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Valérie Revest and Alessandro Sapio

Abstract

Why have thousand companies listed on junior stock markets such as the Alternative Investment Market (AIM)? The controversial evidence on survival and productivity growth of the AIM-listed companies, together with the recent increase in post-IPO sales worldwide suggest that growth motives are far less essential than the attainment of entrepreneurial exit opportunities. Insights on the strategic motivations behind stock market quotation are provided in this article by comparing the characteristics of AIM-listed companies involved in two trajectories, namely graduation and post-IPO company sales. Estimates of discrete choice and duration models outline the relationship between the probabilities of AIM-listed companies to be acquired or to graduate to the LSE main market and their size, age, and sector between 1995 and 2009. The results show that the AIM has mainly acted as a “show room” for the sale of its larger and older companies, especially after the Internet bubble: companies in high-tech sectors featured prominently among graduates in the late Nineties, but not among takeovers. As such, the AIM has not been a facilitator for young and small innovative firms, or it has mainly attracted those wishing to retain independence.

Keywords: Technology-based small firms, Alternative Investment Market, acquisitions, graduations.

Introduction

The increasing number of stock exchange segments with low listing requirements ("junior stock markets") testifies to the political will to support stock market financing of SMEs. The tight constraints to loans that have disproportionately affected young innovative firms since 2008 have only reinforced this tendency (Cowling et al., 2012; Mina et al., 2013; Schneider and Veugelers, 2010 among others).

Nevertheless, stock markets in both US and Europe have been facing a decline in small firms IPOs in recent years, accompanied by an increase in trade sales (Ritter et al., 2013). Selling business to larger companies that can exploit innovations more effectively and generate synergies is increasingly preferred to IPOs as an entrepreneurial exit strategy (see Carpentier and Suret, 2014, regarding business angels strategies, and the theoretical model in Bayar and Chemmanur, 2012). One can however observe also an increase in post-IPO company sales (Ritter, 2013; Ritter et al., 2013), suggesting that an IPO can be seen as an intermediate stage in a sequential divestiture strategy (Reuer and Shen, 2004; Brau et al., 2010; Mantecon and Thistle, 2011). Such a "double track" strategy can be deployed on highly liquid first-tier segments of the stock exchanges only if listing requirements are satisfied. This effectively cuts SMEs and young firms out of the picture, unless a junior segment is available.

A junior stock market can then act as a "show-room" of promising acquisition targets for larger and more established companies, including those wishing to supplement traditional technology sourcing modes, such as patent licensing or contract research (Grandstrand and Sjolander, 1990). But companies listing on a junior stock market can alternatively choose to graduate to the main market in hope of reaping the benefits of stock market flotation (e.g. visibility, high-powered managerial incentives, competition among providers of finance; see Röell, 1996), that are magnified in the official list due to its greater liquidity and wider analyst coverage. Graduation represents an additional strategic options for entrepreneurs that wish to enact a multi-stage divestiture strategy.

Building on these premises, the goal of this article is to learn about the strategies of publicly listed firms by comparing the characteristics of firms that have followed different post-IPO trajectories, such as sell-out and graduation.

Junior stock markets, such as the iconic Alternative Investment Market (AIM) created in 1995 by the London Stock Exchange, pose challenges for the theory and practice of financial markets. Regulatory outsourcing is a rather controversial institutional innovation (Carpentier and Suret, 2012; Revest and Sapio, 2013a) and, perhaps relatedly, even the AIM has performed poorly in several respects, despite being the largest among junior stock markets. Negative results are highlighted regarding survival rates, operational performances, delisting rates, as well as the quality of the firms involved in reverse mergers (Hornok, 2014; Revest and Sapio, 2014; Vismara et al., 2012), although one should not deny that listing on the AIM can also yield positive feedbacks for the listed firms, such as facilitating post-IPO capital raising (Hoque, 2011; Nielsson, 2013).

Our empirical analysis may then shed light on why thousand companies have listed on the AIM as well as in similar markets (such as Alternext in France, AIM Italy, AIM Japan). When it comes to new and small firms, light regulation (Jenkinson and Ramadorai, 2008; Rousseau, 2008) and growth motives are considered as important reasons for stock market flotation, but according to Davies (2011) and Fraser (2005), the majority of small firms seeking to go public do not view growth as a strategic goal. As suggested by the mentioned evidence on double track strategies, stronger emphasis should be placed on other corporate strategic motivations, related to the control and combination functions of stock markets, as defined by Lazonick (2007a).

If previous results of empirical studies on the AIM tend to show that the number of transferts from the AIM to the main list is sparse, and that the percentage of high-tech firms is rather low (Campbell and Tabner, 2014, and), it is compelling to know what are the characteristics of the companies that are acquired or that graduate, also for political purposes.

Drawing on data on AIM-listed companies since its inception (January 1995) to June 2009, we estimate how the probabilities of AIM-listed companies to graduate to the LSE Main Market or to be acquired change with their size and age measured at the time of introduction on AIM, as well as across sectors, conditional on aggregate trends and fluctuations that affect market valuation. Our modeling approaches encompass binary response and duration models, which are appropriate tools to analyze the probability and hazard rates of discrete events. Our findings show that the probabilities of acquisitions and graduations in a time horizon of 5 years after introduction are higher among the largest AIM-listed companies, that technology acquisitions are not more likely than acquisitions of companies in less technology-intensive sectors, and that graduations of companies in science-based sectors were almost entirely “helped” by the “new economy” fad of the late Nineties.

The remainder of the article is structured as follows. Part one reviews the empirical studies regarding the performance of the AIM as a stock market and of its listed companies. Part two discusses the graduation trajectory, i.e. a company transfer from a junior market to a main market. Part three considers the issue of post-IPO acquisitions. Part four presents the empirical analysis, including the dataset, the variables and the summary statistics. In part five, the econometric methods are briefly described and the results are interpreted. Part six concludes and illustrates some avenues for future research.

The AIM: a controversial junior stock market

The main organizational specificity of the AIM is a combination of low admission requirements with information disclosure processes centered on financial intermediaries assisting the issuers. AIM does not set any minimal initial requirements in terms of capitalization, assets, equity capital, trading history, and free float. Every company seeking admission on AIM, though, needs to appoint a Nominated Advisor (Nomad), who assesses the company's suitability for quotation by carrying out an examination of the applicants business and activities. Once the company is listed, Nomads have to ensure that the issuers supervised by them comply with the AIM listing rules. Although there are no mandatory corporate governance rules, Nomads may persuade their clients to align with the best practice. Nomads act as gatekeepers, advisers and, ultimately, regulators of AIM-listed companies (Mendoza, 2008).

Fast admission processes, as well as customized oversight and disclosure have contributed to the long term growth of the AIM in terms of issues and capitalization. During the last decade, AIM "replicas" have emerged all over the world, such as AIM Japan, AIM Italia, First North (Baltic countries), Toronto Venture Stock Exchange (Canada), New Zealand Alternative Exchange. Though, empirical works provide diverging results on the ability of the AIM to support SMEs, in regards to the survival rates of the listed companies, their financial health, as well as their real performances (e.g. growth in market shares and in productivity).

Triggered by the widespread perception of AIM as a "casino" (Roël Campos, quoted by Bawden and Waller, 2007), Espenlaub et al. (2012) find that between 1995 and 2004, around 10% of the listed companies have been delisted within 5 years after the IPO, for voluntary and administrative reasons (see also Gregory et al., 2010). The survival rate is on average higher for the AIM-listed companies assisted by larger (and presumably more reputable) Nomads. Consistently, the results in Gerakos et al. (2013) highlight the shorter time-to-failure of companies introduced on AIM with respect to those listing on other markets. Vismara et al. (2012) shed light on a 42% failure rate for the AIM, as compared to 20%-28% for other stock markets. Recent studies on the failure rates of UK firms include also spatial and industry effects: the AIM is dominated by London-based IPOs (Amini et al., 2012) and a higher failure rate is observed for financial companies in or near London (Amini and Keasey, 2013).

In parallel, relatively low stock returns and liquidity by AIM firms were underlined by Gerakos et al. (2013), Vismara et al. (2012), and Hoque (2011). Over the period 1995-2010, the post-listing returns in the 5 years after IPO, on average, was negative in AIM for all years, and positive for the main market of the London Stock Exchange. In addition, AIM companies produce lower dividends, are less likely to make acquisitions and more likely to be cancelled (Hoque, 2011). Along the same lines, the results in Gerakos et al. (2013) for the period 1995-2008 were less than encouraging, finding lower post-listing returns than for similar companies listed on other markets, be it the LSE Main List, the Nasdaq, or the OTCBB (see also on this point Vismara et al., 2012). Even the AIM-listed fast growing firms were less likely to enjoy extra positive outcomes than firms listing on other exchanges. Yet, more promising and homogeneous results appear in regards to capital raising. AIM companies would encounter a higher probability to proceed to a capital increase than similar companies on the main list (Hoque, 2011; Vismara et al., 2012). The funds raised during one year by either IPO or capital increase on the AIM are shown to be larger on average than on markets in the USA or continental Europe (Nielsson, 2013).

Few empirical works deal with the influence of the AIM on company-level real performances. Colombelli (2009) found that the growth rate of companies listed on AIM between 1995 and 2006 is positively affected by the presence of intangible assets, as well as by the educational level and experience of the managing director. A link is also established between the quality of the innovation system, symbolized by the university patenting activity, and the growth rate of the listed companies (Cassia et al., 2009). A recent study highlights the differences between the growth rates of the AIM listed companies with those of similar privately-held companies - in terms of size, age and sectoral distribution, incorporated in the United Kingdom (Revest and Sapio, 2013b) and observed in the 1997-2009 period. After accounting for a selection effect, AIM-listed companies display an additional 10.6% growth rates (in terms of employees) compared with non-listed companies. Yet, for the AIM-listed companies growth in productivity - defined as added value per employee - appears to be lower (-20.7%). Hence, higher rates of job creation do not translate into stronger productivity growth.

However poorly may this market be in enhancing social welfare (as through net job creation and productivity growth), it may still prove effective from an issuer's point of view. The key insight here is that there is usually more to the listing decision than capital raising or real growth. According to Davies (2011) and Fraser (2005), most small firms seeking to go public do not view growth as a strategic goal. Stock markets perform control and combination functions (Lazonick, 2007), i.e. they are suited to enhance the transfer of control rights as they provide liquidity to issuers and traders. We focus on two ways in which the control and combination function can be exploited by issuers in junior stock markets: graduation to the main market and post-IPO company sale. The upcoming sections will discuss the theoretical insights and evidence on both trajectories.

Graduations from a junior stock market

Back in 1995, the AIM was conceived as feeder for the main list of the LSE, in an attempt to learn from previously unsuccessful experiments such as the Unlisted Securities Market: promising companies would be temporarily floated on AIM, in view of a graduation to the LSE main market (Posner, 2009). In this perspective, the graduation rate can be taken as a measure of market performance. Through graduation, a company can prove it is ready to face a tighter regulatory setting. Such a signal may translate into lower cost of capital, may attract new investors and thus increase the shareholders base. Carpentier et al. (2010) is so far the most complete empirical study on graduations from a junior market: the TSXV, a segment of the Canadian Toronto Stock Exchange (TSX) catering to companies in the pre-revenue stage. In fact, the opportunity of graduation is presented by the TSX as an advantage of listing for prospective issuers. Indeed, from 1989 to 2006 included, 802 companies migrated from the TSXV to the main market, i.e. nearly 45 companies per year on average. Estimates of a probit model for the probability of graduation showed that larger companies and companies in high-tech and minerals were better positioned for a transfer to the main market. The estimated rate of graduation from the TSXV to the TSX main market in the 1986-2006 period, was 7.67% (including IPOs and back-door listings), higher than the rate of IPOs on the main exchange, seen as the exit rate for venture capital investments.

When it comes to AIM, the graduation record looks dismal. Between 1997 and 2009, only 55 companies moved from the AIM to the LSE, while, quite surprisingly, 210 companies switched from the LSE to the AIM (Campbell and Tabner, 2014). Companies switching from the LSE main list to AIM are relatively small by main market standards, credit constrained, and generate poor cash flows (Jenkinson and Ramadorai, 2008). More broadly, light regulation, moderately low admission fees, and an organization rather favorable to SMEs are the key motivations of the companies that move from the main list to the AIM (Campbell and Tabner, 2014). When the average company moves from the AIM towards the main market, ownership concentration declines, signaling that companies may seek graduation in order to enlarge their shareholder bases (Jenkinson and Ramadorai, 2008; Campbell and Tabner, 2014).

Post-IPO company sales

In focusing on company post-IPO sales, we implicitly conceive them as positive events in the life of a company – although this view may not be widely shared. The ambiguity of company sales was clear to Fama and French (2004), who noted how acquired companies can be strong or weak. Carpentier and Suret (2010) classified all mergers and acquisitions as non-survivors. In Espenlaub et al. (2012) acquired companies are classified as survivors only if highly ranked in terms of selected financial performance measures.

Our positive assessment of company sales relies on the entrepreneurial exit literature (Wennberg et al., 2010). The entrepreneurial process, indeed, involves the exploration of various possible exit paths, the development of exit strategies, and the identification of potential successors. Consequently, exit is not seen as a systematically negative outcome, although it may appear so from an investor standpoint (Mason and Harrison, 2002; Parhankangas and Landström, 2006). An entrepreneur might run several firms concurrently as a portfolio entrepreneur (Westhead et al. 2005), or move from one firm to another as a serial entrepreneur (Toft-Kehler et al., 2013). Exit can be considered as the beginning of a new adventure (Ucbasaran et al., 2003).[i]

In line with this insight, Reuer and Shen (2004) argue that IPOs should not be considered as a "natural end state that address a financial objective", as the standard financial theory teaches us, but rather as an intermediate step in the company life, such as the first step in a sequential divestiture (Rock, 1994; Zingales, 1995). IPOs are often considered as a part of a larger process of transferring control rights in organizations (Mikkelson et al., 1997).

The role of IPOs in stimulating acquisitions raises the following question: why should a firm decide to incur the costs of an IPO instead of just selling the firm outright? Asymmetric information and adverse selection may provide answers. Privately-held firms tend to use sequential divestitures through IPOs rather than outright sales because IPOs improve the visibility of the firm for potential acquirers, and allow to partly overcome the difficulties for the sellers to obtain a selling price that reflects the business value (Reuer and Shen, 2004). Information asymmetry and adverse selection do exist for an IPO, but are less pronounced than for a private sale. Coffee (1999) has shown that in knowledge-intensive industries, M&As are more prolonged than in other industries and buyers tend to propose lower bid premia. Hence, IPO procedures can ease the valuation a company - even if IPO prices have at times contributed to price overvaluations, as during the Internet bubble.[ii]

In this vein, Reuer and Ragozzino (2008) investigated the role of alliances and IPOs in mergers and acquisitions during the period 1992-2002. They found that both alliances and IPOs positively influence mergers and acquisitions operations, by diminishing the transactions costs in the M&A markets and the risk of adverse selection. IPOs contribute to shape the evolution of the firms and can contribute to improve the liquidity of the market for corporate control. Consequently, some private firms decide to use the "dual-track" strategy of going public before a sale (Brau and Fawcett, 2006). Brau et al. (2010) and Mantecon and Thistle (2011), focusing on US takeovers in the periods 1995-2004 and 1996-2005, respectively, showed that companies selling outright earn lower sell-out premia than companies selling after the IPO completion or even pending the IPO process. These results are only partly due to self-selection of the most promising targets into the IPO market.

Dual-track strategies rooted in information asymmetries are also appropriate for the sale of high-tech companies, whose assets are relatively hard to evaluate. Technology sourcing through acquisitions of entrepreneurial start-ups pertain to the innovation strategy of large and mature high-tech firms facing organizational inertia, competency traps, and technology competition (Desyllas and Hughes, 2009; Dushnitsky and Lenox, 2006; Graebner et al., 2010), as acquired firms can substitute for internal R&D (Blonigen and Taylor, 2010; Danzon et al., 2004). Knowing this, high-tech companies take active steps to become attractive acquisition targets (Lindholm, 1996). Decisions to sell seem to be guided by the will to gain access to critical resources, e.g. large scale manufacturing capabilities, distribution channels, or experienced managers (Graebner and Eisenhardt, 2004; Teece, 1986).

The evidence on dual track strategies helps making sense of the changing function of the stock market highlighted by the drop in IPO activity that has occurred since the outburst of the financial crisis in 2008 (Gao et al., 2013; Ritter et al., 2013), a drop that has been driven mainly by small firms both in Europe and in the US. In the British, French, German, and Italian main markets, the percentage of small firm IPOs has dropped from 38.2% (1995-2000) to 25.4% (2001-2011) (Ritter et al., 2013). While several explanations have been advanced, e.g. in Ritter (2013) and Ritter et al. (2013),[iii] this decline was partially offset by an increase in the number of acquisitions of privately-held companies and, notably, by an increase in the number of post-IPO acquisitions (table 5 in Ritter et al., 2013).

Empirical analysis

The empirical analysis performed in this paper seeks to learn about the characteristics that make firms more likely to graduate to the main market or to sell out after an IPO, conditional on their survival and controlling for aggregate trends and fluctuations that affect market valuation. We expect graduation to be a strategic choice mainly available to the larger and older AIM-listed companies, as they are the most suited to meet the main market listing requirements. Post-IPO sell-outs, if rooted in informational asymmetries, should instead be more attractive for younger and smaller firms, whose business projects are less easy to evaluate, and even more for companies in high-tech sectors, that are potential targets for technology acquisitions. Finding the opposite would cast doubts on the informational effectiveness of the market.

Data and variables

For the purposes of this paper, a dataset has been collected including balance-sheet data on 1531 companies listed on the AIM or delisted from it between January 1, 1995 and June 30, 2009 (sources: Osiris, Amadeus, http://www.londonstockexchange.com). Financial holdings are excluded from the sample. For each company, the LSE website provides information about the AIM introduction date, the introduction type (IPO, introduction from the official listing, private placement), the delisting date, and the delisting reason (failures, takeovers, reverse takeovers, transfers).[iv] Among delisting events, we focus on graduations and sale of business, but as it will be clear, the other delisting types are taken into account as competing risks.[v]

Company characteristics of interest are size, age, and sector. Company size is measured here by using, alternatively, sales and total assets; both are commonly used proxies of firm size in industrial economics.[vi] Values of sales and total assets are deflated using sectoral deflators (source: Eurostat). Age at introduction is defined as the number of days elapsed between the incorporation date and the date of introduction on AIM. Size and age are expected to be highly relevant determinants of graduations. One reason is that, by construction, companies that are larger and older at the time of introduction on AIM are "closer" to satisfying the stricter listing and information disclosure requirements imposed by the main market (if not already able to meet them).[vii] Thus, in a given time frame, companies that start out larger and older are more likely to fill the gap that separates them from main market eligibility. Longer trade histories provide more data on which investors can assess the risk and value of the firm, and larger companies are more ready to put collateral, making it easier to find underwriter banks for a main market offer. Age is also a proxy for knowledge accumulation (Audretsch and Lehmann, 2005). Concerning takeovers, small and young firms are often thought to be more likely takeover targets, more in need to solicit rescue bidders, and less likely to successfully enact takeover defenses (Nuttall, 1999; Powell, 1997). However, agency problems related to the ownership-control separation are more likely to emerge in large firms, where managers would enjoy greater discretion, leading to underperformance and creating incentives for more competent managers to take over. By the same token, older firms could be more likely to attract takeovers as they are affected by greater organizational inertia (Davis and Stout, 1992).

In order to capture differences in technological opportunity and appropriability conditions, we rely on an extended version of the Pavitt (1984) taxonomy. The Pavitt taxonomy paints a multi-faceted picture of technology, taking account whether the main sources of innovation are internal or external, the degree of knowledge appropriability, and cost structures. A Pavitt-based classification of sectors includes four categories: science-based, specialized supplier, scale intensive, supplier-dominated.[viii] While originally meant to cover manufacturing, the Pavitt taxonomy has been subsequently extended to services (see the reviews in Archibugi, 2001; Peneder, 2003). We build upon Bogliacino and Pianta (2010) and, following some suggestions by Bessant and Tidd (2007), we further augment their classification to include NACE Rev. 1.1 sectors not covered by them.[ix]

The science-based category includes sectors such as software, telecommunications, and pharmaceuticals, that are the most interesting for our purposes. In terms of expected impact of technological intensity on firm trajectories, the main theoretical intuition is that, all else being equal, firms in high-tech sectors are less likely to survive, due to the substantive uncertainty and the information asymmetries associated with the innovation process. At the same time, larger R&D expenses may be interpreted by the market as low (short-term) performance, attracting takeover bids. The reviewed evidence on technology acquisitions provides further reasons why high-tech companies may delist through takeovers.

Additional sources of cross-firm heterogeneity are controlled for, namely: whether a company was incorporated in the UK ("UK incorporated" dummy), whether a company switched back from the LSE Main Market ("Introduction from LSE" dummy), and whether a company's Nomad acts also as a broker for the supervised company ("NomadBro" dummy). In line with the bonding hypothesis of Coffee (1999), companies that decided to move from the LSE Main Market to the AIM would do it in order to exploit a lighter regulatory setting. If so, there would be no reason for them to re-switch. The NomadBro dummy accounts for the fact that Nomads can at the same time act as brokers (the so-called Nomad-Bros) and auditors for the companies they supervise. Nomads can use their bargaining power to get better terms and enhance the liquidity of their client companies (see Mallin and Ow-Yong, 2010). This may make it easier for companies advised by Nomad-Bros to obtain a main market transfer for their supervised companies. Weak incentives and moral hazard may arise, too, since Nomads are hired and paid by the companies that they monitor.

Finally, the timing of introduction on AIM can make a difference for the subsequent firm trajectories. As observed by Coakley et al. (2007), stock market rallies make it easier for companies with low operating quality to go public. Indeed, when prices and trading volumes are high, financial markets are more ready to accept new listings, since underwriters are less hard to find in expansionary times. This should be even more true during financial bubbles, when market valuations drift away from fundamentals. The timing of AIM introduction may affect also the relationship between size, age, and the probability of transfers and takeovers. Size and age should matter less during expansionary times: capitalization growth inflated by speculative activities would benefit even firms with relatively small sales and assets. Finding relatively high graduation rates among smaller and younger companies that were introduced on AIM during a downturn would tell something about their quality. Indeed, it may be argued that companies entering shortly after a market crash, who nevertheless graduated before the setting of a new bubble, could avail themselves of high-potential projects or managerial abilities that allow them to survive despite the bearish market.

We therefore build two dummies: one for companies that had their AIM introduction between 1995 and 2000 (i.e. during the Internet bubble), and another for companies that had their AIM introduction right after the stock market crash of 2000 and before the on-set of the housing bubble (i.e. between 2001 and 2004 included). Such periods are identified by looking at the 3-year returns of the FTSE 100 Index, which was positive between 1995 and 2000 and between 2005 and 2008, negative between 2001 and 2004 and in 2009 (our calculations on LSE data). We use such dummies to build interaction terms with size and age. Yearly dummies and 3-years FTSE100 returns are also used as time controls to capture time variation in graduation and acquisition rates.

Summary statistics

For each year between 1995 and 2008, Table 1 (Appendix) reports the number of companies introduced on AIM, the average log-total assets, log-sales, and age of the new issuers, the composition of entrants by Pavitt sectors (in shares), and the shares of each year's entrants that, within 5 years of admission on AIM, were acquired and graduated.[x] All these data refer to our available sample. The time fluctuations of the variables can be made sense of by recalling that the observation period was characterized by two bubbles (the Internet bubble of the late Nineties and the housing bubble of 2007-2008). Consistently, the number of new admission on AIM boomed in 2000, then dropped when the bubble burst, only to reach even higher counts in 2004-2005. The recent decline is again explained with recessionary times. Average size and age values reported in the table suggest that, as the bubbles came near to their peaks, new entrants where younger and smaller. A clear decrease in average age occurred in 1999 and 2007. Average sales seem to drop more than average assets (e.g. in 1999-2000), perhaps because a fair share of new listings was made of companies still unable to generate enough sales from their assets.

The science-based and supplier-dominated are the most represented sectors. Unsurprisingly, the share of science-based entrants peaked at 40% in 2000, while new admissions from supplier-dominated sectors are apparently more frequent when the stock market goes down, e.g. 48% in 2002 and 58% in 2008. Finally, the time trends in company sales and graduations suggest an interesting characterization of the two bubbles. For companies that joined AIM in 1995, 1996, and 1997, it was more likely to subsequently transfer to the LSE main market (19% to 20% graduation rates), whereas being acquired was a more likely fate for firms introduced on AIM in the 2000s (31% of the 2005 entrants sold out eventually). The sectors more frequently involved in transfers were telecommunications, pharmaceuticals, software publishing, computer programming, and real estate agencies. All these sectors were among the main drivers in the last two bubbles. An interesting observation is that, while acquisitions of high-tech companies boomed during the

Internet bubble in most stock markets (see Inkpen et al., 2000; Lazonick, 2007a, 2007b), the same was not true for acquisitions of AIM-listed companies.

Results

Goal of the econometric analysis presented here is to understand the characteristics of AIM-listed companies that have been acquired or that have graduated to the LSE Main Market. Operationally speaking, we investigate the question of what characteristics of AIM-listed companies are able to statistically explain the probability of the events "AIM-listed company *i* was acquired within τ years after introduction" and "AIM-listed company *i* was granted admission to the LSE official list within τ years after introduction". In our analysis, we observe companies from the time of introduction on AIM onwards; we also assume that each firm experiences no more than one event, and that all events within a category can be treated as identical. The probabilities of acquisition and graduation are evaluated over a time horizon of 5 years. Considering a shorter window would increase the rarity of the events of interest, whereas more than 5 years would aggravate the censoring problems.

Binomial logit and single-event duration models

Tables 2 and 3 display Maximum Likelihood estimates of logit and duration models of acquisitions and graduations, respectively.[xi] In the logit model we relate the odds-ratio of a given event (acquisition, graduation) to a number of explanatory variables.[xii] Estimates of duration models, instead, provide information on the hazard function of the time-to-graduation and of the time-to-acquisition, i.e. the rate at which companies are acquired or graduate at a certain time, given that they were on the AIM list before (Van den Berg, 2000).[xiii] Time-to-graduation (time-to-acquisition) is defined as the number of days elapsing between introduction on AIM and graduation (acquisition). We focus on proportional hazard models, such as the Weibull model and the Cox model. Hazard functions in the proportional hazard models are shifted upwards or downwards depending on the values of the covariates, but have the same shape for different firms. An advantage of using the Weibull model is that it also belongs to the family of Accelerated Failure Time models, hence its coefficients admit an interpretation as marginal effects of the explanatory variables on the time-to-event.

According to the results on takeovers, size, age, and sectors all appear as important determinants. In particular, the coefficients of total assets and sales are positive and significant, with higher point estimates for companies that joined AIM in 2001-2004 (see columns (1) and (2) of Table 2, and all estimates of Table 3). This might suggest that the Internet bubble supplied the market with smaller takeover targets. When the FTSE returns are used as time controls (Table 2, columns (3) and (4)), size variables retain their significance, but coefficients in the 1995-2000 and 2001-2004 periods are comparable in magnitude.[xiv] Older companies that entered in 1995-2000 seemed more likely to be acquired: Table 2 (first 2 columns) and Table 3 report positive and significant coefficients for age, 1995-2000. Age turns out to be not statistically significant in the specifications with FTSE returns. The coefficients for all the three sector classes that we consider are positive, with varying significance. Since we have left out scale-intensive sectors, one concludes that acquisitions on AIM were quite diversified across sectors, with the exception of firms in sectors characterized by economies of scale, with intermediate degrees of appropriability of new knowledge. In a way, such evidence indicates that AIM patterns of acquisitions were rather diversified, with no specific focus on technology acquisitions, such as those in science-based sectors.

Results on graduations are displayed in Table 4 (logit) and Table 5 (Weibull and Cox). Size is a key determinant of graduations too, as expected. Also here, the estimates suggest that the advantage of larger entrants in achieving transfers was larger during the downturn of 2001-2004, which is consistent with the intuition that, when the economy slows down, it is much harder for smaller companies to grow. Yet again, changing the time control from yearly dummies to FTSE returns blurs the results. Bad news for young companies is brought by the estimates of the age coefficients, which are never significant. On the contrary, the science-based sector dummy is the only significant one, consistent with the technological origin of the late Nineties bubble. Interestingly, the NomadBro dummy is significant and positive in one instance, albeit weakly (Table 4, column (3)). Notice that the “Introduction from LSE” dummy is dropped because, in our sample, none of the companies that switched to AIM from the LSE main market would eventually go back.

All the estimated logit models perform nicely, as they correctly predict a high percentage of cases, and the results of the Hosmer-Lemeshow tests for model specification are positive. The tests on the Weibull shape coefficients reject the null of an exponentially-distributed baseline hazard. It is worth noting that, since the Weibull model admits also an accelerated time failure representation, the reported estimates also mean that larger companies spent less time on AIM before being acquired or before graduating.

Robustness I: multiple events and competing risks

The foregoing results are based on the untested assumption that the companies not involved in either takeovers or transfers – that is, those that stayed listed and those involved in reverse takeovers, bankruptcy, and voluntary delistings - share the same characteristics. One can however consider all the latter events as competing with graduations and takeovers. In other words, at each time a company is potentially subject to more than one event, and the occurrence of any of those events prevents the occurrence of the others (in the most trivial example, bankruptcy prevents transfers and takeovers). More general models are called for, such as the Multinomial Logit model (MNL) and a duration model with competing risks.

The MNL model treats the delisting events as belonging to separate categories, namely transfers, takeovers, reverse takeovers, failures, and a residual category including companies that stay listed until the end of the sample period. Duration models with competing risks answer to the following question: What is the probability that companies stay listed on AIM until time *t* and then, when they are delisted, it is because of graduation or takeover?

Tables 6 and 7 show the estimates of the multinomial logit model and the competing risk model, respectively. Table 6 only focuses on a specification with total assets and yearly dummies, for the sake of brevity. Size is again a positive and significant influence on acquisitions and graduations, and its increasing weight after the 2000 bubble crash is confirmed (the size, 2001-2004 estimates are larger than the size, 1995-2000 estimates). Reverse takeovers, on the contrary, are more frequent among small firms, while surprisingly no negative size effect is found for failures.[xv] Age is positive and significant for acquisitions for companies that joined AIM during the Internet bubble (1995-2000), and does not affect graduations. Since the age coefficients are negative and significant for reverse takeovers and failures, we have an explanation why younger firms are not more likely than older ones to graduate. Sectoral results found in logit and models are confirmed. Table 7 reports results on acquisitions and graduations together, for both size proxies, using yearly dummies. These results are in line with those based on basic Cox and Weibull models.

Robustness II: separation, rarity and censoring

Further robustness checks are proposed hereby, with a view to taking care of some econometric problems: complete separation of the sample, rarity of the graduation events, censoring, and unobserved heterogeneity. Complete separation of the sample occurs because companies that switched from the LSE Official List to AIM did not switch back during our observation period. Hence, the probability of graduation, conditional on entry from LSE, is zero for all companies, and maximum likelihood algorithms fail to converge. Instead of dropping the LSE dummy from the logit specification, we keep it and use the penalized likelihood estimator introduced by Firth (1993) as suggested by Heinze and Schemper (2002). The results in Table 8, which refer to graduations only, confirm the evidence of size effects increasing during the 2001-2004 downturn, the lack of age effects, and the prominence of science-based firms among transfers. Thus, the main difference with previous specifications is that now the "Introduction from LSE" dummy is estimated, and its coefficient is negative as expected.

Rarity of the graduation events (as testified by Table 1) can have a number of unpleasant implications for the estimates, such as: low power, as the standard error of the log of relative risk of an event, for a given sample size, increases with its rarity, especially if occurrence falls below 5% (Cunningham and Lindenmayer, 2005); amplification of small-sample biases in estimated coefficients, and downward bias of the probability of the rare event (King and Zeng, 2001). We therefore implement King and Zeng's (2001) correction (relogit package in Stata) when the dependent variable is the graduation probability. Estimates are in Table 9. Notice that the FTSE returns variable is used as a time control instead of yearly dummies that had to be dropped because of computational problems. Nevertheless, the increasing size effect is confirmed in three out of four specifications. Most interestingly, now the age variable for companies admitted in 2001-2004 is negative and significant. We have checked companies admitted in that period, to find that among them, 12 managed to graduate. Out of such 12 companies, 7 graduated after 2004, in a period when the housing bubble made life easier, while 5 graduated rather quickly even before the on-set of the new bubble. The ability of listing on AIM shortly after the burst of the Internet bubble and of graduating to the LSE main market even without benefiting from the overvaluations of the subsequent bubble may testify to the good quality of those companies or to the strategic use of graduation – at least at a conjectural level.

Finally, a censoring problem arises because some of the sampled companies may have experienced delisting events after the end of our observation period (i.e. after June 2009). Furthermore, any company introduced on AIM after June 2004 was observed for less than 5 years, that is, for less than the window used in our logit analysis. Following Dubin and Rivers (1989), this would underrepresent delistings that occurred in the 2000s. The ensuing biases and inconsistency of the estimates are cured by means of a Heckman probit model. This is a two-stage estimation method: in the first stage, one regresses a dummy (1 if for uncensored, 0 for censored observations) on a set of variables, in our case size and time dummies ("selection equation"); in the second stage, the inverse Mill's ratio from the first stage is included as an explanatory variable in a probit model of the probability of the event of interest ("outcome equation"). Results are in Tables 10 (acquisitions) and 11 (graduations).[xvi] While results for acquisitions are basically confirmed, we again find negative coefficients for age during 2001-2004 when time is controlled for by yearly dummies. Interestingly, NomadBros exert a positive influence on graduations positive for (see columns (3) and (4) in Table 11).

Conclusion

For some time, European policy-makers have hoped to find a European Nasdaq. Regulatory outsourcing and the deregulation of the flotation process may have shown the way by allowing essentially any firm to go public. This is the core concept of the AIM, the largest junior stock market in Europe. Firm types that were traditionally out of the stock market have thus been offered an additional option for their financial sourcing, but there may be more to the listing decision than capital raising. Analyzing the trajectories of the AIM-listed companies in the form of post-IPO company sales and graduations to the LSE main market can be very informative on the strategic motives behind stock market flotation. Estimates of binomial and multinomial logit models, as well as duration models, show that the probabilities of graduations and post-IPO company sales in a time horizon of 5 years after introduction are higher among the largest AIM-listed companies, that post-IPO company sales are not more likely in high-tech than in less technology-intensive sectors, and that graduations of companies in science-based sectors were almost entirely "helped" by the "new economy" fad of the late Nineties.

A number of lessons can be learned from this study. First, younger and smaller AIM-listed companies are not likely to graduate, suggesting that a graduation strategy, if any, is pursued over relatively long horizons. However, the AIM is characterized by a lower number of graduations than other junior markets, such as the TSXV (Carpentier et al., 2010), casting doubts on the very adoption of graduation strategies by AIM-listed companies. The institutional reasons why AIM and TSXV behave so differently with respect to graduations are worth inquiring. One may argue that unfavorable macroeconomic scenarios may have discouraged graduations; indeed, during the expansionary years, graduations were more frequent, at least for companies belonging to the science-based sectors; and size was an advantage during the 2001-2004 downturn. Yet, we are unsure whether this can be generalized to any macroeconomic expansion, or there was something to the Internet bubble that made graduations particularly suitable.

Second, post-IPO sales are relatively frequent on AIM, consistent with evidence in Reuer and Shen (2004) and Ritter et al. (2013). Thus he dual track strategy of going public before a sale finds application on junior stock markets, too. Despite the alleged lack of transparency of the junior market architecture, it still manages to provide visibility valuable enough for relatively opaque companies. Information produced by the junior stock market, however, is probably not enough to overcome the uncertainty surrounding high-tech projects. Indeed, acquisitions of AIM-listed companies are diversified across sectors, so there is no bonus for high-tech sectors. AIM-listed companies may have been acquired within a technology sourcing strategy, but overall this does not seem to be the prevailing motive. It may as well be that founders of high-tech companies quoted on AIM are control averse, i.e. they prefer to retain independence. Notice also that age is a stronger determinant of post-IPO company sales than of graduations, suggesting that, although companies may go public *in order to* sell out, a dual track strategy is not adopted early in the company life cycle, i.e. when information asymmetries are wider.

It can be useful to interpret these results in light of recent studies on reverse takeovers, which tend to show that a lemon market can emerge if the regulation is not binding enough (Carpentier and Suret, 2011; Kashefi-Pour and Lasfer, 2011; Roosenboom and Vasconcelos, 2010). Our evidence is also consistent with existing accounts of the shifting balance between innovation support and financialization, a hot issue in these years (Lazonick, 2007a; Dore, 2008; Lazonick and Mazzucato, 2013). The link between the innovative firm and stock markets has been analyzed in detail by O'Sullivan (2000) and Lazonick (2007a, 2007b), showing that "new economy" start-ups of the Eighties and Nineties had little resort, if any, to the stock market as a source of funds.

All in all, the AIM appears to be mostly a show-room for company sales in which, however, smaller, younger, and high-tech companies are not prominently featured. This may call for a rather pessimistic view on the ability of AIM to support new and small firms, unless we recall that the freedom to go public, guaranteed by junior stock markets, does not undermine the freedom of smaller, younger, and high-tech companies to pursue their strategic goals *outside* of the stock market.

Our results lead us to focus on the demand side and on the quality of small high-tech firms that go public. The most promising high-tech SMEs must be acquired before the IPO (Carpentier et al., 2014). This calls for more in depth reflection on policy support. Firstly, not all the so-called start-ups should be sustained by public policies, only the "true" gazelles (Nightingale and Coad, 2014). Secondly, following Mason and Brown (2013), current forms of public support must be reconsidered in order to better take into account the firm specificities and heterogeneity, and to best adapt the financing by stock markets for preserving the independence of SMEs.

Future research may enlarge the scope to some more recently established junior stock markets, rooted in widely different financial systems than the UK (e.g. markets in Scandinavian countries and in Japan) and, in addition, track the post-IPO evolution of size, age, technological intensity, and capital structure of the listed companies. Indeed, firms after going public undergo significant organizational changes, which may improve (or diminish) their likelihood to transfer or be acquired with respect to the chances they had at introduction time. Panel methods could be employed in order to capture the time-changing weight of company sale and graduation determinants.

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Appendix A

An extended Pavitt taxonomy for manufacturing, agriculture, and services (building on Bogliacino and Pianta, 2010).

	NACE Rev. 1.1 2-digit Codes
Science-Based	
Chemicals	24
Office machinery	30
Manufacture of radio, television and communication equipment and apparatus	32
Manufacture of medical, precision and optical instruments, watches and clocks	33
Communications	64
Computer and related activities	72
Research and development	73
Specialised Suppliers	
Mechanical engineering	29
Manufacture of electrical machinery and apparatus n.e.c.	31
Manufacture of other transport equipment	35
Real estate activities	70
Renting of machinery and equipment	71
Other business activities	74
Scale intensive	
Pulp, paper and paper products	21
Printing and publishing	22
Mineral oil refining, coke and nuclear fuel	23
Rubber and plastics	25
Non-metallic mineral products	26
Basic metals	27
Motor vehicles	34
Financial intermediation, except insurance and pension funding	65
Insurance and pension funding, exc, compulsory social security	66
Activities auxiliary to financial intermediation	67
Supplier Dominated	
Agriculture, hunting, and forestry	01-02
Fishing	05
Mining and quarrying	11-12-13-14

Food, drink and tobacco		15-16
Textiles		17
Clothing		18
Leather and footwear	19	
Wood and products of wood and cork		20
Fabricated metal products		28
Furniture, miscellaneous manufacturing; recycling		36-37
Sale, maintenance and repair of motor vehicles and motorcycles; retail sale of automotive fuel		50
Wholesale trade and commission trade, except of motor vehicles and motorcycles		51
Retail trade, except of motor vehicles and motorcycles; repair of personal and household goods		52
Hotels and catering	55	
Inland transport		60
Water transport		61
Air transport	62	
Supporting and auxiliary transport activities; activities of travel agencies	63	
Public administration and defence; compulsory social security		75
Education	80	
Health and social work	85	
Sewage and refuse disposal, sanitation and similar activities		90
Recreational, cultural, and sporting activities		92
Other service activities		93

Table 1. Summary statistics by year: number of AIM introductions; average log-size, average age, sectoral composition of the entrants; percentages of entrants that were acquired and graduated within 5 years of AIM introduction.

Years	Entrants	Log Tot. assets	Log Sales	Age	Sc.-based	Scale-intens.	Spec.-supplier	Supplier-dom.	Acq.	Grad.
	(n.)	(avg.)	(av.g)	(avg. yrs)	(%)	(%)	(%)	(%)	(%)	(%)
1995	40	n.a.	n.a.	11.32	0.25	0.18	0.13	0.45	0	0.2
1996	57	9.02	8.34	7.42	0.32	0.19	0.18	0.32	0	0.19
1997	47	8.83	8.32	9.82	0.38	0.15	0.11	0.36	0	0.19
1998	44	9.08	9.04	6.45	0.30	0.02	0.21	0.48	0.05	0.05
1999	41	8.87	8.12	4.95	0.39	0.15	0.22	0.24	0.07	0.05
2000	165	9.08	7.73	7.57	0.40	0.09	0.18	0.33	0.09	0.01
2001	120	9.00	8.25	12.83	0.24	0.14	0.23	0.39	0.08	0.02
2002	103	8.94	8.12	14.56	0.23	0.14	0.16	0.48	0.13	0.01
2003	102	9.13	8.82	17.55	0.26	0.17	0.12	0.46	0.17	0.05
2004	203	8.99	8.56	6.24	0.32	0.12	0.20	0.36	0.13	0.03
2005	270	9.12	8.47	6.82	0.27	0.14	0.18	0.41	0.31	0.02
2006	196	9.48	8.33	7.81	0.26	0.19	0.25	0.30	0.21	0.02
2007	115	9.95	8.55	4.63	0.24	0.20	0.24	0.31	0.11	0
2008	26	10.47	10.04	19.06	0.19	0.12	0.12	0.58	0.15	0

Table 2. Logit estimates of the acquisition probability: AIM-listed companies.

Acquisitions, logit	(1)	(2)	(3)	(4)
Total assets	0.886***		0.586***	
	(7.30)		(9.46)	
Total assets, 1995-2000	0.221***		0.502***	
	(8.00)		(9.46)	
Total assets, 2001-2004	0.479***		0.477***	
	(8.04)		(7.35)	
Sales		0.572***		0.493***
		(8.42)		(8.35)
Sales, 1995-2000		0.250		0.370***
		(0.63)		(7.34)
Sales, 2001-2004		0.461***		0.077
		(9.93)		(0.71)
Age	0.193**	0.093	0.206**	0.125
	(2.46)	(1.44)	(2.51)	(1.47)
Age, 1995-2000	0.205***	0.235***	0.125	0.077
	(2.67)	(2.86)	(1.38)	(0.71)
Age, 2001-2004	0.010	-0.093	0.032	-0.094
	(0.08)	(0.80)	(0.31)	(-0.88)
Science-based	1.737**	1.781*	1.670**	1.726*
	(2.25)	(1.87)	(1.99)	(1.76)
Specialized supplier	1.359**	1.506*	1.302**	1.420*
	(2.19)	(1.91)	(2.17)	(1.93)
Supplier-dominated	1.675***	1.856**	1.476***	1.682**
	(3.03)	(2.32)	(2.72)	(2.22)
UK incorporated	-0.228	-0.772***	-0.240	-0.588**
	(-0.99)	(-3.77)	(-0.73)	(-2.05)
LSE	0.246	0.279	0.155	0.242
	(0.38)	(0.39)	(0.21)	(0.31)
1998	12.234***	12.493***		
	(11.66)	(11.85)		
1999	13.605***	13.861***		
	(12.89)	(13.08)		
2000	13.492***	13.805***		

	(12.83)	(12.99)		
2001	12.534***	12.417***		
	(9.03)	(9.79)		
2002	12.956***	12.512***		
	(9.15)	(9.78)		
2003	13.070***	12.807***		
	(9.04)	(9.97)		
2004	12.995***	12.720***		
	(9.57)	(10.08)		
2005	9.202***	11.846***		
	(5.92)	(8.84)		
2006	7.934***	10.829***		
	(4.84)	(7.96)		
2007	6.099***			
	(3.32)			
2008	9.693***	12.704***		
	(5.50)	(7.94)		
FTSE 3-year returns			-2.545***	-2.204***
			(-4.59)	(-3.57)
NomadBro			0.020	0.077
			(0.08)	(0.35)
Constant	-20.669***	-18.871***	-8.345***	-6.516***
	(-12.53)	(-10.95)	(-7.96)	(-5.03)
Observations	798	662	661	561
Hosmer-Lemeshow test	6.97 (0.540)	5.88 (0.661)	7.88 (0.445)	6.33 (0.610)
% correct prediction	86.3	85.7	85.9	84.9
Predicted prob(acq.)	0.174 (0.191)	0.201 (0.208)	0.196 (0.175)	0.208 (0.193)

Robust z-statistics in parentheses, except: Hosmer-Lemeshow test (p-value), predicted probability (standard error). Legend: *** p<0.01, ** p<0.05, * p<0.1

Table 3. Duration models of the acquisition hazard: AIM-listed companies.

Acquisitions, duration models	**Cox**	**Cox**	**Weibull**	**Weibull**
Total assets	0.654***		0.652***	
	(5.08)		(5.00)	
Total assets, 1995-2000	0.188***		0.188***	
	(6.08)		(6.49)	
Total assets, 2001-2004	0.479***		0.485***	
	(8.71)		(9.47)	
Sales		0.410***		0.410***
		(8.63)		(8.33)
Sales, 1995-2000		0.044		0.044
		(1.34)		(1.30)
Sales, 2001-2004		0.427***		0.433***
		(14.10)		(13.94)
Age	-0.03	-0.150*	-0.031	-0.149*
	(-0.35)	(-1.85)	(-0.33)	(-1.82)
Age, 1995-2000	0.178***	0.192***	0.181***	0.195***
	(2.77)	(2.47)	(2.78)	(2.46)
Age, 2001-2004	-0.005	-0.098	-0.007	-0.102
	(-0.05)	(-1.03)	(-0.07)	(-1.07)
Science-based	1.366***	1.322**	1.370***	1.329**
	(2.69)	(2.02)	(2.67)	(2.02)
Specialized supplier	0.940**	0.941	0.940*	0.947
	(1.98)	(1.64)	(1.95)	(1.63)
Supplier-dominated	1.079**	1.196*	1.081**	1.208*
	(2.55)	(1.94)	(2.53)	(1.94)
UK incorporated	0.052	-0.332	0.050	-0.340
	(0.18)	(-1.39)	(0.17)	(-1.38)
Introduction from LSE	0.203	0.247	0.196	0.236
	(0.36)	(0.38)	(0.34)	(0.36)

1997	-18.056***	-17.129***	-0.054	-0.126
	(-9.43)	(-13.76)	(-0.04)	(-0.09)
1998	21.997***	23.015***	12.425***	14.849***
	(13.56)	(32.31)	(11.91)	(14.21)
1999	23.418***	24.524***	13.862***	16.371***
	(14.43)	(37.80)	(13.18)	(15.58)
2000	23.188***	24.327***	13.636***	16.175***
	(14.20)	(34.41)	(13.06)	(15.45)
2001	21.987***	23.268***	12.404***	15.091***
	(13.15)	(45.26)	(9.72)	(12.34)
2002	22.212***	23.161***	12.634***	14.984***
	(12.85)	(44.32)	(9.65)	(12.35)
2003	22.453***	23.584***	12.894***	15.439***
	(12.77)	(43.46)	(9.74)	(12.68)
2004	22.303***	23.429***	12.736***	15.266***
	(13.30)	(45.09)	(10.07)	(12.49)
2005	20.576***	23.766***	11.059***	15.610***
	(100.49)	(227.24)	(6.18)	(12.36)
2006	19.388***	22.773***	9.855***	14.600***
	(99.27)	(289.77)	(5.48)	(11.63)
2007	17.424***	-18.293***	7.889***	-1.321
	(98.23)	(-17.51)	(4.34)	(-0.80)
2008	18.524	22.142	8.989***	13.963***
			(4.63)	(10.99)
Constant			-33.116***	-33.866***
			(-14.24)	(-13.81)
Observations	1228	1006	1228	1006
Weibull shape parameter			1.738 (0.575)	1.726 (0.210)

Robust z-statistics in parentheses, except for the Weibull shape parameter (standard error). Legend: *** p<0.01, ** p<0.05, * p<0.1

Table 4. Logit estimates of the graduation probability: AIM-listed companies.

Graduations, logit	(1)	(2)	(3)	(4)
Total assets	0.503*		0.985***	
	(1.66)		(2.81)	
Total assets, 1995-2000	0.338***		1.195***	
	(4.52)		(3.89)	
Total assets, 2001-2004	1.523**		1.144***	
	(4.36)		(5.09)	
Sales		-0.014		0.445
		(-0.03)		(1.26)
Sales, 1995-2000		0.103		0.466***
		(1.51)		(2.45)
Sales, 2001-2004		0.948***		0.626***
		(8.15)		(7.90)
Age	0.209	0.236	0.199	0.069
	(0.69)	(0.47)	(0.43)	(0.14)
Age, 1995-2000	-0.180	-0.203	0.084	0.149
	(-1.13)	(-1.47)	(0.37)	(0.90)
Age, 2001-2004	0.119	0.045	0.215	-0.014
	(0.82)	(-0.28)	(1.62)	(-0.12)
Science-based	3.310***	2.906*	3.109*	1.731
	(2.64)	(1.84)	(1.91)	(1.29)
Specialized supplier	1.986**	1.828	2.031	0.780
	(1.98)	(1.25)	(1.36)	(0.59)
Supplier-dominated	1.707*	1.390	1.500	0.256
	(1.71)	(0.90)	(0.87)	(0.18)
UK incorporated	-0.241	-0.543		
	(-0.39)	(-1.20)		
1997	-0.633***	-0.525***		
	(-6.56)	(-4.03)		
1998	-2.318***	-2.339***		

	(-13.08)	(-12.31)		
1999	-2.471***	-2.225***		
	(-7.63)	(-8.61)		
2000	-4.616***	-4.224***		
	(-16.10)	(-17.89)		
2001	-16.757***	-11.935***		
	(-3.91)	(-5.25)		
2002	-16.954***	-12.366***		
	(-3.97)	(-5.46)		
2003	-15.657***	-10.682***		
	(-3.64)	(-4.55)		
2004	-16.611***	-12.698***		
	(-3.87)	(-5.28)		
2005	-7.266***	-4.799***		
	(-5.54)	(-3.16)		
2006	-7.393***	-4.702***		
	(-4.93)	(-2.86)		
FTSE 3-years return			1.220	1.005
			(0.58)	(0.42)
NomadBro			2.268*	1.911
			(1.65)	(1.56)
Constant	-4.723***	-1.760	-19.792***	-11.208***
	(-2.84)	(-1.01)	(-4.84)	(-5.65)
Observations	689	570	503	418
Hosmer-Lemeshow test	9.05 (0.338)	6.21 (0.624)	3.22 (0.920)	13.98 (0.082)
% correct prediction	95.1	94.7	97.0	96.4
Predicted prob(grad.)	0.040 (0.091)	0.051 (0.092)	0.027 (0.060)	0.034 (0.052)

Robust z-statistics in parentheses, except: Hosmer-Lemeshow test (p-value), predicted probability (standard error). Legend: *** p<0.01, ** p<0.05, * p<0.1

Table 5. Duration models of the graduation hazard: AIM-listed companies.

Graduations, duration models	**Cox**	**Cox**	**Weibull**	**Weibull**
Total assets	0.639*		0.639*	
	(1.91)		(1.91)	
Total assets, 1995-2000	0.338***		0.328***	
	(5.41)		(4.95)	
Total assets, 2001-2004	1.470***		1.333***	
	(5.66)		(8.34)	
Sales		0.041		0.041
		(0.09)		(0.09)
Sales, 1995-2000		0.112***		0.110***
		(2.65)		(2.85)
Sales, 2001-2004		0.984***		0.981***
		(6.36)		(6.27)
Age	0.125	0.050	0.120	0.034
	(0.64)	(0.14)	(0.63)	(0.10)
Age, 1995-2000	-0.136	-0.161	-0.136	-0.159
	(-0.97)	(-1.31)	(-0.95)	(-1.26)
Age, 2001-2004	0.113	-0.031	0.160	-0.016
	(1.04)	(-0.27)	(1.26)	(-0.15)
Science-based	2.735**	2.984*	2.747**	3.085*
	(2.17)	(1.91)	(2.19)	(1.95)
Specialized supplier	1.526	1.885	1.520	1.960
	(1.30)	(1.20)	(1.28)	(1.23)
Supplier-dominated	1.299	1.539	1.288	1.566
	(1.18)	(0.99)	(1.20)	(1.02)
UK incorporated	-0.092	-0.440	-0.161	-0.588
	(-0.15)	(-0.96)	(-0.24)	(-1.18)
Introduction from LSE	-46.984	-36.654***	-17.543***	-17.428***
	(.)	(-39.52)	(-23.42)	(-17.34)
1997	-0.485***	-0.470***	-0.531***	-0.518***
	(-8.60)	(-7.19)	(-6.91)	(-8.27)
1998	-1.816***	-1.885***	-1.912***	-1.991***
	(-16.52)	(-18.18)	(-14.52)	(-17.66)

1999	-1.851***	-1.554***	-1.912***	-1.640***
	(-11.07)	(-16.15)	(-10.04)	(-14.95)
2000	-4.042***	-3.698***	-4.110***	-3.779***
	(-30.09)	(-41.88)	(-26.77)	(-38.54)
2001	-15.297***	-11.050***	-14.292***	-11.166***
	(-4.97)	(-5.64)	(-5.90)	(-5.56)
2002	-15.829***	-11.626***	-14.611***	-11.657***
	(-4.90)	(-5.64)	(-6.13)	(-5.66)
2003	-14.258***	-9.378***	-13.408***	-9.371***
	(-4.41)	(-4.58)	(-5.21)	(-4.63)
2004	-15.377***	-11.740***	-14.223***	-11.805***
	(-4.72)	(-5.64)	(-5.70)	(-5.57)
2005	-8.070***	-4.063***	-8.193***	-4.053***
	(-4.24)	(-2.74)	(-4.16)	(-2.74)
2006	-8.739***	-4.547***	-8.929***	-4.616***
	(-4.01)	(-3.13)	(-3.99)	(-3.17)
2007	-52.670***	-39.324***	-24.426***	-19.417***
		(-20.88)	(-9.86)	(-10.22)
2008	-51.500***	-38.573***	-24.373***	-18.811***
		(-16.53)	(-9.80)	(-7.94)
Constant			-17.705***	-14.137***
			(-6.25)	(-5.19)
Observations	1228	1006	1228	1006
Weibull shape parameter			1.725 (0.579)	1.555 (0.201)

Robust z-statistics in parentheses, except for the Weibull shape parameter (standard error). Legend: *** p<0.01, ** p<0.05, * p<0.1

Table 6. Multinomial logit estimates for acquisition, graduation, reverse takeover, and failure probabilities: AIM-listed companies.

Multinomial logit	Acquisitions	Graduations	Reverse takeovers	Failures
Total assets	0.686***	0.658**	-0.267***	-0.078
	(5.92)	(2.03)	(-3.58)	(-1.11)
Total assets, 1995-2000	0.159***	0.303**	-0.179	-0.278
	(2.20)	(2.36)	(-1.65)	(-1.64)
Total assets, 2001-2004	0.446**	1.537***	-0.293**	-0.050
	(7.06)	(5.73)	(-2.36)	(-0.48)
Age	-0.042	0.096	-0.457***	-0.215***
	(-0.53)	(0.49)	(-4.19)	(-4.91)
Age, 1995-2000	0.075	-0.240	-0.102	0.024
	(0.53)	(-1.32)	(-1.53)	(0.30)
Age, 2001-2004	-0.033	0.053	-0.098*	-0.100***
	(-0.35)	(0.57)	(-1.80)	(-3.71)
Science-based	1.113**	3.351***	-0.260	-0.091
	(2.52)	(3.15)	(-1.00)	(-0.26)
Specialized supplier	0.776*	2.408**	-0.077	-0.179
	(1.82)	(2.22)	(-0.26)	(-0.57)
Supplier-dominated	0.817**	2.004**	-0.483*	0.269
	(2.19)	(2.08)	(-1.91)	(1.13)
Introduction from LSE	-0.165	-0.077	1.131*	0.022
	(-0.53)	(-0.10)	(1.81)	(0.07)
UK incorporated	0.147	-16.418***	0.283	0.211
	(0.28)	(-20.02)	(0.55)	(1.11)
1997	0.643***	-0.389***	1.335***	0.378***
	(15.27)	(-4.94)	(21.63)	(9.22)
1998	0.741***	-1.566***	1.482***	0.417***
	(14.19)	(-13.14)	(15.48)	(4.97)
1999	0.408**	-1.727***	1.378***	0.689***
	(2.06)	(-5.58)	(14.33)	(5.12)

2000	0.590***	-4.243***	1.495***	0.840***
	(5.69)	(-18.75)	(12.09)	(8.93)
2001	-2.016	-17.296***	1.750	-1.241
	(-1.32)	(-4.39)	(1.36)	(-0.59)
2002	-1.824	-16.607***	1.592	-1.172
	(-1.19)	(-4.26)	(1.26)	(-0.56)
2003	-1.730	-16.092***	1.723	-0.946
	(-1.13)	(-4.06)	(1.37)	(-0.45)
2004	-2.248	-17.212***	1.303	-1.323
	(-1.46)	(-4.36)	(1.01)	(-0.63)
2005	-4.954**	-10.004***	2.611**	-0.919
	(-2.50)	(-4.05)	(2.16)	(-0.47)
2006	-6.417***	-10.919***	1.968	-1.122
	(-3.17)	(-4.07)	(1.58)	(-0.57)
2007	-8.471***	-25.807***	1.916	-2.024
	(-4.10)	(-8.77)	(1.54)	(-1.02)
2008	-7.241***	-26.033***	1.775	-17.653***
	(-3.45)	(-9.06)	(1.38)	(-7.98)
Constant	-3.686*	-3.490	-0.256	1.269
	(-1.92)	(-1.42)	(-0.23)	(0.61)
Observations	1228	1228	1228	1228
Predicted probabilities	0.126 (0.100)	0.031 (0.086)	0.143 (0.105)	0.157 (0.075)

Robust z-statistics in parentheses, except for predicted probabilities (standard deviation). Legend: *** p<0.01, ** p<0.05, * p<0.1

Table 7. Estimates of competing risk models of acquisition and graduation hazards: AIM-listed companies.

Competing risks models	Acquisitions	Acquisitions	Graduations	Graduations
Total assets	0.654***		0.595**	
	(5.98)		(1.98)	
Total assets, 1995-2000	0.187***		0.335***	
	(8.03)		(5.66)	
Total assets, 2001-2004	0.392***		1.495***	
	(8.01)		(5.40)	
Sales		0.418***		0.030
		(9.19)		(0.07)
Sales, 1995-2000		0.032		0.103**
		(1.08)		(2.21)
Sales, 2001-2004		0.385***		0.974**
		(11.94)		(6.24)
Age	0.015	-0.104	0.146	0.088
	(0.20)	(-1.57)	(0.68)	(0.25)
Age, 1995-2000	0.206***	0.226***	-0.125	-0.143
	(3.28)	(3.20)	(-0.97)	(-1.30)
Age, 2001-2004	0.050	-0.050	0.121	-0.038
	(0.50)	(-0.51)	(1.06)	(-0.31)
Science-based	1.380**	1.377*	2.775**	2.895*
	(2.41)	(1.92)	(2.31)	(1.87)
Specialized supplier	0.941*	0.983	1.588	1.841
	(1.91)	(1.63)	(1.47)	(1.21)
Supplier-dominated	1.152**	1.255*	1.316	1.421
	(2.41)	(1.91)	(1.28)	(0.92)
UK incorporated	0.035	-0.382*	-0.134	-0.427
	(0.12)	(-1.68)	(-0.24)	(-1.03)
Introduction from LSE	0.149	0.212	-18.802***	-23.373***
	(0.29)	(0.37)	(-25.85)	(-23.79)
1997	-0.055	-0.120	-0.484***	-0.443***

	(-0.04)	(-0.08)	(-8.10)	(-6.51)
1998	12.603***	14.026***	-1.938***	-1.962***
	(12.09)	(13.44)	(-21.26)	(-20.57)
1999	13.843***	15.292***	-2.026***	-1.775***
	(13.20)	(14.59)	(-12.04)	(-17.12)
2000	13.785***	15.270***	-4.178***	-3.801***
	(13.20)	(14.58)	(-29.45)	(-42.60)
2001	13.138***	14.309***	-15.716***	-10.944***
	(10.29)	(11.73)	(-4.70)	(-5.35)
2002	13.479***	14.374***	-16.179***	-11.614***
	(10.34)	(11.71)	(-4.68)	(-5.39)
2003	13.503***	14.545***	-14.780***	-9.460***
	(10.10)	(11.79)	(-4.22)	(-4.38)
2004	13.547***	14.570***	-15.862***	-11.822***
	(10.70)	(11.96)	(-4.57)	(-5.31)
2005	11.039***	14.473***	-7.962***	-4.366***
	(7.04)	(11.61)	(-5.32)	(-2.91)
2006	9.841***	13.458***	-8.603***	-4.827***
	(6.21)	(10.82)	(-4.94)	(-3.29)
2007	7.973***	-1.490	-26.285***	-26.426***
	(5.01)	(-0.91)	(-12.96)	(-14.08)
2008	9.082***	12.922***	-26.097***	-25.665***
	(5.37)	(10.22)	(-13.06)	(-10.97)
Observations	1228	1006	1228	1006

Robust z-statistics in parentheses. Legend: *** p<0.01, ** p<0.05, * p<0.1

Table 8. Firth logit estimates of the graduation probability: AIM-listed companies.

Graduations, Firth logit	**(1)**	**(2)**	**(3)**	**(4)**
Total assets	0.443		0.873***	
	(1.12)		(2.81)	
Total assets, 1995-2000	0.313*		1.041***	
	(1.89)		(3.44)	
Total assets, 2001-2004	1.339***		1.009***	
	(4.21)		(4.22)	
Sales		-0.021		0.401
		(-0.09)		(1.60)
Sales, 1995-2000		0.094		0.427*
		(0.72)		(1.67)
Sales, 2001-2004		0.823***		0.567***
		(3.72)		(3.51)
Age	0.178	0.185	0.185	0.093
	(0.58)	(0.55)	(0.51)	(0.28)
Age, 1995-2000	-0.164	-0.184	0.090	0.131
	(-1.10)	(-1.23)	(0.37)	(0.57)
Age, 2001-2004	0.110	0.048	0.186	-0.020
	(0.56)	(0.25)	(1.02)	(-0.12)
Science-based	2.604***	2.239**	2.486**	1.265
	(2.77)	(2.34)	(2.08)	(1.26)
Specialized supplier	1.461	1.307	1.601	0.481
	(1.49)	(1.30)	(1.31)	(0.44)
Supplier-dominated	1.165	0.900	1.110	-0.019
	(1.21)	(0.92)	(0.90)	(-0.02)
UK incorporated	-0.314	-0.542	1.293	0.733
	(-0.39)	(-0.65)	(0.83)	(0.48)
Introduction from LSE	-3.370**	-3.872**	-3.310**	-2.832*
	(-2.12)	(-2.37)	(-2.08)	(-1.84)
1996	4.223	1.365		
	(0.85)	(0.43)		
1997	3.660	0.911		
	(0.74)	(0.29)		
1998	2.182	-0.689		

	(0.44)	(-0.21)		
1999	2.076	-0.537		
	(0.42)	(-0.17)		
2000	0.169	-2.331		
	(0.03)	(-0.72)		
2001	-10.438*	-9.091**		
	(-1.75)	(-2.28)		
2002	-10.412*	-9.274**		
	(-1.74)	(-2.32)		
2003	-9.422	-7.979**		
	(-1.58)	(-2.02)		
2004	-10.371*	-9.800**		
	(-1.75)	(-2.44)		
2005	-1.954	-2.522		
	(-0.97)	(-1.30)		
2006	-1.836	-2.288		
	(-0.95)	(-1.18)		
2007	-1.681	-2.038		
	(-0.76)	(-0.91)		
FTSE 3-years return			1.229	1.013
			(0.57)	(0.48)
NomadBro			1.696*	1.434
			(1.72)	(1.56)
Constant	-8.109	-2.569	-18.271***	-10.322***
	(-1.64)	(-0.82)	(-4.40)	(-3.69)
Observations	839	710	661	561

z-statistics in parentheses. Legend: *** p<0.01, ** p<0.05, * p<0.1

Table 9. Rare events logit estimates of the graduation probability: AIM-listed companies.

Graduations, rare events logit	**(1)**	**(2)**	**(3)**	**(4)**
Total assets	0.250		0.664**	
	(1.07)		(2.48)	
Total assets, 1995-2000	0.377***		0.815**	
	(2.92)		(2.50)	
Total assets, 2001-2004	0.582***		0.884***	
	(4.16)		(4.78)	
Sales		-0.033		0.352
		(-0.08)		(1.28)
Sales, 1995-2000		0.194*		0.327**
		(1.71)		(2.21)
Sales, 2001-2004		0.395***		0.557***
		(3.67)		(4.82)
Age	0.085	0.178	0.050	-0.078
	(0.30)	(0.37)	(0.15)	(-0.19)
Age, 1995-2000	0.018	-0.013	-0.029	0.049
	(0.17)	(-0.13)	(-0.13)	(0.35)
Age, 2001-2004	-0.341***	-0.387***	-0.120	-0.253**
	(-2.65)	(-3.34)	(-1.11)	(-2.42)
Science-based	1.702*	1.373	1.707*	1.014
	(1.86)	(1.40)	(1.84)	(0.98)
Specialized supplier	0.802	0.555	0.945	0.392
	(0.79)	(0.52)	(0.88)	(0.34)
Supplier-dominated	0.631	0.259	0.291	-0.306
	(0.65)	(0.25)	(0.26)	(-0.27)

FTSE 3-years return	1.032	0.677	1.436	1.352
	(0.83)	(0.55)	(0.58)	(0.60)
NomadBro			1.595	1.215
			(0.97)	(1.02)
Constant	-7.650***	-5.024***	-13.360***	-7.950***
	(-5.45)	(-4.10)	(-4.44)	(-4.31)
Observations	839	710	661	561

Robust z-statistics in parentheses. Legend: *** p<0.01, ** p<0.05, * p<0.1

Table 10. Heckman probit estimates of the acquisition probability: AIM-listed companies.

Acquisitions, Heckman probit (outcome equation)	**(1)**	**(2)**	**(3)**	**(4)**
Total assets	0.288***		0.303***	
	(7.17)		(4.96)	
Total assets, 1995-2000	0.095***		0.145*	
	(2.87)		(1.74)	
Total assets, 2001-2004	0.142***		0.169*	
	(4.01)		(1.87)	
Sales		0.273***		0.277***
		(6.30)		(6.69)
Sales, 1995-2000		0.050*		0.124**
		(1.76)		(2.07)
Sales, 2001-2004		0.188***		0.202***
		(3.19)		(3.18)
Age	0.025	0.027	0.059	0.048
	(0.59)	(0.80)	(0.94)	(1.16)
Age, 1995-2000	0.043**	0.075	0.047	0.036
	(1.98)	(1.21)	(0.97)	(0.59)
Age, 2001-2004	-0.038	-0.090	-0.010	-0.067
	(-0.67)	(-1.44)	(-0.14)	(-1.01)
Science-based	0.393**	0.702	0.565	0.767
	(2.11)	(1.53)	(1.16)	(1.44)
Specialized supplier	0.339*	0.630**	0.480	0.668**
	(1.84)	(2.08)	(1.52)	(1.98)
Supplier-dominated	0.501***	0.787**	0.554*	0.824**
	(4.36)	(2.43)	(1.71)	(2.21)
UK incorporated	-0.100	-0.247**	-0.120	-0.287**

	(-0.98)	(-2.23)	(-0.94)	(-1.98)
Introduction from LSE	0.29	0.343	0.259	0.264
	(1.37)	(1.18)	(0.77)	(0.66)
NomadBro			0.001	0.030
			(0.01)	(0.28)
Constant	-2.405***	-2.498**	-2.961**	-2.851**
	(-4.50)	(-2.37)	(-2.05)	(-2.51)
Observations	1235	1012	1079	883
Wald test indep. equations	0.23 (0.628)	3.06 (0.080)	2.43 (0.119)	2.79 (0.095)

Robust z-statistics in parentheses, except: Wald test for independence of equations (p-value). Legend: *** p<0.01, ** p<0.05, * p<0.1

Table 11. Heckman probit estimates of the graduation probability: AIM-listed companies.

Graduations, Heckman probit (outcome equation)	**(1)**	**(2)**	**(3)**	**(4)**
Total assets	0.123		0.425***	
	(1.04)		(2.63)	
Total assets, 1995-2000	0.254***		0.531***	
	(3.59)		(3.75)	
Total assets, 2001-2004	0.314***		0.527***	
	(5.67)		(4.37)	
Sales		-0.008		0.178
		(-0.06)		(1.31)
Sales, 1995-2000		0.136***		0.214***
		(3.31)		(2.75)
Sales, 2001-2004		0.206***		0.295***
		(4.76)		(4.09)
Age	0.130	0.126	0.139	0.082
	(0.96)	(0.71)	(0.75)	(0.42)
Age, 1995-2000	0.047	0.030	0.064	0.073
	(0.73)	(0.58)	(0.50)	(0.87)
Age, 2001-2004	-0.111**	-0.133***	0.078	-0.016
	(-2.16)	(-2.62)	(1.31)	(-0.28)
Science-based	1.173***	0.923*	1.540**	0.835
	(2.85)	(1.82)	(2.11)	(1.43)
Specialized supplier	0.681**	0.512	1.001	0.352
	(2.03)	(1.15)	(1.61)	(0.67)
Supplier-dominated	0.594*	0.359	0.743	0.195
	(1.71)	(0.74)	(1.01)	(0.34)
UK incorporated	-0.252	-0.335	5.299***	4.811

	(-0.90)	(-1.34)	(3.76)	(.)
Introduction from LSE	-8.802***	-4.912***	-6.431***	-6.661***
		(-23.26)	(-8.67)	(-5.23)
NomadBro			1.023**	0.853*
			(1.97)	(1.76)
Constant	-4.660***	-3.009***	-14.728***	-10.375***
	(-5.51)	(-4.68)	(-5.09)	(-13.11)
Observations	1234	1011	1058	864
Wald test indep. equations				

Robust z-statistics in parentheses. Legend: *** p<0.01, ** p<0.05, * p<0.1

Appendix B: Models.

Binomial logit. Let $p_{i,\tau}$ be the probability that company *i* transfers from AIM to the LSE Main Market (or, alternatively, is acquired) within a given time window *τ*, conditional on a matrix of explanatory variables observed at time *t0* (introduction time). Let $1\text{-}p_{i,\tau}$ be the conditional joint probability of all other events. The binomial logit model assumes that the log-odds ratio of observing the event of interest is a linear function of the covariates (Cameron and Trivedi 2005):

$$\log (p_{i,\tau} / 1\text{-}p_{i,\tau}) = X'\beta \qquad (1)$$

In Eq. 1, β is a vector of unknown coefficients, to be estimated. All non-binary explanatory variables are taken in natural logarithms; therefore, coefficients can be interpreted as elasticities. The coefficients are estimated via Maximum Likelihood, using a covariance matrix clustered by years.

Weibull. In the Weibull model, the hazard function *h(t, X)*, conditional on covariates *X*, reads

$$h(t \mid X) = \alpha\, t^{\alpha-1} \lambda^{\alpha} \qquad (2)$$

where $\alpha > 0$ is the shape parameter of the Weibull distribution; $\lambda = X'\beta$; β is the vector of regression coefficients.[xvii] In Eq. 2, is the baseline hazard, measuring duration dependence, whereas observed individual-specific heterogeneity is measured by the systematic component $\lambda = X'\beta$.[xviii] α determines the shape of the baseline hazard: increasing in *t* when $\alpha > 1$, decreasing if α is between 0 and 1. When $\alpha = 1$, the Weibull model reduces to an exponential model, which is characterized by a constant hazard rate. α and β are estimated via Maximum Likelihood using the Stata command streg, with variance-covariance matrix clustered by years.

Cox. The Cox model reads

$$h(t \mid X) = h_0(t)e^{X'\beta} \qquad (3)$$

where h_0 is the baseline hazard. Unlike the Weibull and other parametric proportional hazard models, the Cox model makes no assumption on the functional form of the baseline hazard. In the Cox model, the marginal effect of a covariate is measured by the so-called hazard ratio (calculated as the exponentiated coefficient from the Cox model). A positive coefficient implies a hazard ratio above one, suggesting that an increase of the covariate increases the graduation/acquisition rate. Similarly, a negative coefficient implies a hazard ratio below one, indicating that an increase in the explanatory variable reduces the failure rate. Estimates of the Cox model coefficients are obtained via Partial Maximum Likelihood, using the Stata command stcox, with variance-covariance matrix clustered by years. In the Weibull and Cox models, companies that stayed listed are considered as censored, since those companies may have been delisted after the end of our observation period.

Multinomial logit. Let $p_{i,j,\tau}$ be the probability that firm *i* is involved in a delisting event j within a given time window τ, conditional on the matrix of explanatory variables X. The multinomial logit reads

$$\log (p_{i,j,\tau} / 1\text{-}p_{i,j,\tau}) = X' \beta_j \qquad (4)$$

where the default event j = 0 refers to companies that stay listed; the other events are transfers, takeovers, reverse takeovers, and failures. The coefficients in the vector are set equal to zero for normalization purposes. The MLE estimates are obtained through the Stata command mlogit, with variance-covariance matrix clustered according to the years.

Competing risks. Let us assume that company *i* is at risk of *k* different delisting events. Delisting events have durations associated with them. What we actually observe for each company is only the shortest duration. Durations for different risks are assumed to be independent, conditional on covariates. We estimate the competing risks model by Fine and Gray (1999) using the Stata command stcrreg, with variance-covariance matrix clustered according to the years.

Notes

[i] Collewaert (2012) addresses the issue of entrepreneurial exit by studying the relationship between entrepreneurs and angel investors.

[ii] The example of the acquisition of Paypal by E-Bay is a good case in point, as mentioned by Reuer et al. (2008).

[iii] The alternative hypotheses are economies of scale, regulatory overreach and market conditions.

[iv] In order to keep classification mistakes to a minimum, we have keyword-scanned the announcements published on the website http://investegate.co.uk.

[v] We are unable to distinguish between friendly and hostile takeovers. In a reverse takeover, shareholders of a private

company acquire a public company ("shell company") and merge it with the private company (Sjostrom 2008). According to AIM rules, shell companies listed on AIM are delisted after a reverse takeover, and the company resulting from the merger has to newly file for admission on AIM. What we classify as "failures" include bankruptcies as well as voluntary decisions to go private or dark.

[vi] Carpentier et al. (2010) also use assets as a size variable. Due to lack of data, we could not use market capitalization, that is frequently used as a measure of company size in much of the financial literature on corporate failure.

[vii] Fama and French (2004) noted that listing requirements ultimately boil down to some measure of size.

[viii] Stricter adherence to Pavitt's original idea would require classifying firms, not sectors, among the four categories. However, the literature has long been oriented towards operationalizing the Pavitt taxonomy on a sector basis, due to data availability issues.

[ix] Such as agriculture, mining, fishing, quarrying, public/social/personal services, motion pictures, radio & tv broadcasting, news agencies, libraries, sports, gambling/betting. See Appendix.

[x] All tables are in the Appendix.

[xi] Instead of reporting the coefficients of the interaction terms of size and age with years, these tables – as well as the following ones – report the sums of the size and age coefficients with the respective interaction term coefficients. For instance, on the line "Total assets, 1995-2000" it is reported the sum coefficient of total assets + coefficient of total assets*years. The t-stat behind that estimate is the t-stat of the test that such sum of coefficients is null. This gives a flavor of the time profile of size and age effects on the acquisition and graduation probabilities.

[xii] We prefer the logit to the alternative probit model, since predicted event probabilities for logit and probit models are very similar (see Cameron and Trivedi 2005); it is based on a latent variable model with non-Normal (i.e., logistic) disturbances, that seems more suitable in light of the evidence of heavy tails in firm growth rate distributions (e.g. see Bottazzi and Secchi 2006); and it allows an easier interpretation of coefficients as elasticities of the odd ratio of the events of interest with respect to the explanatory variables (Cameron and Trivedi 2005).

[xiii] We focus on single-spell duration models with time-constant covariates.

[xiv] Estimates of the NomadBro dummy coefficients are only performed in the specifications with FTSE returns. The NomadBro dummy had to be erased from the specifications with yearly dummies for computational reasons.

[xv] Previous studies show that companies which enter the market through a reverse takeover (RTO) are low quality and poor performers (Arellano-Ostoa and Brusco, 2002, Gleason et al., 2005, Adjei, Cyree and Walker, 2008, see also Roosenboom and Vasconcelos, 2009 about agency conflicts on the AIM).

[xvi] Recall that the probit coefficients differ in interpretation and systematically differ in magnitude from logit coefficients, according to an approximate formula reported e.g. by Cameron and Trivedi (2005). Hence, comments will only focus on the direction of the effects.

[xvii] beta is a vector of elasticities of the hazard function with respect to the explanatory variables if these are expressed in logarithmic form.

[xviii] Subscripts are omitted in order to avoid cumbersome notation.