IPO survival in a reputational market

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Abstract

We examine IPO survival in a "reputational" market, the Alternative Investment Market (AIM), where principle-based regulation pivots on the role of a regulatory agent, the nominated advisor (Nomad) to the IPO company, who certifies and controls listing quality. We find survival rates of AIM IPOs broadly in line with North American results. Our study examines whether and to what extent regulators can increase the chances of survival by tightening AIM's notoriously lax listing rules. We examine the impact of four regulatory levers on IPO survival: the reputation of the Nomad, and (minimum) requirements on firm age, size, and public float. We find that the impact of all four levers on survival times is positive and (except for public float) statistically and economically significant with Nomad reputation having by far the strongest effect. We also report significantly worse survival chances for IPOs issued during hot markets. While these results are of obvious interest to regulators and participants of AIM, they also provide important lessons for market places modeled on AIM including the upper-tier of the U.S. over-the-counter market (OTCQX), Italy's AIM Italia, and Japan's Tokyo AIM.

JEL classification: G14, G18

Keywords: IPO; new list(ing); survival; delisting; Alternative Investment Market; AIM; over-the-counter; OTCQX; regulation.

1. Introduction

In 2007, the US Securities and Exchange Commission (SEC) argued that London's second tier market, the Alternative Investment Market (AIM) had captured its large market share in new listings thanks to its lax regulation at a time when US regulation had become more burdensome following the Sarbanes Oxley Reforms. This came against the backdrop of a record influx of new listings on AIM, persistently low numbers of IPOs in the U.S., and a growing number of U.S. companies listing on AIM. The London Stock Exchange indignantly rejected the SEC claim that 30 per cent of new listings on AIM were 'gone within a year' (SEC commissioner Roel Campos quoted in The Financial Times, 9 March 2007) arguing in turn that failure rates on AIM were a mere three percent. The first objective of our paper is to provide evidence on these conflicting claims by quantifying the survival rates of new listings on AIM.

The second and main objective of this study is to investigate the effect of AIM's regulatory regime on the survival of new AIM listings.[1] We focus on the role of the nominated advisor (Nomad), who act as gatekeepers tasked to ensure the suitability of new entrants to the market. Our results provide valuable new insights and lessons for new markets with regulatory features modeled on AIM such as the OTCQX, the "premier tier" of the U.S. over-the-counter market, the First North tier of the Nordic OMX market, and the Tokyo AIM (a joint venture between the London and Tokyo stock exchanges).[2] The OTCQX website explicitly credits the successful advisory role of the Nomads on AIM for inspiring its own "community-based" listing process.

Opened in 1995 as a market for small and growing companies, AIM has continually attracted new listings (see Figure 1 in the Appendix), even in the aftermath of the dot com bubble when other lower-tier stock markets collapsed (Audretsch and Lehmann 2005, Giudici and Roosenboom 2004 and Goergen et al. 2009). Compared to listing activity in the U.S. which collapsed after the

[1] Studying survival complements other analyses of post-IPO events and long-term performance, such as, e.g., the recent long-term performance study of UK IPOs by Gregory et al. (2010). Here we adopt survival analysis (also known as hazard models) to examine the survival rates and times of AIM IPOs. Unlike probit or logit analysis, survival analysis allows us to take into account not just the binary information on whether a stock survives for a specified period or until a specified point in time, but also the length of time the stock survives.

[2] OTCQX has positioned itself as a competitor to AIM seeking to attract both U.S. and foreign companies. Its marketing material claims substantially higher stock liquidity on OTCQX than on AIM (http://www.otcmarkets.com/content/doc/ps/OTCQXMedia.pdf). See Mendoza (2008) for a list of further markets emulating the AIM model.

internet bubble burst in 2000 and has stagnated ever since, during 2001-2004 the numbers of non-financial IPOs on AIM roughly matched or exceeded those in the U.S. (taking Amex, NYSE and NASDAQ together). In the same period, AIM also attracted more IPOs than the upper-tier of the London Stock Exchange, the Main Market. During 2000-8, AIM attracted 50 percent more non-domestic companies than NASDAQ.[3] However, the flip side of AIM's apparent success in attracting listings under its "light-touch" rules may be that AIM "*did not have any standards at all and anyone could list*" (John Thain, CEO of the New York Stock Exchange, quoted in The Financial Times, 26 January 2007).

This raises questions over the role of regulation, specifically listing rules, in filtering potential new entrants and ensuring that newly floated stocks are of sufficiently high quality to survive for a reasonable period of time after the IPO. Regulation on AIM is a prime example of principle-based regulation (as opposed to rule-based regulation), a system that allows players discretion in the interpretation and implementation of broad principles. The functioning of this regulatory regime relies on repeated players' concerns for their reputational capital. On AIM, these repeated players include institutional investors and, in particular, the nominated advisors (Nomads) who act not merely as underwriters but also as guardians of AIM listed companies during the listing process and throughout the period of listing. A substantial part of regulation is effectively outsourced to Nomads, who act as "regulatory agents" or "decentralized regulators". AIM has been termed a "reputational market" (Davidoff 2007 cited in Mendoza 2008) where the quality of listed company is certified and controlled by regulatory agents staking their reputational capital rather than by the explicit rules and oversight of the (central) regulatory authorities (including the Financial Services Authority, FSA).

The centralized AIM regulator controls at least four regulatory levers in the form of (actual or potential) listing rules: (1) Rules regarding the role (and specifically, the reputation) of the Nomad; and minimum requirements on (2) firm age (or trading record), (3) firm size (or market capitalization), and (4) public float. This study examines whether and to what extent regulatory

3 See Figure 1 in the Appendix. The figures are from Jay Ritter's website http://bear.cba.ufl.edu/ritter, and the websites of AIM and NASDAQ http://www.nasdaq.com/ and http://www.londonstockexchange.com/en-gb/products/companyservices/ourmarkets/ AIM_new/. Ritter's IPO numbers are based on IPOs with an offer price of at least $5.00, excluding ADRs, unit offers, closed-end funds, REITs, partnerships, banks and S&Ls, and stocks not listed on CRSP.

change can improve the survival rates and times of AIM IPOs using one or several of the above regulatory levers. By examining the survival of IPOs since the opening of AIM, we examine not merely the survival of AIM listings but by implication the survival and success of AIM itself.

Using data for all IPOs floated in the period from the opening of AIM in 1995 until the end of 2004, and tracking these IPO stocks until 31 December 2010, we estimate survival rates of AIM IPOs and find them broadly comparable to those of North American IPOs. We define survivors as stocks that continue to be traded on AIM or transfer their listing to the upper-tier of the London Stock Exchange Main Market (the Official List or Main Market).[4] We identify various reasons for delisting, and estimate survival (and failure) rates associated with alternative delisting reasons. We investigate the determinants of survival rates (and times) to answer whether and to what extent central regulators may improve the survivability of AIM IPOs by tightening the listing rules on AIM, focusing in particular on the four regulatory levers mentioned above (Nomad reputation, company age and size, and public float) We estimate an accelerated failure time (AFT) model that allows the independent variables to have stronger (or weaker) impact on survival times nearer the IPO date as compared to later in the listing period.

We find that all four regulatory levers increase survival times and (except for public float) their effects are statistically and economically significant. We quantify the impact of the variables on survival rates in several ways including by estimating "time ratios", a method not reported in previous IPO survival studies. Nomad reputation has by far the strongest effect: IPOs backed by top-5 Nomads survive for between 3-8 years longer than other IPOs (depending on the measure of Nomad reputation used). This finding highlights the crucial role played by Nomads on AIM, and the value of Nomad reputation in resolving information problems and incentive conflicts that are left unresolved by AIM's principle-based regulation. Our results highlight the potential for central regulators to extend survival times by tightening listing rules and requiring companies to retain reputable Nomads.

[4] A stock is a non-survivor if it is delisted due to a merger or acquisition (M&A), suspension, liquidation or for any reason other than a transfer to the upper-tier of the LSE. We recognize that delisting due to a merger or acquisition is not always bad news for the shareholders of the delisted stock. Therefore, we differentiate M&As from other, "unfavourable", reasons for delisting. We check the robustness of our survival analyses that classify M&As as failures to treating some or all M&As as "right censored" survivors (i.e., observations that are not delisted during the period over which they are tracked). Previous IPO survival studies classify (some) M&As as non-survivors (e.g. Carpentier and Suret 2011) or as censored survivors (Jain and Kini 2000), or exclude them altogether from their samples (Hensler et al 1997).

Our analysis controls for a number of potential determinants of survival time including pre-IPO company profitability, inside ownership at the time of the IPO, industry dummies, a time dummy to control for IPOs during the internet bubble, and a dummy for UK incorporation of the company (as opposed to foreign, non-UK incorporation).

The rest of the paper is organized as follows: Section 2 provides an overview of AIM and its regulation; it also reviews the literature on IPO survival and outlines our research questions. Section 3 describes the data and methodology. Our empirical findings are discussed in Section 4, and Section 5 concludes the paper.

2. Background, Literature and Research Questions

The Alternative Investment Market (AIM) was established in 1995 by the London Stock Exchange (LSE) to provide a market for small and growing companies, especially those unable to meet the listing rules of the upper tier, the Main Market. Even in the aftermath of the dot com bubble, AIM continued to attract a large number of IPOs and that the number of foreign IPOs has consistently increased year on year with a four fold increase from 2003 to 2004. Figure 2 in the Appendix gives information on the numbers of domestic and other firms admitted to AIM during 1995 to 2004, including both IPOs and non-IPO new entrants. The latter are excluded in this study. Our sample comprises 918 UK-incorporated and other firms that listed on AIM during 1995-2004 and conducted an IPO. In total, our sample IPOs raised approximately £7 billion.

Regulation on AIM, both in terms of initial listing requirements and ongoing obligations after listing, is among the least stringent in the world. The status of AIM as an exchange-regulated market allows AIM to operate outside the regulatory regime imposed by European Union directives on listing rules. The regulatory approach of AIM is a prime example of principles-based regulation involving a comply-or-explain option giving companies considerable scope to interpret the principles laid down in AIM's regulatory documents and customizing their compliance. By contrast, the rule-based regulatory approach adopted by the SEC provides detailed, explicit guidelines that facilitate routine compliance checks but provide less flexibility and are likely to impose higher compliance costs on companies (see e.g. Ford 2010). Central to self-regulation approach of AIM is the role and the reputation of the Nominated Adviser (the so-

called "Nomad"). AIM regulation requires every AIM company to retain an AIM-approved financial firm to act as its Nomad not only at the time of its IPO but for as long as the company is listed on AIM. Nomads act not only as advisers and underwriters to companies at the time of the IPO. By guiding companies on how to comply with AIM's regulatory principles and by certifying compliance by their advisee companies to the market, they also act as "gatekeepers" and "decentralized regulators". [5] AIM has been described as a "reputational market" in which the quality of listed company is certified by the reputational capital of Nomads rather than by the explicit rules and oversight of market authorities (Davidoff 2007 cited in Mendoza 2008).

If a company dismisses its Nomad, or if a Nomad decides to end its relationship with an AIM quoted company, the company has 30 days to appoint a new Nomad, otherwise its shares are suspended and eventually removed from AIM. A Nomad has to be a firm (not just an individual) that has practiced corporate finance for at least two years and has been involved in at least three relevant transactions (e.g., IPOs or takeovers requiring a prospectus) in those two years. Nomads include accounting firms, investment banks, corporate finance firms and stockbrokers; all of these firms are required to employ at least four suitably qualified individuals. The LSE website carries a list of all firms authorized to act as Nomads (63 firms in 2010).

AIM requires that all new entrants produce an admission document disclosing details of the directors' backgrounds, their promoters, business activities and the firm's financial position. The main requirement for listing on AIM is that the stock is "appropriate" for the AIM market. It is the responsibility of the Nomad to make this judgement and certify the suitability of the stock to AIM participants. Once admitted to AIM, a company has ongoing disclosure requirements. It is the Nomads' responsibility to ensure the adequacy and timeliness of these disclosures.

Table 1 summarizes the admission requirements on the AIM, the Main Market, OTCQX and NASDAQ. While the distinctive regulatory feature of AIM is the Nomad, on OTCQX this role is performed by the so-called "designated advisor for disclosure" (DAD). Like AIM Nomads, U.S. companies listing on OTCQX must appoint a DAD during the application process and retain this adviser throughout their listing. While the admission documents of companies listing on the UK

[5] By contrast, on the upper-tier Main Market of the London Stock Exchange the sponsoring financial advisers to IPOs companies are not required to provide continued advice and oversight to issuing companies after the IPO.

Main Market or on NASDAQ (Capital Market) are checked by the respective market regulatory authority, these checks are delegated to the Nomad on AIM and to the DAD on OTCQX. Both AIM and OTCQC have no minimum requirements on public float, while the Main Market requires at least 25% of the shares in public hands, and NASDAQ requires at least 300 shareholders and at least one million shares in public hands. Like OTCQX, AIM does not require its entrants to have a trading record while the Main Market requires at least three years trading record. Depending on the listing route, NASDAQ requires zero to two years listing record. Unlike OTCQX and the other markets, AIM does not stipulate a lower limit on size or market capitalization. By contrast, the minimum market capitalization required is $5 million on OTCQX, £10m on the Main Market and $50 million on NASDAQ. For an overview of the listing rules of several European lower tier markets (the so called new markets) see Giudici and Roosenboom (2004).

In sum, the explicit admission requirements stipulated by AIM (and OTCXQ) are less stringent than those on the Main UK Market or on NASDAQ. At the same time, many regulatory responsibilities on AIM are delegated to the Nomads (and to the DADs on OTCQX). Despite its apparent success in spawning imitators, the role of Nomad has recently come under close scrutiny following several scandals involving corporate fraud and failure, and allegations that Nomads failed in their duties to appropriately screen and monitor companies. In response, the LSE introduced a new rulebook for Nomads in February 2007 spelling out the duties of a Nomad in greater detail. One Nomad, Nabarro Wells, was fined and publicly censured in October 2007 for failing to conduct due diligence on companies it was bringing to AIM in 2005 and earlier. Others decided to withdraw from the market resulting in a substantial decline in the number of Nomads from 85 at the start of 2007 to 63 in 2010. Given the ample scope for abuse or negligence by Nomads, their concern for their reputation is a crucial mechanism for controlling the multitude of information and incentive problems among market participants on AIM (and similar markets).

There is an established body of literature on the survival of newly listed stocks in North America, but to our knowledge, there is no published survival study of IPOs on UK stock markets. Next, we discuss the most relevant North American studies, but we do not provide a comprehensive literature review. Schultz (1993), Seguin and Smoller (1997), Hensler et al (1997), Jain and Kini (1999, 2000, 2008), Fama and French (2004), Bradley et al (2006), Demers and Joos (2006), and

Kooli and Meknassi (2007) examine IPO survival using US data, and Carpentier and Suret (forthcoming) use Canadian data. Table 2 summarizes the key aspects and findings of these studies. The failure rates reported in previous US studies range from 2 to 9 percent over the first year of listing, 6 to 42 percent over two years, 9 to 47 percent over five years, to 58.5% over 10 years post-IPO. The wide range of failure-rate findings is due to differences between markets, sample periods, and stratification criteria (e.g. comparisons of penny and other stocks, or between high tech and other industries).

Hensler et al. (1997) investigate the relation between the survival rate of IPO stocks and firm characteristics using a hazard model. Their findings show that survival rates are positively related to firm age and size, IPO initial returns and insider ownership. Jain and Kini (1999) examine the probability of surviving post-IPO using a multinomial logit model. The results indicate that firm size at the time of the IPO, pre-IPO operating performance and investment bankers' prestige are positively related to IPO survival. Jain and Kini (2000) examine whether venture capital (VC) involvement improves the survival profile of IPO firms. Their findings indicate that the probability of post IPO survival is significantly positively affected by VC backing and the prestige of the investment bank leading the underwriting syndicate (as well as by other factors likely to benefit from VC involvement such as road show success and analyst following). Jain and Martin (2005) investigate the relationship between audit quality and post-IPO survival using a proportional hazard model. They find that the hazard rate is negatively (and hence survival time is positively) related to auditor quality. Kooli and Meknassi (2007) examine the survival profile of IPO issuers from 1985 to 2005. They find that large IPOs have lower probability of failing relative to small IPOs. They also find evidence that IPO underpricing increases the likelihood of failure, while having a prestigious underwriter improves the survivability of the issuing firm.

Fama and French (2004) examine 10-year post-issue survival rates of US 'new lists' coming to the market between 1973 and 1991. They find that the characteristics of companies going public, such as profitability and growth, significantly changed over their sample period with more recent new lists having lower profitability and higher growth. These changes in firm characteristics are associated with a sharp decline in survival rates of new lists. Fama and French (2004) argue their results show that the changes in the characteristics and survival rates of new lists are due to a decline in the cost of equity allowing younger and less profitable firms to go public.

Our study examines the impact of regulation on IPO survival in a market specifically designed to reduce the cost of listing for younger and riskier companies. We seek to answer the following questions: What are the survival rates and times of AIM IPOs, and how do they vary over the post-IPO period, and by industry, delisting reason, listing year and country of incorporation. Does regulation affect the survival of new listings? Specifically, can (central) regulators increase survival time of new listings by tightening listing rules in terms of stricter minimum requirements on company size, age, and public float. In particular, should regulation make it mandatory for companies to retain reputable nominated advisers that stake their good name to certify and control quality? We aim to answer these questions below by measuring survival rates and times, and by estimating the impact on survival times of Nomad reputation, company age, size and public float (along with several control variables). We use a range of alternative measures for Nomad reputation including market share (specifically, whether the Nomad ranked among the top 5 based on issue numbers or proceeds), Nomad credit score, Nomad profitability and Nomad firm age.[6] In the UK, the reputation measure typically used in US studies, the Carter-Manaster (1990) tombstone measure, is often unavailable as "tombstone" listings of the underwriting syndicate are rarely published. Our first two measures are designed to reflect reputation in terms of market share. The three other reputation measures (credit score, profitability and age) are chosen to capture the stability and likelihood of survival of the Nomad firm, which is often crucial to the survival of AIM stocks given the requirement of ongoing Nomad supervision of AIM companies.

We also estimate the impact on survival of domestic versus foreign incorporation of the issuing company and of the year of listing (to identify the impact of hot issue markets on subsequent survival). Finally, we control for the impact of pre-IPO profitability of the issuing company and inside ownership at the time of the IPO. High insider ownership is likely to mitigate agency conflict and hence we expect the survival time to increase when insider ownership is high.

6 The five nomads backing the highest numbers of IPOs over our sample period 1995-2004 are Seymour Pierce Ltd, W. H. Ireland Ltd, Colins Stewart Europe, Nabarro Wells & Co. Ltd, and Canaccord Adams Ltd (ranked in descending order).

3. Data and Methodology

Our sample comprises all IPOs issued on AIM from the opening of the market in 1995 to the end of 2004. The numbers of new admissions including both IPOs and non-IPOs is shown in Figure 2 in the Appendix. There were a total of 1683 new admissions during 1995-2004. We exclude companies that entered AIM without conducting an IPO, such as introductions of stocks previously traded on another market, leaving a sample of 918 IPOs.

IPOs are tracked until 31 December 2010 to determine whether they were delisted or not. The list of IPO firms, offer price, market capitalization, issue proceeds, country of incorporation and industry sectors are obtained from the London Stock Exchange (LSE). Dates of incorporation are obtained from Companies House. The dates of the delisting of stocks are collected from World Scope and cross-referenced with the London Share Price Database (LSPD). First-day closing stock prices are taken from Datastream and Perfect Analysis. Venture-capital (VC) backed IPOs are identified using data provided by the British Venture Capital Association (BVCA). Information on the credit score, return on assets and firm age of Nomads is from the FAME database.

Unlike the Logit and Probit methods, applied in some previous studies of IPO survival (see Table 2), survival analysis allows us to take into account not just binary information on whether a stock survives for a specified period or until a specified point in time, but also the length of time the stock survives. Unlike linear regression, survival analysis uses non-normal distributions that accommodate so-called "censored" observations. In our study, sample IPOs are "right censored" if they have not (yet) been delisted and remain listed until the end of the study period (31 December 2010). Survival analysis uses both censored and uncensored observations to provide consistent estimators (Allison 2000). Shumway (2001) finds that survival models are theoretically and empirically superior to "static models" (such as Logit or Probit).

We define survivors as stocks of firms that continue to be traded on AIM or transfer to the London Stock Exchange's upper-tier, the Main Market.[7] By implication, non-survivors are stocks that were delisted from AIM trading due to suspension, liquidation, merger/acquisition or for any

[7] During our sample period 1995-2004, 47 AIM companies transferred to the Main Market.

other reason except a move to the Main Market. We also distinguish between delisting due to merger or acquisition and delisting due to other, negative reasons because the impact on investors is typically far more adverse in the case of negative delistings (e.g. liquidations) than in mergers or acquisitions. We examine the robustness of our results by alternately classifying all mergers and acquisitions as failures (non-survivors), or by treating all or some M&A stocks as "censored" survivors, that is, as stocks that drop out of the study for reasons other than delisting and are therefore still considered alive at the end of our study period. Some firms are likely to be acquired as a result of poor performance or financial difficulty. We seek to differentiate such poorly performing M&A stocks from others by imposing a performance criterion. We identify M&A delistings of well-performing companies and classify them as censored survivors by ranking companies on the basis of four performance measures: cash to total assets, total liability to total asset, operating income to total asset, and the current ratio (current assets over current liabilities) in the year prior to the M&A delisting. Companies that rank above median based on all four measures are considered censored survivors. We classify M&A delistings of below-median performing companies as failures.

The survival rates of IPOs are estimated non-parametrically using the Kaplan-Meier method based on the following expression:

$$S(t_j) = \prod_{i=1}^{j} \left(\frac{n_i - d_i}{n_i} \right)^{\delta_i} \tag{1}$$

or equivalently

$$S(t_j) = \left(\frac{n_j - d_j}{n_j} \right) S(t_{j-1}) \tag{2}$$

where $S(t_j)$ is the estimated survival function in month t_j (measuring the probability of survival beyond t_j conditional on a stock being listed until at least month t_j), n_i is the number of the IPOs that are listed and participating in the study at the start of month t_j (also known as the risk set at t_j), and d_j is the number of the IPOs delisted during month t_j, δ_i is equal to one if there is a failure and zero if there is no failure. Alternatively and equivalently, Equation (1) can be restated as

Equation (2) to express the survival function in month t_j as the probability of survival in month t_j (conditional on a stock being listed until at least month t_j) times the survival function in the previous month t_{j-1} (see Kleinbaum 1996, p56).

Below, we apply Equation (2) to estimate the survival rates for each post-IPO month for the full sample and for various subsamples. To test whether IPOs in different groups (such as subsamples of IPOs grouped by issue year or by industry) share the same Kaplan-Meier survival curves, we use the log rank test (e.g., Kleinbaum 1996, p557-63), a large-sample chi-square test. The test involves classifying the failure rates into observed and expected failure rates. If the observed failure rate is significantly different from the expected failure rate, the test rejects the null hypothesis that the groups share the same survival curves.

Median survival time (ST) is defined as the number of months elapsed from the IPO until the point in time when half the sample stocks have failed and the cumulative sample survival rate has dropped to 50 percent. If the cumulative survival rate is still greater than 50 percent at the end of the study period (here, 31 December 2010), the median survival time is not computed and reported as N/A.

We estimate a special type of survival model known as the Accelerated Failure Time (AFT) model. Three previous studies (listed in Table 2) use the accelerated failure time (AFT) method that allows the impact of the independent variables on survival time to vary over the post-IPO period depending on the length of time since listing. In the AFT model, $\exp(\sum\beta_i X_i)$ is an "acceleration factor": The effect of a covariate is to extend or shrink the length of survival by a constant relative amount $\exp(\sum\beta_i X_i)$ if $\exp(\sum\beta_i X_i) > 1$ survival time is increased, and if $\exp(\sum\beta_i X_i) < 1$ it is decreased (Bradburn et al. 2003). Our AFT model allows for the possibility that the impact of the four regulatory levers on survival may be particularly pronounced in the period soon after the IPO and less so in the longer term.

The AFT model is typically expressed in terms of a log-linear function with respect to time (see e.g. Hensler et al. 1997; Bradburn et al. 2003)

$$\mathrm{Ln}(T_j) = \beta_0 + \beta_1 X_1 + ... \beta_p X_p + \varepsilon_j \qquad (3)$$

Specifically, we estimate the following model

$$Ln(T_j) = \beta_0 + \beta_1 Age + \beta_2 Size + \beta_3 Public\ \ float + \beta_4 \text{P}\ eROA + \beta_5 Insiderown\ ership + \beta_6 Nomad\ \ Reputation + \beta_7 VC\ Backed + \beta_8 Initial\ \ Return + \beta_9 Bubble\ \ period + \beta_{10} DOM - IPO + industry\ \ dummies + \varepsilon_j \quad (4)$$

where $Ln(T_j)$ is the natural logarithm of the survival time (or time to failure), and the independent variables are defined as in Table 3: *Age* is the number of years from incorporation until the IPO; *Size* is market capitalization at the IPO price in £ million; *Public float* is IPO proceeds as a percentage of market capitalization; *Pre ROA* is the operating income to total asset averaged over the year before the IPO and the year of the IPO. *Insider ownership* is the percentage of insider ownership at the time of the IPO. *Nomad Reputation* is a dummy indicating whether the Nomad is among the top-5 advisors ranked according to (1) numbers and (2) proceeds of issues backed in the year prior to the IPO; *VC Backed* is a dummy variable coded one if the IPO firm is backed by venture capital (or more generally, private equity) and zero otherwise; *Initial Return* is the difference between first day closing and offer prices as a percentage of the offer price; *Bubble period* is a dummy coded one for IPOs issued between 1999 and 2000 and zero otherwise; *DOM-IPO* is a dummy variable coded one for IPOs issued by domestic (UK incorporated) companies and zero for foreign issuers. We also include five industry dummies for financials, cyclical services, information technology, non-cyclical consumer goods and the resource sector (using the industry sector "Others" as the base).

As the AFT is a parametric model, it is necessary to specify the distribution of the baseline survival function. We use the likelihood ratio or Wald tests to determine the appropriate distribution in the case of nested models, such as comparing the Weibull against the exponential distribution, or the gamma against the Weibull or log-normal distributions. The Akaike Information Criterion (AIC) is the appropriate test to choose the best-fitting model in the case of non-nested models such as between the log-logistic and the log-normal distribution. The AIC is defined as

$$AIC = -2LnL + 2(k + c) \quad (5)$$

where L is the maximized value of the likelihood function, k is the number of model covariates and c is the number of model-specific distributional parameters. Either of the log-normal and log-logistic models has two distributional parameters (c = 2). The AIC test shows that log-normal distribution has lower AIC value than the log-logistic model, and hence we select the log-normal distribution.

Pseudo R^2 is used as a measure of the goodness of the fit. Pseudo R^2 provides a value reflecting how well the model fits the data (although it does not measure the proportion of variation in the dependent variable explained by the independent variables as does the conventional R^2). Specifically, pseudo R^2 is calculated as $1 - (L_u/L_0)$, where L_u is the log-likelihood function of the unrestricted model and L_0 is the log-likelihood function of the restricted model with only an intercept.

As a robustness check and for comparison with other studies, we also estimate the Cox proportional hazard model applied by e,g. Carpentier and Suret (2011) in addition to the AFT model. The Cox model makes no assumption about the failure distribution. The dependent variable in the Cox model measures the risk of failure as opposed to survival time in the AFT model. In the Cox model, the marginal effect of an independent variable is measured by the so-called hazard ratio. A positive coefficient implies a hazard ratio (calculated as the exponentiated coefficient from the Cox model; see e.g., Kleinbaum 1996) of greater than one, suggesting that an increase of the covariate increases the failure rate. Similarly, a negative coefficient implies a hazard ratio of less than one, indicating that an increase in the covariate reduces the failure rate.

The corresponding measure of the marginal effect in the AFT model is the so-called time ratio. The time ratio is calculated as the exponential of the AFT coefficient (see e.g. Bradburn et al. 2003, p434). A positive AFT coefficient implies a time ratio of greater than one, which indicates that an increase in the covariate increases the survival time (or equivalently, slows down failure). As a consequence, we expect that a given independent variable with a positive sign and a time ratio above one in the AFT model will have a negative coefficient and a hazard ratio of less than one in the Cox model due to the structural differences between the Cox and AFT models.

4. Results

Descriptive Statistics and IPO Frequency

Table 4 presents descriptive statistics of the variables used in the analysis. The average age of IPO firms joining the AIM, measured as the number of years from incorporation until AIM listing, is three years. The youngest firm in our sample was incorporated only four months before the IPO (which is rounded up to one year in our analysis). By contrast, the oldest company had been incorporated for 11 years at the time of its IPO. AIM firms show a lot of variability in terms of their size. While the average market capitalization at IPO is £21.549 million, market capitalization ranges from a mere £234,000 to £518.6m. Over the sample period, the average initial return is 4.5 percent, but median initial return is far lower at a mere 0.735 percent. Public float, in terms of the proportion of IPO proceeds over market capitalization at the IPO, averages 31 percent and ranges from a mere one percent to a maximum of 95 percent. Only 11 percent of AIM IPOs are backed by private equity or venture capital; this is discussed further below.

We measure Nomad reputation using five alternative measures (see also Table 4). The first two are dummy variables coded one (for a given IPO company) if the Nomad ranks among the top five Nomads according to (1) the number and (2) the proceeds of AIM IPOs backed by the Nomad in the year prior to the IPO of the given sample company. We find 60 or 72 percent of our sample IPOs are backed by reputable (top five) Nomads depending on whether the Nomads are ranked by IPO numbers or by proceeds. Next, we examine the characteristics of the Nomads in terms of their credit scores, profitability (return on assets) and Nomad age. The average credit score of the Nomad (at the time of the advisee company's IPO) is nearly 55 ranging from a minimum of 9 to a maximum of 96. The return on assets of the Nomad firms (at the time of the advisee's IPO) is healthy averaging 20 percent but ranging from a very low -88 percent to almost 98 percent. The average age of the Nomad firm (at the advisee's IPO) is 12.57 years ranging from one to 57 years.

Nearly 26 percent of the IPOs considered in our sample came to the market during the dot-com bubble years of 1999 and 2000. The majority (89 percent) of the IPOs are issued by domestic companies. In terms of industry composition, the largest number of IPOs come from the cyclical

services industry (31 percent), followed by the financial sector (23 percent). The information technology, non-cyclical consumer goods and resources industries each account for around 8 to 10 percent of our sample IPOs.[8]

Table 5 shows the distribution of IPOs by year of issue and by industry (based on the FTSE Global industry classification). During our sample period from 1995 to 2004, the IPO market on AIM tends to fluctuate around an upward sloping trend line reaching temporary peaks every four years: first in 1996 with 94 IPOs, then in 2000 with 179 IPOs, and finally again in 2004 with the highest number of IPOs in the sample period (243 IPOs). In 1997 and 1998, and again in 2001 and 2003, IPO numbers on AIM fell. Compared to listing activity in the U.S. which collapsed after the internet bubble burst in 2000 and has stagnated ever since, during 2001-2004 the numbers of IPOs (of non-financial companies) on AIM roughly matched or exceeded those in the U.S. (for Amex, NYSE and NASDAQ together). During 2001-2004, there were 94, 60, 66 and 243 IPOs on AIM, and only 79, 66, 62 and 174 IPOs in the U.S.[9] AIM also attracted more IPOs during 2001-2004 than the upper-tier of the London Stock Exchange, the Main Market.

As noted previously, most AIM IPOs in our sample originate from the financial and cyclical services sectors. The number of IPOs in the cyclical service sector was consistently high since the inception of the market, while the number of IPOs in the financial sector only gathered momentum from 1999 onwards. The number of technology firms joining AIM only picked up during the internet bubble of 1999 and early 2000 and, as expected, dropped off after the internet bubble burst in the spring of 2000. However, 2004 saw a renewed rise in IPOs from the IT sector.

Panel A of Table 6 breaks down the numbers and percentages of sample IPOs by year and by Nomad reputation (Panel A), domestic versus foreign incorporation (Panel B), or venture-capital backing of the issuing company in Panel C (where venture capital is defined broadly to include private equity).

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[8] In the Appendix, we report the correlation matrix for the variables in our analysis. Based on the estimated correlation coefficients, multicollinearity is not an issue in this study.

[9] See Figure 1 in the Appendix. The figures are numbers of IPOs per year. For the U.S. the figures are based on IPOs with an offer price of at least $5.00, excluding ADRs, unit offers, closed-end funds, REITs, partnerships, banks and S&Ls, and stocks not listed on CRSP. The figures are taken from Jay Ritter's website http://bear.cba.ufl.edu/ritter; see that site for further details on U.S. IPO activity.

In almost each year between 44 to 59 percent of AIM IPOs involved a reputable (top-5) Nomad. The year 2001 saw a sudden drop in the percentage of top-5 Nomad-backed IPOs to 32 percent, and the reverse occurred during 2003 when 73 percent of IPOs were brought to the market by a top-5 Nomad. Notably, in the hot-issue years 2001 and 2004, characterized by unusually large numbers of IPOs (179 and 243 IPOs, respectively), the majority of IPOs were backed by reputable Nomads (59 and 62 percent of IPOs, respectively). In 2001 and 2004, the numbers of IPOs brought to the market by the top-5 Nomads quadrupled and tripled, respectively, relative to the previous year. This suggests that reputable Nomad firms are able to expand their business rapidly, probably in the face of increased demand by issuers, and are unlikely to face tight capacity constraints during hot issue periods.

Panel B of Table 6 gives a breakdown of IPO numbers by country of incorporation and by issue year. IPOs of foreign firms make up a relatively small proportion ranging from a minimum of under six percent in 2000 to a maximum of over 16 percent in 2004. The highest number of foreign IPOs took place in 2004 with 40 foreign IPOs; by contrast, throughout the previous nine years, 1995-2003, there were only 60 foreign IPOs. As the allegations relating to the decline in the quality of AIM entrants have often focused on issuers incorporated outside the UK, it will be interesting to examine the survivability of this subsample with a specific focus on the final sample year, 2004 (see below and Table 8).

Finally, Panel C shows figures on IPOs backed by venture-capital or private-equity versus non-backed IPOs by year. The proportion of backed IPOs started to decline in 1998 from around 25 percent during 1995-1997 to under six percent in 2000 and then to a low of three percent in 2002. This relatively low and declining proportion of venture-backed IPOs may appear surprising given the supposed attractiveness of AIM to speculative and young ventures. However, it needs to be appreciated that “venture capital” in the UK is mostly not in the form of seed or early-stage funding but rather later stage funding known in the US as private equity. It seems that AIM is not an attractive exit venue for these private-equity backers.

IPO Survival Rates and Times

Table 7 shows the survival rates of our sample AIM IPOs for one, three and five years after the IPO. Specifically, the table reports median survival times and cumulative survival rates calculated using the non-parametric Kaplan-Meier method. The median survival time (ST) for the full sample is 76 months (Panel C); that is, half the sample IPOs survive for 76 months or less. Median survival time varies considerably by issue year with IPOs issued during the hot markets of 1999 and 2004 having the lowest median survival times: half the IPOs issued during 1999 and 2004 survive for only 43 and 46 months or less, respectively. By contrast, IPOs issued in 1995 had a median survival time of 103 months.

By comparison with issue year, the industry sector of the issuing company causes less survival-time variation with median survival times ranging from 70 months for financials to 98 months for companies in "other" industries.

Breaking these figures down further by Nomad reputation, we find that IPOs with top-5 Nomads have (often substantially) higher median survival times for all issue years except for 2004.

As with median survival times, the figures on survival rates in Table 7 indicate a substantial degree of variation depending on the year of issue with one-year survival rates ranging from 85 to 100 percent: Specifically, survival rates drop from the maximum of 100 percent recorded for IPOs in 1995 and 2002 to 85 percent for issues during the internet bubble in 1999. The bubble year 1999 is also associated with the lowest survival rates over three and five years (at 57 and 32 percent, respectively). These year differences are statistically significant as a log rank test rejects the null hypothesis of equality of survival rates across issue years (chi-square: 42, p-value: 0.000).[10]

Breaking the sample down by industry, we find that survival rates vary comparatively little across industries; e.g., survival rates over one year range from 91 percent (for IT IPOs) to 97 percent for the non-cyclical consumer goods sector and resource companies. While there is considerable industry variation in the five-year survival rates among non-domestic companies, this result is

[10] Under the null hypothesis of equality of the subsamples the log rank test statistic is chi-square distributed with G – 1 degrees of freedom, where G is the number of groups (G=2 in this case).

due to the small numbers of observations in each industry sector. Overall, the industry differences in survival rates are statistically insignificant with the log rank test across industries taking a chi-square value of 6.623 (p-value: 0.250).

We find a substantial effect of Nomad reputation on survival rates and times. Table 7 shows the figures separately for IPOs backed by a "Top-5 Nomad" and those backed by an "Other Nomad". We find that median survival times and cumulative survival rates over 1, 3 and 5 years after the IPO are consistently higher for top-5 Nomad-backed IPOs than for others for the full sample period, and in each issue year. The pattern is similar but not quite as clear-cut when we compare IPOs with Top-5 and other Nomads across the issuers' industrial sectors (in Panel C).

Table 8 breaks down the failure rates (defined as 100 percent minus the survival rate) by reason of delisting. It also reports figures separately for IPOs with and without top-5 Nomads. Delisting due to M&A accounts for 1.81 percent points of the overall one-year failure rate of 7 percent (see Table 7). Of the three-year failure rate of 27 percent, over 10 percentage points are due to M&A delistings; and for the five year window, M&A make up 16 percent out of a total failure rate of 41 percent.

We also find a clear-cut Nomad reputation effect in that the involvement of a top-5 Nomad results in consistently lower failure rates across all three windows and all delisting reasons.

Referring back to the summary of the results of earlier studies in Table 2, we can conclude that the failure rates we estimate for AIM IPOs are within the ranges reported in previous studies of the US and Canadian markets (Bradley et al 2006, Kooli and Meknassi 2007, Schultz 1993).

In conclusion, we do not find support for the claims of the US regulator that the failure rate of AIM IPOs is 30 percent within one year of the issue. Instead we find that seven percent of IPOs are delisted within one year (treating mergers and acquisitions as failures). And this figure falls to slightly over five percent (7–1.81 percent) when we focus solely on negative reasons for delisting (i.e. excluding M&As).

Univariate Analysis of Survivors and Failures

Table 9 compares the descriptive statistics for the subsamples of survivors (stocks that remain listed until the end of the study period on 31 December 2010) and non-survivors (stocks that are delisted). In Panel A we classify M&As as non-survivors (failures). The results in Panel A show that there are substantial and significant differences between survivor and non-survivor IPOs.

Survivors clearly differ from non survivors in terms of the reputation of their Nomads. The proportion of IPOs backed by top-5 Nomads (ranked on the basis of IPOs backed in the pre-IPO year) is significantly higher at over 62 percent among survivors than among non survivors (53 percent). Using the Nomad ranking based on IPO proceeds, 77 percent IPOs of the survivors are backed by top-5 Nomads compared with only 68 percent of the non-survivors. The means and medians of the continuous reputation measures (Nomad credit score, return on assets and age) are statistically significantly higher for survivors than for non-survivors. Among survivors, the average Nomad credit score is almost 69, but among non survivors it is only 41. The Nomads of survivors have an average return on assets of over 21 percent, compared with 16.6 percent for the Nomads of non survivors. The average age of the Nomad is almost 14 years among survivors but less than 11 years among non-survivors.

In terms of the other regulatory levers, we find that surviving IPO companies are significantly older and larger than non-surviving IPO companies. Survivor IPOs have significantly higher initial returns (underpricing) than non survivors. Of the surviving sample IPOs only 17 percent occurred during the bubble period compared to a significantly higher proportion of bubble IPOs (34%) among non-survivors indicating a disproportionately higher failure risk among bubble IPOs. The proportion of IPOs issued by domestic companies is (marginally significantly) higher among the survivors than among non-survivors suggesting that domestic IPOs are more likely to survive than non-domestic IPOs. There are also some significant industry effects with a higher percentage of cyclical services IPOs among survivor IPOs than among non-survivor IPOs, and vice versa for IPOs of companies in the resource sector. By contrast, there are no significant differences between survivors and non-survivors in terms of public float and VC backing. Survivors have substantially, but statistically insignificantly, higher pre-IPO profitability than non-survivors. Survivors also differ in terms of inside ownership at the IPO; this difference is less

substantial than the profitability differential (with survivors having around 67 percent, and others 63 percent inside ownership) but the difference is statistically significant.

In Panel B of Table 9, M&As are classified as censored, yet the results remain qualitatively unchanged except for the industry effect in the cyclical services sector which is no longer significant. Instead, it is now in the financial sector where we find a significantly higher proportion of IPOs among non-survivors than among survivors.

AFT Estimation of Survival Model

Next, we estimate an accelerated failure time (AFT) model to investigate the effects on IPO survival time of the four regulatory levers: nomad reputation, minimum age, market capitalization (size), and public float, controlling for other issue and firm characteristics, specifically initial returns, VC backing, timing of the IPO during the internet bubble, domestic incorporation, and industry effects. Based on the AIC (outlined in the Methodology section above), we choose the log-normal distribution over alternatives such as the log-logistic distribution.

The results of the AFT model are presented in Table 10. The models in Panel A treat observations delisted due to a merger or acquisition as non-survivors (or failures), while those in Panel B treat some mergers and acquisitions as censored observations (i.e., delisting is not observed in the period over which the observation is tracked). Specifically, M&A delistings of companies with above-median performance in the year before the M&A are classified as censored survivors, while M&A delistings of below-median performers are treated as failures. Prior studies of IPO survival classify (some) mergers and/or acquisitions as non-survivors (e.g. Carpentier and Suret forthcoming), while others classify them as censored survivors (Jain and Kini 2000) or exclude them altogether from their samples (Hensler et al 1997).

We employ five alternative variables measuring Nomad reputation as outlined above and summarized in Table 3. Model I in Table 10 (in both panels) reports the results using the binary measure coded one for Nomads ranking among the top 5 in terms of the *numbers* of IPOs the Nomads backed in the year before the IPO (Nomad Reput1). Model II uses the corresponding binary top-5 measure based on IPO *proceeds* (Nomad Reput2). Models III through V use the

continuous reputation measures of Nomad credit score (Nomad Reput 3), Nomad return on assets (Nomad Reput 4) and Nomad age (Nomad Reput 5).

In all five models, survival time is positively related to the four regulatory levers: Nomad reputation, company age, size (market capitalization), and public float. In all models, the coefficients of *Nomad Reputation*, *Age*, and *Size* are statistically significant, while the coefficient of *Public float* is insignificant. Our results on the effect of the regulatory levers on survival are robust to alternative classifications of M&As (see Table 10, Panel B, and Appendix Table 2) and to variations in the measurement of Nomad reputation. We conduct further robustness tests using a broader definition of Nomad reputation with Nomads classed as reputable if they rank among the top 10 (instead of the top 5) ranked on either IPO numbers or proceeds. The results are qualitatively similar but with smaller estimated coefficients on *Nomad Reputation*. (These results are not reported in the tables but are available from the authors on request.)

Initial returns also have a significant positive effect on survival time. By contrast, IPO issuance during the internet bubble period (*Bubble period*) significantly reduce survival time. Similarly, venture-capital backing (*VC_Backed*) has a negative and in Panel A significant effect on survival time. By contrast, the indicator of domestic incorporation of the IPO firm (*DOM-IPO*) is insignificant, and there are no statistically significant industry effects.

Our results are broadly consistent with prior U.S. studies (Schultz 1993; and Hensler et al 1997) on the determinants of the survival rate and time, indicating that age, size and initial returns at the time of issue are positive key determinants of survival times. Although we find a negative (and in Panel A, significant) effect of venture backing on survival, contrary to Jain and Kini (2000), this result is probably unreliable due to the small number of venture-backed IPOs on AIM (with venture-backed IPOs accounting for only 11 percent of our sample).

Based on the coefficients of the AFT model, our results suggest a clear role for three of the four regulatory levers: Nomad reputation, and company age and size. Next, we assess the impact of these four levers and the other explanatory variables on IPO survival on the basis of the estimated time ratios. As outlined in the Methodology section, the time ratio equals the exponential of the coefficient, $\exp(\beta)$, and measures the extent to which changes in the independent variable speed up or delay the occurrence of delisting (i.e., shorten or lengthen the time to failure or delisting).

The regulatory lever with the strongest impact on survival is *Nomad Reputation*. The time ratios of the variables show the multiple by which survival time increases for a unit increase in the explanatory variable. The time ratios of the binary reputation measures Reput1 and Reput2 are 1.456 and 1.74 (in Panel A, Models I and II, respectively) and 1.403 and 1.85 (in Panel B, Models I and II, respectively). This suggests that a one unit increase in either of the two binary reputation variables from its mean extends survival time by a multiple of between 1.405 to 1.85, or in other words by between 40 and 85 percent. However, given the binary nature of the variables, it is difficult to interpret the effect in this way, and we use an alternative method discussed below.

To quantify the effect of the binary variables, we calculate the effect on estimated survival time of a binary increase in the variable from zero to one holding all parameters constant and measuring all other variables at their means.[11] For the binary Nomad reputation measures, an increase from zero to one represents a switch from a lower ranked Nomad to one in the top 5. We find that switching to a reputable Nomad raises estimated survival time by between 1.6 to 4.2 years (depending on the reputation measure and the classification of M&As). The lowest result (1.6 years) is found in Model I, Panel A, where mergers and acquisitions are treated as failures and Nomads are ranked based on IPO numbers using *Nomad Reputation* (1); the highest is in Model II, Panel B, using Nomad Reputation (2) based on IPO proceeds and classifying M&A delistings of above-median performing companies as censored survivors. These results suggest that regulators can increase IPO survival by an economically significant one and a half to four years by requiring all new issues to be certified and controlled by reputable financial firms (such as the AIM Nomads or the DADs on OTCQX). This finding is of clear interest not merely to regulators but to issuers and investors alike. It is also a feather in the cap of reputable Nomads.

The time ratios of the continuous reputation measures (based on Nomad credit score, return on assets and age) are smaller than those of the binary measures, ranging from 1.002 (in Model IV, Panel B) to 1.124 (Model III in Panel B). In other words, a one unit increase in one of these measures increases survival time by between 0.2 to 12.4 percent. In interpreting these results it is important to remember that a one unit change in the continuous variables is proportionately very

[11] We are grateful to Norman Strong for suggesting this measure.

small (e.g. a one percentage point change in return on assets). We explore the quantitative impact of these variables further below.

Among the three continuous levers, *Age* has the strongest impact on survival with a time ratio ranging from 1.069 (in Model II, Panel A) to 1.093 (in Model IV, Panel B). These time ratios indicate that *ceteris paribus* a regulator can increase survival time by a multiple of between 1.069 to 1.093, in other words by between 6.9 and 9.3 percent, by taking measures that raise the age of the average issuing company by one year. Equally, it suggests that issuers can increase the expected survival time of their stock by delaying their issues. The third strongest effect of the four potential regulatory levers is that of *Size*. With a time ratio between 1.007 (e.g. in Models I to III, Panel A) and 1.009 (in Models IV, Panel B), an increase in market capitalization by £1 million increases survival time by between 0.7 to 0.9 percent. While this effect seems at first glance almost negligible, it must be borne in mind that the imposition of minimum size constraints on AIM similar to those of NASDAQ would increase size not merely by £1 million, but by substantially more. Relating the change in size to the standard deviation of *Size* (see Table 4) indicates that the *proportionate* impact of *Size* on survival time is in fact considerable; see the sensitivity analysis below and in Table 11.

Public float appears to be the least powerful of the regulatory levers with a statistically insignificant coefficient and low time ratios of between 0.999 (in most models in Panel A) and 1.003 (in most models in Panel B), suggesting that a one unit increase in the variable has a statistically and economically negligible impact on survival time of between –0.1 to 0.3 percent. The discussion of the sensitivity analysis in Table 11 below returns to this point.

Among the control variables, going public during the internet bubble period (indicated by the dummy *Bubble period*) has an overwhelmingly negative impact on survival time with time ratios of between 0.527 (in Model V, Panel A, with M&As classed as failures) and 0.448 in Model II of Panel B (with M&As treated as censored survivors). These ratios correspond to *decreases* in survival time of 47.3 percent and 55.2 percent, respectively, evaluated at the mean of the dummy variable.

The marginal effect of changing the binary variable from zero to one shows that, *ceteris paribus*, going public during the bubble period reduces survival time by between three to five years. The

weaker effects of around three years is found in Panel A (where M&As are failures), while the stronger five-year result comes from Models II to V in Panel B (with the above median performers' M&As classed as censored) suggesting that the impact of the *Bubble period* is particularly pronounced on the time to failure due to "negative" reasons (other than M&A).

IPO timing is primarily at the discretion of the issuers and their advisors. However, regulators may find ways to limit the influx of IPOs during bubbles and hot issue periods, for instance, by placing stock market applicants onto (artificial) waiting lists, or by adding regulatory "bottle necks" such as requiring that every issuer retain one of a limited number of top Nomads. Our results suggest that steering IPOs away from hot issue periods is likely to substantially improve subsequent survival profiles of new listings.

The time ratios of the indicator of domestic incorporation DOM-IPO range from 1.127 in Model II, Panel A, to 1.286 in Model IV, Panel B. Evaluating the impact of a binary change in the variable from zero to one equivalent to a switch from foreign to domestic incorporation, we find that a switch to domestic incorporation increases survival time by between 0.6 years in Model II, Panel A, and 1.8 years in Models IV in Panel B. The stronger effect of the variable is found when focusing on time to failure due to negative reasons (other than M&A or associated with rescue M&As of poorly performing companies) in the models in Panel B. While the country of incorporation may be unlikely to be a choice variable from the issuers' perspective; it is at the discretion of regulators to bar non-domestic issuers.[12] At first glance our results suggest that regulators may raise survival times of new listing by delaying failures due to negative reasons by an economically significant 1.8 years. However, all DOM-IPO results are in fact statistically insignificant. Also any regulatory barriers to foreign issuers would require careful reflection of the (unwelcome) side effects of such a policy (see also below).

The time ratios of most industry dummies are below one (except for the non-cyclical consumer goods and the resources sectors) suggesting that they have shorter survival times than the base sector "Others". However, none of these industry effects are statistically significant, suggesting no need for regulators barring, or investors avoiding, issuers from specific industries.

[12] However, the distinction between foreign and domestic companies is becoming increasingly blurred. Foreign-based companies may seek UK incorporation with a view to listing on AIM. We thank the referee for pointing this out.

Initial returns of the IPO have a statistically significant, positive impact on survival time with time ratios of between 1.011 (Model II and III, Panel A) to 1.022 (Model IV, Panel B). *Initial returns* may be interpreted as a proxy of intentional IPO underpricing, a variable arguably at the discretion of issuers. Our results suggest that there is some scope for issuers to increase the survival time of their IPO by discounting the offer price. However, the percentage increase in survival time due to a one percentage point rise in initial returns is relatively modest at between one to two percent.

Pre-IPO profitability (Pre ROA) has a highly (statistically) significant, positive impact on survival time in all models in Table 10 with time ratios of between 1.006 (in Model III, Panel A) to 1.013 (Model II, Panel B). Similarly, inside ownership at the time of the IPO has a highly significant, positive coefficient in all models and time ratios of between 1.01 (in Model III, Panel B) to 1.014 (in Models I, IV, V of Panel A). The results suggest that these two variables may be useful screening measures to help investors and practitioners (primarily Nomads) select "appropriate" stocks, provided these players are concerned with survival times.

Sensitivity analysis

In this section we further examine the sensitivity of the expected (or predicted) survival times to the changes in the continuous independent variables. Based on the AFT coefficient estimates of Model I (in Table 10, Panel A), Table 11 shows the actual, absolute and percentage changes in the median expected (or predicted) survival time due to changes in the continuous independent variables expressed in terms of multiples of their standard deviations, σ. Changes are calculated relative to the base of predicted survival time evaluated at the means of all independent variables; at this base, the median predicted survival time equals 77 months. The analysis was conducted in Stata using the command mfx following the AFT survival analysis. [13]

The results of the sensitivity analysis suggest that there is considerable scope to increase survival times by raising the age and size of the issuing company: a two-standard deviation increase in *Age* would increase predicted survival time from its mean of 77 months to 111 months; and a

[13] The sensitivity analysis in Table 11 is based on Table 5 in Hensler et al. (1997). We are grateful for advice from Thomas Springer (one of the co-authors of Hensler et al. 1997) and to Wesley Eddings, Senior Statistician at Stata, for helping us create this table.

corresponding increase in *Size* would raise survival time to 113 months. These changes are equivalent to percentage increases in survival time of 44 percent and 47 percent, respectively. By contrast, the scope for raising survival time by requiring higher public float is more limited with a two-standard deviation increase in *Public float* raising expected survival time by only 16 percent or 12 months (from 77 to 89 months).

Finally, we evaluate the impact of variations in the continuous Nomad reputation measures on median survival time based on the estimates of Models III to V in Panel A of Table 10. We find that a one-standard deviation increase in credit score (Reput3) extends survival time by 38 percent, and a two-standard deviation increase in Reput3 raises survival time by an economically highly significant 56 percent. By comparison, the impact of the two other continuous reputation measures is relatively more modest. A one- (two-) standard deviation increase in return on assets (Reput4) raises survival time by only 5 (10) percent. The figures for the Nomad-age based measure Reput5 are 8 and 12 percent, respectively.

In sum, our results suggest that regulators have ample scope to increase survival times of new listings as indicated by the positive and significant estimated marginal effects on survival time of a range of explanatory variables that can in principle be manipulated by regulators. Of course, this interpretation of our results ignores any secondary (confounding or compounding) effects of any changes in listing rules. It is important to note that the marginal effects are derived *ceteris paribus*, and that our study uses past data that was generated under a given regulatory regime. Any regulatory changes are likely to systematically affect the composition of the listing population in the future, and generate other (possibly unwelcome) side effects. For instance, rules requiring mandatory backing by reputable Nomads would increase issuers' demand for top Nomads' services causing rationing (in the short term) and pushing up Nomads' fees, raising the direct listing costs and deterring potential issuers. Also as with the use of any rankings, Nomad prestige can be measured in various ways resulting in unproductive controversy over which measures to use, and intensifying the temptation for players to game the reputation measure.

Stricter listing rules and higher direct listing costs might deter the very issuers for whom AIM was originally created, namely smaller, younger, more risky companies. By deterring smaller, younger firms that are most at risk of failure (see Table 10), stricter rules may have positive side-

effects on survival (in addition to the direct effects measured in our analysis) because those issuers that do list experience longer survival times. Of course, this beneficial self-selection effect on listing survival must be weighed against the downside of lower real investment and loss of economic value due to the reduced availability of finance and increased costs of capital experienced by younger, smaller companies that are effectively barred from listing.

Robustness of the results

An obvious concern about our sample is the high percentage of observations in the latter period 2002-2004. Since we aim to study the population of IPOs in each year, this is unavoidably due to variations in IPO activity and the particularly high numbers of IPOs in 2004 (see Table 5). Therefore, we examine whether our AFT results in Table 10 are robust to omitting IPOs issued after 2001. Appendix Table 1 shows the results of AFT estimations equivalent to the models reported in Table 10, Panel B. We find our results are qualitatitively unchanged in the reduced, pre-2002 subsample for all our variables of interest except for *Age*, which become less significant or even insignificant in some models. The results for most of the control variables also remain qualitatively unchanged except for pre-IPO profitability (*pre ROA*), which becomes insignificant.

We further explore the robustness of our AFT results in Models I to V of Table 10 to using alternate performance criteria to differentiate between the M&A delistings of well and under-performing companies. In the AFT analysis reported in Table 10, we identify M&A delistings of well-performing companies and classify them as censored survivors by ranking companies on the basis of four performance measures: cash to total assets, total liability to total asset, operating income to total asset, and the current ratio (current assets over current liabilities) in the year prior to the M&A delisting. Companies that rank above median based on all four measures are considered censored survivors. We classify M&A delistings of below-median performing companies as failures. In the Appendix, we check the robustness of our results by alternately classifying M&A as survival if firm ratios are above the 25^{th} or 75^{th} percentiles in terms of performance (and treating them as failure otherwise). The results, reported in Appendix Table 2, suggest that our earlier findings are mostly robust except for a reduction in the statistical significance in one of our Nomad reputation measures (*Nomad Reput 1*) when the performance

hurdle is the top quartile (25 percent) in Panel A of Appendix Table 2 (as opposed to the top 50 percent in Table 10, Panel B).

5. Conclusion

This paper is motivated by recent debates over the impact of stock-market regulation on stock delistings. We examine the survival of new listings on a "reputational market", the UK Alternative Investment Market (AIM). AIM's principle-based regulation delegates important aspects of oversight to financial firms acting as nominated advisors (Nomads) to issuers and expected to certify and control listing quality. While U.S. IPO activity stalled after 2000, AIM has continued to attract both domestic and foreign issuers. However, AIM has been criticized for its lax listing rules that arguably fail to screen out issues with little chance for longer-term survival. We examine the impact of regulation on survival times focusing on four "regulatory levers": the reputation of the Nomad, and company age, size and public float immediately after the IPO.

Based on data of all non-financial IPOs issued since the opening of AIM until the end of 2004, we find historical survival rates that are in line with previously reported results for other (North American) markets. We use the Kaplan-Meier approach to estimate survival times and rates, and find that the median survival time is 76 months. Survival rates also vary statistically significantly across issue years with much lower survival times of between 43 to 46 months for IPOs issued during hot markets (in 1999 and 2004).

To investigate the effect of the regulatory levers (and other variables) on survival times, we estimate an Accelerated Failure Time model that the impact of independent variables on survival times to vary over the post-IPO period, e.g. by having a stronger impact on stocks nearer the IPO than later on. The results show all four regulatory variables increase survival times, and the impact of three of the four variables (all except public float) is statistically significant. Nomad reputation has the strongest effect: *Ceteris paribus* backing by a top-5 Nomad delays the time to failure (due to "unfavorable" reasons other than M&A, or due to rescue M&As of poorly performing companies) by up to four years (depending on the model specification). Moreover, holding all else equal, a two-standard deviation increase in either company age or size adds three

years to average predicted survival time. On the other hand, going public during the internet bubble hastened delisting (particularly in the form of failure due to non-M&A reasons) by up to five years.

Our findings demonstrate clear scope for central regulators to increase survival times by tightening listing rules, in particular, by requiring that issuers retain reputable Nomads to certify and control listing quality. They also suggest regulators (including Nomads) ought to find ways to discourage companies from going public during stock-market bubbles.

Our results provide important lessons not just to market participants on AIM but also to the designers, regulators and participants of market places modeled on AIM such as the upper tier of the U.S. over-the-counter market, the OTCQX, Italy's AIM Italia, and Japan's AIM Tokyo.

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Table 1

Comparison of Listing Rules

Rules on	AIM	LSE Main Market	OTCQX (U.S.)	NASDAQ Capital Market
Public float	No minimum required	Minimum 25% of shares in public hand	No minimum required	300 shareholders; 1m shares publicly held with minimum market value between $4-5m
Trading record	None required	Three years trading record required	None required	0-2 year trading record
Minimum market capitalization	No minimum required	Minimum £10 million market capitalization	Minimum $5 million market capitalization	Minimum $50 million market capitalization
Profitability	No minimum requirement	No minimum requirement	No minimum requirement	No minimum or $750k net income depending on listing standard
Role of advisors	Nominated advisor (Nomad) required for all transactions at and post-IPO	No such requirement	Designated Advisor for Disclosure (DAD) required for all transactions at and post-IPO	No such requirement
Admission documents	Admission documents not examined by UKLA**	Admission documents inspected by UKLA	Admission documents not examined by US SEC	Admission documents inspected by US SEC

****United Kingdom Listing Authority**

Source: AIM, NASDAQ, www.otcqx.com, Mendoza (2008)

Table 2

Selected previous studies of IPO survival

Authors	Country	Sample (period)	Method	Reported failure rates over		
				1 Year	3 Years	5 Years
Schultz 1993	US	Shares vs unit IPOs; 1986-1988	Logit/Probit	2-7%	12-42%	-
Hensler et al 1997	US	NASDAQ; 1975-84	Survival analysis (AFT)	-	-	28%
Seguin and Moller 1997	US	Penny vs non-penny stocks; 1974-1988	Logit/Probit	-	-	17 vs 47%
Jain and Kini 2000	US	U.S. new issues on SDC; 1977-1990	Survival analysis (AFT)	-	-	28%
Fama and French 2004	US	NASDAQ; 1973-91	10-year survival rates			58.5%*
Bradley et al 2006	US	Penny vs non-penny stocks; 1990-1998	Logit/Probit	-	6-35%	-
Demers and Joos 2006	US	Hitech vs nontech stocks; 1980-2000	Logit/Probit	-	-	17 vs 9%
Kooli and Meknassi 2007	US	1985-2005	Multinomial Logit and survival analysis (AFT)	2%	24%	45%
Carpentier and Suret (2011)	Canada	1986-2003	Survival analysis (Cox model)	-	-	20%
Jain and Kini 2008	US	1980-1997	Survival analysis (Cox model)	-	-	35%

* Based on (1- survival rate) for all IPOs over ten years.

Table 3

Definition of Variables

Variable	Definition of variable and unit of measurement	Data source
Size	Market capitalization at IPO (number of shares outstanding at IPO times initial offer price) measured in £ million	London Stock Exchange
Age	Number of years between incorporation and IPO date.	Companies House
Initial returns	First-day closing price minus offer price divided by offer price; in percentage	London Stock Exchange and DataStream.
Public floats	Money raised at the IPO (issue proceeds) divided by market capitalization at offer price; in percentage	London Stock Exchange
Pre ROA [-1to 0] (%)	Operating income to total asset averaged over year prior to and the year of the IPO (years -1 to 0).	IPO prospectus
Insider ownership (%)	Percentage of insider ownership at the time of IPO	IPO prospectus
VC-Backed	Binary variable taking a value of 1 if IPO is backed by at least one "venture capitalist" (more accurately, private equity), and zero otherwise	BVCA
Nomad reputation	Binary variable coded 1 for IPOs with reputable Nomads and zero otherwise. Nomad reputation is defined in several ways. (1) Reputable Nomads are those ranked among the top 5 based on the number of issues they backed in the year prior to the IPO year. (2) Reputable Nomads are those ranked among the top 5 based on the proceeds of issues they backed in the year prior to the IPO year. (3) Nomad reputation measured by the Nomad firm's credit score in the year of the IPO of the company advised by the Nomad; Nomads with a higher credit score are more stable firms than those with a lower credit scores. (4) Nomad firm's return on assets in the year of the advised company's IPO as a proxy for Nomad reputation (in terms of profitability). (5) Age of the Nomad firm as a proxy for Nomad reputation, measured as the number of years between incorporation of the Nomad firm and the IPO of the company advised by the Nomad.	London Stock Exchange and FAME database
Bubble period	A dummy variable taking a value of 1 during the bubble period 1999-2000 and 0 otherwise.	
DOM-IPOs	Dummy variable taking 1 if IPO is domestic (UK incorporated), zero otherwise	London Stock Exchange
Industry dummies	Binary industry dummies based on the FTSE Global industry classification indicating companies in the • financial industry (financials) • cyclical services • information technology • non-cyclical consumer goods • resources The industry class "Others" is used as the base category in the estimations.	London Stock Exchange

Table 4

Descriptive statistics

The table shows descriptive statistics for our sample of 918 AIM IPOs listed during 1995-2004. The variables are defined in Table 3. Age is measured in years rounding up to the next highest full year; the lowest value of Age observed in our sample is in fact just over four months (rounded up to one year).

Variables	Obs.	Mean	Median	Standard Deviation	Min	Max
Age (Years)	914	3.103	3	2.666	1*	11
Size (£ million)	918	21.549	10.971	36.031	0.234	518.623
Initial returns (%)	915	4.504	0.735	17.897	-87.49	89.74
Public float (%)	918	31.015	27	22.556	1	94.89
Pre ROA (-1 to 0, %)	656	0.342	0.002	7.442	-0.078	12.94
Insider ownership (%)	810	64.389	72.047	23.183	10	98.765
VC-Backed (binary)	918	0.108	0	0.311	0	1
Nomad reputation						
Reput1 (binary; top5 by IPOs)	918	0.596	1	0.22	0	1
Reput2 (binary; top5 by proceeds)	918	0.719	1	0.45	0	1
Reput3 (credit scores, #)	897	54.918	69	53.438	9	96
Reput4 (return on assets, %)	897	19.7	18.7	28.1	-87.7	97.7
Reput5 (age, years)	918	12.57	11	8.641	1	57
Bubble period (binary)	918	0.259	0	0.438	0	1
DOM-IPOs (binary; 1 if domestic)	918	0.891	1	0.311	0	1
Industry dummies (binary)						
Financials	918	0.233	0	0.423	0	1
Cyclical service	918	0.307	0	0.462	0	1
Information technology	918	0.109	0	0.312	0	1
Non-cyclical consumer goods	918	0.113	0	0.317	0	1
Resources	918	0.082	0	0.274	0	1
Others	918	0.233	0	0.423	0	1

Table 5

AIM IPOs by year of listing and industry

The table shows the distribution of our sample of 918 AIM IPOs listed during 1995-2004 by year of listing and by industry based on the FTSE Global industry classification.

FTSE Global classification	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
Financials	**2**	**7**	**8**	**6**	**21**	**51**	**21**	**11**	**19**	**68**	**214**
Insurance		1				4	1	2		1	
Investment companies						1	6		1	7	
Real estates	1	4	4		3	6	4	1	3	4	
Specialty &other finance				6	15	39	10	3	14	54	
Investment entity	1	2	4		3	1		5	1	2	
Cyclical service	**12**	**40**	**35**	**14**	**16**	**41**	**26**	**17**	**19**	**62**	**282**
General retailers	1		2			3	2	1		5	
Leisure, entertainment &hotel	4	7	8	1	7	9	3	7	5	14	
Media &photograph	5	11	6	4	2	15	12	8	4	17	
Support service	2	18	17	8	6	12	9	1	9	17	
Transport		4	2	1	1	2			1	9	
Information technology					**10**	**26**	**13**	**12**	**8**	**31**	**100**
Information technology &hardware						5	3			1	
Software &computer service					10	21	10	12	8	30	
Non-cyclical consumer goods	**1**	**10**	**9**	**7**	**4**	**15**	**10**	**14**	**4**	**30**	**104**
Beverage			1	32	3		2	5		2	
Food producers and process		5	1			1	1	2	2	5	
Health			4			8		2	1	10	
Personal care &household product				2	1		1	4			
Pharmaceutical and biotechnology	1	5	3			6	6	1	1	13	
Resources		**2**	**1**	**2**	**1**	**17**	**18**	**1**	**10**	**23**	**75**
Mining					1	11	13	1	7	15	
Oil & gas		2	1	2		6	5		3	18	
Others	**1**	**35**	**17**	**8**	**7**	**29**	**6**	**5**	**6**	**29**	**143**
Automobile and parts			2		1	2			1	3	
Household goods & textiles		1	3	2	1	3		2	1	3	
Aerospace & defence								1		1	
Electronic & electrical equipment	1	8				5		2		5	
Engineering & machinery		2	3	2	1	7	1		3	5	
Diversified industrials		2									
Chemicals						5	1		1	3	
Construction & building materials			3	3	2	2	1			2	
Packaging		2					1				
Steel & other metals		3								1	
Food & drug retailers			2	1	2					1	
Telecommunication services		9				4	2			4	
Electricity		6								1	
Water		2	4			1					
Total	**16**	**94**	**70**	**37**	**59**	**179**	**94**	**60**	**66**	**243**	**918**

Table 6

AIM IPOs by year of listing, venture-capital backing and country of incorporation

The table shows the composition of our sample of 918 AIM IPOs in terms of a breakdown by year of listing, venture-capital (VC) backing, and by country of incorporation.

Panel A: Nomad Reputation: Top 5% by IPOs.										
Listing year	*1995*	*1996*	*1997*	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*
Top 5 Nomad (#)	9	40	37	17	26	105	32	35	50	151
Other Nomad (#)	7	54	33	20	33	74	62	25	16	92
Top 5 Nomad (%)	56	43	53	46	44	59	34	58	76	62
Other Nomad (%)	44	57	47	54	56	41	66	42	24	38
Panel B: Domestic and non-domestic (foreign) IPOs										
Dom. IPOs (#)	15	82	62	32	53	169	88	53	61	203
Non-dom. IPOs (#)	1	12	8	5	6	10	6	7	5	40
Dom. IPOs (%)	94	87	89	86	90	94	94	88	92	84
Non-dom. IPOs (%)	6	13	11	14	10	6	6	12	8	16
Panel C: VC backed and un-backed IPOs										
VC-Backed IPOs (#)	4	24	18	8	8	10	8	2	3	15
Un-backed IPOs (#)	12	70	52	29	51	169	86	58	63	228
VC-Backed IPOs (%)	25	26	26	22	14	6	9	3	5	6
Un-backed IPOs (%)	75	74	74	78	86	94	91	97	95	94

Table 7

Kaplan-Meier survival rates

For our sample of 918 AIM IPOs listed during 1995-2004, the table shows median survival times (ST) in months and cumulative survival rates calculated using the Kaplan-Meier method (see Section 3 and also e.g., Kleinbaum 1996). ST is reported as N/A when cumulative survival rates up to the end of our sample period are greater than 50%. Specifically, for IPOs floated in 2001, the cumulative survival rates are greater than 50% for the full sample and hence ST is not applicable. However, in Panel A, we can infer in these cases that the minimum ST is the time remaining from the issue date until the end of the study period (end of 2010). We conduct log rank tests to assess the statistical significance of any differences between the survival curves across issue years and industries, and between reputable and non-reputable Nomad by IPOs.

	All IPOs						TOP 5 NOMAD						OTHER NOMAD					
Panel A: By issue year			Cum. survival rate					Cum. survival rate						Cum. survival rate				
	Obs	**Log Rank**	**1 Yr**	**3 Yrs**	**5 Yrs**	**ST**	**Obs**	**Log Rank**	**1 Yr**	**3 Yrs**	**5 Yrs**	**ST**	**Obs**	**Log Rank**	**1 Yr**	**3 Yrs**	**5 Yrs**	**ST**
1995	16	42	100	75	63	103	9	43.14	100	89	89	145	7	34.11	100	57	29	40
1996	94	(0.000)	91	72	61	92	40	(0.000)	95	83	78	135	54	(0.00)	89	65	48	46
1997	70		96	73	61	88	37		94	76	67	124	33		97	70	57	65
1998	37		95	62	57	98	17		95	70	65	113	20		94	53	47	58
1999	59		85	58	34	43	26		88	62	42	48	33		82	55	27	42
2000	179		89	63	50	60	105		92	66	54	64	74		87	61	47	52
2001	94		97	83	73	N/A	32		97	90	85	N/A	62		97	69	50	56
2002	60		100	90	78	72	35		100	92	80	N/A	25		100	89	77	72
2003	66		97	83	68	58	50		96	86	82	58	16		100	75	75	49
2004	243		93	77	48	46	151		93	77	47	46	92		95	76	53	N/A
Panel B: By industry																		
Financials	214	6.623	92	74	56	70	123	9.47	93	81	64	70	91	2.81	90	61	43	71
Cyclical service	282	(0.250)	93	70	56	73	146	(0.091)	92	72	56	81	136	(0.729)	93	66	50	60
Information technology	100		91	69	50	72	61		90	71	56	80	39		94	68	47	52
Non-cyclical consumer goods	104		97	78	59	76	49		100	79	67	91	55		94	75	52	54
Resources	75		94	78	63	88	47		97	80	69	N/A	28		91	78	60	88
Others	143		94	76	63	98	76		96	78	68	92	67		93	75	59	107
Panel C: Full sample																		
Total	*918*		93	73	59	*76*	*502*		95	77	63	83	*416*		93	71	52	72

Table 8

Failure rate within Year 1, Years 3 and Years 5 post-IPO, by Nomad and by delisting reason

For our sample of 918 AIM IPOs listed during 1995-2004, the table shows the failure rates estimated using the Kaplan-Meier (K-M) method, broken down by delisting reason and Nomad reputation. The delisting reasons are merger and acquisition, voluntary liquidation, administration receivership, quotation suspended and other delisting for unknown reasons. In Panel A we measure Nomad reputation using Nomad Reput 1 (based on market share in terms of the number of IPOs backed), and in Panel B we use Nomad Reput 2 (based on IPO Proceeds). Table 7 above shows that within a year 5 percent of top-5 Nomad backed IPOs fail (survival rate is 95 percent); Table 8 shows that of these 1.58 percent fail due to merger and acquisition, 1.05 through voluntary liquidation, 0.72 through administration receivership, 1.02 through suspension and 1.09 percent through other unknown reasons for delisting.

Failure rates	**Merger and acquisition**			**Voluntary liquidation**			**Administration receivership**			**Quotation suspended Permanently**			**Other delisting**		
	1 Yr	3 Yrs	5 Yrs	1 Yr	3 Yrs	5 Yrs	1 Yr	3 Yrs	5 Yrs	1 Yr	3 Yrs	5 Yrs	1 Yr	3 Yrs	5 Yrs
PANEL A: Failure rates by Nomad reputation (based on IPOs numbers)															
Top 5 Nomad (%)	1.58	8.97	13.69	1.05	2.71	6.03	0.72	2.92	3.48	1.02	4.74	8.14	1.09	3.66	5.66
Other Nomad (%)	2.04	11.48	18.65	1.34	3.28	7.54	1.09	4.06	4.53	1.38	6.09	9.9	1.45	4.09	6.89
AVERAGE	**1.81**	**10.22**	**16.17**	**1.20**	**3.00**	**6.79**	**0.91**	**3.48**	**4.01**	**1.20**	**5.42**	**9.02**	**1.27**	**3.88**	**6.28**
PANEL B: Failure rates by Nomad reputation (based on IPOs proceeds)															
Top 5 Nomad (%)	1.54	8.48	13.65	1.02	2.71	6.00	0.71	2.87	3.48	1.05	4.7	8.16	1.04	3.6	5.62
Other Nomad (%)	2.08	11.96	18.69	1.37	3.28	7.57	1.1	4.09	4.53	1.35	6.13	9.88	1.5	4.15	6.93
AVERAGE	**1.81**	**10.22**	**16.17**	**1.20**	**3.00**	**6.79**	**0.91**	**3.48**	**4.01**	**1.20**	**5.42**	**9.02**	**1.27**	**3.88**	**6.28**

Table 9

Univariate analysis of survivors and non-survivors

For our sample of 918 AIM IPOs listed during 1995-2004, the table shows means, medians and standard deviations of the variables defined in Table 3 separately for IPOs that survived until (at least) 31 December 2010 and IPOs that had failed by 31 December 2010. In Panel A, mergers and acquisitions are classified as failures (non-survivors), while in Panel B they are treated as censored observations (survivors). The statistical significance of differences in means is assessed using a t-test estimated under the assumption of unequal variances. The statistical significance of differences in medians is assessed using the Mann-Whitney two-sample statistic (performed as ranksum test in Stata). Asterisks *, **, and *** indicate statistical significance at the 10 percent, 5 percent and 1 percent level.

Panel A	Survivor IPOs (444 Obs.)			Non-survivor IPOs (incl. M&As classed as failure; 474 Obs.)			*Equality of means test*	*Equality of medians test*
Variables	*Mean*	*Median*	*Std Dev.*	*Mean*	*Median*	*Std Dev.*		
Age (Years)	3.676	3.000	2.829	2.524	2.000	2.088	6.982***	7.759***
Size (£m)	23.805	11.679	45.470	19.076	9.024	23.954	1.952**	3.343**
Initial returns (%)	5.132	0.800	16.804	3.012	0.362	15.823	1.968**	2.546**
Public float (%)	31.989	27.500	22.900	30.040	25.500	22.254	1.306	0.194
Pre ROA (-1 to 0, %)	0.619	0.001	10.128	0.017	0.000	0.081	1.178	1.069
Insider ownership (%)	66.474	72.071	23.205	63.069	72.00	23.185	2.080**	1.433
VC-Backed	0.086	0	0.280	0.111	0	0.328	-1.238	
Nomad reputation								
Reput1 (binary; top-5 by IPOs)	0.621	1	0.498	0.531	1	0.461	2.01**	
Reput2 (binary; top-5 by proceeds)	0.766	1	0.459	0.675	1	0.424	2.208***	
Reput3 (credit score, #)	68.572	73.000	22.902	41.072	52.000	22.831	17.333***	2.440**
Reput4 (return on assets, %)	21.2	19.5	27.7	16.6	17.8	28.3	2.358**	2.112**
Reput5 (Nomad age, years)	13.678	13.000	8.305	10.589	6.000	8.810	5.151**	15.482**
Bubble period	0.173	0	0.379	0.340	0	0.474	-5.871***	
DOM-IPOs	0.892	1	0.304	0.884	1	0.309	0.150	
Industry dummies								
Financials	0.225	0	0.414	0.241	0	0.42	-0.780	
Cyclical service	0.353	0	0.476	0.257	0	0.439	2.647**	
Info. technology	0.107	0	0.296	0.11	0	0.313	-0.645	
Non-cycl. cons. goods	0.113	0	0.302	0.112	0	0.299	0.100	
Resources	0.048	0	0.332	0.117	0	0.232	-3.668***	

Table 9 continues

Panel B	Survivor IPOs (incl. M&As classed as censored; 632 Obs.)			Non-survivor IPOs (excl. M&As; 286 Obs.)				
Variables	*Mean*	*Median*	*Std Dev.*	*Mean*	*Median*	*Std Dev.*	*Equality of means test*	*Equality of medians test*
Age (Years)	3.869	3.000	2.979	2.661	2.100	2.939	5.713***	4.035***
Size (£m)	23.270	12.664	40.652	16.507	10.230	22.462	2.636**	3.836***
Initial returns (%)	0.063	0.016	0.186	0.035	0.002	0.164	2.189**	2.721**
Public float (%)	31.459	27.000	22.513	30.245	26.000	22.643	0.755	1.165
Pre ROA (-1 to 0, %)	0.966	0.000	13.122	0.048	0.000	0.626	1.652*	1.061
Insider ownership (%)	65.63	73.789	22.161	62.228	71.472	21.188	1.860**	1.393
VC-Backed	0.117	0	0.322	0.091	0	0.288	1.170	
Nomad reputation								
Reput1 (binary; top-5 by IPOs)	0.643	1	0.498	0.541	1	0.487	2.081**	
Reput2 (binary; top-5 by proceeds)	0.742	1	0.472	0.668	1	0.438	2.322**	
Reput3 (credit score, #)	68.692	72.000	22.796	47.624	55	22.926	10.784***	2.443**
Reput4 (return on assets, %)	21.20	21.8	28.2	17.3	17.3	27.9	2.076**	2.345**
Reput5 (age, years)	13.163	12.000	8.542	11.691	10.000	8.802	2.538**	5.783***
Bubble period	0.179	0	0.383	0.437	0	0.497	-8.583***	
DOM-IPOs	0.897	1	0.314	0.888	1	0.307	0.979	
Industry dummies								
Financials	0.267	0	0.446	0.216	0	0.418	1.777*	
Cyclical service	0.300	0	0.457	0.309	0	0.461	-0.419	
Information technology	0.119	0	0.325	0.103	0	0.305	0.782	
Non-cycl. consumer goods	0.123	0	0.329	0.108	0	0.311	1.027	
Resources	0.045	0	0.214	0.088	0	0.296	-2.749**	

Table 10

Accelerated failure time (AFT) results

The table shows the results of two estimated Accelerated Failure Time (AFT) models. The variables are defined in Table 3. Panel A treats M&As as failures, while Panel B classifies them as censored observations. M&A delistings of well-performing companies are classified as censored survivors if they rank above median based on four performance measures: cash to total assets, total liability to total asset, operating income to total asset, and the current ratio in the year prior to the M&A delisting. Companies that rank above median based on all four measures are considered censored survivors. Model I presents the results using the Nomad Reput (1) measure, a binary variable coded one if the Nomad backing an IPO is among the top 5 Nomads ranked on the basis of the number of IPOs the Nomad backed in the year prior to the year of the IPO, and zero otherwise. Model II uses Nomad Reput (2) coded one if the Nomad is among the top 5 ranked on the basis of the proceeds of all the IPOs the Nomad backed in the year prior to the IPO year. Model III uses Nomad Reput (3), which uses the Nomad's credit score. Model IV uses Nomad Reput (4), which is based on the Nomad's return on assets. Model V uses Nomad Reput (5), which uses Nomad age. The time ratio is calculated as the exponential of the estimated coefficient, exp(β). The time ratio (TR) measures the extent to which changes in the independent variables speed up or slow down the occurrence of delisting (time to failure or delisting). For example, in Model I, the time ratio of Age indicates that survival time increases by a multiple of 1.063 as age increases by one unit (one year). Asterisks *, **, and *** indicate statistical significance at the 10 percent, 5 percent and 1 percent levels, respectively.

Panel A: M&A classified as failures

	Model I: Nomad Reput 1			Model II: Nomad Reput 2			Model III: Nomad Reput 3			Model IV: Nomad Reput 4			Model V: Nomad Reput 5		
Variables	Coeff.	P(value)	TR	Coeff.	P(value)	TR	Coeff.	P(value)	TR	Coeff.	P(value)	TR	Coeff.	P(value)	TR
Age	0.072***	0.002	1.075	0.067***	0.004	1.069	0.072***	0.002	1.074	0.080***	0.001	1.083	0.082***	0.000	1.085
Size	0.007**	0.017	1.007	0.007**	0.018	1.007	0.007**	0.029	1.007	0.008***	0.009	1.008	0.008**	0.013	1.008
Initial returns	0.012***	0.000	1.012	0.011***	0.000	1.011	0.011***	0.000	1.011	0.014***	0.000	1.014	0.012***	0.000	1.012
Public float	0.003	0.400	1.003	0.003	0.379	1.003	0.003	0.432	1.003	0.004	0.268	1.004	0.003	0.466	1.003
Pre ROA	0.008***	0.000	1.008	0.011***	0.000	1.011	0.006***	0.000	1.006	0.010***	0.000	1.010	0.008***	0.000	1.008
Insider ownership	0.014***	0.000	1.014	0.013***	0.000	1.013	0.012***	0.000	1.012	0.014***	0.000	1.014	0.013***	0.000	1.014
VC-Backed	-0.439**	0.014	0.645	-0.452**	0.011	0.637	-0.417**	0.020	0.659	-0.420**	0.020	0.657	-0.437**	0.014	0.646
Nomad reputation	0.376***	0.001	1.456	0.554***	0.000	1.74	0.116***	0.000	1.124	0.005	0.388	1.005	0.038***	0.000	1.039
Bubble period	-0.646***	0.000	0.524	-0.673***	0.000	0.51	-0.644***	0.000	0.525	-0.653***	0.000	0.521	-0.640***	0.000	0.527
DOM-IPOs	0.148	0.456	1.159	0.119	0.544	1.127	0.163	0.399	1.177	0.172	0.372	1.188	0.171	0.370	1.186
Industry dummies															
Financials	-0.101	0.580	0.904	-0.046	0.800	0.955	-0.083	0.653	0.921	-0.093	0.616	0.911	-0.11	0.552	0.896
Cyclical service	-0.068	0.687	0.934	-0.024	0.886	0.976	-0.069	0.683	0.933	-0.074	0.661	0.928	-0.061	0.718	0.941
Info-technology	-0.110	0.671	0.896	-0.114	0.656	0.892	-0.1	0.701	0.905	-0.106	0.683	0.899	-0.112	0.665	0.894
Non-cycl cons. goods	0.070	0.747	1.072	0.122	0.582	1.13	0.078	0.724	1.081	0.088	0.691	1.092	0.071	0.744	1.074
Resources	0.239	0.370	1.27	0.208	0.431	1.231	0.263	0.327	1.300	0.241	0.368	1.272	0.225	0.400	1.252
Constant	1.451***	0.000		1.431***	0.000		1.440***	0.000		1.471***	0.000		1.446***	0.000	
Wald Chi-square															
Prob > χ^2	0.000***			0.000***			0.000***			0.000***			0.000***		
Pseudo R^2	0.13			0.16			0.102			0.088			0.089		

Table 10 continues

Panel B: M&A Top 50 classified as censored survivors															
	Model I: Nomad Reput 1			Model II: Nomad Reput 2			Model III: Nomad Reput 3			Model IV: Nomad Reput 4			Model V: Nomad Reput 5		
Variables	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR
Age	0.082***	0.005	1.085	0.071**	0.012	1.074	0.081***	0.005	1.084	0.089***	0.003	1.093	0.088***	0.002	1.092
Size	0.008**	0.028	1.008	0.007**	0.038	1.007	0.007**	0.041	1.007	0.009**	0.020	1.009	0.008**	0.021	1.008
Initial returns	0.020***	0.000	1.021	0.019***	0.000	1.019	0.020***	0.000	1.02	0.022***	0.000	1.022	0.021***	0.000	1.021
Public float	-0.001	0.853	0.999	-0.001	0.768	0.999	0.000	0.903	1.000	0.001	0.902	1.001	-0.001	0.802	0.999
Pre ROA	0.011***	0.000	1.011	0.013***	0.000	1.013	0.008***	0.000	1.008	0.012***	0.000	1.012	0.011***	0.000	1.011
Insider ownership	0.013***	0.000	1.013	0.012***	0.000	1.012	0.010***	0.000	1.01	0.013***	0.000	1.013	0.013***	0.000	1.013
VC-Backed	-0.045	0.851	0.956	-0.063	0.793	0.939	-0.013	0.957	0.987	-0.007	0.978	0.993	-0.054	0.824	0.947
Nomad reputation	0.339**	0.042	1.403	0.615***	0.000	1.85	0.131***	0.000	1.14	0.002	0.456	1.002	0.022**	0.024	1.022
Bubble period	-0.768***	0.000	0.464	-0.802***	0.000	0.448	-0.785***	0.000	0.456	-0.797***	0.000	0.451	-0.785***	0.000	0.456
DOM-IPOs	0.151	0.511	1.163	0.192	0.403	1.211	0.237	0.294	1.268	0.252	0.267	1.286	0.235	0.298	1.265
Industry dummies															
Financials	-0.104	0.608	0.901	-0.04	0.845	0.961	-0.058	0.777	0.943	-0.075	0.716	0.928	-0.082	0.688	0.921
Cyclical service	0.252	0.196	1.286	0.286	0.142	1.33	0.269	0.173	1.309	0.258	0.194	1.295	0.243	0.215	1.275
Info-technology	-0.137	0.612	0.872	-0.151	0.572	0.86	-0.116	0.670	0.891	-0.125	0.649	0.883	-0.15	0.581	0.861
Non-cycl cons. goods	-0.057	0.812	0.944	0.026	0.918	1.026	-0.032	0.898	0.969	-0.014	0.955	0.986	-0.023	0.927	0.978
Resources	0.121	0.664	1.128	0.087	0.753	1.09	0.153	0.586	1.165	0.113	0.691	1.12	0.114	0.687	1.121
Constant	1.537***	0.000		1.507***	0.000		1.520***	0.000		1.550***	0.000		1.534***	0.000	
Wald Chi-square Prob > χ^2	0.000***			0.000***			0.000***			0.000***			0.000***		
Pseudo R^2	0.22			0.23			0.185			0.182			0.181		

Table 11

Sensitivity analysis of the continuous variables for the log-normal AFT Model

Based on the coefficient estimates of Model I in Table 10 and Models III to V for the continuous Nomad reputation measures, this table shows actual, absolute and percentage changes in median predicted survival time as independent variables vary by multiples of their standard deviations σ. Changes are calculated relative to the base of predicted survival time evaluated at the means of all independent variables; at this base, predicted survival time equals 77 Months. The analysis was conducted in Stata using the command mfx following the survival analysis streg.

	+2σ	+σ	+σ/2	+σ/4	-σ/4	-σ/2	-σ	-2σ
Age								
Expected survival time months	111	92	84	80	73	70	64	53
Absolute change months	34	15	7	3	-4	-7	-13	-24
Percentage change %	44	19	9	4	-5	-9	-17	-31
Size								
Expected survival time months	113	93	85	81	73	70	63	52
Absolute change months	36	16	8	4	-4	-7	-14	-25
Percentage change %	47	21	10	5	-5	-9	-18	-32
Initial returns								
Expected survival time months	118	95	86	81	73	69	62	50
Absolute change months	41	18	9	4	-4	-8	-15	-27
Percentage change %	53	23	12	5	-5	-10	-19	-35
Public float								
Expected survival time months	89	83	80	78	75	74	71	66
Absolute change months	12	6	3	1	-2	-3	-6	-11
Percentage change %	16	8	4	1	-3	-4	-8	-14
Nomad credit score Reput3								
Expected survival time months	120	106	95	88	78	76	68	62
Absolute change months	43	29	18	11	1	-1	-9	-15
Percentage change %	56	38	23	14	1	-1	-12	-19

Table 11 continued

Nomad return on assets Reput4								
Expected survival time months	85	81	78	76	74	73	70	64
Absolute change months	8	4	1	-1	-3	-4	-7	-13
Percentage change %	10	5	1	-1	-4	-5	-9	-17
Nomad age Reput5								
Expected survival time months	86	83	81	80	76	72	68	61
Absolute change months	9	6	4	3	-1	-5	-9	-16
Percentage change %	12	8	5	4	-1	-6	-12	-21
Pre return on asset								
Expected survival time months	94	90	88	83	78	72	69	67
Absolute change months	17	13	11	6	1	-5	-8	-10
Percentage change %	22	17	14	8	1	-6	-10	-13
Insider ownership								
Expected survival time months	98	92	86	84	75	74	72	68
Absolute change months	21	15	9	7	-2	-3	-5	-9
Percentage change %	27	19	12	9	-3	-4	-6	-12

Table12
Cox proportional hazard model

The table shows the results of Cox proportional hazard model. The variables are defined in Table 3. Panel A treats mergers and acquisitions as failures, while Panel B classifies them as censored observations. M&A is classified as censored, if firms ratios such as cash to total asset, total liability to total assets, operating income to total assets and current ratios are above the median and failure otherwise Model I presents the results using the Nomad Reput (1) measure, a binary variable coded one if the Nomad backing an IPO is among the top 5 Nomads ranked on the basis of the number of IPOs the Nomad backed in the year prior to the year of the IPO, and zero otherwise. Model II uses Nomad Reput (2) coded one if the Nomad is among the top 5 ranked on the basis of the proceeds of all the IPOs the Nomad backed in the year prior to the IPO year. Model III uses Nomad Reput (3), which uses the Nomad's credit score. Model IV uses Nomad Reput (4), which is based on the Nomad's return on assets. Model V uses Nomad Reput (5), which uses Nomad age. The coefficient (Coeff) is computed as a natural logarithm of hazard ratio (HR). For instance, an increase in age of the IPO firm by 1 year decreases the failure rate by 8 % (1-0.921). Asterisks *, **, and *** indicate statistical significance at the 10 percent, 5 percent and 1 percent levels respectively.

Panel A: M&A classified as failures

	Model I: Nomad Reput 1			Model II: Nomad Reput 2			Model III: Nomad Reput 3			Model IV: Nomad Reput 4			Model V: Nomad Reput 5		
Variables	Coeff	P(value)	HR	Coeff	P(value)	HR	Coeff	P(value)	HR	Coeff	P(value)	HR	Coeff	P(value)	Coeff
Age	-0.082***	0.000	0.921	-0.073***	0.001	0.929	-0.075***	0.000	0.927	-0.092***	0.000	0.912	-0.088***	0.000	0.915
Size	-0.013***	0.002	0.987	-0.014***	0.002	0.986	-0.011***	0.003	0.990	-0.017***	0.001	0.983	-0.013***	0.001	0.988
Initial returns	-0.015***	0.000	0.985	-0.016***	0.000	0.984	-0.014***	0.000	0.986	-0.018***	0.000	0.982	-0.014***	0.000	0.986
Public float	-0.007**	0.048	0.994	-0.009**	0.011	0.991	-0.007**	0.040	0.993	-0.009**	0.015	0.991	-0.006*	0.088	0.994
Pre ROA	-0.012***	0.000	0.988	-0.015***	0.000	0.985	-0.008***	0.000	0.992	-0.014***	0.000	0.986	-0.012***	0.000	0.988
Insider ownership	-0.017***	0.000	0.983	-0.016***	0.000	0.984	-0.014***	0.000	0.986	-0.018***	0.000	0.983	-0.017***	0.000	0.984
VC-Backed	0.331**	0.040	1.393	0.341**	0.035	1.407	0.318**	0.050	1.375	0.324**	0.047	1.382	0.341**	0.033	1.407
Nomad reputation	-0.591***	0.000	0.554	-0.769***	0.000	0.464	-0.016***	0.000	0.984	-0.150	0.575	0.860	-0.054***	0.000	0.948
Bubble period	0.560***	0.000	1.750	0.568***	0.000	1.766	0.556***	0.000	1.743	0.557***	0.000	1.745	0.549***	0.000	1.732
DOM-IPOs	-0.133	0.489	0.876	-0.135	0.442	0.874	-0.157	0.400	0.855	-0.164	0.377	0.849	-0.183	0.319	0.833
Industry dummies															
Financials	0.067	0.722	1.069	0.046	0.804	1.047	0.057	0.764	1.059	0.067	0.726	1.069	0.106	0.582	1.111
Cyclical service	-0.013	0.934	0.987	-0.035	0.826	0.965	-0.008	0.962	0.992	0.001	0.994	1.001	-0.001	0.996	0.999
Info-technology	-0.024	0.921	0.976	0.004	0.988	1.004	-0.021	0.931	0.979	-0.012	0.962	0.988	0.004	0.987	1.004
Non-cycl cons. goods	-0.067	0.753	0.935	-0.161	0.469	0.851	-0.095	0.665	0.909	-0.094	0.671	0.911	-0.059	0.787	0.943
Resources	-0.371	0.213	0.69	-0.337	0.256	0.714	-0.372	0.212	0.69	-0.36	0.228	0.698	-0.328	0.279	0.721
Wald Chi-square Prob > χ^2	0.000***			0.000***			0.000***			0.000***			0.000***		

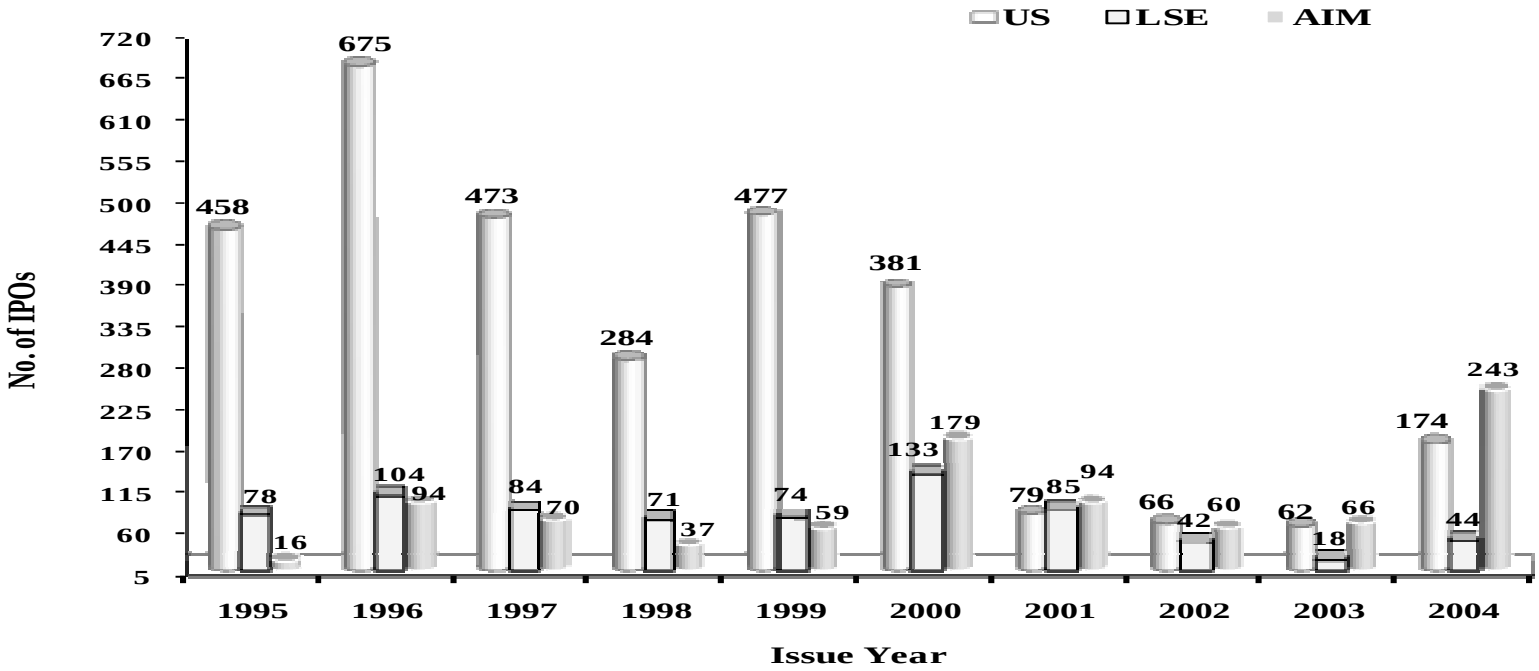
Table 12 continues

Panel C: M&A Top 50 classified as censored survivors															
	Model I: Nomad Reput 1			Model II: Nomad Reput 2			Model III: Nomad Reput 3			Model IV: Nomad Reput 4			Model V: Nomad Reput 5		
Variables	Coeff	P(value)	HR	Coeff	P(value)	HR	Coeff	P(value)	HR	Coeff	P(value)	HR	Coeff	P(value)	HR
Age	-0.093***	0.001	0.911	-0.082***	0.002	0.921	-0.085***	0.001	0.918	-0.102***	0.000	0.903	-0.099***	0.000	0.906
Size	-0.015***	0.009	0.985	-0.015***	0.012	0.985	-0.012**	0.016	0.988	-0.019***	0.004	0.981	-0.015***	0.005	0.985
Initial returns	-0.022***	0.000	0.978	-0.023***	0.000	0.977	-0.021***	0.000	0.979	-0.026***	0.000	0.975	-0.022***	0.000	0.978
Public float	-0.003	0.418	0.997	-0.005	0.231	0.995	-0.003	0.347	0.997	-0.005	0.198	0.995	-0.002	0.539	0.998
Pre ROA	-0.013***	0.000	0.987	-0.017***	0.000	0.984	-0.010***	0.000	0.990	-0.016***	0.000	0.985	-0.014***	0.000	0.986
Insider ownership	-0.016***	0.000	0.984	-0.015***	0.000	0.985	-0.013***	0.000	0.987	-0.016***	0.000	0.984	-0.016***	0.000	0.984
VC-Backed	-0.137	0.560	0.872	-0.111	0.638	0.895	-0.162	0.503	0.850	-0.149	0.538	0.861	-0.148	0.539	0.863
Nomad reputation	-0.518***	0.004	0.596	-0.837***	0.000	0.433	-0.015***	0.000	0.986	-0.083	0.783	0.92	-0.034***	0.003	0.967
Bubble period	0.675***	0.000	1.964	0.697***	0.000	2.007	0.677***	0.000	1.968	0.692***	0.000	1.998***	0.702***	0.000	2.017
DOM-IPOs	-0.052	0.829	0.949	-0.111	0.630	0.895	-0.140	0.556	0.870	-0.160	0.497	0.852	-0.133	0.576	0.876
Industry dummies															
Financials	0.101	0.665	1.107	0.092	0.693	1.096	0.073	0.758	1.076	0.100	0.674	1.105	0.083	0.721	1.087
Cyclical service	-0.348	0.099	0.706*	-0.357	0.093	0.700*	-0.358	0.092	0.699*	-0.333	0.118	0.717	-0.318	0.129	0.727
Info-technology	0.069	0.812	1.072	0.102	0.732	1.107	0.054	0.853	1.056	0.086	0.769	1.089	0.091	0.752	1.095
Non-cycl cons. goods	0.077	0.762	1.080	-0.049	0.853	0.952	0.028	0.916	1.029	0.033	0.901	1.033	0.042	0.869	1.043
Resources	-0.197	0.547	0.821	-0.131	0.685	0.877	-0.211	0.521	0.810	-0.17	0.605	0.843	-0.203	0.540	0.816
Wald Chi-square Prob > χ^2	0.000***			0.000***			0.000***			0.000***			0.000***		

Appendix

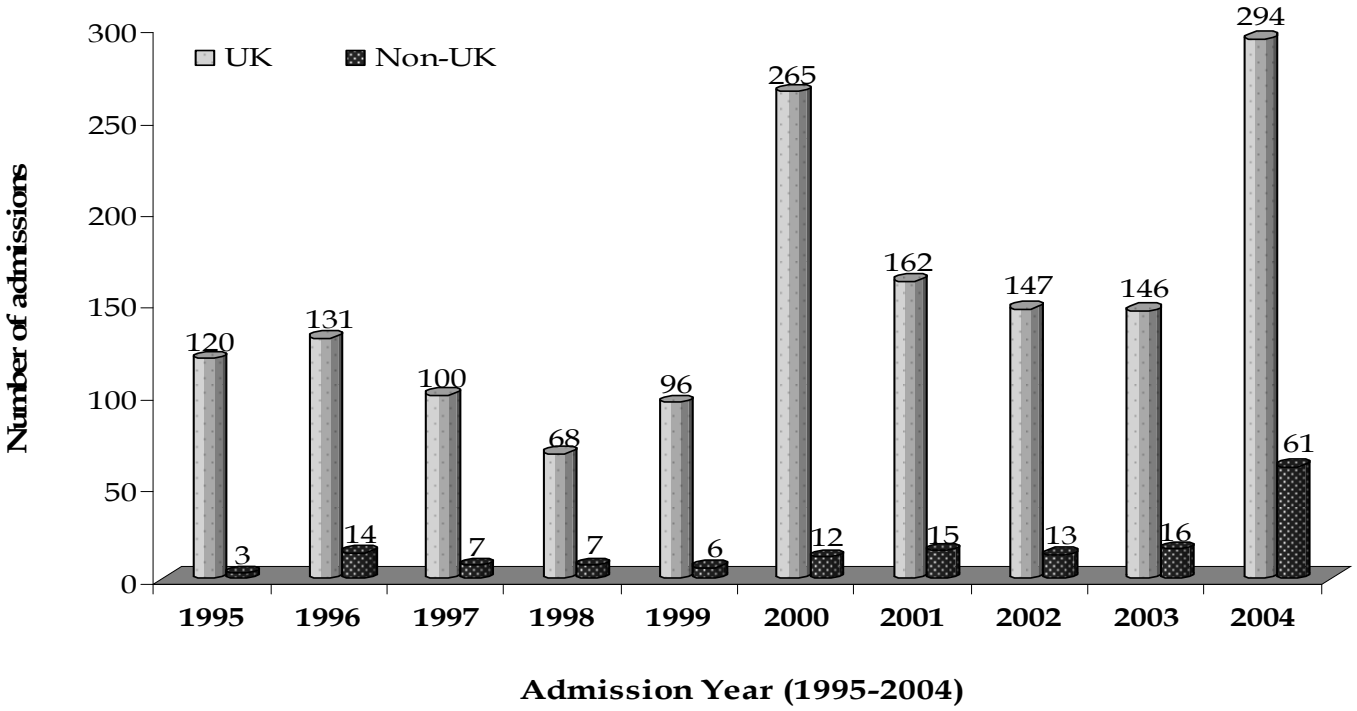
Appendix Figure 1

The figure shows the number of firms listed on the Alternative Investment Market AIM and US market by year of issue in 1995 until the end of our IPO sample period in 2004. The numbers of US IPO firms are collected from J.Ritter's website, LSE from JP Morgan/London Stock Exchange and AIM from London Stock Exchange.



Appendix Figure 2

The figure shows the number of stocks admitted for listing on the Alternative Investment Market AIM by year of admission from the opening of AIM in 1995 until the end of our IPO sample period in 2004. The numbers of admitted stocks include not only the initial public offerings IPOs considered in this study, but also non-IPO new entrants such as introductions of stocks not involving share issuance at the time of listing.



Appendix Table 1

Accelerated failure time (AFT) results (1995-2001)

The table shows the results of the estimated Accelerated Failure Time (AFT) models for IPO between 1995 and end of 2001. M&A is classified as censored, if firms ratios such as cash to total asset, total liability to total assets, operating income to total assets and current ratios are above the median and failure otherwise Model I presents the results using the Nomad Reput (1) measure, a binary variable coded one if the Nomad backing an IPO is among the top 5 Nomads ranked on the basis of the number of IPOs the Nomad backed in the year prior to the year of the IPO, and zero otherwise. Model II uses Nomad Reput (2) coded one if the Nomad is among the top 5 ranked on the basis of the proceeds of all the IPOs the Nomad backed in the year prior to the IPO year. Model III uses Nomad Reput (3), which uses the Nomad's credit score. Model IV uses Nomad Reput (4), which is based on the Nomad's return on assets. Model V uses Nomad Reput (5), which uses Nomad age. Asterisks *, **, and *** indicate statistical significance at the 10 percent, 5 percent and 1 percent levels respectively.

Panel A: M&A Top 50 classified as censored survivors

	Model I: Nomad Reput 1			Model II: Nomad Reput 2			Model III: Nomad Reput 3			Model IV: Nomad Reput 4			Model V: Nomad Reput 5		
Variables	Coeff.	P(value)	TR	Coeff.	P(value)	TR	Coeff.	P(value)	TR	Coeff.	P(value)	TR	Coeff.	P(value)	TR
Age	0.059*	0.089	1.061	0.056	0.105	1.058	0.062*	0.066	1.064	0.070**	0.049	1.073	0.072**	0.037	1.075
Size	0.024***	0.001	1.024	0.024***	0.000	1.025	0.020***	0.004	1.02	0.026***	0.001	1.027	0.024***	0.001	1.024
Initial returns	0.016***	0.000	1.016	0.015***	0.000	1.015	0.014***	0.001	1.014	0.017***	0.000	1.018	0.016***	0.000	1.016
Public float	0.002	0.765	1.002	0.003	0.570	1.003	0.002	0.678	1.002	0.004	0.465	1.004	0.002	0.705	1.002
Pre ROA	-0.224	0.126	0.799	-0.219	0.151	0.803	-0.159	0.250	0.853	-0.202	0.140	0.817	-0.194	0.124	0.824
Insider ownership	0.015***	0.000	1.015	0.014***	0.000	1.014	0.011***	0.003	1.011	0.015***	0.000	1.015	0.015***	0.000	1.015
VC-Backed	-0.249	0.350	0.779	-0.256	0.335	0.774	-0.181	0.500	0.834	-0.187	0.489	0.830	-0.25	0.348	0.779
Nomad reputation	0.518**	0.023	1.678	0.963***	0.000	2.618	0.021***	0.000	1.021	0.215	0.595	1.240	0.032**	0.037	1.032
Bubble period	-1.416***	0.000	0.243	-1.444***	0.000	0.236	-1.474***	0.000	0.229	-1.454***	0.000	0.234	-1.417***	0.000	0.242
DOM-IPOs	0.285	0.335	1.33	0.187	0.506	1.206	0.313	0.274	1.368	0.306	0.284	1.359	0.281	0.320	1.325
Industry dummies															
Financials	-0.192	0.483	0.825	-0.141	0.597	0.868	-0.150	0.588	0.860	-0.136	0.624	0.873	-0.189	0.490	0.828
Cyclical service	0.193	0.420	1.213	0.228	0.340	1.256	0.185	0.443	1.203	0.195	0.419	1.216	0.19	0.427	1.209
Info-technology	-0.175	0.641	0.84	-0.191	0.603	0.826	-0.143	0.703	0.867	-0.144	0.700	0.866	-0.182	0.626	0.834
Non-cycl cons. goods	-0.118	0.715	0.889	-0.087	0.793	0.917	-0.124	0.703	0.883	-0.134	0.683	0.874	-0.111	0.730	0.895
Resources	1.085*	0.097	2.958	1.007	0.112	2.736	1.074	0.109	2.928	1.098*	0.097	2.997	1.091*	0.097	2.976
Constant	1.592***	0.000		1.572***	0.000		1.552***	0.000		1.616***	0.000		1.589***	0.000	
Wald Chi-square															
Prob > χ^2	0.000***			0.000***			0.000***			0.000***			0.000***		
Pseudo R^2	0.12			0.13			0.09			0.07			0.064		

Appendix Table 2

Accelerated failure time (AFT) results

The table shows the results of two estimated Accelerated Failure Time (AFT) models. The variables are defined in Table 3. Panel A treats mergers and acquisitions above 25th quartile as survival; Panel B treats above 75th quartile as survival, while Panel C treats all M&A as survival. Model I presents the results using the Nomad Reput (1) measure, a binary variable coded one if the Nomad backing an IPO is among the top 5 Nomads ranked on the basis of the number of IPOs the Nomad backed in the year prior to the year of the IPO, and zero otherwise. Model II uses Nomad Reput (2) coded one if the Nomad is among the top 5 ranked on the basis of the proceeds of all the IPOs the Nomad backed in the year prior to the IPO year. Model III uses Nomad Reput (3), which uses the Nomad's credit score. Model IV uses Nomad Reput (4), which is based on the Nomad's return on assets. Model V uses Nomad Reput (5), which uses Nomad age. The time ratio is calculated as the exponential of the estimated coefficient, exp(β). The time ratio (TR) measures the extent to which changes in the independent variables speed up or slow down the occurrence of delisting (time to failure or delisting). For example, in Model I, the time ratio of Age indicates that survival time increases by a multiple of 1.063 as age increases by one unit (one year). Asterisks *, **, and *** indicate statistical significance at the 10 percent, 5 percent and 1 percent levels respectively.

Panel A: M&A Top 25 classified as censored survivors

	Model I: Nomad Reput 1			Model II: Nomad Reput 2			Model III: Nomad Reput 3			Model IV: Nomad Reput 4			Model V: Nomad Reput 5		
Variables	Coeff.	P(value)	TR	Coeff.	P(value)	TR	Coeff.	P(value)	TR	Coeff.	P(value)	TR	Coeff.	P(value)	TR
Age	0.084***	0.004	1.087	0.074***	0.009	1.076	0.083***	0.004	1.086	0.090***	0.002	1.094	0.089***	0.002	1.094
Size	0.007**	0.026	1.007	0.007**	0.036	1.007	0.007**	0.039	1.007	0.008**	0.018	1.008	0.007**	0.019	1.008
Initial returns	0.021***	0.000	1.021	0.019***	0.000	1.019	0.020***	0.000	1.02	0.023***	0.000	1.023	0.021***	0.000	1.021
Public float	-0.001	0.757	0.999	-0.002	0.666	0.998	-0.001	0.799	0.999	0.000	0.991	1.000	-0.002	0.701	0.998
Pre ROA	0.011***	0.000	1.011	0.013***	0.000	1.013	0.008***	0.000	1.008	0.012***	0.000	1.012	0.011***	0.000	1.011
Insider ownership	0.013***	0.000	1.013	0.011***	0.000	1.011	0.010***	0.000	1.01	0.013***	0.000	1.013	0.013***	0.000	1.013
VC-Backed	-0.071	0.763	0.931	-0.091	0.701	0.913	-0.042	0.862	0.959	-0.037	0.878	0.964	-0.080	0.735	0.923
Nomad reputation	0.319*	0.052	1.376	0.622***	0.000	1.863	0.135***	0.000	1.144	0.006	0.436	1.006	0.022**	0.023	1.022
Bubble period	-0.750***	0.000	0.472	-0.782***	0.000	0.458	-0.766***	0.000	0.465	-0.778***	0.000	0.46	-0.766***	0.000	0.465
DOM-IPOs	0.176	0.432	1.193	0.227	0.313	1.254	0.266	0.228	1.305	0.282	0.203	1.326	0.267	0.228	1.306
Industry dummies															
Financials	-0.098	0.623	0.907	-0.037	0.855	0.964	-0.053	0.795	0.949	-0.071	0.729	0.932	-0.077	0.704	0.926
Cyclical service	0.256	0.183	1.291	0.287	0.135	1.333	0.272	0.162	1.313	0.261	0.184	1.298	0.247	0.203	1.28
Info-technology	-0.118	0.660	0.889	-0.131	0.621	0.877	-0.098	0.715	0.906	-0.107	0.693	0.899	-0.131	0.627	0.877
Non-cycl cons. goods	-0.038	0.874	0.963	0.045	0.856	1.046	-0.013	0.959	0.987	0.007	0.979	1.007	-0.002	0.994	0.998
Resources	0.151	0.583	1.163	0.118	0.666	1.125	0.183	0.510	1.201	0.141	0.614	1.152	0.143	0.610	1.153
Constant	1.530***	0.000		1.501***	0.000		1.514***	0.000		1.543***	0.000		1.527***	0.000	
Wald Chi-square															
Prob > χ^2	0.000***			0.000***			0.000***			0.000***			0.000***		
Pseudo R^2	0.14			0.17			0.11			0.09			0.084		

Appendix Table 2 continues

Panel B: M&A Top 75 classified as censored survivors

	Model I: Nomad Reput 1			Model II: Nomad Reput 2			Model III: Nomad Reput 3			Model IV: Nomad Reput 4			Model V: Nomad Reput 5		
Variables	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR
Age	0.093***	0.002	1.097	0.083***	0.005	1.086	0.092***	0.002	1.096	0.100***	0.001	1.105	0.099***	0.001	1.104
Size	0.008**	0.032	1.008	0.007**	0.042	1.007	0.007**	0.049	1.007	0.009**	0.023	1.009	0.008**	0.024	1.008
Initial returns	0.021***	0.000	1.021	0.019***	0.000	1.019	0.020***	0.000	1.02	0.023***	0.000	1.023	0.021***	0.000	1.021
Public float	-0.001	0.829	0.999	-0.001	0.784	0.999	-0.001	0.852	0.999	0.000	0.932	1.000	-0.001	0.759	0.999
Pre ROA	0.011***	0.000	1.011	0.014***	0.000	1.014	0.008***	0.000	1.009	0.013***	0.000	1.013	0.011***	0.000	1.012
Insider ownership	0.012***	0.000	1.012	0.011***	0.000	1.011	0.009***	0.002	1.009	0.012***	0.000	1.012	0.012***	0.000	1.012
VC-Backed	-0.098	0.687	0.906	-0.113	0.643	0.893	-0.063	0.801	0.939	-0.058	0.817	0.944	-0.106	0.665	0.899
Nomad reputation	0.311**	0.040	1.365	0.631***	0.000	1.88	0.133***	0.000	1.142	0.005	0.310	1.005	0.025**	0.018	1.025
Bubble period	-0.842***	0.000	0.431	-0.871***	0.000	0.419	-0.863***	0.000	0.422	-0.875***	0.000	0.417	-0.855***	0.000	0.425
DOM-IPOs	0.204	0.391	1.226	0.244	0.303	1.277	0.293	0.211	1.341	0.309	0.190	1.361	0.289	0.215	1.336
Industry dummies															
Financials	-0.142	0.501	0.867	-0.085	0.691	0.919	-0.099	0.649	0.906	-0.114	0.600	0.892	-0.125	0.559	0.882
Cyclical service	0.213	0.294	1.237	0.243	0.232	1.275	0.229	0.267	1.257	0.219	0.290	1.245	0.204	0.318	1.227
Info-technology	-0.035	0.902	0.965	-0.052	0.856	0.95	-0.014	0.962	0.986	-0.018	0.949	0.982	-0.047	0.869	0.954
Non-cycl cons. goods	-0.085	0.738	0.919	-0.007	0.979	0.993	-0.048	0.853	0.953	-0.033	0.901	0.968	-0.051	0.842	0.95
Resources	0.179	0.549	1.196	0.153	0.604	1.165	0.207	0.494	1.23	0.172	0.573	1.187	0.171	0.573	1.186
Constant	1.558***	0.000		1.530***	0.000		1.538***	0.000		1.570***	0.000		1.554***	0.000	
Wald Chi-square Prob > χ^2	0.000***			0.000***			0.000***			0.000***			0.000***		
Pseudo R^2	0.22			0.21			0.195			0.187			0.186		

Appendix Table 2 continues

Panel C: M&A classified as censored survivors

	Model I: Nomad Reput 1			Model II: Nomad Reput 2			Model III: Nomad Reput 3			Model IV: Nomad Reput 4			Model V: Nomad Reput 5		
Variables	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR	Coeff.	Pvalue	TR
Age	0.095***	0.003	1.100	0.084***	0.007	1.088	0.096***	0.002	1.101	0.107***	0.001	1.113	0.100***	0.001	1.106
Size	0.019***	0.000	1.019	0.019***	0.000	1.019	0.017***	0.001	1.017	0.021***	0.000	1.021	0.019***	0.000	1.019
Initial returns	0.017***	0.000	1.017	0.016***	0.000	1.016	0.015***	0.000	1.015	0.018***	0.000	1.019	0.017***	0.000	1.017
Public float	0.004	0.421	1.004	0.004	0.409	1.004	0.003	0.550	1.003	0.004	0.354	1.004	0.003	0.533	1.003
Pre ROA	0.015***	0.000	1.015	0.018***	0.000	1.018	0.011***	0.000	1.012	0.017***	0.000	1.017	0.015***	0.000	1.015
Insider ownership	0.014***	0.000	1.014	0.012***	0.000	1.012	0.010***	0.001	1.011	0.014***	0.000	1.014	0.013***	0.000	1.013
VC-Backed	-0.275	0.280	0.76	-0.292	0.250	0.746	-0.233	0.367	0.792	-0.238	0.359	0.788	-0.279	0.271	0.756
Nomad reputation	0.329*	0.075	1.389	0.630***	0.000	1.840	0.126***	0.000	1.134	0.003	0.691	1.003	0.035***	0.004	1.036
Bubble period	-1.143***	0.000	0.319	-1.173***	0.000	0.310	-1.164***	0.000	0.312	-1.168***	0.000	0.311	-1.143***	0.000	0.319
DOM-IPOs	0.220	0.408	1.246	0.266	0.318	1.305	0.325	0.217	1.384	0.332	0.206	1.394	0.315	0.226	1.37
Industry dummies															
Financials	-0.126	0.583	0.881	-0.071	0.759	0.931	-0.088	0.710	0.916	-0.092	0.697	0.912	-0.125	0.591	0.882
Cyclical service	0.336	0.124	1.399	0.362*	0.099	1.436	0.328	0.139	1.389	0.325	0.144	1.384	0.328	0.136	1.388
Info-technology	0.192	0.531	1.212	0.171	0.572	1.187	0.206	0.506	1.228	0.206	0.506	1.229	0.178	0.562	1.195
Non-cycl cons. goods	-0.050	0.855	0.951	0.021	0.941	1.021	0.003	0.991	1.003	0.004	0.989	1.004	-0.032	0.908	0.968
Resources	0.642	0.109	1.899	0.598	0.129	1.819	0.653	0.109	1.922	0.639	0.115	1.895	0.617	0.127	1.853
Constant	1.582***	0.000		1.553***	0.000		1.556***	0.000		1.596***	0.000		1.571***	0.000	
Wald Chi-square															
Prob > χ^2	0.000***			0.000***			0.000***			0.000***			0.000***		
Pseudo R^2	0.21			0.22			0.198			0.188			0.187		

Appendix Table 3: Correlation matrix

Based on data for our sample during 1995 through 2004, the table shows the Spearman correlation coefficients of the variables defined in Table 3.

Variables	Age Years	Size £m	Initial returns %	Public float %	Pre-ROA %	Insider Ownership %	VC-Backed	Nomad Rep.1	Nomad Rep. 2	Nomad Rep 3	Nomad Rep. 4	Nomad Rep. 5
Age Years	1											
Size £m	-0.007	1										
Initial returns %	0.072	-0.050	1									
Public float %	0.009	-0.250	-0.040	1								
Pre-ROA	0.122	-0.030	0.065	0.073	1							
Insider ownership %	-0.025	0.070	-0.002	0.027	0.077	1						
VC-Backed	0.194	-0.020	0.107	-0.002	0.073	-0.008	1					
Nomad reputation 1	0.015	0.090	-0.037	0.028	-0.036	-0.050	-0.033	1				
Nomad reputation 2	0.009	0.000	0.042	0.015	0.009	-0.022	0.018	0.042	1			
Nomad reputation 3	-0.053	0.03	-0.024	-0.022	0.005	-0.034	-0.026	0.092	0.044	1		
Nomad reputation 4	0.027	0.000	0.012	-0.012	-0.023	0.045	-0.051	0.042	-0.051	0.096	1	
Nomad reputation 5	-0.118	-0.030	-0.079	0.045	-0.038	-0.034	-0.073	0.076	0.025	0.294	-0.151	1
Bubble period	-0.203	0.070	-0.073	-0.011	-0.123	0.050	-0.081	0.024	0.026	0.099	0.126	-0.068
DOM-IPO	-0.047	-0.150	0.001	0.186	-0.040	0.027	0.029	-0.262	0.042	-0.026	-0.051	-0.003
Financial	-0.061	-0.300	-0.032	0.167	-0.021	0.009	-0.049	-0.006	-0.056	0.057	0.014	0.102
Cyclical service	0.104	0.030	0.035	-0.084	0.049	-0.013	0.059	-0.006	-0.037	-0.007	-0.014	-0.114
Info- technology	-0.118	0.100	-0.138	-0.051	-0.062	-0.011	-0.073	0.054	0.053	0.024	0.047	0.008
Non-cycl-cons goods	-0.028	0.090	0.013	-0.022	-0.024	0.004	0.021	-0.110	-0.034	-0.092	-0.056	-0.016
Resource	-0.030	0.120	-0.050	-0.023	-0.052	0.024	-0.076	0.103	0.027	0.067	0.022	0.096

Correlation matrix continues

Variables	Bubble period	DOM-IPO	Financial	Cyclical service	Info-technology	Non-cycl-cons goods	Resource
Bubble period	1						
DOM-IPO	0.026	1					
Financial	0.120	0.102	1				
Cyclical service	-0.014	0.078	-0.400	1			
Info- technology	0.194	-0.043	-0.171	-0.221	1		
Non-cycl-cons goods	-0.032	-0.004	-0.188	-0.242	-0.104	1	
Resource	-0.098	-0.189	-0.150	-0.193	-0.083	-0.091	1