945	82,810	82,824
F-test 1	2.22	5.15**	4.20**	4.41**	0.08
F-test 2	0.54	0.27	3.59*	2.63	1.01
Adjusted R^2	0.1599	0.1510	0.1681	0.1598	0.1574

Table 11. The cross-listing valuation premium before and after Sarbanes-Oxley.
This table presents results from panel data regressions that estimate the valuation differential of cross-listing in the U.S. before and after Sarbanes-Oxley (SOX). The period before SOX is 1990 to 2001 and the period after SOX is 2002 to 2005. In model (1), the sample includes all non-financial, non-U.S. firms that are in the Worldscope database and have total assets of at least $100 million (in 1990 dollars) in a given year. Firms from Bermuda and the Cayman Islands are excluded. In model (2), U.K. firms are also excluded. Information on cross-listings comes from a variety of sources described in Table 1. The dependent variable in each regression is Tobin's *q*, computed as ((Total Assets – Book Equity) + Market Value of Equity) / Total Assets (all variables are in local currency). U.S. Rule 144a, U.S. OTC, and U.S. Exchange are dummy variables that equal one if a firm has a cross-listing of that type in a given year. Post SOX equals 1 during 2002 to 2005. Models (3) and (4) repeat the same regressions as in (1) and (2), except they add the variable, "U.S. exchange × Post SOX × Low legal", where Low legal is a dummy variable that equals one for firms from countries with below-median scores on legal (anti-director × rule of law) and zero otherwise. Sales growth is inflation adjusted two-year sales growth (winsorized at 1% and 99% tails), global industry *q* is the median global industry *q*, and sales is in $ millions. The regressions are estimated by pooled OLS and the *t*-statistics are adjusted for clustering on firms – they are computed assuming observations are independent across firms, but not across time for each firm. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Constant	-0.32	-0.27	-0.31	-0.27
	-(3.76)***	-(3.11)***	-(3.68)***	-(3.03)***
U.S. Rule 144a	0.03	0.03	0.03	0.03
	(0.70)	(0.67)	(0.67)	(0.64)
U.S. OTC	0.09	0.12	0.10	0.12
	(3.50)***	(3.94)***	(3.58)***	(3.93)***
U.S. Exchange	0.25	0.23	0.25	0.23
	(6.50)***	(5.75)***	(6.50)***	(5.75)***
U.S. Exchange × Post SOX	0.02	0.04	0.04	0.07
	(0.48)	(1.20)	(1.08)	(1.78)*
U.S. Exchange × Post SOX × Low legal			-0.10	-0.10
			-(1.52)	-(1.59)
Sales growth	0.46	0.46	0.46	0.46
	(23.89)***	(22.72)***	(23.90)***	(22.73)***
Global industry q	1.04	1.02	1.04	1.02
	(25.54)***	(23.56)***	(25.53)***	(23.54)***
Log(Sales)	0.01	0.01	0.01	0.01
	(2.29)**	(1.69)*	(2.29)**	(1.70)*
Country dummies	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes
Number of observations	90,249	82,786	90,249	82,786
Adjusted R^2	0.1720	0.1644	0.1721	0.1645

Table 12. Capital raising activity before and after cross-listing.

This table reports capital-raising activity from 1993-2002 by firms that cross-listed on U.S. exchanges or on the Main Market in the U.K. (as DRs or ordinary listings) within three years before and after the cross-listing date. It reports the number of cross-listing firms that raise capital by means of public and private issues, the aggregate quantity (in U.S. dollar millions) as well as the component activity (with percentage of total) taking place in the U.S. markets, the U.K. markets, the home market in which the firm is domiciled, and other markets. The "Before" ("After") period presents all capital raising in the three year period before (after) the cross-listing. The "after" period also includes capital raised during the cross-listing event itself. The sample includes all non-financial, non-U.S., non-U.K. firms that are in the Worldscope database with total assets of at least $100 million (in 1990 dollars) in a given year. Firms from Bermuda and the Cayman Islands are excluded. Capital raising data is obtained from SDC and is supplemented with data from the LSE. *t*-statistics are computed to test the differences in before/after means. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	U.S. exchange listings			U.K. main market listings		
	Before	After	*t*-statistic	Before	After	*t*-statistic
Total # of firms	530	530		119	119	
# of firms raising equity	61	157		7	30	
% of all cross-listed firms	11.51%	29.62%		5.88%	25.21%	
Total Equity Raised	28,868.6	151,082.3	2.91***	8,217.4	12,844.2	0.11
Total Raised at Home	14,841.3	79,173.1	2.02**	4,938.4	6,695.2	0.24
% of total raised	51.41%	52.40%		60.10%	52.13%	
Total Raised in US	3,150	17,076.9	2.64***	1,441.9	981.6	-0.80
% of total raised	10.91%	11.30%		17.55%	7.64%	
Total Raised in UK	1,055.8	176.9	-1.59	0	700.7	1.64*
% of total raised	3.66%	0.12%		0.00%	5.46%	
Total Raised in Other Markets	9,821.5	54,655.4	2.71***	1,837.1	4,466.7	0.47
% of total raised	34.02%	36.18%		22.36%	34.78%	

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