

# *Listing Choices and Self-Regulation: The Experience of the AIM*

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## **Abstract**

We compare companies listing on the London AIM to regulated exchanges in the US and UK. The AIM is unique in that it is privately-regulated and relies on Nominated Advisors to provide oversight rather than traditional regulators. We find that AIM firms perform poorly on a variety of dimensions. Their post-listing returns significantly underperform stocks on other exchanges. Liquidity is low and there is evidence of substantial information asymmetry. Results are similar across subsets of firms including US firms that directly list on AIM, firms that cross list, and domestic listings. AIM firms do not appear to distinguish themselves through choice of Nomad. Failure rates are very high and there is no evidence that significant numbers develop into “high-fliers” or graduate to better exchanges. AIM stocks even underperform stocks that trade on the lightly regulated “Pink Sheets” in the US, inconsistent with a significant bonding effect of AIM listing.

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## 1. Introduction

There is an ongoing debate over the role and consequences of regulatory oversight of exchanges (Leuz and Wysocki, 2008; Mendoza, 2008). As the US increased centralized regulation through legislation such as the Sarbanes Oxley Act, the Alternative Investment Market (AIM) in London implemented an approach that provides regulatory flexibility and relies heavily on the private sector to develop oversight of firms.<sup>1</sup> Explicit listing, regulatory and disclosure requirements on the AIM are limited relative to other major markets. The rules that do exist provide flexibility and are open to interpretation. Moreover, firms have the option to “comply or explain” to customize the rules to their specific circumstances. Primary oversight is entrusted to private entities (Nominated Advisors or “Nomads”) who are chosen by the firms to serve the roles of gatekeepers, regulators and advisers.

The AIM has attracted substantial attention because of its relative success in attracting listings, and has spawned the launch of similar markets in a variety of countries.<sup>2</sup> In the US, the AIM drew attention because of its success in attracting new listings relative to the NYSE and NASDAQ. Moreover, in 2006 firms raised more capital through initial public offerings on the AIM than on the NASDAQ (\$16.3 billion versus \$12.8 billion). And, some US firms have chosen direct AIM listings, bypassing US markets entirely. Not surprisingly, the AIM’s regulatory structure and success in attracting new listings generates heated discussion about the optimal level of regulation, the role of public versus private oversight and the effect of regulation on competition among markets.

While there is a substantial body of literature, primarily in the business press and law journals, discussing the benefits and drawbacks of the AIM regulatory system, there is little large sample empirical research to support the discussion. This likely reflects the difficulty of accessing data for AIM firms because of the relatively loose regulatory structure (Mendoza, 2008). To evaluate AIM’s regulatory structure, we gather data from a variety of sources to provide as complete a picture as possible of the characteristics and experiences of firms that choose to list and raise capital on the AIM.

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<sup>1</sup> The regulatory environment of the AIM is discussed in more detail in the Appendix.

<sup>2</sup> For example, “AIMItalia” was launched in Italy in December 2008 and “Tokyo AIM” was launched in Japan in April 2009.

As commentators such as Mendoza (2008) point out, it is unclear ex ante whether AIM firms are subject to more or less oversight relative to firms trading under other regulatory systems. Traditional public regulation applies a standardized set of requirements to all firms wishing to raise capital and trade in order to protect investors and ensure sufficient disclosure for informed decision-making. In all likelihood, these requirements have led some firms to opt out of trading and raising capital on the US markets.<sup>3</sup> Moreover, Mahoney (1997) and Romano (1998) argue that competing regulators should do a better job tailoring regulations to investor needs than government regulators that set uniform standards. Furthermore, these legal scholars argue that such regulatory decentralization should increase investor welfare.

Whether the filtering inherent in a more stringent regulatory environment provides more benefit than detriment for potential investors remains an open question. Almost certainly, more demanding oversight, disclosure and auditing limit the ability of unscrupulous managers to offer securities under false pretences, especially to retail investors with limited resources to gather their own information. On the other hand, the costs associated with the registration process can preclude some reputable companies from raising public capital and, thereby, limit their (and the overall economy's) growth potential. Arguably, the SEC's disclosure and auditing requirements are not as appropriate for small, early-stage companies as for larger, mature companies.

While several countries have experimented with low-regulation markets, the experience has been mixed. For example, before the SEC increased regulation of penny stocks, the market was marred by frequent fraud, poor reputation and negative post-listing returns (Goldstein, Ramshaw and Ackerson, 1992). In fact, legitimate companies were arguably discouraged from trading because of the overall reputation of the unregulated markets. Similarly, many of the European "New Markets," failed in the wake of the technology bubble (Goergen, Khurshed, McCahery and Renneboog, 2003).

The design of the AIM differs from most previous experiences in that the goal is not to reduce oversight, but largely to shift it to the private sector through enhancing the role of gatekeepers. As discussed in Litvintsev (2009), the AIM is an "Exchange Regulated Market," meaning that it is regulated by its parent organization, the London Stock Exchange (LSE), rather

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<sup>3</sup> It is also possible for firms to raise capital from private investors such as venture capitalists. However, venture capital investment in the US is limited to "accredited investors" who are deemed sufficiently sophisticated to invest without regulatory protection.

than a formal regulatory agency.<sup>4</sup> As a consequence, the LSE establishes the regulatory structure of the AIM independent of the regulatory structure of more traditional European exchanges that are regulated under the EU Investment Services Directive. In place of standardized regulatory requirements, the LSE delegates oversight of AIM firms to the Nomads who, in turn, determine the appropriate level of oversight for the firms. Nomad reputations are potentially at stake, as well as their ability to continue to oversee firms because they can be decertified by the exchange. As a result, it is up to the Nomad, in conjunction with the firm, to provide an appropriate degree of oversight.<sup>5</sup>

This regulatory structure can be cost effective for the firm in several ways. First, in terms of direct costs, the Nomad can relax disclosure, auditing and governance standards as it deems appropriate. As a consequence, public disclosure and oversight are customized for the specific firm.<sup>6</sup> Second, indirect costs can potentially be lowered because public disclosure of proprietary information can be limited, as can the amount of time and effort required by management in obtaining the listing. At least in theory, public disclosure can be replaced by private disclosure to the Nomads who then publicly attest to firm quality. In addition, oversight can vary as appropriate. As discussed by Mahoney (1997), given that changes in regulation are costly, a more flexible system could better fit the needs of investors.

On the other hand, the lack of a formal regulatory structure means that the effectiveness of oversight hinges critically on the role of the Nomad. The Nomad relationship is complicated by the fact that the Nomad is hired and paid by the listing firm. Furthermore, the requirements for admission as a Nomad are quite light. Hence, it is unclear how much oversight is provided by Nomads or the LSE in practice.<sup>7</sup> As noted in Taylor (2009), “in Aim's 14-year existence, only

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<sup>4</sup> The Main Market of the London Stock Exchange, on the other hand, is a more traditionally regulated exchange, falling under the jurisdiction of the UK's Financial Services Authority (FSA).

<sup>5</sup> As Mendoza (2008) notes, “Nomads are called to play simultaneously the part of gatekeepers, advisers and, ultimately, regulators of the AIM.”

<sup>6</sup> For example, Mendoza (2008) estimates that initial costs of a \$50,000,000 public offering would be about \$4,472,000 on the NASDAQ versus \$3,426,300 on the AIM and, more importantly, the ongoing annual costs would be \$147,300 on the AIM relative to \$2,017,500 on the NASDAQ due primarily to ongoing regulatory compliance costs.

<sup>7</sup> In theory, Nomads can also be fined for lack of due diligence. In general, disciplinary action is rare and fines are modest. The first fine was in 2007 for £250 thousand for the Nomad, Nabarro Wells, for failing to undertake the necessary level of due diligence in bringing Crown International to market. Crown International claimed £365 million of cash, which did not exist. The only other fine we are aware of was in 2009 for £225 thousand in the case of the Nomad, Blue Oar Securities, related to the AIM listing of the Worthington Nicholls Group, which was found to have made deceptive statements.

four companies quoted on the market have been publicly censured, with just one fined. And only one nominated adviser to an Aim company has been fined and publicly censured.”<sup>8</sup>

Nevertheless, Nomad’s include major commercial banks (e.g., Citigroup, Credit Suisse, Deutsche Bank and ING), investment banks (e.g., Merrill Lynch, Morgan Stanley and Goldman Sachs) and affiliates of major audit firms (e.g., PricewaterhouseCoopers, Deloitte and KPMG), so reputational concerns may, for at least some Nomads, provide incentives for greater oversight.

In the end, the effectiveness of the AIM’s regulatory structure in screening companies is an empirical question. Given the lower level of mandated regulation and disclosure, unscrupulous managers of low-quality firms might be attracted to the AIM. On the other hand, given that the Nomad’s and the LSE’s reputations are potentially at stake, and that Nomads ostensibly require access to private information, the AIM might attract high quality small firms for whom the costs associated with standardized disclosure are an issue.

Understanding the types of firms listing on the AIM and their performance post-listing is particularly important given that the AIM is designed to serve individual investors. Unlike offerings under Rule 144a or venture capital offerings in the US, which are limited to “sophisticated investors” and institutions, the AIM is designed to provide access to retail investors. Moreover, the UK tax code has encouraged retail investment in the AIM by providing tax advantages relative to shares traded on other UK exchanges.<sup>9</sup> Historically, retail investors have generally held a majority of AIM shares (Dossa, 2010).

We compare AIM firms to several benchmark samples controlling for a variety of factors across several measures to assess the performance of firms that self-select into an AIM listing. In particular, our main comparison is with firms listing on traditionally-regulated exchanges (the NASDAQ and OTC Bulletin Board [OTCBB] in the US and the LSE Main Market in the UK). We include a range of comparison venues to ensure that results are not driven by particular types of firm or economic environments. We control for a range of factors including size, industry and

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<sup>8</sup> Critics of the AIM’s regulatory structure include John Thain, former chief executive of the NYSE, who was quoted as saying the AIM “did not have any standards at all and anyone could list,” and SEC commissioner Roel Campos who commented that the AIM included, ‘issuers who can’t even meet the standards of our over-the-counter, or pink sheet, situations. They’re hoping that they’ll get lucky and investors will look at this lower-standard exchange” (Bawden and Waller, 2007).

<sup>9</sup> Prior to April 2008, retail investors on the AIM were accorded special treatment known as taper relief. For individual investors on the AIM, taper relief effectively amounted to a reduced long-term capital gains tax rate of 10% on gains from the sale of shares held over two years in lieu of the 18% rate normally applicable to gains on publicly-traded securities. Details on the specifics of the taper relief provision can be found on [www.hmrc.gov.uk](http://www.hmrc.gov.uk).

year. In addition, we split our sample between local listings, foreign listings and US direct listings into London.

Overall, our results suggest the AIM's relaxed regulatory environment limits its ability to screen firms relative to more traditionally regulated exchanges. Compared with firms on other exchanges and controlling for a variety of factors, AIM firms perform poorly on almost every dimension. Perhaps most tellingly, AIM firm post-listing returns significantly underperform post-listing returns on other markets. Moreover, liquidity in AIM-traded shares tends to be very low, and the information asymmetry component of the bid-ask spread tends to be very large, suggesting investors perceive substantial informational issues for AIM firms. Furthermore, even controlling for other potential determinants of delisting, AIM firms are much more likely to fail than are firms on other markets.

When we split by type of listing, our results are similar. For example, concern has been expressed about US firms bypassing listing on US markets in favor of a direct listing on the AIM because of the compliance costs created by regulations such as Sarbanes-Oxley (SOX). Our results suggest that US firms choosing to list on the AIM significantly underperform comparable US listings. Similarly, concern has been expressed about the fact that non-US, non-UK firms choose the AIM in lieu of listing on US exchanges. Again, our results suggest that foreign firms choosing to list on the AIM substantially underperform foreign firms listing on US markets. Moreover, our results show that UK firms listing on the AIM tend to underperform UK firms listing on the LSE Main Market or US firms listing on the NASDAQ or the OTCBB.

While our preceding analysis is based on averages, it is possible that there are subpopulations of the AIM that perform differently. To explore this possibility, we first differentiate based on type of Nomad. One potential advantage of the AIM is the possibility that high quality firms distinguish themselves from the average firm through their choice of Nomad. However, our results suggest that choice of Nomad appears to have a relatively modest association with return performance and liquidity. AIM firms tend to underperform even when they use Nomads who are auditors or brokers, who oversee large numbers of listings and substantial capital raising, and who have relatively few subsequent delistings. As a result, it appears that the Nomads may serve more to certify a minimal level of compliance than to provide substantive oversight.

Second, we investigate the possibility that, while AIM firms perform poorly on average, the market provides access to an unusually large pool of “high-flier” stocks. In particular, some commentators assert that the AIM provides small investors with the opportunity to gain access to a significant number of high performance firms that might otherwise be available only to venture capitalists (for a discussion, see Litvintsev, 2009). To investigate this possibility, we first assess whether the AIM has an unusually large number of firms that double in price over the two years following the IPO. Again, the results are disappointing. If anything, the AIM has fewer firms with extreme positive returns relative to more conventional exchanges.

Furthermore, some have asserted that the AIM is a stepping stone to more established markets such as the Main Market (Arcot, Black and Owen, 2007). Inconsistent with this claim, we find that firms are far more likely to move from the Main Market to the AIM than the reverse. More generally, we investigate, across exchanges, the frequency with which firms delist after substantial stock price increases. To the extent that a particular exchange has a larger number of successful stocks graduating to higher profile exchanges or being acquired at a premium, we predict a higher frequency of positive returns prior to delisting. However, relative to the AIM, we find firms on other exchanges are significantly more likely to delist following positive returns.

Finally, we compare AIM firms to firms on the relatively unregulated “Pink Sheets” in the US. Pink Sheets listed firms are not required to be SEC registrants, are limited in terms of permitted capital raising and share ownership and are viewed as “among the riskiest investments” by the SEC.<sup>10</sup> This analysis addresses the question of whether the AIM regulatory environment appears to materially screen firms relative to what is largely an unregulated market. Again, results are disappointing. AIM firms are more like Pink Sheets firms than firms that trade on regulated exchanges and, if anything, underperform the typical Pink Sheets firm. In other words, there is no evidence of substantial screening through the AIM registration process.

Of course, because the overall costs and benefits of regulatory oversight are generally unobservable, normative conclusions cannot be drawn from our analyses. Rather, our study provides descriptive evidence on the kinds of firms attracted to this type of self-regulated market. Taken as a whole, the results suggest that, contrary to much of the discussion of the AIM, the market tends to attract relatively weak firms that go on to underperform. To the extent that the

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<sup>10</sup> <http://www.sec.gov/answers/pink.htm>.

AIM regulatory structure is viewed as a model for other exchanges going forward, our results potentially provide evidence on the types of firms that might be attracted. In particular, while the AIM has attracted a significant number of listings relative to venues in countries such as the US, the firms have performed poorly on average.<sup>11</sup>

Our results are likely to be of interest to several groups. First, from an academic perspective, the AIM provides potential insights into the effects of private regulation. In particular, it is conceptually arguable that it is cost effective to allow the optimal level of regulation for a firm to be chosen endogenously rather than being imposed uniformly by an external regulator. The AIM provides a unique setting in which to examine the potential effects of private regulation in practice. While private regulation might be optimal in some cases, our results suggest that it has had a limited screening role as applied in the case of the AIM.<sup>12</sup>

Second, regulators may be interested in assessing the types of firms that are attracted by a regulatory structure such as that of the AIM. For example, the SEC has been put under pressure because of the number of firms (both US and non-US) apparently bypassing US markets by listing on the AIM.<sup>13</sup> A reasonable question is what has been the experience of the firms that have been lost. The US, and other regulators, explicitly choose to exclude certain companies from public listing and capital raising by establishing regulatory structures. While it is beyond the scope of our analyses to judge whether regulatory structures should be changed, our results suggest that firms attracted by the AIM's regulatory structure tend to underperform relative to similar firms on more traditionally regulated exchanges and are characterized by significant informational asymmetries.

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<sup>11</sup> While it is difficult to definitively establish that underperformance by AIM firms is related to limited oversight and regulation, it is striking that the underperformance of the AIM firms is consistent with the performance of the OTC Bulletin Board in the US before it was regulated. The post-listing underperformance of firms on OTC Bulletin Board was generally attributed to the lack of oversight, and was a primary motivation for the imposition of new regulation (Ritter and Welch, 2002). Similarly, the performance of the AIM firms is similar to the unregulated pink sheets in the US, which significantly underperform the regulated US markets. Moreover, Greenstone, Oyer, and Vissing-Jorgensen (2006) find significantly positive abnormal returns for OTC Bulletin Board firms that were subject to the extended mandatory disclosure requirements of the 1964 Securities Acts Amendments.

<sup>12</sup> It is important to emphasize that the AIM is a unique setting and it is dangerous to draw broader inference. For example, one might argue that a similar venue in the US would perform differently because litigation risk would further discipline Nomads. However, given the limited variation in practice, we believe that it is important to understand the experience in contexts where variance exists even if results cannot necessarily be generalized.

<sup>13</sup> The SEC is currently under substantial pressure to expand access to private companies such as Facebook which are not SEC registrants. (Eaglesham, 2011). However, critics have responded that the experience with unregulated markets in the US has been decidedly mixed, with significant losses to uninformed investors who have purchased overpriced shares. (Zwieg, 2011).



Similarly, our results may be of interest to UK regulators. As noted earlier, the AIM has traditionally catered, at least in part, to retail investors. To the extent that regulatory hurdles are designed to discourage retail investors from owning certain particularly risky classes of assets, our results suggest that securities markets such as the AIM are likely less appropriate for unsophisticated investors.<sup>14</sup>

Finally, our results are likely to be of interest to investors. One of the potentially attractive aspects of the AIM is that (based on its marketing literature) it attracts firms that are high-risk, but also have high-growth potential (London Stock Exchange, 2010). For example, the AIM argues that it permits small investors to participate in the types of early-stage firms that are otherwise available only to venture capitalists. Our results suggest that, while the AIM is risky, it does not, on average, reward extra risk with extra returns. Further, we find evidence of substantial information asymmetry and low liquidity, suggesting there are significant costs to enter and exit AIM investments. While there are undoubtedly profits to be made by research on individual shares, our results suggest that, at a minimum, the AIM is unlikely to be attractive to an investor pursuing a diversified passive portfolio.

In the next section, we discuss related literature and institutional background. Then, we turn to experimental design, empirical results, conclusions and, finally, an appendix that provides more detail on the AIM regulatory structure.

## **2. Related Literature**

Our goal is to compare characteristics and outcomes for the population of firms choosing the AIM relative to those on regulated exchanges in order to better understand the features of the firms attracted to the AIM's unique regulatory model. As noted earlier, while there is discussion of the pros and cons of the AIM's regulatory environment in the business press, there is relatively little large sample empirical evidence and most of the existing research focuses on limited contexts. However, there are several related streams of literature.

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<sup>14</sup> Concern about AIM regulation has recently increased in London. For example, a recent survey by *The Telegraph* found that at least 80 leading money managers expressed significant concern about current regulation and oversight of AIM firms, following a spate of complaints to the Financial Services Authority and AIM about recent capital raising based on misleading disclosure. Similarly, in a survey by the London Capital Group, 40 percent of all money managers indicated dissatisfaction with the current level of AIM scrutiny. In response, Marcus Stuttard, head of AIM, indicated, "We treat regulation of AIM companies very seriously, and have a strong track record of robust enforcement of the rules, which are rigorous and transparent." (Mason, 2011).

First, several studies have discussed broad regulatory issues related to US competitiveness and, in particular, the underperformance of US exchanges relative to the AIM market in attracting listings. For example, in its report on “The Competitive Position of the U.S. Public Equity Market,” the Committee on Capital Markets Regulation argues that the US’s public market share of global offerings has decreased over time and discusses potential reasons for the decline, including regulatory hurdles (Committee on Capital Markets, 2007). Similarly, the report commissioned by US Senator Charles Schumer and New York City Mayor Michael Bloomberg, “Sustaining New York’s and the US’s Global Services Leadership,” provides evidence that the US’s leading role in financial services has waned, arguing that it has been, at least in part, due to regulatory issues (Bloomberg and Schumer, 2007). However, neither of the reports directly examines the characteristics of firms choosing to list on various exchanges and private markets.

In related work, Zingales (2007) studies the distribution of global IPOs across countries to analyze the competitiveness of US equity markets. He finds that the US equity market share declined from 2000 to 2005 and interprets this decrease as the result of an improvement of the European exchanges and an increase in the compliance costs associated with a US listing. Piotroski and Srinivasan (2008) and Doidge, Karolyi and Stulz (2009) provide empirical evidence on the cross-listing choices by non-US, non-UK firms to address the question of whether the US lost listings to the UK markets due to SOX. The general conclusions of those papers is that, overall, there is relatively little evidence that SOX affected cross listing choices by firms choosing between the Main Market of the London Stock Exchange and the major U.S. exchanges (NYSE and NASDAQ). Piotroski and Srinivasan (2008), however, provide evidence that some small firms may have chosen the AIM over US exchanges.<sup>15</sup> Those studies only consider listing choices by non-US, non-UK firms on US versus UK exchanges and do not focus on the performance of firms choosing the AIM relative to other markets.

Bauer and Boritz (2006) discuss the history and performance of the AIM in attracting listings and compare it to the Toronto Stock Exchange, with a particular emphasis on Canadian

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<sup>15</sup> The descriptive statistics in Piotroski and Srinivasan (2008) and Doidge, Karolyi and Stulz (2009) suggest that cross-listed AIM firms are smaller, have lower leverage and are less profitable than firms on some of the other exchanges. It seems unlikely that those types of characteristics naturally lead firms to underperform (for example, to the extent firms are riskier, one might expect higher average returns to compensate for risk). To ensure that our results are not driven by difference in firm characteristics, we conduct extensive robustness analyses.

stocks that have listed on the AIM. Campbell and Tabner (2010) and Jenkinson and Ramadorai (2008) both document that AIM stocks moving to the Main Market experience positive returns when the decision is announced, opposite to stocks moving in the other direction, consistent with greater bonding on the Main Market. Espenlaub, Khurshed and Mohamed (2008) examine determinants of survival times for firms listed on the AIM and find that survival probability is lower for firms that are young, small and in high technology industries.<sup>16</sup> None of these studies directly compare the characteristics and outcomes for firms opting to list on the AIM relative to those listing on the Main Market in London or in the US, which is the focus of our analysis.

### **3. Research Design**

As noted earlier, the fundamental objective of our empirical analyses is to understand the types of firms attracted to the unique regulatory environment of the AIM as well as how those firms perform subsequent to listing on the AIM compared to firms listing on other exchanges. Our main set of analyses uses three other regulated exchanges, the LSE Main Market, NASDAQ and the OTCBB, as the primary comparison set for the AIM.<sup>17</sup> We focus on these three exchanges because we are interested in comparing AIM firms with those that chose to list on exchanges that have more traditional regulatory environments. We choose exchanges in the UK and US because of their similar underlying economics and regulation and because they constitute much of the worldwide turnover.<sup>18</sup> In addition, the US and UK are primary competitors for listings, and inclusion of the LSE Main Market helps ensure that our results for the AIM do not simply reflect UK-specific effects.<sup>19</sup>

We use three primary types of tests to draw inferences about the relative performance of firms listed on each of the four markets: post-IPO buy-and-hold returns analyses, liquidity tests

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<sup>16</sup> In addition, they argue that survival probabilities for 2001 to 2003 seem to be in line with those reported in Schultz (1993] for the NASDAQ, but do not provide any direct analysis on that point.

<sup>17</sup> For convenience, we refer to the OTCBB as an “exchange” even though the OTCBB is an interdealer electronic quotation system rather than an exchange. However, as of January 1999, all firms trading on the OTCBB are regulated by, and must register and file with, the SEC. For an analysis of the initiation of SEC regulation of the OTCBB, see Bushee and Leuz (2005).

<sup>18</sup> We exclude the NYSE/AMEX because there is relatively little overlap with the AIM in terms of firm size.

<sup>19</sup> The three exchanges each have useful characteristics for comparison purposes. Comparisons to the NASDAQ are relevant because many of the competitive concerns are in terms of the NASDAQ versus the AIM. The LSE Main Market is useful because it permits comparisons within the UK to ensure that results are not driven by country-level factors. The OTCBB is important because firms there are generally smaller and younger than on the AIM, helping to mitigate concerns about firm size and age.

and survival analyses. The returns analysis is motivated by regulatory concerns and by the literature on IPO long run performance summarized in Ritter and Welch (2002). While the specific reason for systematic returns underperformance by firms following listings is not well understood, it appears to be related to managerial incentives to artificially increase share price in the offering to reduce cost of capital coupled with over-optimism by unsophisticated investors (Ritter and Welch, 2002). A substantial body of research (e.g., Willenborg, 1999; Weber and Willenborg, 2003; Beatty and Kadiyala, 2003; Carter, Dark and Singh, 1998; Beatty and Ritter, 1996) suggests that post-IPO underperformance is mitigated by effective regulation and oversight consistent with the notion that, absent significant oversight, managers are able to raise capital at inflated prices, leading to subsequent underperformance. This is clearly a concern to regulators, particularly in markets with significant retail investor participation and was, for example, a primary factor in the SEC's decision to regulate "penny stock" firms (Ritter and Welch, 2002) and in the recent calls for increased AIM regulation discussed earlier.

We also consider liquidity because it captures the cost of transacting and is also likely influenced by the degree of oversight and disclosure (Lang, Lins and Maffett, 2011). To the extent that the level of oversight and disclosure on the AIM is low, we would expect to see higher levels of information asymmetry and, therefore, lower liquidity. Finally, we consider probability of failure, motivated in part by the SEC's accusation that failure rates on the AIM are abnormally high, reflecting lower-quality registrants. To the extent that the AIM attracts disproportionately weak firms, we would expect unusually high failure rates.<sup>20</sup>

In the next section, we discuss the sample and the design of each of these tests in further detail.

## **4. Sample and Results**

### *4.1 Sample Construction*

Our sample is constructed from a variety of publically available sources, depending on the exchange. To collect our sample of AIM firms, we first obtain a comprehensive historical list of all firms listing on the AIM from the inception of the market on June 27th, 1995 until

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<sup>20</sup> Admittedly, our choice of measures is somewhat subjective, but we are interested in providing descriptive evidence from a range of perspectives.

December 31st, 2008 from the London Stock Exchange's website.<sup>21</sup> The LSE's comprehensive 'Admissions Summary' shows 3,055 firm listings on the AIM during our sample period. We eliminate from this list 302 instances of duplicate listings by a single firm due to readmissions or listings of multiple classes of shares. To obtain accounting and market data, we next match these firms by hand to the Datastream Advance database. We eliminate an additional 548 firms that are either not covered by, or could not be matched to, Datastream, and 284 firms that are missing data necessary to calculate the statistics displayed in Tables 1 and 2, leaving us with a sample of 1,922 total unique AIM listings with available data.<sup>22</sup> In our main analyses we focus on firms raising capital on the AIM, which excludes an additional 461 firms, leaving us with a final sample of 1,461 capital raising AIM firms.<sup>23</sup> We construct our sample of LSE firms using procedures similar to those used to construct our sample of AIM firms. This procedure results in a final sample of 367 LSE Main Market firms.

We use Datastream Advance to compile our sample of NASDAQ and OTCBB firms. This sample includes all available firms listing for the first time and raising capital on these exchanges with the necessary data to calculate the descriptive statistics in Table 1. Our main sample includes 2,513 NASDAQ and 613 OTCBB firms.

#### *4.2 Descriptive Statistics*

Table 1 Panel A presents descriptive statistics for our sample of new listings that raised capital on the AIM from its inception in June, 1995 through December 31, 2008. This table illustrates why the AIM has been intriguing to regulators and exchanges around the world. In particular, there has been a strong trend of increased listing on the AIM over time. There was an

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<sup>21</sup> [www.londonstockexchange.com/statistics/companies-and-issuers](http://www.londonstockexchange.com/statistics/companies-and-issuers).

<sup>22</sup> To the extent our sample selection excludes AIM firms, we likely exclude the smallest and riskiest firms (e.g., those for which it is most difficult to find publicly available data), which are most likely to underperform and fail. Of the excluded firms, 107 did not raise capital and 110 had no information other than listing date and name on the LSE website. The remainder tended to be very small and raise little capital. This is less of an issue with the other exchanges because their standardized mandatory filing requirements mean that data are generally available for firms on regulated exchanges. Overall, our sample selection criteria should bias against finding underperformance of AIM firms relative to other exchanges.

<sup>23</sup> We focus on listings that involve capital raising because capital raising creates unique incentives. Specifically, the issuing firm actually receives money from investors, so investor protection is particularly important. That explains, for example, why significant additional requirements are imposed on firms in the US that wish to raise capital as opposed to simply listing on the market.

almost four-fold increase in new listings that raised capital between 2003 and 2004 (54 to 208). For firms that raised capital, there are fewer delistings than listings for every year except 2008.

Table 1 Panel A also presents descriptive statistics for listings on the other exchanges. Compared to the LSE Main Market there are more new listings on the AIM for every year except for 1998. Compared to the NASDAQ, there are generally fewer new listings on the AIM for the first part of the sample (1995–2003). However, starting in 2004, each year there are more new listings on the AIM than on NASDAQ. Listings on the regulated OTCBB begin in 1999. For every year except 1999 and 2008, new listings on the AIM exceed those on the Bulletin Board. For all of the exchanges the number of new listings temporarily decreases after the technology boom ended in 2000–2001.

Table 1 Panel B compares foreign listings on the AIM with the other regulated venues.<sup>24</sup> Throughout our sample period the number of foreign listings on the AIM is comparable with or exceeds that of the other venues (except in 1999 and 2000 when the NASDAQ had more foreign listings). This difference is especially noteworthy from 2003–2007 when the number of foreign listings on the AIM exceeds that of all the other markets combined.

Table 2 Panel A compares the capital raised for new issues on the AIM with the capital raised for new issues on the LSE Main Market, NASDAQ and the OTCBB. In terms of total capital raised, the first year of the exchange is the minimum (\$100 million) and 2006 is the highest (\$16.3 billion). Only the year 2008 shows a sharp drop in median and total capital-raised, likely reflecting the effects of the worldwide financial crisis. Compared with the LSE and the NASDAQ, the median amount of capital raised in an individual new listing on the AIM is lower. However, given the increase in new AIM listings starting in 2004, the total capital raised by new listings on the AIM is higher in 2006 than the amount raised on NASDAQ (\$16.3 billion versus \$12.7 billion) and only slightly lower than the total capital on the LSE Main Market (\$16.3 billion versus \$18.7 billion), for our sample of firms. With respect to the OTCBB, for the latter period of 2000–2007 median and total capital raised are higher for the AIM.<sup>25</sup>

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<sup>24</sup> Foreign listings are defined as cases in which the country of incorporation differs from the exchange on which the stock is trading. Foreign firms include both direct listings (i.e., the foreign exchange listing is the firm's primary listing) and cross-listings (i.e., the firm is also listed on an exchange in its home country).

<sup>25</sup> OTCBB firms are only allowed to directly raise \$1 million through a listing. They are, however, allowed to raise capital with a concurrent private placement. Given that we measure capital raised using data from the cash flow statements, we capture such private placements.

Table 2 Panel B compares the capital raised by foreign new issues on the AIM with the capital raised by foreign issues on the three other regulated venues. This is particularly relevant to US exchanges because many of the non-US, non-UK firms potentially choose between London and US listings. Again, in all but a few years, the median capital raised by foreign domiciled firms on the LSE Main Market and NASDAQ exceeds the median capital raised by foreign firms on the AIM. However, the dramatic increase in the number of foreign listings on the AIM from 2004–2007 leads to a significant jump in the total capital raised by foreign firms on the AIM. In fact, from 2005–2007 the total capital raised by foreign firms on the AIM exceeds the amount raised on NASDAQ. This increase in listings in the UK relative to the US has been attributed by some to the regulatory costs associated with SOX (although it mirrors listings by UK-domiciled stocks on the AIM, which should not be affected by SOX).

The preceding descriptive evidence illustrates the surge in AIM listings. Moreover, this evidence shows that although firms listing on the AIM are relatively small compared to firms listing on the LSE Main Market and NASDAQ, similar amounts of total capital were raised on the AIM in the latter part of the sample period.

Our primary interest is in providing evidence on the characteristics and outcomes for firms choosing an AIM listing. Table 3 reports descriptive statistics on firm size for firms that raised capital on each of the four venues. At the end of the first day of trading, the average market value of common equity for firms that list on the AIM is less than other exchanges except for the Bulletin Board. Importantly, however, there is notable size overlap among the exchanges. Specifically, the 75<sup>th</sup> percentile of the AIM is larger than the 25<sup>th</sup> percentile of the NASDAQ and nearly equal to the 25<sup>th</sup> percentile of the LSE Main Market. Given the differences in size, we control for size in all analyses and report robustness to sensitivity tests in which we exclude the largest firms and include other controls for size.

Our first set of primary analyses compares post-listing returns for firms that listed and raised capital on the AIM relative to the other regulated markets. One of the issues in permitting firms to list and raise capital with relatively weak oversight and disclosure is the potential that firms raise capital at inflated prices and subsequently underperform the market.<sup>26</sup>

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<sup>26</sup> There are at least two reasons why AIM firms might underperform in terms of returns: the effect of initial mispricing or subsequent decisions made by the firm. In other words, the AIM firms might underperform because the lack of oversight provides the opportunity to issue shares at inflated prices, or the lack of oversight might permit

To measure post-IPO performance, we calculate 12-, 18- and 24-month buy-and-hold returns. We conduct several procedures to ensure our performance measures are not driven by extreme return observations. First, before calculating the 12-, 18- and 24-month buy-and-hold returns, we truncate daily returns at the 99.9% level by exchange. Next, prompted by the findings of Ince and Porter (2006), which calls for caution in handling data errors in Datastream, we follow the procedure outlined in Karolyi, Lee and van Dijk (2010) and set daily returns to missing if:

$$(1 + RET_{i,d}) * (1 + RET_{i,d-1}) - 1 \leq 0.5 \quad (1)$$

where,  $RET_{i,d}$  and  $RET_{i,d-1}$  are the stock returns of firm  $i$  on day  $d$  and  $d-1$ , respectively, and at least one of the two returns is greater than or equal to 100%. Finally, after calculating the 12-, 18- and 24-month returns, we truncate each of these firm-level returns at the 99<sup>th</sup> percentile by exchange.<sup>27</sup> Because our primary data source for returns (Datastream) does not provide delisting returns, we set all delisting returns equal to -100 percent.<sup>28</sup>

Table 3 also provides initial descriptive data on post-IPO returns. While it is important to note that these returns do not control for factors such as size, industry and time period, which are controlled in later analyses, a consistent pattern in post-listing returns is quite clear. In particular, the mean AIM return is strongly negative for all three return windows considered. More importantly, the mean AIM return is substantially below those on the other exchanges.

#### 4.3 Multivariate Return Analysis

We test differences in performance across venues using ordinary least squares regressions of the following form:

$$RET_i = \alpha_i + \beta_1 LN(\text{Market Value at Listing})_i + \beta_2 AIM_i + \beta_3 LSE \text{ Main Market}_i + \beta_4 OTCBB_i + \text{Fixed Effects} + \varepsilon_i \quad (2)$$

where  $RET_i$  is the 12-, 18- or 24-month (depending on the specification) buy-and-hold return calculated from the price at the end of the firm's first day of trading through the end of the

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managers to make value-destroying self-interested decisions. We simply document the return behavior and do not attempt to disentangle the causes.

<sup>27</sup> Results are robust to not truncating returns and to using log returns. Throughout our analyses when we refer to "robust" or "similar" results, we mean that the relations remain statistically significant with comparable coefficient estimates.

<sup>28</sup> Results are robust to setting delisting returns equal to -50%, 0% or eliminating delisting days entirely.



specified return window,  $\ln(\text{Market Value at Listing})$  is the natural logarithm of the market value (in millions of US dollars) of the firm's common equity at the end of the first day of trading, and *AIM*, *LSE Main Market*, and *OTCBB* are indicator variables set equal to one if the firm trades on that market and zero otherwise.<sup>29</sup> We include year and industry fixed effects in all specifications to control for general macro-economic and industry-wide return trends but, for parsimony, do not report the coefficients. *NASDAQ* is the omitted exchange in all of our return analyses.<sup>30</sup>

Table 4 reports results for the multivariate comparisons of the 12-, 18- and 24-month post-IPO buy-and-hold returns across venues. In terms of the control exchanges, the coefficients on the indicator variables for the LSE Main Market and OTCBB indicate that, *ceteris paribus*, firms listed on those exchanges outperformed the NASDAQ, although the differences are not always statistically significant. For the sample as a whole, large firms underperformed small firms, so results are unlikely to be driven by the fact that AIM firms are, on average, smaller than firms on the NASDAQ and LSE Main Market. In addition, industry effects are controlled by inclusion of fixed effects, so results should not reflect difference in industry concentration.

More importantly, in terms of our primary comparisons of interest, the coefficient on the AIM indicator suggests that post-IPO returns for firms listed on the AIM were significantly lower than on any other exchange. Tests of the coefficient differences between the AIM and the LSE Main Market, and between the AIM and the OTCBB, coupled with the significantly negative coefficient on the AIM relative to the NASDAQ, indicate that returns for the AIM were significantly lower than returns for all three comparison exchanges over all windows considered. Further, the magnitudes are substantial.

A related question is whether return performance varies based on where firms are domiciled. In particular, the US and UK probably do not compete significantly for the listings of domestic firms (although, as discussed later, some US firms do choose direct listing on the AIM), however the competition is likely to be keener for foreign listings. As a consequence, it is

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<sup>29</sup> As discussed in Ritter and Welch (2002), a variety of approaches have been used in the literature to measure returns. Our results are robust to a wide range of approaches to adjusting returns for market-, time period-, industry- and firm-level factors as discussed in the robustness section.

<sup>30</sup> As discussed later, results are robust to including market-to-book, price-earnings and firm age as controls for risk. However, inclusion of these variables reduces the sample size by 30% and a risk-based explanation for our results seems unlikely because AIM firms would have to be much *less* risky than firms on other exchanges.

potentially interesting to investigate the performance of foreign firms that choose the AIM over other exchanges and whether that performance differs from the performance of domestic firms.<sup>31</sup>

Table 5 presents a multivariate comparison of returns across regulated venues split by foreign versus domestic listings. We classify firms as foreign listings if they are incorporated in a country different from the location of the exchange of their primary listing.<sup>32</sup> In all specifications, domestic NASDAQ listings are the omitted category. Conclusions are consistent with those in the previous analysis. In terms of the controls, there is not a statistically significant difference between foreign and domestic returns across all of the exchanges.

In terms of our primary relations of interest, domestic AIM listings perform significantly worse than listings on the other exchanges over the 12-, 18- and 24-month windows. In particular, F-tests of the coefficient differences indicate that AIM domestic listings significantly underperform domestic listings on the NASDAQ, the LSE Main Market and the OTCBB. With respect to foreign listings, the point estimates on *AIM Foreign* indicators are, in all cases, substantially less than the foreign coefficients for the regulated exchanges. In terms of statistical significance, AIM firms significantly underperform NASDAQ firms in all of the specifications, although the differences are not always significant for the LSE Main Market and the OTCBB.<sup>33</sup>

The consistency of results across foreign and domestic firms is important for at least two reasons. First, it suggests that the AIM's underperformance is not driven solely by listings from a single source, lending credence to the regulatory explanation because the regulatory hurdles are similarly lower for domestic and foreign firms. Second, the underperformance by AIM firms relative to US foreign listings is informative about the types of international listings that the US loses to the AIM. While the jury is still out on whether the US lost foreign listings to the AIM due to SOX and other regulatory issues, the results suggest that foreign firms choosing an AIM listing tend to underperform comparable firms.

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<sup>31</sup> In addition, the performance of foreign firms may differ systematically from domestic firms in general, so it is reassuring to know that results are robust for both groups of firms.

<sup>32</sup> Country of incorporation for firms listed on the AIM and the LSE Main Market is based on data obtained directly from the LSE's website. Country of incorporation for the NASDAQ and the OTCBB markets is based on Datastream's *NATION* variable.

<sup>33</sup> The small sample sizes of foreign firms that listed on the LSE Main Market and the OTCBB limit our statistical power to detect significant differences with foreign firms that listed on the AIM. For example, there are only 16 foreign firms that listed on the OTCBB. For the LSE Main Market there are only 22 firms with 24 months of returns.

#### *4.4 Robustness*

In this section, we discuss several alternative tests designed to increase confidence in the interpretation of our prior results.

First, it is possible that our results are driven by fundamental differences in the types of firms that choose the AIM as a listing venue. For example, prior research suggests that AIM firms may differ in terms of factors such as size, industry, leverage, market-to-book and ownership structure. Our primary analysis includes controls for size and industry. However, to the extent that other factors also are associated with post-listing returns, our results may reflect differences in underlying economics. We address that issue in two ways. First, we replicate our primary analyses including controls for market value of equity, industry, leverage, market-to-book and percentage closely held shares with very similar results.

However, it is also possible that simply including controls is not sufficient in that controls impose a linear structure. Ideally we would like to be able to match firms across a wide range of variables that are associated with underperformance, but our sample sizes preclude matching on multiple variables. As an alternative, we estimate a first-stage regression which identifies the variables most likely to be correlated with underperformance, and we then compare firms based on that mix of variables. In particular, we first estimate a regression of post-listing returns on size, industry, leverage, age, market-to-book and ownership structure. We then compare AIM firms to those in the same decile in terms of this propensity matching. Conclusions are very similar to those reported earlier—AIM firms experience significantly lower returns relative to what would be predicted based on firm characteristics.

Another potential concern is that results are driven by unusual economic circumstances. If, for example, AIM firms are particularly sensitive to economic downturns and our sample period is dominated by downturn years, results could be unduly influenced by sub-periods. Admittedly, this concern is mitigated by the fact that our analyses include controls for year, industry and size, and our sample period is long enough to include significant boom and bust periods. However, it is potentially informative to document the consistency of results over time. To assess the robustness of our results to sub-periods, we re-estimate Equations (2) and (3) by year of listing. Overall, the sample includes 13 years (1995–2007) for the AIM, the LSE Main Market and the NASDAQ and 9 years for the OTCBB post-regulation (1999–2007). Untabulated analyses for the 18-month returns indicate that AIM listings underperform the LSE for 12 out of

the 13 listing years, AIM listings underperform the NASDAQ for 12 out of 13 listing years, and AIM listings underperform the OTCBB for 9 out of 9 listing years. Further, a simple t-test of the differences across exchanges, using each year as one observation, indicates each comparison is statistically significant.<sup>34</sup>

Third, we assess the robustness of our results to alternative controls for size. Given the differences in firm size across exchanges, it is possible that the size controls in our multivariate tests are inadequate. To address this issue, we re-estimate all of the reported regressions using a sub-sample that excludes all firms on the other exchanges that are larger than the 95<sup>th</sup> percentiles of the market value at listing for the AIM.<sup>35</sup> Results for this restricted sample are very similar to those presented in the tables. In addition, we replaced the log of market value at listing with indicator variables for the deciles of the log of market value at listing. An advantage of this approach is that it effectively compares each firm only to firms in its own size decile. Once again, results are very similar to those presented in the tables. Overall, these additional analyses suggest that our results are not driven by differences in firm size.

Fourth, we follow the approach in Fan, Wong and Zhang (2007) and use monthly cumulative abnormal returns, controlling for market returns, size, market-to-book, leverage and ownership structure. Our primary analysis does not explicitly include a control for the market return because the year fixed effects mean that comparisons are effectively across exchanges within time period. However, replicating the analysis including controls for market returns based on the MSCI World Index, total assets, market-to-book, leverage and concentrated ownership yield very similar results.

In addition, we assess several additional controls for risk in the returns analyses. It seems unlikely that risk drives the results in our primary analysis because it would need to be the case that AIM firms are less risky than other firms. In the returns regressions presented in the tables, we control for size, year and industry. However, these controls may not fully capture risk differences across exchanges. To further control for risk, we include market-to-book, price-to-

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<sup>34</sup> For the AIM/LSE Main Market comparison the t-statistic is 4.8 (13 observations), for the AIM/NASDAQ the t-statistic is 4.8 (13 observations), and for the AIM/OTCBB the t-statistic is 2.8 (9 observations). We find similar results when we re-estimate the regressions annually using 12 and 24 month returns.

<sup>35</sup> When we impose a cutoff based on the 95<sup>th</sup> percentile of AIM size, we lose 40.6% of the LSE Main Market firms, 27.7% of the NASDAQ firms, and 2.5% of the OTCBB firms. For this restricted sample, mean market values at listing for the exchanges are as follows: AIM, \$87 million; NASDAQ, \$134 million; LSE Main Market, \$142 million; OTCBB, \$29 million.

earnings, and the age of the firm at listing. Results that include these measures are very similar to those presented in the tables. One drawback of this assessment is that these measures require that the Datastream field for age and the equity and earnings fields are populated for the fiscal year end prior to listing.<sup>36</sup> These requirements decrease our sample size by 30% and we therefore do not present these analyses as our main results.

Finally, to ensure that the measurement of the returns variables does not have undue influence, we conduct a variety of robustness tests. As noted earlier, the returns have been truncated in our main analyses to eliminate the effects of extreme observations and potential data errors. However, we confirm that our results are not sensitive to the truncation rule used and to eliminating truncation entirely. In addition, to ensure that skewness does not drive our returns results, we re-run each return regression using the natural logarithm of one plus the return as the dependent variable. Further, to ensure that our results are not sensitive to assumptions about delisting returns, we replicate our analyses assuming delisting returns of -50%, 0% and eliminating delisting returns entirely. Results for these alternative specifications are very similar to those presented in the tables.

#### *4.5 Nomad Characteristics.*

It is possible that there are cross-sectional differences in IPO performance for AIM firms based on the Nomad's characteristics and reputation. On one hand, the customizable nature of the regulatory framework on the AIM provides the opportunity for firms to distinguish themselves by their choice of Nomad. On the other hand, if Nomads view their role as simply attesting to minimal AIM standards with limited reputational or other risk, it is not clear that there would be strong incentives for differential standards across Nomads.

We therefore examine whether the performance of AIM firms varies based on several characteristics of the Nomad.<sup>37</sup> It is difficult to judge ex ante what observable features of a Nomad would matter, so we consider five separate Nomad characteristics and assess whether

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<sup>36</sup> Because we measure returns from the listing date, we are unable to estimate betas to control for systematic risk. Nevertheless, for differences in systematic risk to explain our returns results, it must be the case that AIM firms are lower risk than firms listing on the other exchanges. Given the nature of the firms that list on the AIM, lower risk seems unlikely. Further, industry fixed effects should mitigate the impact of differences in underlying economics.

<sup>37</sup> We obtain data for identifying AIM firms' Nomads from the LSE's website:  
<http://www.londonstockexchange.com/statistics/historic/aim/aim.htm>.

selecting such nominated advisors leads to cross-sectional variation in AIM performance by including each of these characteristics in Equation (1).<sup>38</sup>

Our first Nomad variable is an indicator, *Nomad is broker*, which takes the value of one if the firm's broker also serves as its Nomad and zero otherwise. Serving as a firm's broker could provide the Nomad with additional private information which better enables the Nomad to screen and monitor its clients. Simultaneously serving as a firm's broker could, however, create an additional moral hazard problem that prevents the Nomad from effectively screening and monitoring its client firms since the NOMAD's self interest is even more closely tied to the firm.

Second, we include an indicator, *Nomad is auditor*, which takes the value of one if the firm's Nomad is a public accounting firm and zero otherwise. To the extent that audit firms more highly value their public reputations relative to other Nomads, they could, potentially, more strictly screen the clients for which they are willing to serve as advisors.

Third, we include two proxies for the size of the Nomad: the total number of firm IPOs the Nomad has overseen,  $\ln(\text{Total IPOs})$ , and the total amount of capital that has been raised by the Nomad's client firms,  $\ln(\text{Total capital raised})$ .<sup>39</sup> We measure both variables immediately prior to the firm's listing. At least two possibilities exist with regard to the relation between the Nomad's size and the quality of the Nomad's regulation. First, it is possible that larger Nomad's have more experience, expertise and reputational concerns, and thus provide a greater level of screening and oversight. Alternatively, it is possible that Nomads with large numbers of clients have fewer resources available to monitor individual clients and, thus, provide a lower level of oversight and screening of potential listings, or that Nomads with lower standards attract more firms.

Our final Nomad characteristic is the number of the Nomad's clients that have delisted from the exchange, *Total delistings*. As with the size proxies, we measure this variable immediately prior to the firm's listing. We expect *Total delistings* to be indicative of the quality of the Nomad's screening, with more delistings being indicative of worse screening.<sup>40</sup>

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<sup>38</sup> Because it is unclear ex ante what attributes of Nomads are likely to provide effective bonding, we are currently exploring other methods to assessing likely bonding by AIM firms.

<sup>39</sup> Because we expect diminishing returns to scale, we use the natural log of *Total IPOs* and *Total Capital Raised*.

<sup>40</sup> *Total delistings* is defined based on the number of delistings. Results are consistent if it is defined based on delistings as a percentage of total listings.

Table 6 presents a multivariate comparison of 18-month returns across the regulated venues with the five measures of Nomad characteristics. For parsimony, we tabulate only the results for the 18 month window. Results for the 12- and 24-month windows are consistent.

Results for the control variables and venue main effects are virtually identical to the results in the Table 4 analysis. In terms of the indicators for Nomad characteristics, none of the five measures are significantly different from zero and the magnitudes of the coefficient estimates imply that the effect of the Nomad choice is relatively minor in terms of economic significance.<sup>41</sup> These results suggest that the quality/reputation of the Nomad has relatively little association with the client firm's post-IPO return performance. In other words, while the type of Nomad chosen might, in theory, help signal the quality of the offering, these results suggest that (at least based on our measures) any effect is relatively weak in practice. Given that fees for serving as a Nomad are relatively modest and the definition of "suitability for listing" is not clearly articulated, it is possible that there is little cross-sectional difference in Nomad oversight and Nomads are willing to serve firms that cross a similarly minimal threshold.

#### *4.6 Extreme returns and returns prior to delisting*

The preceding analyses suggest that AIM firms underperform on average after listing relative to firms on other exchanges. Although AIM firms underperform on average, certain subsamples could perform significantly better. For example, it is possible that the AIM is more like a venture capital market in the sense that the average firm performs poorly, but the market has an unusually promising upside. An argument made in favor of the AIM is that, while it is very risky, it may be an incubator for firms that go on to stellar performance (Litvinsteve, 2009).

In our next set of analyses, we explore the possibility that there is a subset of AIM firms that experience unusually stellar performance. Because we do not know of an objective means to quantify stellar performance, we use a cutoff of a doubling in share price over our primary return windows. The first three columns of Table 7 present regressions in which the dependent variables are indicator variables coded as 1 if the buy-and-hold return over 12-, 18-, and 24-months is greater than or equal to 100%, and 0 otherwise. Over all three horizons, AIM firms are

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<sup>41</sup> We find similar results when we include all five measures together in the regression.

significantly less likely to have extreme positive outcomes than firms listing on the other exchanges.

A similar argument about the prospect of an unusually promising upside is that a large number of firms may use the AIM as a steppingstone to a more established exchange. In order to evaluate this possibility, we first compare the number of firms moving from the AIM to the Main Market to those moving in the opposite direction.<sup>42</sup> In terms of promotions from the AIM to the Main Market, there were only 76 cases from 1998–2007, versus 271 that moved in the other direction (from the Main Market to the AIM). More notably, since 2000, only 24 firms moved from the AIM to the Main Market, versus 222 that moved from the Main Market to the AIM. In other words, the AIM seems much more like a landing pad for struggling firms than a launching pad for highfliers.

The preceding analysis only examines moves from the AIM to the Main Market and does not permit a comparison with other exchanges. In addition, it is possible that highflying AIM firms leave the exchange through acquisitions or other transactions. To broaden our investigation, we assume that favorable upgrades or acquisitions are accompanied by positive returns prior to delisting, and assess the frequency of delisting for “good” reasons across our comparison set of exchanges. Specifically, we calculate cumulative returns for 20, 40 and 60 trading days prior to delisting and then create indicator variables that are coded as 1 if the cumulative return over each period is positive, and 0 otherwise. The last three columns of Table 7 present regressions that use these indicators as dependent variables. Once again, AIM firms are significantly less likely to have positive returns prior to delisting than do firms on the other exchanges. Overall, there is little evidence that highflying firms use AIM listing as a steppingstone to positive outcomes.

#### *4.7 Multivariate Liquidity Analysis*

To this point, our comparison across exchanges has been based on firm returns. A related issue is liquidity. Liquidity is important for at least two reasons. First, the returns implied by stock price movements can only be realized if the stocks can be bought and sold in a timely manner at relatively low transactions costs. Second, liquidity provides potential insight into the

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<sup>42</sup> This comparison is based on statistics obtained directly from the LSE’s website: <http://www.londonstockexchange.com/statistics/historic/aim/aim.htm>



information environment of AIM firms because a major determinant of liquidity is information asymmetry. To the extent the AIM's regulatory environment is associated with greater information asymmetry, we would expect to see less liquidity.

In comparing the AIM to regulated venues, we use two measures of illiquidity: the proportion of zero-return trading days, *Zero Returns*, and the bid-ask spread, *Bid-Ask Spread*. The *Zero Returns* variable is designed to measure the extent to which trade does (or does not) occur. Volume can be measured differently across exchanges, but *Zero Returns* abstracts from that by assuming that, to the extent that prices did not move, trade is unlikely to have occurred. Firms with high levels of information asymmetry are likely to experience infrequent trading because investors expect, on average, to encounter more informed counterparties in the market and, therefore, only transact when they believe price has deviated substantially from fundamental value. Prior literature, such as Lesmond (2005), horse races various liquidity measures and finds that the *Zero Returns* measure performs well relative to other measures, and papers such as Lang, Lins and Maffett (2011) provide evidence that liquidity is associated with information environment.

Our second measure of liquidity, *Bid-Ask Spread*, is a more direct measure of the cost of trading because it captures a portion of the actual roundtrip cost of trade. However, it can vary in terms of measurement across types of exchanges and does not reflect the depth of the market in terms of the number of shares that could be transacted at the bid or ask.<sup>43</sup> A substantial body of research following Glosten and Milgrom (1985) has documented theoretically and empirically that market makers will price protect in the face of perceived information asymmetry by increasing the bid-ask spread.

We follow Bekaert, Harvey and Lundblad (2007) and define *Zero Returns* as the number of zero-return trading days over the firm's fiscal year divided by the total number of trading days during the fiscal year. We calculate *Bid-Ask Spread*, as the median daily bid-ask spread over the fiscal year, where bid-ask spread is calculated as  $(ASK-BID)/((ASK+BID)/2)$ .<sup>44</sup>

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<sup>43</sup> All of the exchanges in our sample are electronic, continuous, dealer-driven markets (as opposed to the NYSE, for example, which features elements of both auction and dealer markets), which should enhance our ability to make comparisons across exchanges (Madhavan, 2000).

<sup>44</sup> For the NASDAQ and the OTCBB, Datastream provides bid-ask spreads starting only in 2006, which reduces our sample size for these analyses.

We test for differences in liquidity across regulated venues using OLS regressions of the following form:

$$\begin{aligned} \text{Liquidity Measure}_{i,t} = & \alpha_i + \beta_1 \text{Market Value}_{i,t-1} + \beta_2 \text{Volatility}_{i,t-1} + \beta_3 \text{Turnover}_{i,t-1} \\ & + \beta_4 \text{AIM}_i + \beta_5 \text{LSE Main Market}_i + \beta_6 \text{OTCBB}_i \\ & + \text{Fixed Effects} + \varepsilon_{i,t} \end{aligned} \quad (3)$$

where  $\text{Liquidity Measure}_{i,t}$  is equal to either *Zero Returns* or *Bid-Ask Spread* for firm  $i$  in year  $t$ . In our multivariate analyses, we use the log transformation of *Zero Returns* (i.e.,  $\text{Ln}(\text{Zero Returns}/(1-\text{Zero Returns}))$ ) and the natural log of *Bid-Ask Spread*. The model also includes a variety of control variables commonly used in empirical tests of liquidity (e.g., Stoll, 2000). First, we control for the log of the firm's market value of equity (*Market Value*) measured in millions of US dollars at the beginning of the year. Second, we control for return variability (*Volatility*), measured as the annualized standard deviation of daily returns. Finally, we control for turnover (*Turnover*), measured as the annual US dollar trading volume scaled by market value of equity at the beginning of the year. To control for outliers, we use the percentile ranks of each of these control variables in the primary regression analyses.<sup>45</sup> Further, we include industry and year fixed effects in all of the liquidity analyses and cluster standard errors by firm.<sup>46</sup>

Table 3 presents descriptive statistics for liquidity across exchanges. The number of zero return days is higher for the AIM than other exchanges, suggesting that non-trading periods are more common. Furthermore, the bid-ask spread is larger on the AIM than for the NASDAQ or LSE Main Market, although similar to that of the OTCBB. However, these statistics do not control for differences in size and other factors across exchanges.

Table 8 presents multivariate tests of liquidity across regulated venues. Results for the control variables are consistent with expectations and prior research. Specifically, the first column shows that firms that are larger, more volatile and have higher turnover have lower *Zero Returns*. In addition, all else equal, LSE Main Market and the OTCBB all have higher *Zero Returns* than NASDAQ. In terms of our primary relation of interest, the coefficient on the AIM exchange indicator is significantly positive, indicating that *Zero Returns* are higher on the AIM

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<sup>45</sup> To test the robustness of the percentile rank specification, we truncated the distributions of the control variables to the 2.5 and 97.5 percentiles and then re-ran the liquidity regressions. The results for this alternative specification are similar in terms of rankings and significance of differences across the exchanges.

<sup>46</sup> Note that our sample size increases substantially for these tests because we measure liquidity annually on an ongoing basis for each firm post-listing.

than the NASDAQ. Moreover, the magnitude of the AIM coefficient is twice as large as the coefficient on the LSE Main Market and nearly 60 percent larger than the coefficient on the OTCBB. F-tests indicate that both of these differences are highly statistically significant (p-value < .001).

Looking next at the *Bid-Ask Spread* analysis in the second column of Table 8, results for the control variables are again consistent with predictions and prior research. Specifically, *Bid-Ask Spread* is smaller for firms that are larger, less volatile and have greater turnover. Coefficients on the market indicator variables show that the LSE Main Market and the OTCBB all have significantly higher bid-ask spreads than the NASDAQ. In terms of our primary relations of interest, the coefficient on the AIM market indicator shows that, controlling for other determinants, bid-ask spreads are highest on this venue. Moreover, to the extent *Bid-Ask Spread* captures information asymmetry given that we have controlled for inventory-based determinants of liquidity, these results suggest investors perceive substantial informational issues for AIM firms, as compared to the other regulated venues.

Table 9 presents a multivariate comparison of liquidity across regulated venues split by foreign and domestic listings. In terms of sign and significance, results for the control variables are identical to the prior analysis. The market indicator variables show *NASDAQ Domestic* stocks (the omitted category) have the lowest proportion of zero return trading days, while the *AIM Domestic* and *AIM Foreign* indicators have the two largest coefficients. In general, results for the *Bid-Ask Spread* analysis lead to similar inferences, suggesting our liquidity results are not sensitive to the measure used. Moreover, the coefficients for *AIM Domestic* and *AIM Foreign* indicators are larger than each of the other exchange indicators. Based on F-tests (untabulated) the differences are statistically significant in each case except for *OTCBB Foreign* in the *Bid-Ask Spread* comparison, where the difference is insignificant likely due to the small sample size.

Results are robust to similar sensitivity tests considered for the returns analysis. In terms of yearly results, the AIM is less liquid than the NASDAQ, LSE Main Market and OTCBB in every year in the sample. A t-test of the differences across exchanges indicates each comparison is statistically significant.<sup>47</sup> The consistency across years is reassuring because it indicates that results are not driven by sub-periods or economic cycles. Further, the fact that the relation is

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<sup>47</sup> For the AIM/LSE Main Market comparison the t-statistic is 8.0 (13 observations), for the AIM/NASDAQ the t-statistic is 13.9 (13 observations), and for the AIM/OTCBB the t-statistic is 6.7 (9 observations).

statistically significant using one observation per year mitigates concern that statistical significance might be overstated due to cross correlation (although our clustering of standard errors should mitigate that concern). In addition, results are robust to estimation including controls for size deciles or propensity matched deciles formed based on a two-stage approach where we first estimate each of our liquidity measures as a function of market value, volatility, and turnover and then include a control for the predicted value of liquidity based on the coefficients from the first stage regression.

Table 10 repeats the multivariate analysis of *Zero Returns* and *Bid-Ask Spread* including (separately) the five Nomad characteristic variables. To the extent that a Nomad provides better oversight, one might expect investors to anticipate lower levels of information asymmetry and be more willing to transact. Magnitudes for the exchange indicator variables and control variables (untabulated) are virtually unchanged from the Table 8 analysis. The first five columns of Table 10 show that the Nomad characteristic measures, *Nomad is Broker* and *Nomad is Auditor* are not significantly associated with *Zero Returns*. However, the two proxies for the size and experience of the Nomad, *Total IPOs* and *Total Capital Raised*, are both positively related to *Zero Returns*, indicating that having a Nomad that has brought more firms to market and raised more capital is associated with worse liquidity.<sup>48</sup> Finally, looking at *Total Delistings*, firms with Nomads that have had fewer of their clients delist from the exchange are associated with a lower proportion of *Zero Returns*, consistent with a stronger monitoring role.

The last five columns of Table 10 provide results for tests of the relation between the Nomad characteristic measures and *Bid-Ask Spread*. Results for the exchange main effects and control variables are similar to the previous analysis. Looking at the Nomad characteristic variables, we find that *Nomad is auditor*, *Total Capital Raised* and *Total Delistings* are not significantly associated with *Bid-Ask Spread*. However, the first column indicates that firms who have a Nomad that is also their broker have lower bid-ask spreads, while results in the third column suggest that firms with Nomads who have brought more IPOs to market have higher spreads.

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<sup>48</sup> This finding is interesting in that it suggests that Nomads with more and/or larger clients provide *less* effective oversight, consistent with the notion that having more clients thinly spreads the Nomad's oversight and that Nomads with lower standards attract more listings.

More importantly, the magnitudes of the Nomad coefficients imply that choice of Nomad has a relatively minor association with the illiquidity associated with an AIM listing. For example, using a Nomad who is also the firm's broker reduces the bid-ask spread by approximately 8%, while the mean spread of an AIM firm is almost twice as large as the spread for a similar NASDAQ firm. Similarly, a one percent increase in the Nomad's total number of IPOs is associated with a 0.026% increase in the bid-ask spread. The magnitudes of the zero return coefficients lead to similar inferences.

Overall, while there is some evidence from the liquidity analysis that firms self select in terms of Nomads, even firms with higher-quality Nomads experience lower liquidity than firms on regulated exchanges. This result confirms the conclusion from the returns analysis that choice of Nomad does not appear to be a significant discriminatory variable on the AIM. Perhaps that is not surprising given that Nomad fees are relatively modest and suitability for listing is not clearly defined in the AIM regulations.

#### *4.8 Survival Analysis*

In our final set of analyses, we compare the AIM to the other exchanges in terms of survival rates. Survival rates are particularly interesting because of the controversy generated by an SEC Commissioner who compared the AIM to a casino based on its alleged 30% failure rates.<sup>49</sup> The LSE responded by asserting that the failure rate was closer to 3% and comparable to other exchanges (Quinn, 2007). However, we know of no prior direct empirical evidence comparing failure rates on the AIM to other exchanges.

To provide empirical evidence on this point, we compare failure rates across the exchanges. We identify failure as a suspension of trading on the relevant exchange in combination with a maximum share price over the 60 days prior to suspension that was less than 50 cents for the US exchanges and 33 pence for the UK exchanges. While this is admittedly a crude measure, it likely captures firms that leave the exchange through bankruptcy or other financial distress.<sup>50</sup>

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<sup>49</sup> In particular, Roel Campos, an SEC commissioner, asserted, "I'm concerned that 30 percent of issuers that list on AIM are gone in a year. That feels like a casino to me" (Bawden and Waller, 2007).

<sup>50</sup> Results are similar if we define failure based on delisting following substantial negative returns.

Table 11 presents parameter estimates from the maximum likelihood estimation of an Accelerated Failure Time model.<sup>51</sup> In this analysis, we assume that failure rates are log normally distributed so that the parameter estimates represent ratios of instantaneous times to failure relative to the instantaneous time to failure for the mean NASDAQ firm. Coefficients closer to one indicate failure rates that are lower and more similar to NASDAQ. These results indicate that AIM firms have significantly higher instantaneous failure rates than firms listing on the NASDAQ, LSE Main Market, or the OTCBB. In terms of economic significance, the time to failure for an AIM firm is 79.8% shorter than the time to failure for a NASDAQ firm. Moreover, the times to failure for AIM firms are significantly shorter than times to failure for LSE Main Market or OTCBB firms. Overall, the results from the survival analysis are consistent with the returns and liquidity tests and support the SEC's assertion that the AIM is subject to substantially greater failure rates than other exchanges.<sup>52</sup>

#### *4.9 Comparison of the AIM versus the Pink Sheets*

To this point our comparisons of the AIM to other venues have focused on regulated exchanges. However, as discussed previously, unregulated markets also represent a potentially interesting comparison set. In particular, if the Nomad oversight is binding and, consequently, the AIM serves a significant screening function, we would expect AIM listings to outperform listings on unregulated markets. In our next set of analyses, we compare the AIM market to the unregulated (by the SEC) Pink Sheets market.

Table 12 presents the results of our tests comparing the AIM with the Pink Sheets. In this analysis, we repeat versions of each of our prior analyses including only firms listed on the AIM and the Pink Sheets. In all specifications the Pink Sheets is the omitted venue. The first three columns present results for the returns tests. AIM firms have returns that are lower than the Pink Sheets over all three return windows, although the difference is statistically significant only over 18 months. Further, as expected, the differences are smaller relative to the exchange-traded firms

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<sup>51</sup> For a discussion of Accelerated Failure Time models, see Cleves, Gutierrez, Gould, and Marchenko (2008). Results are robust to alternative distributional assumptions (Weibull, loglogistic, and exponential).

<sup>52</sup> In terms of failure rates, our results suggest that 28.4% of our AIM sample firms fail within a year of listing, comparable to the number suggested by the SEC and far in excess of any of our comparison exchanges or of the number claimed by the LSE.

in the earlier analyses suggesting that regulated exchanges outperform the Pink Sheets.<sup>53</sup> Overall, though, there is no evidence that the AIM's regulatory environment provides significant screening compared with the relatively unregulated Pink Sheets market based on returns.

Moving next to the liquidity analysis, columns four and five show the AIM indicator is significantly positively associated with *Zero Returns* and *Bid-Ask Spread*. Taken with the results from our earlier analyses, these results suggest that the AIM suffers not only from worse liquidity, and potentially greater information asymmetry, than our comparison set of regulated exchanges, but is also worse on these dimensions than our *unregulated* comparison set. Finally, the survival analysis in column seven indicates that AIM firms have a higher probability of failure than firms trading on the Pink Sheets.

While conclusions should be drawn with caution, these results are potentially interesting because they compare AIM firms to firms that fall outside much of the normal regulatory process in the US. If the self-regulatory environment on the AIM constituted significant bonding and oversight, one might expect AIM firms to outperform firms in unregulated environments. However, the results suggest that AIM firms are no better (in terms of returns, liquidity and failure rates) and are potentially worse than even the typical unregulated firm.<sup>54</sup>

#### 4.10 US Firm Analysis

In our final set of analyses, we directly compare US incorporated firms listed on US regulated ("US incorporated-US listed" firms) to US firms listed on the AIM. Commentators evaluating the competitiveness of US exchanges have specifically noted the fact that some US firms have bypassed US listing entirely, apparently to avoid the US regulatory environment. However, a reasonable question is how the firms that chose an AIM listing compare with those that list on US markets.

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<sup>53</sup> In an untabulated analysis, we compared AIM firm's returns to returns for firms listed on the OTCBB before and after SEC regulation was imposed in 1999. Consistent with the results from the Pink Sheets analysis, we find that the performance of the AIM firms was similar to the OTCBB firms before regulation, but that the OTCBB firms significantly outperformed AIM firms after SEC regulation.

<sup>54</sup> That result is particularly striking because the SEC goes out of its way to warn retail investors away from unregulated Pink Sheet firms and significantly limits their ability to raise capital, while the AIM appears to encourage individual investors. Further, the results are consistent with the assertion of the SEC's Roel Campos mentioned earlier that the AIM includes "issuers who can't even meet the standards of the over-the-counter, or pink sheet, situations" (Bawden and Waller, 2007).

Our analysis is limited by the fact that the sample comprises only 40 US firms that chose direct AIM listing. Because there is a wide set of potential comparison firms on US markets, we identify the set of US-listed firms most similar to US AIM-listed firms using propensity score matching based on market value of equity and the year of listing.<sup>55</sup> To facilitate direct, rather than relative, assessment of the variables of interest we present results for this analysis as a univariate comparison.<sup>56</sup> To assure that differences between the exchanges are not driven by differences in industry composition, population-level industry effects are removed from the return and liquidity variables.

Table 13 presents the results of our tests comparing US incorporated-US listed firms to US AIM-listed firms. Tests of differences between US firms that listed on the AIM and the US incorporated-US listed firms are based on bias-corrected bootstrap confidence intervals that use 1,000 repetitions. In Panel A we compare the 12-, 18- and 24-month post-IPO buy-and-hold returns for US AIM firms to the propensity-matched set of US incorporated firms listed on US regulated exchanges. Across all three return windows, US AIM-listed firms have significantly lower returns than their US-based counterparts.

Panel B of Table 13 reports the results of the US firm analyses for differences in liquidity. Prior to the comparative tests, both *Zero Returns* and *Bid-Ask Spread* were orthogonalized to *Market value*, *Volatility* and *Turnover* using the entire sample. Results from both the *Zero Returns* and *Bid-Ask Spread* comparisons indicate that liquidity is significantly lower for US AIM-listed firms than the regulated US-exchange-listed propensity score matched sample of firms. Finally, we compare the survival rates of US AIM-listed firms with regulated US domiciled and listed firms. Results are presented in Panel C of Table 13. Compared to regulated US firms, US AIM-listed firms have significantly higher probabilities of failure.

Overall, our results here are consistent with those reported earlier in the sense that the AIM appears to attract firms that go on to underperform the market, experience low liquidity and high information asymmetry and are ultimately more likely to fail. While it is dangerous to draw normative conclusions, the results at least suggest caution in inferring that these firms would have been attractive candidates for listing on US exchanges.

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<sup>55</sup> After propensity matching, the size of AIM firms is statistically indistinguishable from the control firms.

<sup>56</sup> Inferences are robust to conducting this analysis in an OLS regression framework similar to the previous analyses.



## 5. Conclusion

We provide evidence on the types of firms that are attracted to the unique regulatory environment of the AIM in London relative to more traditional exchanges in the US and UK. Our conclusions are consistent across the three classes of performance characteristics considered—post-IPO buy-and-hold returns, liquidity and survival. Relative to firms on the LSE, the NASDAQ and the OTCBB, AIM firms underperform in terms of returns, have lower liquidity and experience a significantly higher probability of failure. Furthermore, AIM firms are unlikely to go on to become high flyers or move to better exchanges. We find minimal, at best, evidence of self-selection through the choice of Nomad. Finally, our results are robust to consideration of various subsamples of AIM firms and time periods.

Of course, it is dangerous to draw normative conclusions from empirical analyses. At a minimum, however, the results appear to support the conclusions of the AIM's critics, such as the SEC and NYSE, who argue that the AIM's relaxed regulatory environment may limit its ability to screen firms relative to more traditional exchanges. Further, our results suggest that, at least in the context of the AIM, private securities regulation with self-selected oversight may not be a complete substitute for public regulation.

Our conclusions are subject to several caveats. Most importantly, we can only examine the AIM experience as implemented. Therefore, we cannot draw conclusions about how the markets would perform with differences in, for example, litigation environment or Nomad oversight. Given the uniqueness of the AIM experience and the attention it has received, however, we believe that our analysis provides interesting insights into the potential effects of alternate regulatory environments.

Further, there are strong *ceteris paribus* assumptions at work here. In particular, we implicitly assume that other aspects of the economic environment are generally similar across our comparison exchanges. If that is not the case, our results may be influenced by unobserved correlated variables. However, the fact that we include a variety of controls, and that the US and UK are similar economies on a variety of levels, provides some comfort with respect to our comparisons. Moreover, the consistency of our results across a variety of comparison samples mitigates potential concerns that results are driven by a specific comparison set. That being said, conclusions should be drawn with caution.

## **Appendix—Institutional Background**

The AIM provides issuers with a “light touch” exchange-based regulatory environment.<sup>57</sup> This environment differs markedly from other exchange-based regulatory venues in that private entities enforce and, to a certain extent, formulate securities regulations. Moreover, these private entities (Nomads) compete to bring new listings to the AIM and to oversee existing listings. Furthermore, given its structure, the AIM is exempt from virtually all of the UK Listing Authority’s and the EU’s regulatory provisions that cover mandatory disclosures and corporate governance.

Given that AIM firms are exempt from virtually all of the UK’s and the EU’s securities regulations, the LSE’s “AIM Rules for Companies” determine the minimum level of regulation faced by AIM firms. These rules represent the minimum level of regulation because AIM Nomads are free to set and enforce higher-levels of regulation for the firms that they cover.

As stated by the LSE, this light touch regulatory environment provides five main benefits to firms who choose to list on the AIM: no proscribed level of shares to be held by the public; no trading record requirement; no prior shareholder approval for most transactions including delistings and takeovers; no minimum market capitalization; unquoted status for tax purposes which provides relief on capital gains taxes for UK taxpayers.

To list on the AIM, a firm must engage a Nomad to certify that the firm is suitable for listing. The firm must then issue admission documents that disclose relevant information about the firm. The AIM Rules for Companies require that admission documents contain a statement that the company has, in its directors' opinion, sufficient working capital for at least 12 months from the date of admission. When a company has not been revenue earning or financially independent for two years, its directors and substantial shareholders are restricted from selling their shares for a period of 12 months after admission.

If the firm raises capital on the AIM, it is also required to issue a prospectus that complies with the FSA’s prospectus rules. The AIM Rules for Companies, however, provide firms with the option to either “comply or explain” with respect to the prospectus rules. Under this option,

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<sup>57</sup> This Appendix is based on information obtained from a variety of sources including the LSE’s website (<http://www.londonstockexchange.com/companies-and-advisors/aim/aim/aim.htm>), Litvintsev (2009) and Mendoza (2008).

firms can choose not to comply with the rules and instead provide an explanation of why they are not complying.<sup>58</sup>

The LSE does not review the admission documents, prospectuses, and/or the explanations for non-compliance. The firm's Nomad has the sole responsibility to review all documents and disclosures made by the firm. Instead of regulating firms, the LSE is responsible for regulating the Nomads to ensure that they maintain the regulations outlined in the AIM Rules for Nominated Advisors. The LSE can sanction or fine Nomads who do not ensure that firms meet the minimum levels of regulation detailed in the AIM rules, although public sanctions and fines are rare.

To maintain an AIM listing, a firm must engage a Nomad at all times. If an AIM listed firm loses its Nomad, the exchange ceases trading in the firm's securities. If within one month of the suspension the firm is unable to engage a new Nomad, the exchange cancels the firm's admission to the AIM. The Nomad's ongoing role is to ensure that the firm makes the required periodic disclosures and that these disclosures are of the minimum quality level in that they are not deceptive and they do not omit "relevant" information. According to the AIM Rules for Companies, AIM listed firms are required to disclose price-sensitive, non-public information and it is the responsibility of the Nomad to ensure that such disclosures are made. In addition, firms are required to disclose information about substantial transactions, related party transactions, reverse takeovers, and asset disposals that lead to a fundamental change in the business. Moreover, the firm must issue immediate notification of any developments that affect the firm's financial condition, sphere of activity, performance, and expectation of performance, which would likely lead to substantial changes in price. Once again, it is the responsibility of the firm's Nomad to ensure that such disclosures are made and that they are not deceptive.

AIM listed firms are required to issue semi-annual financial statements and audited annual financial statements. Companies incorporated in the European Economic Area must publish their accounts according to IFRS. Companies incorporated outside of the European Economic Area can use US, Canadian, and Japanese GAAP, or Australian IFRS. If a company in

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<sup>58</sup> As of 2006, there are additional regulations for investing companies (cash shells). An investing company is required to raise a minimum of £3 million. In addition, the company must state and follow an investment policy. If the company has not substantially implemented its investment policy within 18 months of admissions, it must receive shareholder approval for a revised policy.

the European Economic Area has no subsidiaries, it can, however, use local GAAP. It is the Nomad's responsibility to ensure that the firm meets the requirements for financial statements. The Nomad can also be the firm's auditor. As of February 2007, every AIM company must also maintain a website that contains basic information about its business.

The eligibility requirements to become a Nomad are minimal: be a firm or company, not an individual; have practiced corporate finance for at least the last two years; have acted on at least three relevant transactions during that two year period (for example, initial public offerings); and employ at least four "qualified executives."

The Nomad's primary responsibility and duty of care is owed to the LSE and not to investors. According to the AIM Rules for Nominated Advisors, the Nomad must ensure that the admission and conduct of a firm do not impact adversely on the reputation and integrity of the LSE. Nomads that violate the AIM Rules are subject to penalties and sanctions outlined in the LSE's AIM Disciplinary Procedures. Although Nomads do not owe a primary duty of care to investors, investors do appear to have the ability to sue the Nomad if they have been misled into making a poor investment. However, we have been unable to document any instances of investors successfully suing a Nomad. Further, public fines or sanctions against Nomads by the LSE are rare.

In addition to a Nomad, every AIM firm is required to have at all times a broker, who handles distribution and research. Brokers also maintain relationships between the company and investors in the aftermarket. Firms can also have market makers who are members of the LSE who have agreed to quote prices and actively buy and sell stocks during market hours. The broker can also be the firm's Nomad. The Nomad's client is the firm and its dealings with the firm are private. In contrast, the broker's clients are its institutional investors and it is not privy to the confidential communications between the Nomad and the firm. A Nomad that also serves as the firm's broker is required by LSE to implement "Chinese" walls between the advising and brokerage groups.

AIM's regulatory structure differs markedly from other comparable worldwide exchanges such as the LSE's Main Market, the NASDAQ, the OTCBB, and the Pink Sheets. Although the Main Market and the NASDAQ require minimum levels of corporate governance and disclosures in order to list and maintain a listing, these standards are enforced by the exchange itself. Moreover, firms listing on the Main Market and the NASDAQ are subject to the

national securities regulations of the UK and US, which are enforced by the FSA and the SEC. In contrast, firms listing on the AIM are exempt from most of the UK's securities regulations.

Potentially more comparable with the AIM, are the two major US based quotation systems: the OTC Bulletin Board and the Pink Sheets. To be quoted by each service, a firm must be covered by a market maker, who submits the application for the fee and pays all relevant fees to the quotation system. Similar to the AIM, neither service has minimum share price, turnover, market capitalization, or corporate governance requirements. However, as of January 1999, firms quoted by the OTCBB are required to be SEC registrants. The Pink Sheets also recently introduced a classification scheme that indicates a quoted firm's level of disclosure and its regulatory status.

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Table 1: Comparison of new listings and delistings

This table presents new listings for firms that listed and raised capital on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008).

Panel A: All listings that raised capital

Year	AIM		LSE Main Market		NASDAQ		OTCBB	
	Listings	Delistings	Listings	Delistings	Listings	Delistings	Listings	Delistings
1995	14	0	10	0	165	0	0	0
1996	66	4	38	0	358	0	0	0
1997	45	4	38	0	296	7	0	0
1998	17	9	31	8	240	57	0	0
1999	38	22	19	11	379	116	135	1
2000	120	31	51	13	269	148	36	0
2001	68	29	9	9	62	138	37	11
2002	53	31	17	20	72	82	47	3
2003	54	48	9	14	66	95	33	7
2004	208	30	20	15	170	86	46	7
2005	280	52	23	15	135	84	75	8
2006	279	95	41	12	142	107	77	11
2007	179	99	50	12	137	126	74	46
2008	40	141	11	22	22	91	53	43
Total	1,461	595	367	151	2,513	1137	613	137

Panel B: Foreign listings that raised capital

Year	AIM		LSE Main Market		NASDAQ		OTCBB	
	Listings	Delistings	Listings	Delistings	Listings	Delistings	Listings	Delistings
1995	1	0	0	0	1	0	0	0
1996	5	0	0	0	9	0	0	0
1997	2	0	1	0	8	0	0	0
1998	1	1	4	0	7	1	0	0
1999	5	0	3	0	14	1	1	0
2000	8	2	4	0	22	3	1	0
2001	3	2	0	2	4	2	2	0
2002	6	4	0	1	4	3	8	0
2003	4	4	2	1	2	4	5	0
2004	33	0	3	0	8	5	4	1
2005	59	6	3	0	13	7	1	0
2006	76	12	21	1	3	5	0	0
2007	57	20	24	1	7	2	0	0
2008	11	33	6	2	0	2	0	1
Total	271	84	71	8	102	35	22	2

Table 2: Comparison of capital raised

This table presents capital raised at listing for firms that listed on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). Median and Total Capital Raised are denominated in millions of US Dollars.

Panel A: Capital raised by all listings												
Year	AIM			LSE Main Market			NASDAQ			OTCBB		
	Median (\$)	Total (\$)		Median (\$)	Total (\$)		Median (\$)	Total (\$)		Median (\$)	Total (\$)	
1995	5	100		82	1,068		24	5,628		0	0	
1996	6	636		45	5,304		26	15,266		0	0	
1997	4	348		36	14,795		27	11,717		0	0	
1998	5	108		39	8,662		22	9,536		0	0	
1999	4	328		43	4,265		58	34,289		1	2,345	
2000	8	1,507		83	7,381		84	33,610		0.5	746	
2001	4	532		102	2,057		45	3,582		0.1	53	
2002	4	607		60	5,480		31	5,292		0.2	3,223	
2003	6	1,571		168	4,824		44	3,780		1	286	
2004	7	3,931		165	4,707		51	13,829		0.4	306	
2005	10	8,211		257	7,860		60	10,477		0.9	341	
2006	18	16,327		294	18,703		62	12,839		0.9	372	
2007	30	12,076		269	27,790		75	15,702		1.5	340	
2008	16	1,717		445	8,585		57	1,943		0.4	88	

  

Panel B: Capital raised by foreign listings												
Year	AIM			LSE Main Market			NASDAQ			OTCBB		
	Median (\$)	Total (\$)		Median (\$)	Total (\$)		Median (\$)	Total (\$)		Median (\$)	Total (\$)	
1995	6	6		0	0		432	432		0	0	
1996	4	29		0	0		69	2,424		0	0	
1997	10	20		13	13		54	775		0	0	
1998	2	2		57	3,971		36	559		0	0	
1999	5	104		263	623		99	3,549		38	38	
2000	7	89		214	897		158	5,103		0.5	0.5	
2001	4	10		0	0		42	185		1	2	
2002	6	50		0	0		16	1,134		0.2	3,161	
2003	16	77		877	1,754		27	55		6	223	
2004	11	874		350	844		99	1,308		0.6	5	
2005	16	2,862		112	732		62	1,640		1	1	
2006	30	4,984		437	12,122		41	114		0	0	
2007	46	5,151		587	20,690		109	1,059		0	0	
2008	25	591		572	5,043		0	0		0	0	

Table 3: Descriptive statistics for characteristics of firms that listed and raised capital

This table presents descriptive statistics for firms that listed and raised capital on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). *Market value at listing* is the market value of the firm's common equity at the end of the first day of trading and is in millions of US dollars. *12 month return*, *18 month return*, and *24 month return* are buy-and-hold returns starting at the end of the firm's first day of trading. We truncate the buy-and-hold returns to the 99th percentile and set delisting returns equal to -100%. *Zero return* is the proportion of the calendar year's trading days for which the firm had a return of zero. *Bid-ask spread* is the median daily closing bid-ask spread for the calendar year. For the NASDAQ and the OTC Bulletin Board, Datastream provides bid-ask spreads starting in 2006. *Market value of equity* is measured at the beginning of the year in millions of US dollars. *Turnover* is annual US Dollar trading volume scaled by the market value of equity. *Volatility* is the annualized standard deviation of daily returns. *Market value of equity*, *Turnover*, and *Volatility* are winsorized to the 2.5 and 97.5 percentiles to control for outliers.

	N	Mean	Std. Dev.	25th Pct.	75th Pct.
<i>Market value at listing</i>					
AIM	1,409	88.229	155.125	15.590	87.211
LSE Main Market	305	967.725	2,150.131	90.565	891.436
NASDAQ	2,480	447.630	1,533.744	72.910	381.815
OTCBB	600	55.148	347.245	4.300	36.190
<i>12 month return</i>					
AIM	1,409	-0.162	0.548	-0.545	0.111
LSE Main Market	305	0.040	0.655	-0.407	0.352
NASDAQ	2,480	-0.004	0.709	-0.512	0.337
OTCBB	600	0.228	1.739	-0.699	0.287
<i>18 month return</i>					
AIM	1,300	-0.237	0.680	-0.786	0.067
LSE Main Market	286	0.106	0.920	-0.536	0.516
NASDAQ	2,400	-0.030	0.881	-0.680	0.363
OTCBB	526	0.069	1.792	-0.851	0.221
<i>24 month return</i>					
AIM	1,237	-0.335	0.751	-0.937	0.000
LSE Main Market	267	0.096	1.225	-0.720	0.541
NASDAQ	2,327	-0.061	0.964	-0.800	0.363
OTCBB	494	-0.070	1.502	-0.920	0.273

	N	Mean	Std. Dev.	25th Pct.	75th Pct.
<i>Zero return</i>					
AIM	6,943	0.674	0.222	0.550	0.846
LSE Main Market	1,910	0.357	0.264	0.092	0.570
NASDAQ	16,694	0.152	0.144	0.057	0.198
OTCBB	4,461	0.516	0.264	0.282	0.747
<i>Bid-ask spread</i>					
AIM	6,890	0.112	0.098	0.043	0.146
LSE Main Market	1,891	0.034	0.037	0.011	0.041
NASDAQ	4,487	0.008	0.011	0.002	0.009
OTCBB	1,681	0.149	0.169	0.039	0.182
<i>Market value of equity</i>					
AIM	6,942	66.186	108.530	7.820	67.949
LSE Main Market	1,908	646.590	864.196	71.870	822.535
NASDAQ	16,694	414.628	646.057	57.970	441.870
OTCBB	4,461	29.918	49.909	3.640	33.280
<i>Turnover</i>					
AIM	6,942	0.499	0.684	0.087	0.596
LSE Main Market	1,908	0.917	1.176	0.231	1.090
NASDAQ	16,693	2.162	2.969	0.412	2.529
OTCBB	4,452	1.041	2.287	0.072	0.748
<i>Volatility</i>					
AIM	6,943	0.578	0.377	0.304	0.732
LSE Main Market	1,910	0.465	0.271	0.270	0.571
NASDAQ	16,694	0.680	0.361	0.401	0.879
OTCBB	4,461	1.348	0.839	0.581	2.098

Table 4: Multivariate comparison of returns

This table presents estimates of ordinary least squares regressions that compare the buy-and-hold returns for firms that listed and raised capital on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). In all specifications, the NASDAQ is the omitted exchange. The table also presents p-values from two-sided tests of whether the AIM coefficients are significantly different from the coefficients for the LSE Main Market and the OTC Bulletin Board. We truncate returns to the 99th percentile and set delisting returns equal to -100%.

	Buy-and-hold returns		
	12 months	18 months	24 months
Ln(Market Value at Listing)	-0.036*** (0.009)	-0.038*** (0.010)	-0.030*** (0.010)
AIM	-0.200*** (0.036)	-0.286*** (0.042)	-0.324*** (0.044)
LSE Main Market	0.093* (0.052)	0.168*** (0.061)	0.183*** (0.063)
OTCBB	0.194*** (0.049)	0.065 (0.058)	-0.049 (0.059)
Intercept	0.436*** (0.077)	0.386*** (0.087)	0.496*** (0.088)
AIM = LSE Main Market	0.000	0.000	0.000
AIM = OTCBB	0.000	0.000	0.000
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	4,789	4,508	4,321
Adjusted R-squared	0.075	0.091	0.116

\* p<.1, \*\* p<.05, \*\*\* p<.01, two-sided test

Table 5: Multivariate comparison of returns split by foreign versus domestic

This table presents estimates of ordinary least-squares regressions that compare the buy-and-hold returns for foreign versus domestic firms that listed and raised capital on the AIM, the LSE/Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). In all specifications, domestic NASDAQ firms comprise the omitted category. We truncate returns to the 99th percentile and set delisting returns equal to -100%.

Ln(Market Value at Listing)	Buy-and-hold returns		
	12 month return	18 month return	24 month return
	-0.038*** (0.009)	-0.039*** (0.010)	-0.032*** (0.010)
NASDAQ Foreign	0.101 (0.091)	0.168 (0.103)	0.151 (0.107)
AIM Foreign	-0.138** (0.060)	-0.234*** (0.072)	-0.239*** (0.075)
AIM Domestic	-0.211*** (0.038)	-0.290*** (0.044)	-0.336*** (0.046)
LSE Main Market Foreign	-0.009 (0.147)	0.005 (0.182)	0.003 (0.204)
LSE Main Market Domestic	0.111** (0.055)	0.195*** (0.063)	0.208*** (0.065)
OTCBB Foreign	0.057 (0.216)	0.095 (0.244)	-0.106 (0.244)
OTCBB Domestic	0.198*** (0.049)	0.066 (0.058)	-0.047 (0.060)
Intercept	0.442*** (0.077)	0.393*** (0.088)	0.505*** (0.088)
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	4,789	4,508	4,321
Adjusted R-squared	0.075	0.092	0.116

\* p<.1, \*\* p<.05, \*\*\* p<.01, two-sided test

Table 6: Multivariate comparison of 18 month returns with Nomad characteristics

This table presents estimates of ordinary least squares regressions that compare the buy-and-hold 18 month returns for firms that list and raise capital on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). In all specifications, the NASDAQ is the omitted exchange. The table also includes measures of the characteristics of the Nomad that brought the AIM firm to market. *Nomad is broker* is an indicator for whether the Nomad is also the broker for the AIM firm's shares. *Nomad is auditor* is an indicator for whether the Nomad is also an audit firm. *Ln(Total IPOs)*, *Ln(Total capital raised)*, and *Ln(Total delistings)* are the natural logarithms of the number of total public offerings, total capital raised, and delistings of offerings brought to the AIM by the Nomad prior to the firm's listing. We truncate returns to the 99th percentile and set delisting returns equal to -100%.

	18 month return				
Ln(Market Value at Listing)	-0.039*** (0.010)	-0.038*** (0.010)	-0.038*** (0.010)	-0.040*** (0.010)	-0.038*** (0.010)
AIM	-0.348*** (0.060)	-0.288*** (0.043)	-0.287*** (0.063)	-0.382*** (0.083)	-0.300*** (0.049)
Nomad is broker	0.087 (0.059)				
Nomad is auditor		0.033 (0.106)			
Ln(Total IPOs)			0.001 (0.023)		
Ln(Total capital raised)				0.021 (0.016)	
Ln(Total delistings)					0.015 (0.027)
LSE Main Market	0.169*** (0.061)	0.168*** (0.061)	0.168*** (0.061)	0.170*** (0.061)	0.168*** (0.061)
OTCBB	0.062 (0.058)	0.065 (0.058)	0.065 (0.058)	0.063 (0.058)	0.066 (0.058)
Intercept	0.395*** (0.087)	0.387*** (0.087)	0.387*** (0.087)	0.402*** (0.088)	0.389*** (0.087)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	4,508	4,508	4,508	4,508	4,508
Adjusted R-squared	0.092	0.091	0.091	0.092	0.091

\* p<.1, \*\* p<.05, \*\*\* p<.01, two-sided test

Table 7: Extreme returns and returns prior to delisting

This table presents estimates of ordinary least squares regressions that compare the propensity of returns greater than 100% after listing and the propensity of positive returns prior to delisting for firms that listed and raised capital on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). In all specifications, the NASDAQ is the omitted exchange. The first three columns present regressions in which the dependent variable is an indicator variable coded as 1 if the firm's buy-and-hold return was greater than or equal to 100% over the first 12, 18, or 24 months, and 0 otherwise. The last three columns present regressions in which the dependent variable is coded as 1 if the firm's buy-and-hold return over the 20, 40, or 60 trading days prior to delisting are positive, and 0 otherwise. The table also presents p-values from two-sided tests of whether the AIM coefficients are significantly different from the coefficients for the LSE Main Market and the OTC Bulletin Board.

Ln(Market Value at Listing)	100% after listing						Positive returns prior to delisting					
	12 months	18 months	24 months	20 trading days	40 trading days	60 trading days	20 trading days	40 trading days	60 trading days	20 trading days	40 trading days	60 trading days
AIM	-0.007** (0.003)	-0.003 (0.003)	-0.006* (0.003)	0.018** (0.008)	0.016** (0.007)	0.015* (0.008)	-0.035*** (0.011)	-0.376*** (0.032)	-0.304*** (0.032)	-0.348*** (0.032)	-0.304*** (0.032)	-0.348*** (0.032)
LSE Main Market	0.002 (0.016)	0.035* (0.018)	0.056*** (0.019)	-0.156*** (0.040)	-0.137*** (0.039)	-0.147*** (0.040)	0.002 (0.016)	0.035* (0.018)	0.056*** (0.019)	-0.156*** (0.040)	-0.137*** (0.039)	-0.147*** (0.040)
OTCBB	0.053*** (0.015)	0.014 (0.017)	-0.007 (0.018)	-0.110** (0.055)	-0.161*** (0.054)	-0.127** (0.055)	0.053*** (0.015)	0.014 (0.017)	-0.007 (0.018)	-0.110** (0.055)	-0.161*** (0.054)	-0.127** (0.055)
Intercept	0.169*** (0.023)	0.161*** (0.026)	0.237*** (0.027)	0.658*** (0.056)	0.758*** (0.055)	0.702*** (0.056)	0.169*** (0.023)	0.161*** (0.026)	0.237*** (0.027)	0.658*** (0.056)	0.758*** (0.055)	0.702*** (0.056)
AIM = LSE Main Market	0.034	0.001	0.000	0.000	0.000	0.001	0.034	0.001	0.000	0.000	0.000	0.001
AIM = OTCBB	0.000	0.002	0.010	0.000	0.000	0.001	0.000	0.002	0.010	0.000	0.000	0.001
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,789	4,508	4,321	2,104	2,104	2,104	4,789	4,508	4,321	2,104	2,104	2,104
Adjusted R-squared	0.036	0.033	0.042	0.164	0.160	0.126	0.036	0.033	0.042	0.164	0.160	0.126

\* p<.1, \*\* p<.05, \*\*\* p<.01, two-sided test



Table 8: Multivariate tests of liquidity

This table presents estimates from ordinary least squares regressions that compare liquidity for firms that listed and raised capital on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). In all specifications, the NASDAQ is the omitted exchange. *Market value*, *Volatility*, and *Turnover* are in percentile rank form to control for outliers. For the *Zero return* regression, we take the natural logarithm of the proportion of zero return days in the year to one minus the proportion of zero returns days. We also take the natural logarithm of the median daily bid-ask spread. For the NASDAQ and the OTC Bulletin Board, Datastream provides bid-ask spreads starting in 2006. The table also presents p-values from two-sided tests of whether the AIM coefficients are significantly different from the coefficients for the LSE Main Market and the OTC Bulletin Board. Standard errors are clustered at the firm level.

	Zero return	Bid-ask spread
Market value	-2.176*** (0.045)	-2.503*** (0.045)
Volatility	-0.609*** (0.043)	0.531*** (0.043)
Turnover	-0.976*** (0.041)	-1.020*** (0.041)
AIM	2.263*** (0.032)	1.942*** (0.028)
LSE Main Market	1.103*** (0.053)	1.360*** (0.045)
OTCBB	1.410*** (0.041)	1.759*** (0.041)
Intercept	0.595*** (0.198)	-3.401*** (0.188)
AIM = LSE Main Market	0.000	0.000
AIM = OTCBB	0.000	0.000
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	30,007	14,948
Adjusted R-squared	0.712	0.811

\* p<.1, \*\* p<.05, \*\*\* p<.01, two-sided test

Table 9: Multivariate comparison of liquidity split by foreign versus domestic

This table presents estimates of ordinary least squares regressions that compare the liquidity for foreign versus domestic firms on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). In all specifications, domestic NASDAQ firms comprise the omitted category. *Market value*, *Volatility*, and *Turnover* are in percentile rank form to control for outliers. For the *Zero return* regression, we take the natural logarithm of the proportion of zero return days in the year to one minus the proportion of zero returns days. We also take the natural logarithm of the median daily bid-ask spread. For the NASDAQ and the OTC Bulletin Board, Datastream provides bid-ask spreads starting in 2006. Standard errors are clustered at the firm level.

	Zero return	Bid-ask spread
Market value	-2.187*** (0.045)	-2.524*** (0.045)
Volatility	-0.614*** (0.043)	0.516*** (0.043)
Turnover	-0.965*** (0.040)	-0.998*** (0.040)
NASDAQ Foreign	0.065 (0.062)	0.166** (0.079)
AIM Foreign	2.443*** (0.068)	2.040*** (0.040)
AIM Domestic	2.236*** (0.033)	1.934*** (0.029)
LSE Main Market Foreign	1.145*** (0.182)	1.432*** (0.115)
LSE Main Market Domestic	1.105*** (0.054)	1.362*** (0.047)
OTCBB Foreign	0.958*** (0.168)	1.887*** (0.142)
OTCBB Domestic	1.426*** (0.042)	1.764*** (0.041)
Intercept	0.621*** (0.199)	-3.389*** (0.188)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Observations	30,007	14,948
Adjusted R-squared	0.712	0.811

\* p<.1, \*\* p<.05, \*\*\* p<.01, two-sided test

Table 10: Multivariate comparison of liquidity with Nomad characteristics

This table presents estimates of ordinary least squares regressions that compare the percentage of a zero return and bid-ask spreads for firms that listed and raised capital on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). In all specifications, the NASDAQ is the omitted exchange. *Market value*, *Volatility*, and *Turnover* are in percentile rank form to control for outliers. For the *Zero return* regressions, we take the natural logarithm of the proportion of zero return days in the year to one minus the proportion of zero returns days. We also take the natural logarithm of the median daily bid-ask spread. For the NASDAQ and the OTC Bulletin Board, Datastream provides bid-ask spreads starting in 2006. The table also includes measures of the characteristics of the Nomad that brought the AIM firm to market. *Nomad is broker* is an indicator for whether the Nomad is also the broker for the AIM firm's shares. *Nomad is auditor* is an indicator for whether the Nomad is also an audit firm. *Ln(Total IPOs)*, *Ln(Total capital raised)*, and *Ln(Total delistings)* are the natural logarithms of the number of total public offerings, total capital raised, and delistings brought to the AIM by the Nomad prior to the firm's listing. Standard errors are clustered at the firm level.

	Zero return			Bid-ask spread				
AIM	2.252*** (0.044)	2.269*** (0.033)	2.017*** (0.066)	2.174*** (0.040)	1.941*** (0.028)	1.838*** (0.046)	1.973*** (0.056)	1.919*** (0.032)
Nomad is broker	0.017 (0.046)				-0.084*** (0.029)			
Nomad is auditor		-0.069 (0.074)			0.011 (0.059)			
Ln(Total IPOs)			0.066*** (0.015)			0.026*** (0.009)		
Ln(Total capital raised)				0.027** (0.012)			-0.005 (0.007)	
Ln(Total delistings)				0.059*** (0.014)				0.013 (0.008)
LSE Main Market	1.104*** (0.053)	1.104*** (0.053)	1.104*** (0.053)	1.104*** (0.053)	1.365*** (0.045)	1.360*** (0.045)	1.351*** (0.045)	1.355*** (0.045)
OTCBB	1.410*** (0.041)	1.410*** (0.041)	1.415*** (0.041)	1.413*** (0.041)	1.763*** (0.041)	1.759*** (0.041)	1.761*** (0.041)	1.759*** (0.041)
Intercept	0.596*** (0.198)	0.590*** (0.198)	0.589*** (0.197)	0.603*** (0.198)	-3.412*** (0.188)	-3.401*** (0.188)	-3.402*** (0.189)	-3.397*** (0.189)
Liquidity controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30,007	30,007	30,007	30,007	14,948	14,948	14,948	14,948
Adjusted R-squared	0.712	0.712	0.712	0.712	0.811	0.811	0.811	0.811

\* p<.1, \*\* p<.05, \*\*\* p<.01, two-sided test

Table 11: Survival analysis

This table compares failure rates for firms that listed on the AIM, the LSE Main Market, and the NASDAQ over the period June 1995 through December 2008 and on the OTC Bulletin Board over the period during which it was regulated by the SEC (January 1999 through December 2008). Failure rates are estimated using maximum likelihood, assuming a log normal distribution. In all specifications, the NASDAQ is the omitted exchange. The parameter estimates for the exchange indicators represent ratios of instantaneous times to failure for the mean firm on the exchange relative to the instantaneous time to failure for the mean NASDAQ firm and statistical tests are therefore against one instead of zero. Failure is identified as the combination of a suspension of trading and maximum share price over the 60 days prior to the suspension that was less than 50 cents for the US exchanges and 33 pence for the UK exchanges. The table also presents p-values from two-sided tests of whether the AIM coefficients are significantly different from the coefficients for the LSE Main Market and the OTC Bulletin Board.

Ln(Market Value at Listing)	1.090*** (0.023)
AIM	0.202*** (0.021)
LSE Main Market	0.307*** (0.038)
OTCBB	0.858 (0.122)
AIM = LSE Main Market	0.000
AIM = OTCBB	0.000
Industry fixed effects	Yes
Year fixed effects	Yes
Observations	4,789

\* p<.1, \*\* p<.05, \*\*\* p<.01, two-sided test

Table 12: Comparison with OTC Pink Sheets

This table compares firms that listed and raised capital on the AIM with firms that listed and raised capital on the OTC Pink Sheets over the period June 1995 through December 2008. OTC Pink Sheets is the omitted exchange for all regressions. *12 month return*, *18 month return*, and *24 month return* are buy-and-hold returns starting at the end of the firm's first day of trading. We truncate the buy-and-hold returns to the 99th percentile and set delisting returns equal to -100%. *Zero returns* is the log transform of the proportion of calendar year's trading days for which the firm had a return of zero. *Bid-ask spread* is the natural logarithm of the median daily closing bid-ask spread for the calendar year. Standard errors are clustered at the firm-level for the liquidity regressions. For the OTC Pink Sheets, Datastream provides bid-ask spreads starting in 2006. For the survival tests, failure rates are estimated using maximum likelihood, assuming a log normal distribution. The parameter estimate for the AIM represents the ratio of the instantaneous time to failure for the mean AIM firm relative to the instantaneous time to failure for the mean OTC Pink Sheets firm. The statistical tests for this parameter are therefore against one instead of zero. Failure is identified as the combination of a suspension of trading and maximum share price over the 60 days prior to the suspension that was less than 50 cents for the US exchanges and 33 pence for the UK exchanges.

	Returns				Liquidity		Survival
	12 month return	18 month return	24 month return	Zero returns	Bid-ask spread		
AIM	-0.023 (0.038)	-0.247* (0.135)	-0.135 (0.133)	0.739*** (0.046)	0.593*** (0.043)	0.568*** (0.030)	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	3,021	2,898	2,815	18,618	8,337	3,021	
Adjusted R-squared	0.048	0.026	0.025	0.431	0.482	3021	

\* p<.1, \*\* p<.05, \*\*\* p<.01, two-sided test

Table 13: Analysis of US firms that listed on AIM

This table compares the returns of US firms that listed on the AIM with US firms that listed on SEC regulated exchanges. SEC regulated exchanges are defined as the NASDAQ and the OTC Bulletin Board starting in 1999. We propensity score match the US firms that list on AIM with US firms that list on a SEC regulated exchange using size and the year of listing. Furthermore, population-level industry effects are removed from returns and liquidity. Tests of differences between the US firms that listed on the AIM and the US firms that listed on the SEC regulated exchanges are based on bias-corrected bootstrap confidence intervals that use 1,000 repetitions. Panel A presents differences in buy-and-hold returns. *12 month return*, *18 month return*, and *24 month return* are buy-and-hold returns starting at the end of the firm's first day of trading. We truncate the buy-and-hold returns to the 99th percentile and set delisting returns equal to -100%. Panel B presents differences in liquidity. *Zero returns* is the log transform of the proportion of calendar year's trading days for which the firm had a return of zero. *Bid-ask spread* is the natural logarithm of the median daily closing bid-ask spread for the calendar year. Prior to the tests, both liquidity measures were orthogonalized to the ranks of market value of equity, volatility, and turnover using the entire sample. Bid-ask spread tests are only for the period 2006-2008 to reflect the fact that Datastream does not report bid-ask spreads for US firms prior to 2006. Panel C presents differences in the proportion of firm failures. Failure is identified as the combination of a suspension of trading and maximum share price over the 60 days prior to the suspension that was less than 50 cents for the US exchanges and 33 pence for the UK exchanges.

Panel A: Returns			
	Firms	AIM	SEC regulated
12 month return	40	-0.175	0.070*
18 month return	36	-0.312	-0.025*
24 month return	34	-0.410	-0.132**
* p<.1, ** p<.05, *** p<.01, two-sided test			
Panel B: Liquidity			
	Firm years	AIM	SEC regulated
Zero returns	124	0.231	-0.046***
Bid-ask spread	73	-0.001	-0.022**
* p<.1, ** p<.05, *** p<.01, two-sided test			
Panel C: Survival			
	Firm years	AIM	SEC regulated
Failure	37	0.351	0.054***
* p<.1, ** p<.05, *** p<.01, two-sided test			