

Do Less Regulated Markets Attract Lower Quality Firms? Evidence from the London AIM market

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Abstract

The paper examines competition among international capital markets in light of the apparent outperformance of the moderately regulated Alternative Investment Market (AIM), which is a growth market governed by the London Stock Exchange. The rise of AIM has sparked a debate on i) whether the U.S. capital markets may be losing their competitive edge and ii) whether financial markets should be more (or less) regulated. Recent literature diminishes such worries and concludes that the relatively more regulated U.S. stock exchanges still stand strong and any potentially outperforming exchanges – such as the London AIM market – primarily attract small firms. This study, however, shows that these small firms listing on the relatively less regulated AIM market are of similar quality level as firms listing in the U.S. and in continental Europe. Consistent with this result, the failure rate among AIM listed firms is the same as that of other markets. Interestingly, they also raise relatively more capital and have a higher market valuation. Overall, even though high regulation standards may appease investors, the paper questions whether a strict regulation environment will necessarily facilitate stock market prosperity.

JEL classification: F30, G15, G20.

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1 Introduction

This paper explores the current level of competition among leading stock markets in terms of where firms choose to list, how they fare off while listed and what drives some firms to subsequently delist. In particular, the paper investigates whether newly established and relatively less regulated capital markets – which often are viewed to offer a less attractive listing environment than e.g. more reputable U.S. stock markets – primarily cater to lower quality firms?

The focal point of the study will be on a relatively newly established market segment named the Alternative Investment Market (AIM). This is a London based growth market which was established in 1995 and is governed by the London Stock Exchange (LSE). The AIM market, which primarily attracts small and newly established firms, has experienced remarkable growth in the last decade. The rise of AIM has sparked a debate on i) whether the U.S. capital markets may be losing their competitive edge and ii) whether financial markets should be more (or less) regulated.¹ This paper investigates the success of the AIM market and asks whether it has truly outperformed the U.S. stock market and other leading markets. The discussion will center around the distinctive feature of the AIM market, which is its relatively light touch on regulation and listing requirements. Specifically, this lenient regulatory environment has led to suggestions that AIM poses no real threat to incumbent exchanges – such as NYSE and NASDAQ – since AIM is likely attract lower quality firms. This study explores whether this is the case, i.e. if a less stringent regulatory environment attracts a less desirable customer base than maintained by more regulated markets – thereby explaining the apparent ‘success’ of AIM. In other words, the study compares the AIM market with U.S. (and continental Europe) stock markets and analyses how firm quality differs across various listing venues.² The study further examines the listing premium (Tobin’s q) associated with choosing one listing venue over another, how much capital firms manage to raise across different exchanges and how the delisting choice differs depending on firm characteristics. In

¹ See e.g. anecdotal evidence and general discussion in the media – some headlines include i) “What’s wrong with Wall Street?” (*Economist*, 2006), ii) “Is a US listing worth the effort?” (*Wall Street Journal*, 2006a), iii) “Is Wall Street losing its competitive edge?” (*Wall Street Journal*, 2006b), iv) “Firms list in UK to avoid tough US standards” (*Reuters News*, 2006).

² Firm quality is rather loosely defined in this context. As related literature, this paper will throughout refer to ‘high quality firms’ as those having generally desirable characteristics, such as high growth, high market valuation, low leverage, etc.

short, the paper examines how successful competing capital markets are in creating an attractive environment for their clientele – and to outline how the customer base differs in terms of quality (firm characteristics) across exchanges.

To adequately outline the paper's contributions to the ongoing debate, a brief review of related literature is in order. Until recently U.S. capital markets were typically found to be relatively attractive and outperform other markets. Academic literature suggested that there were many potential gains from listing in the U.S., such as greater access to capital (Lins et al., 2005), greater liquidity (Amihud and Mendelson, 1986; Brennan and Subrahmanyam, 1996), lower cost of capital (Merton, 1987; Karolyi, 1998), improved product market visibility (Röell, 1996), more rapid expansion possibilities (Pagano et al., 2002), higher market valuation (Doidge et al., 2004) and signals of quality when bonding to relatively strict regulation (Coffee, 1999). However, more recently there is evidence that the competitiveness of U.S. capital markets has weakened. The literature has argued that capital controls and a more stringent regulatory environment in the U.S. has contributed to fewer foreign listings (Piotroski and Srinivasan, 2007) and has made delisting difficult, which makes foreign issuers avoid listing in the U.S. in the first place (Committee on Capital Markets Regulation [2006], Marosi and Massoud [2008]). Also international competition has increased as electronic trading has facilitated multi-market trading (Karolyi, 2003), numerous countries have improved corporate governance (De Nicoló, Laeven and Ueda, 2008), many (non-U.S.) exchanges have relaxed their listing requirements (Fernandes and Giannetti, 2010) and international markets have generally improved in terms of liquidity, transparency and capital raising (Bekaert and Harvey, 1995; Henry, 2000a and 2000b). The increased competitiveness of international capital markets has e.g. led to a significant decrease in U.S. share of world IPOs (Zingales, 2006) and the number of new foreign listings has become only half of what e.g. U.K. exchanges now manage to attract (Fernandes and Giannetti, 2010).

But the question of whether U.S. capital markets are losing their competitive edge continues to be debated. In a recent paper Doidge et al. (2007) argue that the decline in U.S. listings is not explained by changes in the net benefits of listing in the U.S., but rather by a change in firm characteristics. In other words, it is not the relatively attractiveness of the U.S. market that has decreased, but rather the customer pool is different. The implication is that the success of other exchanges (such as AIM) is

explained by their ability to attract specific firm types (primarily small firms) that would not have chosen to list in the U.S. anyway. In particular, lower quality firms will choose to list in less regulated markets, in contrast to firms listing in the U.S. which are “bonding” themselves to fulfill relatively stricter regulatory requirements. This argument is supported by Chaplinsky and Ramchand (2007) who show that there are few voluntary delists in the U.S. and involuntary delists occur among “undesirable” firms, i.e. firms characterized by low profitability and median assets. In sum, these studies argue that U.S. capital markets are just as competitive as before in attracting a particular set of (high quality) firms.

This study offers several contributions to the outlined literature. First, it adds to the general debate of whether U.S. capital markets may be losing their competitive edge following tighter regulation and an increase in delistings among international firms. More precisely, this paper presents empirical evidence on AIM which suggests that the above mentioned literature has been too light-hearted with regards to the competitive threat posed by overseas growth markets. Second, but on a related note, it contributes to the discussion of whether increased regulation in financial markets is advisable. During the downfall of global markets in the past few years, there has been an increase in calls for heavier regulation on financial markets. This study adds to this debate by showing how various regulatory environments are associated with different listing choices and well-being of firms. Third, the paper presents additional empirical evidence on the so-called legal bonding hypothesis, which states that listing in a stringent regulatory environment is a sign of high firm quality. Fourth, the paper contributes to the study of small firms. Despite their economic importance for future growth, this clientele of the stock exchanges has typically been overlooked by the literature – and it has even been suggested that small firm size is in itself an undesirable characteristic (see e.g. Chaplinsky and Ramchand, 2007).³ Also, small firms are an ideal sample group as they are particularly vulnerable to changes in the costs associated with regulation and red tape – since such costs are generally fixed and therefore represent a relatively higher burden to small firms. This paper focuses

³ Moreover, studies often indirectly state that small firms are of less interest and thus drop them from the sample. For example, Canaccord Adams (2006) report that the average market value of AIM firms is \$50 million and Doidge et al. (2007) exclude firms that have less than \$100 million in assets from their analysis – thereby effectively dropping most of AIM listed firms from their sample. Our paper instead focuses on this sample group and emphasizes that small firm size does not translate to relatively lower quality of the firm. Also, even the industry has experienced a “near-evaporation of research on small firms” (Economist, 2009a, p. 86).

on small firms and demonstrates that they do not possess inferior qualities – and that small firms are of notable economic significance. Finally, in addition to analyzing firms listing in the U.S. and U.K., this study also analysis the key listing locations in continental Europe (Euronext and Deutsche Börse). Thus, this study provides a more comprehensive cross market analysis than previously offered.⁴ It also presents a detailed analysis of the London Alternative Investment Market (AIM), which has been relatively understudied despite having experienced remarkable growth in recent years.

The results of the paper show that the relatively less regulated AIM market performs at least as well – or even better – than other exchanges. More specifically, the study shows that the outperformance of AIM (in terms of number of foreign listings) cannot be solely explained by an increase in listings of lower quality or less desirable firms. In fact, the quality level of firms listing on AIM is just as high (i.e. same characteristics) as for the smallest set of firms listing in the U.S. and continental Europe. Consistently, the failure rate among AIM listed firms is no higher compared to more regulated markets. AIM firms also raise relatively more capital and have a higher market valuation than firms listed elsewhere.

These results are particularly interesting given the relatively lenient regulation environment of the London AIM market. However, despite the results are overall well-disposed towards the AIM market, there are still partial signs of investor skepticism within the segment. In particular, i) the valuation premium of AIM listed firms is only present in times with no financial distress, ii) the valuation premium of AIM listed firms peaks only after firms have established a sound track record and iii) AIM listed firms originating from less investor friendly countries (which are more likely to face investor skepticism) raise relatively lower levels of capital compared to other AIM listed firms. Thus, heavier regulation may in principle invoke more trust in listed firms, even though heavier regulation does not necessarily imply better stock market outcomes (i.e. AIM firms still have higher market valuation overall and raise more capital than small firms listed elsewhere). In short, even though heavier regulation may appease investors, the paper questions that a strict regulation environment will necessarily facilitate stock market prosperity.

⁴ For example, as Karolyi (2006) points out in an extensive literature review that existing research has almost exclusively focuses on cross-listings by non-U.S. firms on U.S. exchanges. Also, more recent literature only looks at the U.S. in isolation (Chaplinsky and Ramchand, 2007) or merely provides a New York vs. London main market comparison (Doidge et al., 2007).

The paper proceeds by providing background information and outlining the different characteristics of U.S. and European capital markets and associated stock exchanges. Section 3 introduces the dataset to be used in the empirical analysis, which follows in section 4. Section 4 separately studies (4.1) listing decisions, (4.2) delisting, (4.3) valuation and (4.4) capital raising. Section 5 concludes.

2 Market characteristics

This section provides background information on the stock markets under study and outlines the differences that exist across various listing locations. Specifically, the markets under study are the major U.S. markets (NYSE and NASDAQ), the London AIM market and two continental European exchanges, namely the Deutsche Börse and Euronext.⁵ First, market size of each listing location is discussed in terms of the historical evolution of the number of firm listings and their market capitalization on each exchange. Second, the regulation environment of each market is described, before turning to the fee and revenue structure of each exchange. Fourth and finally, we outline the market architecture and trading mechanism of each exchange under study.

A. Size

In general, the major stock exchanges around the world have experienced a gradual decline in the number of firm listings over the last decade. Figure 1 shows this delisting trend across the world's leading exchanges, where the exception from this pattern is the London Stock Exchange – in particular the London AIM market, which has experienced considerable growth during its lifetime. However, since firms typically tend to list in their home market, it is more meaningful to focus on foreign firm listings when evaluating the relative competitive standing of these exchanges. In

⁵ Note that since the focus is on relatively small firms, the London main market is not included. Moreover, since the London main market and the London AIM market are both owned and operated by the London Stock Exchange, it would be misleading to include the former in the subsequent empirical analysis as it is not competing with the latter. Lastly, the AIM vs. London main market comparison has already been carefully studied in the literature (see e.g. Jenkinson and Ramadorai, 2008). Regarding continental European exchanges, it should be noted that Euronext – which is the consolidated exchanges of the former national stock exchanges of Belgium, France, Netherlands and Portugal – merged with NYSE in 2006. However, NYSE and Euronext still run separate operations and no concrete steps have yet been taken towards the complete unification of the two exchanges (e.g. trading, clearing and settlement unification, as described in e.g. Nielsson [2009]). Thus it is natural to treat these exchanges as separate identities in the analysis that follows. Lastly, the Deutsche Börse is the largest German stock exchange and is based in Frankfurt.

other words, a more relevant question is where do firms choose to list if they decide to list outside their home market? Such statistics can be taken to partially reflect past competitiveness of competing exchanges. Figure 2 shows the number of foreign firms listed on these markets over the 1995-2009 period. Here the outperformance of the AIM market segment becomes even more pronounced, i.e. there is a dramatic drop in foreign listing among most of the world's leading exchanges incident to a remarkable increase in AIM foreign listings. The number of foreign listings on this relatively young market segment is now comparable to that of the world's major exchanges. This has exacerbated the debate on stock market competition and optimal level of regulation mentioned in the introduction. Whether these AIM listings represent desirable listings of truly good quality firms – as well if these firms would have been better off listing elsewhere (e.g. in terms of price valuation and capital raising potentials) – are the questions at hand.

Despite an impressive number of listings, the average market value of AIM listed firms is very low in this comparison set. Figure 3 represents stock exchange size as the market value of listed firms, which makes the AIM market look tiny in comparison to other major stock exchanges. This is non-surprising since the AIM market is explicitly founded to attract small and medium sized enterprises. Viewed in that perspective – as well as keeping in mind the very young age of the AIM market – it can even be considered impressive that small firms listed on this market segment correspond to 7% of the entire Deutsche Börse. Also, it would be a mistake to conclude that the AIM market is small in absolute terms as figure 3 compares the AIM market to some of the truly largest stock exchanges in the world. In fact, the market value of the AIM market segment is of similar size as that of the national stock markets of Poland, Thailand or Turkey – and much larger than the Argentinean, Irish or Austrian stock exchanges. Thus, the AIM market cannot be considered small in a more reasonable comparison, in particular when keeping in mind that this market segment is barely more than a decade old. The immense growth of the AIM market becomes even more apparent when it is compared to other 'junior' market segments around the world, i.e. other segments that are primarily geared to the needs of small and medium-sized companies. Table 1 lists the major 'junior' market segments around the world, comparing both the number of firms and the total market value of firms across all venues. The only two junior market segments that compare with AIM in terms of number of listed firms are the Toronto TSX and the Korea KOSDAQ

market segments. However, AIM is dominant in terms of the number of foreign listings and has the highest market capitalization. Also, AIM caters for a larger number of small and medium sized companies (average market cap is \$71m at year-end 2009), while most of the other junior markets either have a small number of relatively large companies (e.g. Germany, Ireland, Hong Kong and Tokyo) or a large number of very small companies (e.g. Toronto).

B. Regulation

Stock exchanges appeal to different firms by offering different market characteristics in terms of regulation, listing requirements, trading architecture, fees, etc. Small firms are likely to prefer markets with less stringent regulation and less cumbersome listing procedures since such requirements involve relatively high fixed costs for small business operations. Thus, when analyzing which competing markets are more attractive to small firms, we focus on U.S. ADR listings, U.K. AIM listings and two parallel markets in continental Europe (those of Deutsche Börse and Euronext).⁶ Furthermore, for the analysis to be meaningful we restrict our attention to foreign firm listings, since firms have a natural tendency to list in their home market. Below we summarize the main characteristics of these specific markets and the regulation environment that foreign firms face in each market segment. Also, table 2 provides an overview of the listing requirements.

The most convenient way for a foreign company to have its shares traded in the U.S. is to issue an American Depositary Receipt (ADR).⁷ The attraction of issuing an ADR is that it typically trades with minimum reporting and regulation requirements, which is particularly appealing to small firms which are likely to want to avoid relatively high listing costs. However, a firm can issue different types of ADRs which represent different levels of regulatory requirements. Effectively there are three ADR levels, i.e. levels 1 (OTC), 2 (listed) and 3 (offering).⁸

⁶ Thus we exclude London main listings from the study and – as previously noted in footnote 5 – it is also natural to treat NYSE and Euronext as separate identities in the analysis that follows.

⁷ An ADR represents ownership in shares of a foreign company and is exchangeable for the foreign stock it represents. ADRs are quoted in U.S. dollars, pay dividends in U.S. dollars and can be traded like the shares of any U.S. based companies.

⁸ There are also unsponsored shares that have no regulatory requirements, but these are not common in practice. Also, there are programs where trading is restricted to certain individuals, e.g. Rule 144-A (shares may only be issued or traded by qualified institutional buyers) and Regulation S (shares cannot be held or traded by any U.S. person). The use of these programs is relatively limited so we omit them from the analysis.

First, level 1 offers minimal registration and reporting requirements with the U.S. Securities and Exchange Commission (SEC). For example, a level 1 firm does not need to issue or disclose quarterly or annual reports – and even if it chooses to do so it is not required to follow U.S. generally accepted accounting principles (GAAP). The disadvantage of level 1 shares is that they can only be traded on the over-the-counter (OTC) market. The majority of ADRs currently trade through the level 1 program which partly reflects the demand for minimum regulatory requirements. Second, level 2 depositary receipts can be listed on an U.S. exchange, such as NYSE or NASDAQ. This demands more from the foreign issuer, such as meeting the exchange’s listing requirements (outlined in table 2) and complying with stricter SEC regulation. A registration statement must be filed with the SEC and regular reporting requirements are higher as level 2 ADRs are subject to the same disclosure requirements as domestic firms. For example, the firm must file annual reports (Form 20-F, which is comparable to Form 10-K for U.S. companies) and is required to follow GAAP standards. Third, issuing level 3 shares allows a foreign firm to raise capital in the U.S. In other words, it allows firms not only to offer home market shares but also to issue new shares in the U.S. This correspondingly entails further requirements such as filing an offering prospectus (Form F-1) and any information given to shareholders in the home market must also be filed with the SEC (Form 8K). Any registration and reporting requirements applying to the level 2 program also apply to level 3 shares.⁹

Firms have two major listing segments to choose from when listing on the London Stock Exchange (LSE), i.e. the main market segment or the Alternative Investment Market (AIM).¹⁰ If the firm seeks to list on the main market it must have a market value of at least 700,000 GBP and have filed audited accounts in accordance to international standards at least 3 years prior to listing (see further details in table 2). The focus of this study is, however, on the AIM market segment, which is tailored to attract small, growing companies and offers considerably more lenient listing

⁹ It should also be noted that it can potentially be costly to delist from the U.S. since if a firm has at least 300 U.S. investors it remains subject to SEC supervision (Zingales, 2006). Thus SEC deregistration is required to remove all costs associated with having listed in the U.S. Hence, costly exists may discourage firms from listing in the first place. Numerous papers have presented and/or evaluated this argument, see e.g. Witmer (2006), Berger et al. (2005), Hostak et al. (2006), Li (2006), Marosi and Massoud (2008), Smith (2006), Woo (2006), Zingales (2006), Piotroski and Srinivasan (2007), Chaplinsky and Ramchand (2007), Doidge et al. (2007) and Litvak (2007a,b).

¹⁰ Strictly speaking, a firm also has the option to list as a depositary receipt (DR) on the main market, in which case the financial information need not be prepared in accordance with International Accounting Standard (IAS), U.K. GAAP nor U.S. GAAP (Generally Accepted Accounting Principles).

requirements. The AIM is an exchange regulated market governed by the LSE, which in turn is regulated by the U.K. Financial Services Authority (FSA). Listing on AIM requires no minimum age, size or sector – and there is no float requirement and raising funds when going public is not compulsory. To list on AIM a firm only needs the support of so-called nominated advisors (“Nomads”), which are underwriters designed and controlled by the LSE. In addition to assessing the suitability of AIM entrants, Nomads also co-ordinate, produce and approve admission documents and implement floatation. They further monitor firms’ subsequent compliance with AIM rules, such as minimal disclosure duty which involves semi-annual reports according to U.S. GAAP accounting standards and the disclosure of non-public information that may affect share price. This delegation of responsibility to Nomads is a central feature of the AIM’s regulatory system and is unique to this market segment – for example Arcot et al. (2007) note that the regulatory regime which applies to e.g. so-called main market sponsors is considerably more onerous. There are in total around 85 Nomads associated with AIM, although the activities and duties of Nomads are concentrated among approximately 30 Nomads who are appointed to around 80 percent of AIM companies (Canaccord Adams, 2006; Arcot et al., 2007).

Overall, the AIM market is therefore characterized by a light touch on regulation and minimum admission criteria. In fact, the IPO process on AIM typically takes only between 10 and 16 weeks (Canaccord Adams, 2006). Accordingly, Gajewski and Gresse (2006) argue that AIM caters to firms that have sound business prospects but do not necessarily meet the listing criteria (primarily in terms of size) of other well-established markets.

Lastly, this study also examines firms listing on the two major exchanges of continental Europe, namely the Euronext exchange and the Deutsche Börse. Partly in response to the success of AIM, the Euronext exchange closed its various growth market segments in 2005 (the Euro.NM in Amsterdam, the Nouveau Marché in Paris, the Novo Mercado in Lisbon, and the Nouveau Marché in Brussels) and replaced them with a loosely regulated market segment named Alternext (Gajewski and Gresse, 2006). Alternext is under the authority of Euronext (which in turn is regulated by the French ‘Autorité des Marchés Financiers’, AMF) and is tailored for small and medium sized companies looking for a simplified access to the stock market. Public offering is managed by a specialized intermediary (listing sponsor) whose role is loosely comparable to that of a Nomad on AIM (although less extensive). The

Alternext market segment has no specific industrial or country requirements, but firms need a 2 year track record of existence, a minimum floating capitalization of 2.5 million Euros and a prospectus must be approved by the AMF – although any post-IPO disclosure is simplified (Gajewski and Gresse, 2006). Partly due to the young age of this market segment it has yet relatively few listings, i.e. 115 domestic listings and 10 foreign (see table 1). Thus, the subsequent empirical analysis will not be solely restricted to Alternext firms, but instead includes all foreign firms listed in Euronext. In addition, all firms listing on Deutsche Börse, which is continental Europe’s other major exchange, are also included in the analysis. This follows from Deutsche Börse not having reestablished a strong growth market after it did away with their growth market (Neuer Markt) in 2003 due to lack of candidate firms (Gajewski and Gresse, 2006). Its current junior market lists merely 103 domestic firms and 13 foreign (see table 1). Foreign firms listing in either Euronext or Deutsche Börse’s main markets are subject to presenting audited accounts at least 3 years prior to listing and must distribute at least 25% of their shares to the public. In addition, firms listing on the Deutsche Börse must have a market value of at least 1.25 million Euros.

C. Exchange fees and revenues

In order to compare firms’ listing choices across different exchanges, the relative monetary costs associated with listing need to be accounted for. Oxera (2006), an independent consultancy group, has estimated the total fees associated with different listing venues and the main results of Oxera’s report are reproduced in table 3. The table shows the total initial admission fees and the subsequent, recurring annual fees for small cap stocks. The average costs per firm are relatively low for the AIM market segment.¹¹ However, the absolute magnitudes of these costs are very low across all exchanges (ranging from 0.01% to 0.10% of firm value) and are therefore very unlikely to have any meaningful effect on the listing decision of firms.

However, it is worth noting that although exchange fees may be trivial for firms, the listing fees and affiliated services are a non-trivial source of income for the exchanges. Figure 4 depicts the revenue breakdown for the major exchanges in the U.S. and Europe. Notably, listing fees and ongoing administration fees represent a non-negligible fraction of total revenue. Moreover, trading fees (paid by investors, not

¹¹ Canaccord Adams (2006) also offers a detailed survey that concludes that IPOs costs are considerably lower on AIM than on NASDAQ, which is their choice of comparison.

issuers) contribute to a large portion of exchange revenue, implying that attracting more exchange listings can contribute considerably to trading revenue.¹²

D. Trading mechanism

The design of the trading mechanisms also differs across of the exchanges under study. Swan and Westerholm (2003) summarize the market architecture of 38 major exchanges and point out that the choice of market design is a trade-off between cost efficiency and service – and consequently has to be selected depending on what type of companies are traded on the exchange and what type of listings the exchange is targeting. In general there exists 3 types of market designs; a limit order market, a dealer market or a hybrid market.¹³

The NYSE and NASDAQ stock exchanges can be classified as hybrid markets, although they partly maintain a certain amount of dealer emphasis (Canaccord Adams, 2006). The Euronext and Deutsche Börse are also hybrid markets but they have relatively less human interface and instead more limit order book emphasis. However, all of these exchanges support the use of designated dealers for newly listed or low capitalization companies. As the AIM market specifically targets small-cap stocks, which typically do not have a consistent pool of buyers and sellers, it is primarily a dealer-to-dealer market. In other words, trading mostly occurs on a dealer supported system (SEAQ) which is based on two-way quotes from competing market makers. Each firm on AIM is required to appoint a market maker who is a member of the London Stock Exchange (typically the same as the firm's Nomad). AIM also has a more hybrid system for the top 50 AIM stocks, i.e. an electronic order book with committed market makers (SETSmm).

Different characteristics of the stock exchanges' trading mechanisms imply that the liquidity of stocks is naturally going to differ. But comparison of liquidity across exchanges is further complicated by the fact that exchanges have historically used

¹² For example, Aggarwal (2002) argues that the ability to generate trading volume will be a key factor in determining stock exchanges' future success, since transaction revenue is likely to become the most important source of income. She argues that listing fees, revenues from sales of market data and membership fees are all likely to decrease due to competition among exchanges, technological innovation and members increasingly finding it advantageous to trade on multiple exchanges.

¹³ A limit order market is a market where orders (which specify direction, quantity and acceptable price of trade) are compared to orders already held in the system (the book) and execution of trade takes place if there is a match between buy and sell orders. A dealer system is a market where an intermediary (the dealer) acts as a counterparty for the trades of his customer. A hybrid system is a combination of these two market systems.

different definitions and calculation methods to compile turnover statistics.¹⁴ The only exchange under study that reports turnover in the same manner as the LSE is the NASDAQ stock exchange. Canaccord Adams (2006) estimate that in 2005 the average monthly dollar volume per firm of similar size (market capitalization in the \$100-\$400 million range) is \$35m for NASDAQ listed firms and \$14m for AIM listed firms. The report therefore concludes that even though there has been a dramatic increase in turnover on AIM, the trading turnover is still considerably lower than for other major exchanges. But admittedly, such a direct comparison is tricky (and perhaps misleading) since the trading systems differ and liquidity tends to correlate with company size – which implies that liquidity is bound to be higher on larger markets.

To summarize chapter 2, the AIM market has experienced a dramatic increase in the number of listings in recent years. Despite its young age, it now has an impressive number of listings compared to almost any stock exchange or market segment in the world. Since AIM primarily attracts small firms the market value of AIM is small compared to the world's major exchanges, but it is nonetheless of similar size as national stock exchanges of reasonably sized countries. It is also the largest junior market segment in the world.

The AIM market has relatively loose regulation and criteria required for listing and maintaining a continued listing status. This is likely to have contributed to the increased listing of small firms, which may in some cases not fulfill the more stringent listing standards of other exchanges. The listing and annual fees of AIM are also relatively low, although the absolute value of these costs are negligible across all exchanges and unlikely to affect firms' listing decisions. Finally, the trading mechanism of AIM is designed for small-cap stocks, although other exchanges apply designated dealers to newly listed or small-cap stocks as well.

¹⁴ The World Federation of Exchanges classifies the methods into two main categories, i.e. the Trading System View (TSV) and the Regulated Environment View (REV). TSV exchanges (e.g. NYSE) count turnover as only those transactions which pass through their trading systems or which take place on the exchanges trading floor. REV exchanges (e.g. NASDAQ and LSE) count all transactions that are subject to their regulatory supervision, i.e. they count transactions included either in disclosures made by intermediaries to the market authority or in final settlement transactions performed by the subsystems. Thus they count transactions by members firms – and sometimes non-members – with no distinction between on- and off-market, and also transactions made into foreign markets that are reported on the national market.

3 Data

The study employs annual firm-, exchange- and country level data. The sample period used in the analysis is 1995-2009, which corresponds to the time period since the AIM market was established. We obtain annual firm level data from the Thomson One Banker data source, which incorporates the Datastream, Worldscope and other Thomson Financial databases. From these databases we compile annual reports data for both active and inactive firms listed on NASDAQ, NYSE, London Stock Exchange, Euronext and Deutsche Börse, as well as for private (non-listed) firms. The data identifies U.S. securities that are American Depository Receipts (ADRs), but we also cross-check and verify ADR indicators using three publicly available Citibank databases (the Universal Issuance Guide, the Capital Raising Database and the Trading Volumes Database), which we favor in cases of disparities between data sources. The data does not separate London Stock Exchange (LSE) listings between the Alternative Investment Market (AIM) and the LSE main market listings. Hence, we read through all LSE's monthly AIM reports issued in 1995-2009 to identify the SEDOL numbers of each AIM listed firm. For firms where no SEDOL number is reported, we attempt to look them up on-line for identification. We also use monthly AIM reports back to 1995 to manually note the dates of listing and delistings (and reason for delisting) for each AIM firm in this period in order to construct an entry and exit variable. We then merge the hand-collected AIM indicator sample with annual reports data for all London listed firms obtained from the OneBanker databases and remove main market listings and all double-countings from a sample of over 7000 securities entries. Lastly, the dataset includes entry and exit indicators for U.S. listed firms, but only exit variables for Euronext/Deutsche listed firms. For Euronext/Deutsche listed firms we therefore define the entry year to be the year in which no market value of the firm has been reported for at least 3 years back in time.

As the focus of the study is on the AIM market segment and relatively small firms, we exclude the largest set of firms from the sample. Firms that do not qualify for the sample are those with total assets value above \$5 billion (in year 2000 dollars) over the sample period, which corresponds to the asset value of the largest AIM listed firm.¹⁵ This procedure results in a sample of 7,491 firms from 54 different countries.

¹⁵ This restriction implies that the largest U.S. and cont. Europe firms are excluded from the sample, while all AIM listed firms are included (lowering this cutoff value would quickly render the sample too

There are 1,275 firms in the sample listed on AIM, 591 ADR firms in the U.S., 1,598 firms in continental Europe (Euronext or Deutsche Börse) and 4,027 private (non-listed) firms. The sample contains a total of 743 foreign firms listed in AIM, the U.S. or continental Europe, which is the primary sample of interest. The geographical origin of these foreign firms is shown in figure 5. Perhaps non-surprisingly, most foreign firms listed across these three locations originate from Western-Europe or North-America. Also, a large fraction of foreign AIM listed firms originate from the Pacific and China, whereas firms from Japan, Hong Kong and Singapore concentrate more on the U.S. market. Overall, the origin of foreign listed firms is reasonable diverse for the U.S. and U.K. markets, in contrast to continental Europe (Euronext and Deutsche Börse) where over 85% of foreign firms are from Western-Europe or North-America.

The paper also employs exchange level data (e.g. in figures 1-4 & tables 1-3) which is obtained from the World Federation of Securities Exchanges (WFE), the Federation of European Securities Exchanges (FESE), Oxera Consulting or directly from the exchanges. Country level data – such as GDP, population, exchange rates, inflation rates, financial regulation measures, etc. – is compiled from La Porta et al. (1998), Djankov et al. (2006) and the Economist Intelligence Unit (EIU) country database.

Summary statistics of key variables to be used in the empirical analysis is given in table 4. The data is inflation adjusted (base year is 2000) and variables are reported in dollars, in percentage terms (growth variables) or in ratios (Tobin's q , leverage, etc.). All variables reported in table 4 are winsorized at the 1st and 99th percentiles within each exchange. Tobin's q is defined in the standard way (market value divided by asset value), leverage is debt proportional to equity and ROA stands for the return on assets ($[\text{net income} + \text{interest expense}] / \text{total assets}$). Various measures that capture country characteristics are used, e.g. we apply the same legal rating measure as used by Doidge et al. (2007) and others before them. Specifically, we define the variable “legal rating” as the product of the anti-director-rights and rule-of-law variables obtained from La Porta et al. (1998) and Djankov et al. (2006). The anti-director rights variable is a measure of shareholder protection and the rule of law captures

small for detailed statistical analysis). Out of the entire sample, 65% of US firms and 55% of cont. European firms pass this restriction. This cutoff therefore increases the comparability of firms across exchanges to some extent, but U.S. and cont. Europe listed firms naturally remain larger on average. Thus it is still important to control for size in subsequent the regression analysis.

country risk in terms of enforcement of law and order. The resulting legal rating index ranges from 0-50, with higher values representing better shareholder rights and more law and order.

Table 4 shows that AIM listed firms have on average a higher Tobin's q ratio, which partly reflects the growth characteristics of this market segment (Tobin's q is to be analyzed in detail in section 4.3). This is consistent with relatively higher average growth rates of income, asset and sales among AIM listed firms. As expected, the relatively young group of AIM listed firms also experiences higher variation in these growth measures and they are lower in dollar levels.¹⁶ The book value of assets illustrates the difference in firm size across listing venues, which will be important to control for in the subsequent empirical analysis when investigating whether small firm size is associated with low quality (undesirable firm characteristics).

4 Empirical results

4.1 Listing

Recent literature has argued that U.S. stock exchanges have not lost their competitive edge since the rise in AIM listings is primarily due to an increase in small firms listings, which are suggested to be less desirable listings as they represent lower firm quality (Doidge et al., 2007; Chaplinsky and Ramchand, 2007). This section investigates whether firms that list on AIM have different characteristics compared to firms listing elsewhere and in particular if they are lower quality firms. As related literature, this paper will throughout refer to 'high quality firms' as those having generally desirable characteristics, such as high growth, high market valuation, low leverage, etc.

To examine firm characteristics across different exchanges we apply a multinomial logit analysis. The multinomial logit model simultaneously estimates the probabilities associated with each listing outcome. The multinomial logit is modeled as

¹⁶ Chaplinsky and Ramchand (2007) suggest that the low income of AIM listed firms signals low quality, but this is to be expected as these relatively young firms are investing in future growth and are experiencing relatively high income growth.

$$p_j = \frac{e^{X\beta_j}}{1 + \sum_{k=1}^J e^{X\beta_k}} \quad (1)$$

where p_j represents the probability of listing choice j , β is a vector of coefficients (which differ across listing choices) and X is a vector of covariates. The categorical dependent variable is equal to 0 if a firm is non-listed, 1 if a firm lists on AIM, 2 if a firm lists on an U.S. exchange (NYSE or NASDAQ) and 3 if a firm lists in continental Europe (Euronext or Deutsche Börse). The probability that a firm stays non-listed represents the base case and equals $p_0 = 1 / [1 + \sum_k \exp(X\beta_k)]$. Thus, the three listing categories of the dependent variable measure the probability of listing on a particular exchange relative to the choice of staying non-listed. Mathematically, this relative risk (or odds ratio) is represented by p_j/p_0 and can be shown to equal $\exp(X\beta_j)$. Hence, $\exp(\beta_j)$ gives the proportional change in this relative risk when a covariate changes by one unit (not marginal change). This is the estimate of interest, i.e. not the β coefficients themselves which are not directly interpretable.

Since the multinomial model is a cross-sectional model the independent variables are averaged over time. Also, to ease the interpretation of economic magnitudes, the independent variables are standardized by their standard deviation, implying that a unit change represents a one standard deviation change in the relevant variable. Thus, reported estimates will represent changes in the probability of listing associated with a one unit (one standard deviation) change in the regressor. Finally, since firms generally tend to list on their home exchange, the analysis is restricted to foreign firm listings. Thus, the analysis asks where high/low quality firms choose to list, provided that they do not list at home. As Zingales (2006) points out, studying foreign firm listings is also of greater relevance since foreign listings are the most sensitive to the costs and benefits of listing and are likely to respond immediately to any change in listing conditions.

Regression (1) in table 5 reports the proportional change in the relative risk ratio, $\exp(\beta_j)$, for a unit change in every independent variable. A relative hazard above (below) one corresponds to a positive (negative) effect on the listing probability relative to the choice of staying non-listed. More specifically, regression (1) documents the relation between the probability that firms are listed on a particular exchange and firms' asset level, asset growth, return on assets, leverage, legal rating,

country GDP and the size of firms' domestic stock market. Non-surprisingly, the results indicate that big firms (high asset value) are less likely to list on AIM, while larger firms tend to list on U.S. exchanges. Compared to private (non-listed) firms, European listings are more likely to be smaller in size, which is consistent with the summary statistics reported in table 4 (where private firms are on average bigger than public firms in continental Europe).

There are three key variables that proxy firm quality in table 5, namely the level of asset growth, the return on assets (profitability) and leverage.¹⁷ The results show that firms with high asset growth are significantly more likely to list on AIM than continue to stay non-listed. The same does not hold for other listing venues, where high growth firms are not more likely to list than to remain non-listed. Second, return on assets (ROA) is the ratio of net income to assets and captures how efficient firm management is at using its assets to generate earnings. The results indicate that firms with high ROA are more likely to list on AIM or continental European exchanges, compared to staying non-listed. The difference in listing probability among the three listing venues is statistically significant in all cases, as depicted in the last three columns of table 5. Third, highly leveraged firms are less likely to list on European exchanges, while there no indication that highly leveraged firms are less likely to list in the U.S., compared to remaining non-listed. The two significant coefficient estimates for the European exchanges (0.95 and 0.96) are also statistically different from the U.S. estimate (1.02). This implies that highly leveraged firms are also significantly less likely to list in Europe compared to listing in the U.S. Thus, it is worth emphasizing that there is no evidence that more indebted firms – which in theory are therefore closer to bankruptcy – tend to be heard on the relatively unregulated AIM market. In fact, they are relatively more likely to list on U.S. exchanges.

Lastly, as is standard in the literature the estimation in table 5 controls for home country characteristics (as opposed to firm characteristics). These are the home legal rating (shareholder protection and rule of law) of each foreign firm, the GDP in the home country and the size of the stock exchange in the home market. These variables are *not* meant to capture firm quality, but merely control for outside factors that may influence the foreign listing decision. We therefore refrain from any detailed

¹⁷ Note that market variables (such as Tobin's q) cannot be included since they do not exist for non-listed firms. Also, return on assets (ROA) relates to both firm income and (the highly correlated) firm sales. Since these measures are therefore inherently captured by ROA, we exclude them to avoid collinearity between covariates.

interpretation since these variables are of limited interest in this study, i.e. they are first and foremost included for control purposes. In short, compared to the choice of staying non-listed, the results show that firms originating in countries (i) with a favorable legal environment are less likely to list in continental Europe (opposite holds true for U.S. exchanges), (ii) with a high GDP per capita are less likely to list on AIM or in the U.S. and (iii) with large home stock markets are more likely to list in the U.S. or in continental Europe. Again, these (perhaps cloudy) variables do not reveal anything about actual firm characteristics, which is the focus of this study, but merely control for home country conditions which may influence the foreign listing decision of any – high or low quality – firm.¹⁸

Overall, the results do not indicate that the characteristics of AIM listed firms are less desirable than those of firms listing elsewhere. In other words, there is no systematic and unfavorable difference between the quality of firms choosing to list on AIM versus elsewhere, despite the AIM market being relatively unregulated and having lower listing requirements. It is certainly not the case that poor quality firms flock to the AIM market due to more stringent listing requirements elsewhere, which purpose is to keep out poor quality listings. Easy access to AIM generates the same (or better) firm quality, albeit smaller firm size. This is a key point, i.e. firms may be different in size and be from countries with different attributes, but other than that, the firms are similar across exchanges in terms of quality. If anything, one could argue that the AIM market segment attracts firms with more attractive characteristics compared to U.S. exchanges. Thus, this analysis does not support suggestions that despite the dramatic increase in AIM listings, other exchanges still outperform the London based growth market due to the different quality level of listings. In particular, small firm size does not imply low quality (undesirable firm characteristics).

Robustness

The robustness of these results are evaluated in table 6. The purpose of table 6 is not only to evaluate the sensitivity of our results, but also make them directly comparable to other papers studying the competitiveness of stock exchanges (e.g.

¹⁸ The relation between *country* characteristics and listing decisions is studied in detail in e.g. Fernandes and Giannetti (2010). For example, they show that shareholder protection and exchanges' market valuation do indeed affects firms' listing decision, justifying the inclusion of these variables in the model for control purposes.

Doidge et al., 2007; Chaplinsky and Ramchand, 2007). First, a multinomial probit model is estimated, which assumes that the data is normally distributed rather than following a logistic distribution as in the case of the multinomial logit estimation in table 5. Since this assumption implies that there is no simplistic expression for the relative risk ratio, regression (1) in table 6 instead reports changes in listing probabilities associated with a marginal change in covariates. Thus, positive (negative) estimate corresponds to a positive (negative) effect on the listing probability relative to the choice of staying non-listed. The results are effectively the same as in the multinomial logit case since all significant coefficients show the same pattern as in table 5. This further reinforces the result that AIM firms are (at least) of the same quality level compared to firms listing elsewhere.

Second, to further evaluate the robustness and soundness of the results, we also employ a Cox proportional hazard model to examine which firm characteristics predict listing across exchanges. This model has periodically been applied in related literature where the objective has also been to characterize firm listings (e.g., Pagano et al., 2002; Doidge et al., 2005, 2007). The model estimates the association of covariates with the probability of listing on an exchange in year t , conditional on not having listed yet. Using the same notation as before, the standard Cox proportional hazard model is

$$h(t | X, \beta) = h_0(t) \exp(X' \beta) \quad (2)$$

where $h_0(t)$ represents the baseline hazard rate at time t . Each type of exchange listing is analyzed in a separate Cox regression and thus the baseline hazard is naturally allowed to differ across listing venues. The dependent variable takes the value one in the year of foreign listing and zero otherwise. As in standard duration analysis, the observations that follow the event under study (listing on an exchange) are excluded from the analysis. As before, the β coefficients are not of primary interest, but rather the hazard ratios $\exp(\beta)$. These values measure the effect of changing a covariate by one unit (not marginally) on the listing probability, i.e. on the hazard ratio $h(t)/h_0(t)$. Thus, since covariates are measured in units of standard deviations, the reported hazard ratios can be interpreted as how a one standard deviation change in a covariate affects the listing probability. An estimated relative hazard ratio above (below) one corresponds to a positive (negative) effect on the listing probability, relative to the

choice of staying non-listed. Since the Cox model and the multinomial logit model are substantially different, it should come as no surprise if the results are not perfectly aligned. Thus, it is particularly reassuring that the results in table 6 indicate that most of the estimates are again consistent with the multinomial logit estimates. The only exceptions are non-significance of assets (firm size) for European exchanges (compared to non-listed firms) and high leverage no longer predicts firms to be less likely to list on continental European exchanges. Most notably, attractive characteristics (i.e. high growth/profitability and low leverage) still predict that firms are more likely to list on AIM. Thus, there is again no indication that lower quality firms list on the less regulated AIM market.

Finally, we repeat the multinomial logit estimation of table 5, where instead of using time-averaged variables we allow each variable to be time-variant. In other words, although the multinomial logit model is inherently a time-constant, cross-sectional model, we allow variables to be time-variant and thereby effectively consider each observation to belong to a different firm. For example, two separate observations (occurring at two points in time) for the same firm are taken to be observations for two different firms. This exploits the full panel, which provides more information and enlarges the sample size (the sample now includes 16,722 “firm observations”, up from 3,062 in table 5). Also, this specification includes time trends to measure variation in listing probability across time and standard errors are clustered on firms to take into account that errors for the same firm may not be independent across time. Although this change implies that the results are not directly comparable to the former specification, the results are nevertheless of interest. In short, all the predictions on AIM listing remain. Compared to the traditional (i.e. non-time-variant) multinomial logit model, the differences in estimates are that high leverage no longer predicts a less likely entry to continental Europe (consistent with the Cox model), and high profitability and high asset growth makes U.S. exchange listing less probable among small, foreign firms. Finally, the time trend is significantly positive for AIM and U.S. exchanges, indicating that for these venues listing has become more likely over time. Interestingly though, this trend is higher for the AIM market and the difference is statistically significant (not reported), indicating AIM listing has become more probable over time compared to other listing choices.

One can spend considerable more time contemplating over the economic interpretation of every coefficient in tables 5-6. However, the overall the message is

clear. To summarize this sub section, firms that list on AIM or of no worse quality levels (possess no less desirable characteristics) than firms listings elsewhere, despite being smaller in size. In short, controlling for size, the more leniently regulated AIM market attracts the same (or better) quality firms as other markets.

4.2 Delisting

In addition to analyzing where firms list – and how the quality distribution compares across exchanges – it is of equal interest to study whether firms stay listed at their preferred listing location. In particular, it is interesting to analyze which exchanges suffer from the highest number of delists and what are the characteristics (the quality level) of exiting firms across the different listing venues.

Unfortunately, the available data is not informative enough to give a full analysis of delisting decisions. In particular, the underlying reason for deciding to exit must be identified in order to produce a meaningful analysis of stock exchange delists. Specifically, comparing the number of delists across stock exchanges is of limited value since not all delists represent firm failure. For example, firms often voluntarily delist, even without being subject to the alternative of being kicked out. Also, successful small firms may merge to form new identities or decide to transfer from growth markets (such as AIM) to an exchange’s main market segment. Thus, a delist does not necessarily represent a negative event or signal low firm quality.

Firm level data on delisting reasons is only available to the authors for firms originally listed on the London AIM market (hand-collected from monthly AIM reports). This sub chapter is therefore restricted on analyzing AIM delistings, but nonetheless compares the results to evidence on other market segments presented by other studies. Thus the focus of this analysis will be to investigate how firms fare after a relatively effortless AIM listing procedure, keeping in mind that firms entering this market are of no lower quality than firms entering competing markets. Specifically, given the lenient listing requirement of AIM, do these firms manage to stay listed – or do lax listing requirements result in limited investor confidence and/or limited growth that ends in listing termination? Or is it the case that firms that delist do so for positive reasons and only initially undesirable, poor quality firms leave the market?

The data set contains approximately seven hundred delists from AIM which are broken down by delisting reason in figure 6. First, the figure shows that 7% of firms

delist from AIM in order to transfer to the LSE's main market. This is clearly a positive event as firms successfully reap the benefits of the growth market and move on to the larger and more liquid main market segment. Second, a sizeable fraction (22%) of firms delist due to merger and acquisitions. The AIM market segment refers to this merger category as 'reverse takeovers', since typically the listed firm takes over a (non-listed) firm that is relatively large in size, which calls for considerable restructuring within the listed firm. In particular, the main function of the firm may change when taking over a relatively larger operation and the firm will therefore change its identity. Also, a new board generally takes over (with members from the acquired firm) and new shares are issued by the newly established firm (e.g. to finance the takeover). Thus the originally listed firm is still open for business and effectively remains on AIM, although under another identity. Therefore it is hard to argue that these types of "delists" should be classified as negative events.

Third, the most common type of delist is voluntary exit. The exact reasoning for deciding to leave the market is not detailed further so it is hard to classify the nature of these delists. For example, although these firms are not officially kicked out, it cannot be ruled out that they 'quit to avoid being fired'. Thus, this category of delists partly remains a black box. However, in order to shed some light on this delisting category, we examine the stock return of the firms that report a voluntary delist. The analysis (not reported for brevity) indeed shows that 71% of firms that report voluntary delisting experience a statistically lower stock returns than firms delisting for other well established reasons (i.e. due to merger or transferral to the main market). This implies that the category of voluntary delists can be broken up into voluntary exists of firms with relatively bad stock returns (40%, our point estimate of 'firms quitting before being fired') and relatively good stock returns (16%, our point estimate of firms voluntarily quitting for legitimate reasons).

Finally, the remaining 15% of firms that delist from AIM do so for involuntary reasons. For example, a firm may fail to raise enough capital to be classified as a publicly held company, the firm may fail to keep a Nomad (see definition in ch. 2) at all times, a firm's Nomad may fail to comply with AIM rules (such as disclosure rules), etc. It is a particularly intriguing result that unambiguously negative delisting events are not more frequent. As Arcot et al. (2007) point out, such a low failure rate is particularly impressive if a large proportion of firms are early-stage businesses and/or are operating in high-risk industries, which is often the case for AIM listed

firms. Admittedly, the proportion of genuine failures may be higher if most voluntarily delists are due to low firm quality, as the stock return data indicates. Specifically, up to 65% of AIM delists (i.e. 15% + 40%) may therefore be classified as negative events. But even if that is that case, these figures are similar in other markets. For example, Chaplinsky and Ramchand (2007) present data on delistings from major U.S. stock exchanges, where delistings are categorized into three exit types; voluntary, involuntary and merger and acquisitions. They find that the proportion of delists due to mergers and acquisitions is 42%, while a sizeable 51% of foreign firms involuntarily delist from U.S. exchanges. They also conclude that the majority of voluntary delists (7%) appear to involve issues of low quality and poor investor recognition. This is in line with Doidge et al. (2008) and Fernandes et al. (2008) who find that a regulation change that made delisting from the U.S. easier, was followed by voluntary delisting among firms with relatively slow growth, low stock return and/or often had been targets of class action lawsuits or SEC enforcement actions. Overall, this evidence in the literature suggests that 51-58% of firms delisting from the U.S. are low quality firms, which implies that they either entered the U.S. as low quality firms or became low quality during their stay. Lastly, it is also worth noting that these studies report U.S. delistings in pre-crisis data, which is likely to sugar-coat the statistics in comparison to AIM delistings in the 1995-2009 sample period (repeating the analysis with pre-crisis AIM data reveals that only 37% of delists can be classified as negative events).

To better examine the characteristics of firms that leave the AIM market, we return to the multinomial logit analysis introduced in the previous sub section. The analysis is no longer restricted to only foreign listings, since once a firm is listed on a particular exchange there is no apparent reason why delisting decisions should differ across nationalities. In other words, the delisting analysis does not suffer from the problem of home bias in the same way as the listing analysis.¹⁹ The results are depicted in table 7, where firm exits are broken down across reported delisting reasons. The simultaneous equation estimation employs a categorical dependent variable which equals 1 if a firm delists in order to transfer to the London main

¹⁹ It is tempting to argue that foreign firms may delist if home conditions change. However, if home market conditions get better and foreign a firm now decides to list there, it still does not need to delist from AIM – so the decision to do so remains the same as for a domestic firm. Nonetheless, as an extra safeguard, the analysis still includes country level variables as control variables, but we do not explicitly interpret these variables as they provide little economic value in this setting.

market, equals 2 if a firm delists due to merger or acquisitions, equals 3 if a firm delists voluntarily with relatively good returns (legitimate exit), equals 4 if a firm delists voluntarily with relatively bad returns (quits before getting fired) and equals 5 if a firm delists for unambiguously involuntary reasons. The probability that a firm stays listed thus represents the base case.

First, the results in table 7 indicate that firms with high asset value and high asset growth are more likely to delist from AIM in order to transfer to the main market. This result is intuitive and conforms to the idea that firms that do well on AIM subsequently move to LSE's main market segment. Second, small firms (low asset level) with high asset growth are more likely to be engaged in mergers and acquisitions. Raising a lot of capital also makes M&A engagement more likely. This is fairly intuitive, i.e. that small and promising (high growth) firms that raise a lot of capital engage in 'reverse takeovers' (taking over a larger identity). Also, highly leveraged firms are less likely to be involved in a takeover, which is non-surprising since typically they do not have the financial means to do so. Third, firms that exit voluntarily with relatively good stock returns (compared to firms merging or transferring to the main market) tend to have high asset growth. Notably, firms with good stock returns that exit voluntarily do not possess negative firm characteristics, suggesting this delisting category is not associated with firm failure. Fourth, firms with high profitability are less likely to delist voluntarily (if also having relatively low stock returns). Rephrasing this statement, firms with low profitability are more likely to belong to the group of voluntarily delisting firms with low stock returns. This supports the idea that this delisting category is associated with firms that potentially decide to leave rather than eventually being forced out due to bad performance. Raising a lot of capital also makes voluntary, low return exit more likely. This is also the case for the involuntary delisting firms. Furthermore, both categories have high coefficients on leverage (statistically significant for involuntary exists) implying that highly indebted firms are more likely to exit in these negative delisting categories. These results likely reflect the need of financially distressed firms to raise capital, either through increased debt or share issuing. Lastly, firms that have low levels of assets are more likely to belong to the group of involuntary delistings or voluntary delisting firms with low stock returns. Thus, particularly small firms (i.e. the smallest firms in this small firm sample) are more likely to genuinely fail and exit AIM.

To examine the robustness of these results we again employ the multinomial probit model, the Cox proportional hazard model and the time-variant version of the multinomial logit model. The overall results are very much aligned with the intuitively appealing multinomial logit results. Thus they provide limited added value to the results presented in table 7 and are therefore omitted to conserve space (available upon request).

In sum, the evidence on delisting indicates that genuine failures are not more frequent among AIM listed firms compared to other markets. This is particularly interesting given the lenient regulation environment of AIM. The comparable failure rate is also consistent with the result that firms listing on AIM are of no lower quality than firms listing elsewhere. The multinomial logit analysis – which identifies the characteristics of delisting firms – provides intuitively appealing results where the characteristics of delisting firms are well aligned with the stated reason for delisting.

4.3 Valuation premium

The two preceding sub sections evaluated the characteristics of firms that enter or exit competing market segments. In contrast, the subsequent analysis evaluates how firms fare during their listing period, which may help shed light on why they choose one particular exchange over another in the first place. Specifically, sub chapters 4.3 and 4.4 study on which listing venue firms tend to have higher stock valuation and raise more capital, respectively.

This sub section examines stock valuation of listed firms. Stock valuation is measured in terms of Tobin's q (mkt.value/assets), where a high Tobin's q reflects investors' beliefs that a firm has potential to take advantage of available growth opportunities with the current level of resources. To measure relative valuation differences across exchanges we regress Tobin's q on indicator dummies that capture where firms list – controlling for variables that are likely correlate with firms' market values and thereby Tobin's q . Such controls include growth variables that are partly predictive of future performance, i.e. here we specifically include sales growth, asset growth and income growth as control variables. Also, since firm distribution across industries is different between exchanges – and some industries typically have higher growth potentials than others – the regressions control for the average within-industry q for each firm. The exchange dummies should thus capture unexplained valuation

differences, i.e. the relative listing premiums at one exchange relative to another. This methodology has become standard practice when evaluating valuation premiums across exchanges (see e.g. Doidge et al., 2007; Gozzi et al., 2008).

Table 8 shows the relative valuation (listing) premiums across exchanges, where Tobin's q is the dependent variable in every regression and other variables are as defined in table 4 (summary statistics). The control sample consists of firms listed in continental Europe (Euronext and Deutsche Börse) and the relative listing premiums for AIM and U.S. listed firms are captured by binary dummy variables. In other words, the time-constant dummy variables "AIM listed" and "U.S. listed" equal one if a firm is listed accordingly – thus capturing the relative differences in valuation premium across exchanges. As before, the analysis focuses on foreign listings and we only consider years where all listing venues have at least 10 foreign listings with data entries on both q ratios and all covariates.²⁰

Panel A presents the main results of table 8. Regression (1) reports results of running a pooled OLS on the panel, where year fixed effects are included to capture time variation in listing premiums. Thus, after controlling for other covariates, the exchange dummies identify the cross-sectional differences in Tobin's q across firms (exchanges). The results show that AIM listed firms have a very high and statistically significant listing premium relative to the control sample, i.e. continental Europe listed firms. In contrast, U.S. listed foreign firms do not have a significantly higher listing premium than continental European listed firms. The relative difference between the AIM and U.S. listing premium is also calculated and presented in the last row of the table, indicating that the valuation premium of AIM listings is also significantly higher vis-à-vis U.S. listings. Thus, controlling for industry and future growth indicators, foreign firms listing on AIM tend on average to be more valued by investors in terms of Tobin's q than foreign firms that are listed in either continental Europe or in the U.S.

As a sensitivity analysis we rerun regression (1) using a random effects specification, which takes account of any potential unobserved heterogeneity across firms.²¹ The regression confirms earlier conclusions, i.e. the relatively higher listing

²⁰ This holds for AIM in 2001 and every year thereafter. Note that using longer periods for U.S. or continental Europe exchanges may distort the comparison of results across exchanges if the listing premium was generally higher (lower) across all markets before this period.

²¹ The random effects model (and the between estimation presented in column 9) allows for unobserved heterogeneity across firms, but also assumes that this individual heterogeneity is distributed

premium of AIM listed firms compared to both U.S. and continental Europe listings. Also, in order to better capture the cross-sectional variation across firms, regression (3) presents a between estimation which also allows for unobserved heterogeneity across firms, but only uses cross-sectional variation in obtaining coefficient estimates.²² The results confirm the presence of cross-sectional differences across firms, i.e. there is a relatively higher listing premium for AIM listed firms than U.S. listed firms.

The last two panels of table 8 analyze this result in more detail. First, we break down regressions (1)-(3) by examining whether the overall premium of AIM listed firms is consistently higher throughout the sample period – or if other listing venues perhaps also experience a relative valuation premium at some points in time. In particular, firm values changed dramatically during the 2007-09 financial crisis and the valuation change may have been more pronounced for particular exchanges (such as those with looser regulations and listing requirements). To investigate this, panel B repeats panel A, but now splitting the sample into a pre- and post-crisis period. The results indicate that AIM listed firms have on average higher q ratios than continental Europe listed firms in the pre-crisis period, while the premium disappears during the financial crisis. Thus, firms listed on the less regulated AIM market tend to have higher valuations only in ‘normal’ or prosperous periods, but not in distressed ones. A similar result holds true when the comparison is made to U.S. listed firms (depicted in the last row). However, it is not the case the AIM firms fare worse during the financial crisis, i.e. there are no significant differences in valuation premiums across exchanges during this period. Thus, even though times of financial distress may affect

independently of the regressors (e.g. one firm having more ability is not correlated with its income growth). This is admittedly a questionable assumption in this setting and thus the corresponding results should be viewed purely as providing an additional sensitivity analysis to the pooled OLS estimation, rather than an extension or direct improvement thereof. It could also be noted that here the fixed effects model, which does not make this assumption, is not viable since it eliminates all cross-sectional variation – which the variation of interest in this case (and this would also wipe out the time-constant exchange dummies).

²² In more detail, this estimator is equal to an OLS estimation which measures the variation of group means (means within each firm, i.e. means of observations over time for each firm) around the overall means (mean across all observations, i.e. observations for all firms at all times), which mathematically can be represented as $\bar{x}_i - \bar{\bar{x}}$. Thus, this estimator effectively discards the time series information in the data set and only uses variation between the cross-sectional observations. Hence it is no longer meaningful to include yearly dummies in our regression. In general, the between estimator, random effects estimator and pooled OLS estimator are inconsistent if there is unobserved individual heterogeneity that is correlated with the covariates, otherwise they are consistent and the random effects estimator is efficient.

AIM firms more adversely, those firms are still no worse of (in terms of Tobin's q) during these periods than firms listed at more tightly regulated exchanges.

Finally, we examine the dynamics of the valuation premium over the life cycle of the average AIM listed firm. More specifically, given that the listing premium on average tends to be higher for AIM listed firms (i.e. in the non-crisis periods) it becomes of interest to know when this valuation effect is realized for the firm. More precisely, when in the life-cycle of the listed firm does this premium arise? Also, the premium is expected to subside at later stages in the firm's life-cycle and it is of equal interest to examine the timing of this subsequent decline. More specifically, after a valuation premium has been obtained, theory suggests that it should subsequently fall as firms take advantage of growth opportunities (see e.g. Li et al., 2008), i.e. a initially high q should decrease over time as this temporary effect wears out. For example, Gozzi et al. (2008) show that listing premiums decline following so-called 'internationalization' events, which are defined as cross-listing, issuing depositary receipts or raising equity abroad. These events can be thought of as a start of a firm's growth stage and they show that any existing valuation premium disappears beyond two years following such an event.

The dynamics of the AIM valuation premium are shown in panel C where dummy indicators are included to capture the evolution of the listing premium. More specifically, for every AIM listing firm the dummy variable "AIM listing year 0-1" equals one in year of listing and the following year; the dummy variable "AIM listing year 2-3" equals one in the second and third year of listing; and the last dummy (">3 years after AIM listing") equals one in subsequent listing years. The regression equation is estimated using the same techniques as in panels A and B. However, to avoid biased estimates in the timing of the valuation premium, the analysis now only includes firms that have stayed listed throughout the whole sample period. This is because delisting firms are likely to have relatively low valuations and systematically drop out of the sample at specific times in the life cycle of the firm. For example, if investors can identify low quality firms after they have been listed for a year or two, then such firms may exit systematically at that time (or soon thereafter). This would bias the estimates of the cross-sectional average of the valuation premium downwards in early listing years (e.g. 0-1 years after listing) and upwards in later listing years (when such firms have dropped out). Also, the 2007-09 crisis period is naturally

excluded as the relative AIM listing premium is non-existent in those years (as shown in panel B), making a more detailed analysis thereof meaningless.

Panel C indicates that the AIM premium is only significant at time of listing in the random effects specification, while it is never significant two or more years after listing.²³ A more interesting result is the noteworthy time pattern of the listing premium that arises for the average firm. In particular, the premium peaks only once firms have been listed for 2-3 years. According to theory, this implies that growth opportunities, which are reflected in a high q ratio, are maximized on AIM 2-3 years after listing. The premium then subsequently drops – as predicted by theory – as firms take advantage of growth opportunities. But all methods come to the same intriguing result that the AIM valuation premium does not peak at listing, but rather 2-3 years after listing at the exchange.

This pattern in the AIM valuation premium deserves a brief discussion and reasoning. This result implies that AIM investors may not value newly listed firms as highly as firms with longer listing experience. This differs from other studies that show (for different firm samples) high valuation at time of listing which subsequently declines (see e.g. Gozzi et al., 2008). One can speculate whether firms listing on the relatively less regulated AIM market – which has particularly lenient admission criteria – must establish at least a two year track record to prove to investors that they are good quality firms. Such an explanation is *partially* consistent with the “bonding hypothesis” put forward by Coffee (1999), which argues that a relatively strict regulation environment signals good attributes of those firms that manage to list at such venues. More precisely, the idea of the bonding hypothesis is that managers can bond themselves not to divert excessive private benefits to themselves by deliberately subjecting themselves to stricter regulatory standards. Also, a firm can go through tough listing requirements to advertise itself as good quality and thereby gain access to relatively low cost equity. Thus, the hypothesis effectively implies that firms listed

²³ Note that this is not inconsistent with earlier results. First, panel C estimates cannot be directly compared to panel A and B since the control sample is different (in panel C both U.S. and Europe listed firms serve as a control sample). Second, the relative lack of statistical significance (relative to e.g. panel A) merely means that there is considerable variation in the evolution of the listing premium across different AIM listing firms. More specifically – although there is on average a valuation premium for AIM listed firms (as shown in panel A) – the premium displays high variation (high standard errors) across AIM listed firms in individual stages of firms’ life cycles, which makes coefficients for individual periods in the firms’ operating lives insignificant. But when an average is taken across the whole life cycle of the average AIM listed firm, the premium becomes significant (as shown in panels A and B).

on more regulated exchanges should have higher listing premiums at the date of listing compared to firms listing on less regulated exchanges. On the one hand, this hypothesis is not fully supported since the relative AIM premium is positive at time of listing, but on the other hand this reasoning may nonetheless help explain why the AIM premium peaks 2-3 years after listing. More specifically, investors may be hesitant to invest in firms from exchanges that have a relatively lenient regulation environment (such as AIM) – i.e. firms that therefore have not sufficiently signaled their quality level by merely obtaining such a listing status. Thus a favorable valuation will not occur until at a later stage when the quality level of firms has been convincingly established (e.g. after two successful listing years) and investors start to recognize the potential future growth prospects of good quality firms. However, although this reason is quite plausible, we refrain from making conclusive statements given the lack of statistical significance.

To briefly summarize this section, controlling for industry and future growth indicators, foreign firms listing on AIM are on average more valued by investors in terms of Tobin's q than continental Europe or U.S. listed foreign firms. However, this valuation premium only exists in non-distressed times – although AIM listed firms still do not fare worse during crisis periods than U.S. or continental Europe listed firms. The AIM premium peaks a couple of years after the listing date, which is intuitively consistent with lenient listing criteria on AIM and the resulting need for firms to establish a sound track record in order to convince investors of their abilities (their quality level).

4.4 Capital raised

This section analyses where small firms have been the most successful in raising capital. Foreign firms seeking to raise capital are of particular interest when comparing the attractiveness of different listing venues. For example, Zingales (2006) argues that those firms that are most sensitive to the costs and benefits of listing in different markets are global IPOs, i.e. firms that go public and raise capital in a market other than their domestic market. Also, studying capital raising activity among small firms is of further interest since the ability to raise capital is a particularly important determinant in the listing decision of small firms, as they are typically more exposed to an outstanding need to finance available growth opportunities. For

example, Arcot et al. (2007) argue that the attraction of AIM is that it enables companies to raise small amounts of capital (compared to other exchanges) through IPOs from institutional investors who are likely to support further fund-raising rounds. Zingales (2006) also notes that in 30% of cases where U.S. firms choose to list their stock on AIM, the firms' CEOs state a reason for doing so is to have access to institutional investors. Consistent with these observations, institutions own about half of the shares in all AIM companies and they account for at least 75 per cent of capital raised through IPOs and secondary equity issues (Canaccord Adams, 2006, London Stock Exchange, 2007; Arcot et al., 2007).

Table 9 reports the proportion of sample firms that raise capital in an average year and the average amount raised per firm. The table shows that 56% of small firms listed on AIM raise capital in an average year, either through IPOs or further secondary issues. This exceeds the proportion of small firms raising capital on both U.S. and continental Europe exchanges. But since AIM listed firms are on average smaller than firms listed elsewhere, the absolute amounts raised by individual firms on AIM are naturally lower. However, these amounts are of much greater relative importance. Specifically, AIM listed firms raise funds that on average correspond to 9.7% of the book value of their total assets, which is far above the proportion raised by U.S. (2.4%) or continental Europe (3.1%) listed firms. As indicated in table 9, the difference is strongly and statistically significant.

The overall results remain unchanged when restricting the sample to foreign listings. More specifically, a larger fraction of foreign firms listing on AIM raise capital in an average year compared to firms elsewhere and the amounts are again proportionally higher. Also of interest is the fact that foreign firms on AIM raise considerably more capital than AIM firms in general, i.e. they raise about 2.5 percentage points more (from 9.7% to 12.2%) which is a statistically significant difference (not reported). This suggests that AIM is particularly attractive for foreign firms seeking to raise capital.

To take the analysis one step further, we also attempt to evaluate whether there is empirical evidence of the previously mentioned bonding hypothesis.²⁴ As with the analysis of the valuation premium, we again find only partial (and rather weak)

²⁴ As a reminder, the bonding hypothesis states that controlling shareholders will limit themselves in their ability to extract private benefits from the corporations they control when listing in strict regulatory environment like the U.S – implying that listing in the U.S. signals firm quality.

evidence in support of the bonding hypothesis. In principle, the hypothesis would predict more capital to be raised on more regulated exchanges where a listing status signals better firm quality, but this is not the case as AIM listed firms raise considerable higher proportional amounts. However, there is nevertheless some indication that investor perception of firm quality may matter and listing on more heavily regulated exchanges can partly address a negative firm image. More specifically, investors may be particularly wary of firms from less investor friendly countries – e.g. countries characterized by poor shareholder protection rights and low levels of law and order. Therefore the bonding hypothesis implies that it should be particularly beneficial for firms originating from such countries to signal their capability by listing in foreign markets which provide more stringent regulatory environment. In other words, such firms should be better off listing on e.g. U.S. exchanges rather than on exchanges that require loose admission criteria (such as AIM), which invites investor wariness and may potentially lead to less capital being raised. The last part of table 9 *partly* confirms this argument where the sample is restricted to small, foreign firms from countries with low legal regime ratings.²⁵ Namely, the proportional amount raised on AIM is now lower compared to other foreign AIM listing firms (from 12.2% to 10.5%), while the figure actually increases for U.S. listed firms (from 2.7% to 5.6%). The increase in the proportional amount raised for U.S. listed firms is statistically significant (not reported) and is consistent with the hypothesis that more stringent listing requirements may help to signal good firm quality. The same pattern holds true when comparing AIM listed firms to those listed in continental Europe, where the difference in proportional amounts raised (10.5% vs. 7.1%) is no longer significant. Thus, there is partial evidence in support of the bonding hypothesis in the sense that investors' skepticism may to some extent be addressed by listing in a relatively highly regulated environment. But on the other hand, one still cannot conclude that firms raise less capital overall on less regulated exchanges, i.e. fulfilling more stringent listing requirements does not necessarily translate into more capital being raised – even for firms that may face an image problem due to their country of origin. In other words, firms raise at least the same

²⁵ These are firms with low “legal ratings”, defined in table 4 as the combination of indicator variables covering shareholder protection rights and countries’ law and order (ranging from 0 to 50). More specifically, this restriction includes only firms where the variable “legal rating” is lower than 25, which holds true for a quarter of the sample.

proportional amounts of capital – and avoid more paperwork – when listing on the AIM market segment.

Finally, it should be underlined that although the amounts raised on AIM are lower in absolute terms than elsewhere, they are nonetheless of real economic importance. The amounts of capital raised through IPOs over the relatively short life span of the AIM market segment sum up to 33 billion pounds. Another 33 billion have been raised through further equity issues (London Stock Exchange, 1995-2009). The amounts raised have been steadily increasing and to put the importance of these figures into proper perspective, the amounts raised on AIM have risen to 50% of the total value raised on LSE's main market segment. The AIM market segment has therefore become a large and significant portion of the LSE's market model.

5 Concluding remarks

The paper finds that firms listing on AIM are of no lower quality than similar sized firms that choose to list in the U.S. or in continental Europe. This is despite the loosely regulated market environment of AIM. Also, a considerable fraction of firms delisting from AIM do so for non-negative reasons and the proportion of delistings which can be classified as failures is comparable to the involuntary exit rate at other exchanges. AIM listed firms also tend to have a relatively higher valuation premium than firms listing elsewhere and raise relatively more capital.

It should be stressed that these results are complementary to earlier studies – they can e.g. easily be reconciled with studies that find that U.S. exchanges are maintaining their competitiveness. For example, Doidge et al. (2007) argue that U.S. exchanges maintain their competitiveness since firms with a given set of characteristics (such as being big) still list in the U.S. In other words, U.S. exchanges still attract the same type of listings as in the past and the impressive performance of AIM is explained by a change in the customer pool. But defining competition more broadly, we note that the U.S. exchanges have become less competitive in the sense that other markets have caught up and attracted firms with other characteristics (most notably small firms). In other words, in our study the failure to adapt and grab part of

the small firm customer base is in itself a lack of competitiveness.²⁶ Specifically, AIM has outperformed other exchanges in terms of attracting small firms – which are of no lower quality than small firms listing elsewhere – and AIM has managed to provide them with higher valuation and more potential for capital raising.

A final issue that should be addressed is whether we should really care about these results? That is – even though small firms that list on AIM are of decent quality and fare well – is the success of these small firms and their listing venue of any economic importance?

First, the previous section mentions that the amounts of capital raised over the relatively short life span of AIM total around 66 billion pounds. These amounts are of course non-trivial for setting up and investing in small or medium sized enterprises, which may potentially avoid listing in more stringent regulation environments of other exchanges. Moreover, the annual amounts raised on AIM have risen to 50% of the annual value raised on LSE's main market segment. This has contributed considerably to LSE's overall growth and has occurred simultaneously to a fall in amounts raised on U.S. exchanges. For example, Zingales (2006) notes that in 2000 \$55 billion were raised in the U.S. by 100 foreign firms, which five years later had dropped to \$5 billion raised by 34 foreign firms. Further, to better put this trend into perspective, the total value of London IPOs (main market and AIM) exceeded that of NYSE and NASDAQ combined for the first time in 2006 (McKinsey, 2008).

In addition, it is worth reemphasizing that listing fees, trading fees and affiliated payments, which increase with the number of firm listings – big or small – are an important source of income for stock exchanges (see e.g. figure 4). The immense increase in the number of small firm listings and the growth of the AIM market segment is therefore of great economic importance to the London Stock Exchange. Furthermore, the overall success of LSE as a financial exchange is also vital to the employment and GDP of the U.K. economy. The Economist (2007) estimates that the

²⁶ More specifically, Doidge et al. (2007, p.2) state that for "... the purpose of our analysis, we regard [an U.S. exchange] as having become less competitive if it no longer attracts listings it would have attracted in the past". In particular, they show that "the typical firm that lists on AIM is a small firm that would not have listed on an U.S. exchange either in 1990s or in more recent years." However, this particular definition of 'maintaining your competitiveness' is questionable. Competitiveness can be regarded as not only being able to keep current customers but also grab a new or changing customer base. To use an analogy, although IBM has maintained a large customer base among corporate clients ("big customers"), it can hardly be considered being as competitive as before the rise of Apple, which entered the market and managed to grab a dominant share of a new (changing) customer base of individuals and households.

financial services in London contribute around 350,000 jobs to total employment and 13% towards U.K. GDP. Although the AIM market segment only contributes to a small fraction of these total figures, its contribution is still highly relevant. For example, Arcot et al. (2007) estimate that the income AIM generates – based on fees generated by IPOs and further equity issues, together with payments to lawyers, accountants and other advisers – is running at about 1 billion pounds per year, of which about half comes from foreign firm listings.²⁷ Also, small firms that fare well on growth market segments are likely to become the big firms of the future, which will later amplify their contributions to the local exchange and the economy. Consistent with this notion, a decent portion of AIM firms subsequently transfer to the main LSE market. Thus it is clear that AIM is not only of real economic importance for the firms listing on this market segment, but attracting these small firm listings is very valuable to the London Stock Exchange and the overall U.K. economy.

Finally, the results presented in this paper are important since they have noteworthy policy implications. Specifically, the results imply that the justifications for very strict listing requirements are questionable. For example, even though the paper finds partial evidence in support of the bonding hypothesis (Coffee, 1999), the paper nonetheless questions the overall notion that strict regulation environment will necessarily facilitate stock market prosperity. In other words, our results merely indicate that bonding may potentially affect the timing of valuation premiums (not their existence) and the relative amounts of capital raised across firm types (not across exchanges). In general, the results suggest that heavier regulation may invoke more trust in listed firms, even though heavier regulation does not necessarily imply better firm outcomes. This is consistent with the results of Jenkinson and Ramadorai (2008) who analyze the consequences of firms switching from LSE's main market to the AIM market segment. This is found to be associated with a negative effect on stock returns at announcement, while there is a longer-term upward drift in returns. Our results are also in line with the conclusions of Zingales (2006), who argues that to make U.S. capital markets more competitive, the main area of intervention is more cost-effective regulation (not more regulation per se). The AIM market segment

²⁷ Also note that this is likely to be a conservative estimate since it excludes – for example – subsequent trading revenues, indirect benefits in terms of payments to market analysts, IT service providers, the facilitation of entrepreneurship in small enterprises, etc. Also, small firms list not only to raise capital or to realize direct monetary gains, but also due to indirect benefits such as increased reputation. This may e.g. help firms to attract good employees, etc. It is therefore hard to put a number on the total indirect benefits.

entered the exchange industry with this exact principle in mind, i.e. to offer exchange listing in a relatively flexible regulation environment. The results of our paper also empirically confirm theoretical models revealing that competition among exchanges does not lead to *excessively* low standards ('race to the bottom') in an attempt to attract customers (e.g. Santos and Scheinkman [2001], and Chemmanur and Fulghieri [2006]). After all, the AIM market segment has managed to attract small, high quality firms despite a relatively non-restrictive regulation environment. Furthermore, many of the new AIM listings in fact comply with American listing regulations (Economist, 2007; Zingales, 2006), but nonetheless choose to list on AIM. Thus, we question the importance of the legal bonding mechanism, in line with e.g. Stiegel (2005) who instead argues that in developed countries the overall group of analysts, institutional investors, auditors, investment banks, media, etc., may provide stronger bonding devices than regulation enforced by courts.

To conclude, the observed success of AIM is well-founded. No other growth market has managed to attract as many small, high quality listings. In fact, competing growth markets in Europe have at most 13 non-domestic firm listings (see table 1). Stock exchanges around the world have taken full notice of this and e.g. the Tokyo Stock Exchange is now launching a market segment for Asian start-up companies that is to mimic the AIM market model. Another example is Spain's small-cap exchange (Mercado Alternativo Bursátil, MAB) which started in 2009 and is viewed to be particularly important given the virtually non-existence of venture capital in Spain (see e.g. The Economist, 2009b). Whether U.S. capital markets will take an active part in this battle of the bourses for small firm listings remains to be seen. But on a global scale it is likely that the fight for small firm listings will continue to exacerbate, especially if small firms are not falsely viewed as less desirable exchange listings.

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Figure 1. Number of Firms Listed, 1995-2009

The figure shows the total number of firms (domestic and foreign) listed on each exchange over the period 1995-2009. The number firms listed on LSE are shown separately for the main market segment and the AIM growth market. There is no information available on the number of foreign listings in Deutsche Börse prior to 1999 or for Euronext in 2001-02. The Euronext exchange was created in 2000 by the merger of the national stock exchange of Belgium, France, Netherlands and Portugal. The observed fall in Euronext listings is therefore partially overvalued as some firms were cross-listed across these markets prior to the merger, which artificially reduces the number of listings. The figures for the NASDAQ and NYSE conglomerates only include firms listed in New York, not those listed in their European subsidiaries (OMX and Euronext). Also, LSE main market excludes firms originally listed on Borsa Italiana (the two exchanges merged in 2007). Similarly, NYSE listings exclude firms originally listed on AMEX (the two exchanges merged in 2009). Source: World Federation of Exchanges and Federation of European Securities Exchanges.

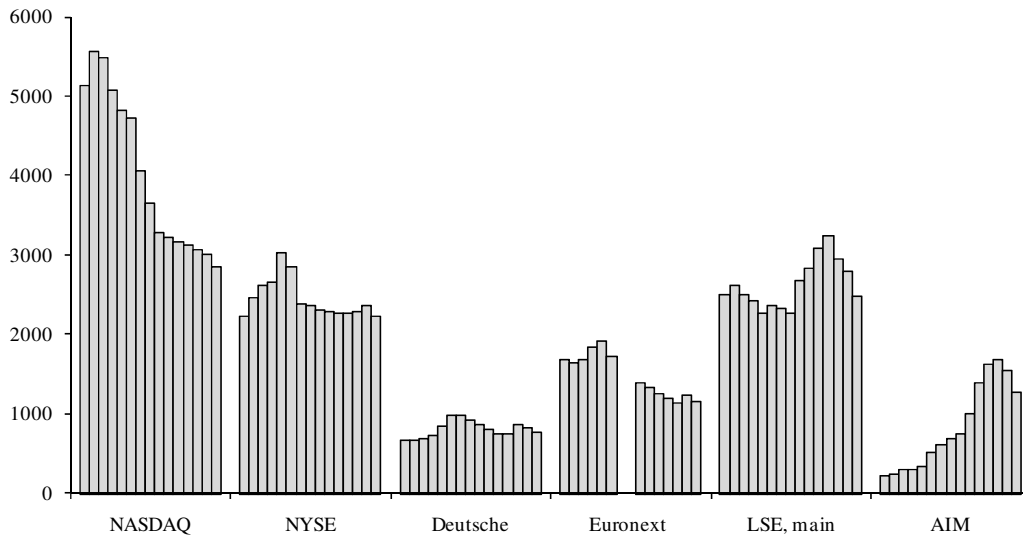


Figure 2. Number of Foreign Firms Listed, 1995-2009

The figure shows the total number of foreign firms listed on each exchange over the period 1995-2009. The number firms listed on LSE are shown separately for the main market segment and the AIM growth market. There is no information available on the number of foreign listings in Deutsche Börse prior to 1999 or for Euronext in 2001-02. The Euronext exchange was created in 2000 by the merger of the national stock exchange of Belgium, France, Netherlands and Portugal. The observed fall in Euronext listings is therefore partially overvalued as some firms were cross-listed across these markets prior to the merger, which artificially reduces the number of listings. The figures for the NASDAQ and NYSE conglomerates only include firms listed in New York, not those listed in their European subsidiaries (OMX and Euronext). Also, LSE main market excludes firms originally listed on Borsa Italiana (the two exchanges merged in 2007). Similarly, NYSE listings exclude firms originally listed on AMEX (the two exchanges merged in 2009). Source: World Federation of Exchanges and Federation of European Securities Exchanges.

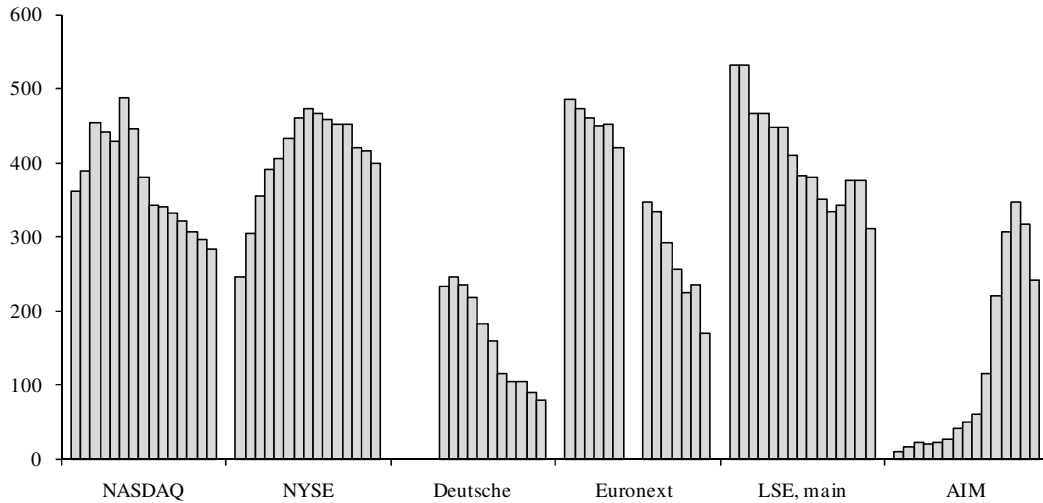


Figure 3. Market Value of Exchanges, 1995-2009

The figure shows the total market value of all firms listed on each exchange over the period 1995-2009 (with the 2009 displayed explicitly). The market value of listed firms on LSE are shown separately for the main market segment (London) and the AIM growth market. The figures for the NASDAQ and NYSE conglomerates only include firms listed in New York, not those listed in their European subsidiaries (OMX and Euronext). Also, LSE main market excludes firms originally listed on Borsa Italiana (the two exchanges merged in 2007). Similarly, NYSE listings exclude firms originally listed on AMEX (the two exchanges merged in 2009).

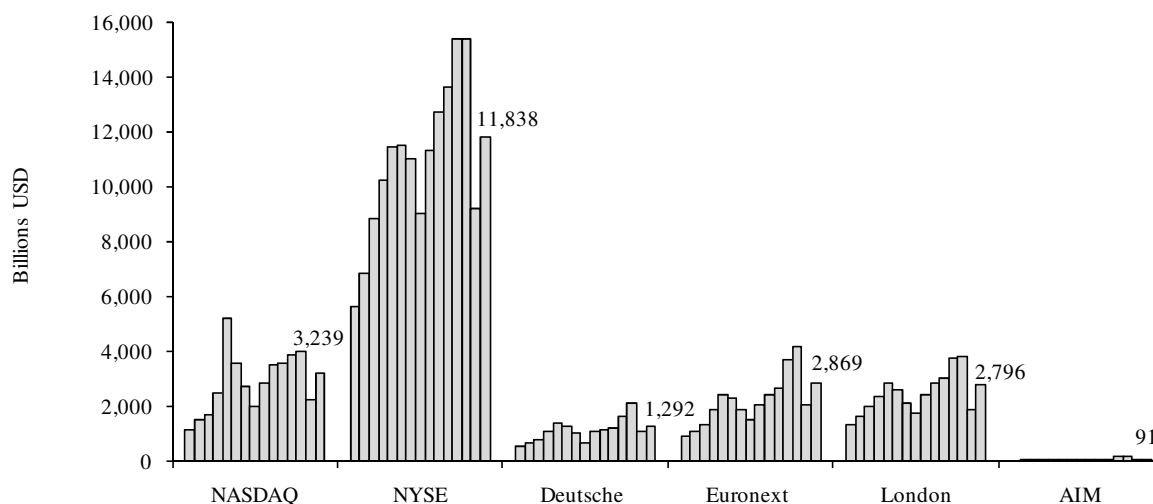


Table 1. Number and Size of Firms on Junior Exchanges

The table lists the total number of domestic and foreign firms listed on the main 'junior' market segments (growth markets) in the world in December 2009. Also shown is the total market capitalization in USD millions of all firms on each exchange, as well as the average (mean) market value per firm. Source: World Federation of Exchanges.

Location	Exchange	Number of companies			Market Capitalization (\$m)	
		Domestic	Foreign	All firms	All firms	Average firm
London	AIM	1,052	241	1,293	91,445	71
Germany	Entry Standard	103	13	116	12,076	104
Euronext	Alternext	115	10	125	5,997	48
Italy	Mercato Expandi	6	0	6	208	35
Ireland	Irish Enterprise	24	1	25	2,314	93
Nordic (OMX)	Investor & NM List	126	3	129	2,894	22
Toronto	TSX Ventures	2,375	0	2,375	34,624	15
Hong Kong	Growth Enterprise	174	0	174	13,546	78
Korea	KOSDAQ	1,020	6	1,026	73,938	72
Singapore	SESDAQ	98	36	134	3,793	28
Tokyo	Mothers	183	2	185	15,939	86
Total		5,276	312	5,588	256,774	59

Table 2. Market Regulation and Listing Requirements

This table summarizes market regulations and listing requirements across exchanges. The parallel market segments for Euronext, Deutsche Börse and LSE are, respectively, Alternext, Neuer Markt and AIM. The NYSE main market refers to minimum requirements that need to be met by non-US firms to qualify for a ‘worldwide’ listing (based on a so-called ‘pure valuation test’) as opposed to less stringent requirements for a ‘domestic’ listing which is outlined here under the parallel market segment. The NASDAQ main market refers to the NASDAQ National Market and the requirements are those for standard 1 listing (standard 2 and 3 are more stringent). The NASDAQ parallel market refers to the NASDAQ Capital Market, which is NASDAQ’s market segment for small-cap stocks. GAAP stands for “Generally Accepted Accounting Principles”, AMF stands for “Autorité des Marchés Financiers” and IAS stands for “International Accounting Standards”. Sources: Gajewski and Gresse (2006), Canaccord Adams (2006), Doidge et al. (2007), MacNeil and Lau (2001) and websites of individual exchanges.

Listing location	Main (senior) market segment	Parallel (junior) market segment
Euronext	<ul style="list-style-type: none"> - At least 25% of shares distributed to the public - Audited accounts filed at least 3 years prior to listing 	<ul style="list-style-type: none"> - No requirement on size, sector, growth. - At least 2 years of existence <p>With public offer</p> <ul style="list-style-type: none"> - Float at least 2.5mill Euros - Prospectus approved by AMF <p>Without public offer:</p> <ul style="list-style-type: none"> - No float requirement - Offering circular with no authority approval
Deutsche Börse	<ul style="list-style-type: none"> - At least 25% of shares distributed to the public - Audited accounts filed at least 3 years prior to listing - Market value of at least 1.25mill. Euros - Financial reporting in accordance with German standards 	<ul style="list-style-type: none"> - At least 10,000 shares distributed to the public - At least 3 years of existence - Audited accounts filed at least 1 year prior to listing
LSE	<ul style="list-style-type: none"> - At least 25% of shares distributed to the public - Audited accounts filed at least 3 years prior to listing - Market value of at least 700,000 GBP - Financial reporting in accordance with UK GAAP, US GAAP or the IAS. 	<ul style="list-style-type: none"> - No requirement on size, sector, growth, age, floating capitalization. - Admission only subject to approval of nominated adviser in charge of the IPO. - Disclose half-yearly and annual reports according to US GAAP standards
U.S. general requirements	<p>Exchange listed: level 2 and 3 ADRs</p> <ul style="list-style-type: none"> - Must file registration statement with the SEC - Must disclose annual reports in accordance with US GAAP standards - Level 3 ADRs (allows for issuing new shares in US) must also file an offering prospectus and any information published in home market must also be filed with the SEC 	<p>OTC market: level 1 ADR</p> <ul style="list-style-type: none"> - Minimal registration and reporting requirements with the SEC - Need not disclose annual reports – but if choose to do so the US GAAP standards need not be met
NYSE specific requirements (level 2 or 3 ADR)	<ul style="list-style-type: none"> - 5,000 shareholders (holding 100 shares or more) - 2.5m of publicly held shares - \$100m public market value - Pretax income of at least \$25m and \$100 in aggregate for the last 3 years - \$75m in revenues over last year - \$500m market capitalization 	<ul style="list-style-type: none"> - 2,000 shareholders (holding 100 shares or more) or 500 shareholders and 1m shares traded each month - 1.1m of publicly held shares - Pretax income of at least \$2m and \$10 in aggregate for the last 3 years - \$75m in revenues over last year - \$500m market capitalization
NASDAQ specific requirements (level 2 or 3 ADR)	<ul style="list-style-type: none"> - \$15m minimum equity - \$1m pretax income - 1.1m of publicly held shares - \$8m market value of publicly held shares - Minimum bid price of \$5 - Minimum of 400 shareholders holding 100 shares or more 	<ul style="list-style-type: none"> - Minimum equity of \$5m or market value of \$50m or post-tax income of \$750k - 1m of publicly held shares - Minimum bid price of \$4 - Minimum of 300 shareholders holding 100 shares or more - At least 1 year operating history

Table 3. Admission and Annual Fees

The table reports the fees associated with listing on different exchanges for small cap stocks (small firms defined as market capitalization equal or less than £100m). Figures are reported in USD dollars. The last column reports the total cost (admission+annual) as a percentage of market capitalization of the average firm (£100m=\$158mill.). Source: Oxera (2006).

	Admission fees	Annual fees	Total fees (% of firm value)
LSE, main market	71,716	6,366	0.05%
LSE, AIM	6,604	6,604	0.01%
NYSE	129,402	30,194	0.10%
NASDAQ	81,955	18,116	0.06%
Euronext	89,289	4,348	0.06%
Deutsche Börse	5,435	8,153	0.01%

Figure 4. Revenues of Stock Exchanges

The figure shows total revenue on the right axis (millions of Euros) and revenue breakdown on the left axis for the major exchanges in U.S. and Europe in 2006 (we choose 2006 as a benchmark year since many of these exchanges have since then merged). A number of things should be duly noted. First, a large chunk of NYSE’s “other revenue” (28%) are fees paid by NYSE’s member organizations (brokers) to the exchange, which NYSE’s then uses to meet its cost with the SEC (it could be argued that these revenues should rather fall under trading revenues). These costs are charged by SEC to recover the costs to the government for supervision and regulation of securities markets. Second, settlement and custody is not separated for Euronext and we split the total amount in two (but the total amount is still a very small fraction of total revenue). Third, the figure does not separately depict AIM revenue since the LSE does not report this information separately. Finally, it could be added that the relatively high revenue of Deutsche Börse and Euronext is partly due to derivatives operations (e.g. not available for the LSE), as these two stock exchanges respectively own the Eurex (jointly owned by Deutsche Börse and the Swiss exchange) and Liffe derivatives exchanges, which are global powerhouses in the derivatives business (only the gigantic Chicago based CME Group earns more income from derivatives trading). The category ‘others’ includes income from advertising, education, properties, etc. (e.g., OMX receives substantial revenue from branching their trading system to other trading venues). Source: FESE (2006) and annual reports of individual exchanges.

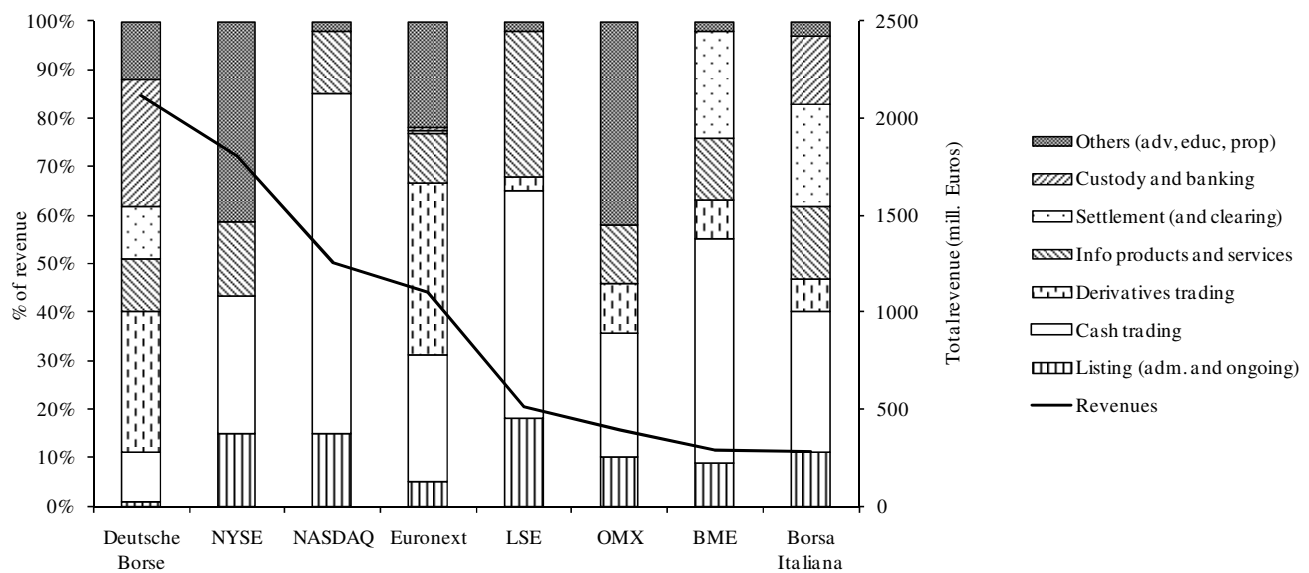


Figure 5. Geographical Origin of Foreign Listed Firms

The figure shows the geographical origin of foreign firms listing in the U.S., AIM or continental Europe (Euronext and Deutsche Börse). All proportions above 5% are numerically depicted on the figure. Source: Thomson One Banker database.

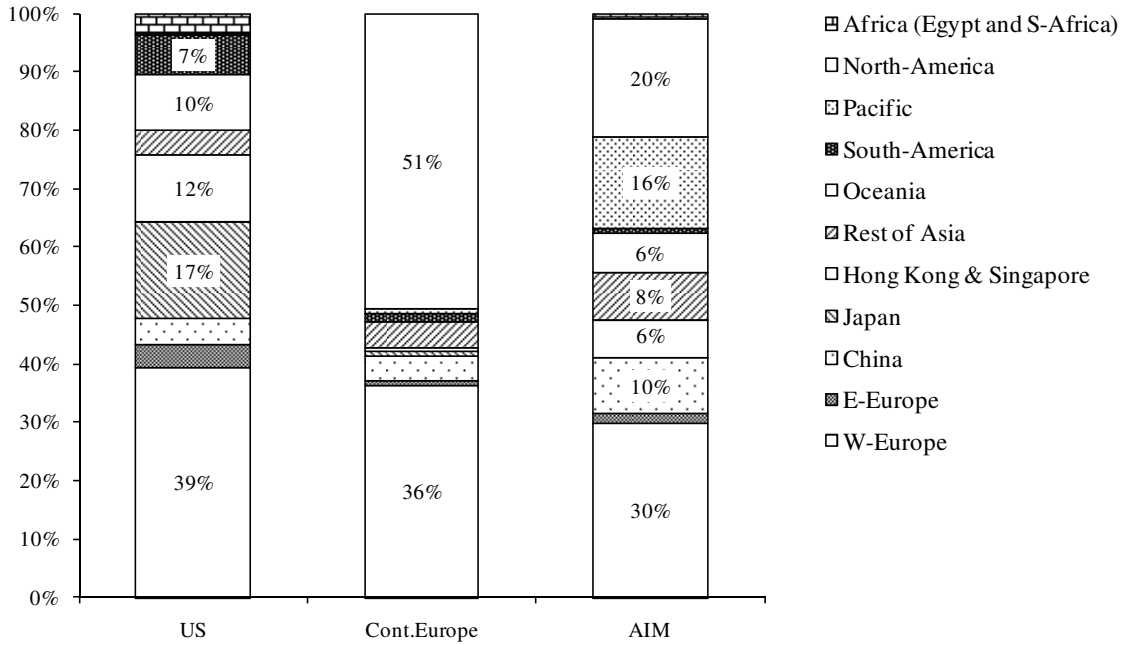


Table 4. Summary Statistics

This table reports total number of firms and means of firm/country variables (with standard deviations in parenthesis) over the 1995-2009 period. The table shows summary statistics separately for AIM, U.S., continental Europe (Euronext and Deutsche Börse) listed firms, as well as private (non-listed) firms. The summary statistics applies to firms with total assets of at most \$5 billion (in year 2000 dollars). Number of foreign, private firms refers number of non-US, non-UK, non-French, non-Dutch, non-Belgian, non-Portuguese and non-German firms. Tobin's q is defined in the standard way, i.e. market value divided by asset value. Assets, sales and income are reported as inflation adjusted USD dollars (in 2000 dollars). GDP per capita is calculated for each firm (this measure differs across firms' country of origin) and this table reports the average thereof for each listing venue. The variable "legal rating" ranges from 0-50 with higher values representing better shareholder rights and more law and order. This is a country level variable defined as anti-director \times rule of law, which are variables obtained from Djankov et al. (2006) and La Porta et al. (1998) – where the anti-director index measures shareholder protection and rule of law captures country risk in terms of law and order. Variables are winsorized at the 1st and 99th percentiles. Source: Thomson One Banker (which incorporates Thomson Financial, Worldscope and Datastream), Economist Intelligence Unit (EIU) country database, Djankov et al. (2006) and La Porta et al. (1998).

	U.K. AIM	U.S.	Cont. Europe	Private
Number of firms	1,275	591	1,598	4,027
Number of foreign firms	168	461	114	976
Tobin's q	1.85 (2.66)	1.67 (1.81)	1.38 (1.65)	-
Assets (millions)	111 (296)	1,580 (1,850)	221 (536)	533 (1,020)
Asset growth	0.77 (2.75)	0.23 (0.59)	0.41 (1.28)	0.75 (4.46)
Leverage	0.29 (0.77)	0.36 (0.46)	0.37 (0.67)	0.30 (1.14)
Sales (millions)	87 (290)	1433 (2523)	183 (556)	407 (1015)
Sales growth	0.68 (2.28)	0.24 (0.69)	0.39 (1.29)	0.30 (1.35)
Income (millions)	1.44 (23.85)	86.59 (177.95)	4.81 (39.47)	12.86 (76.99)
Income growth	0.24 (7.08)	0.10 (2.90)	0.03 (5.77)	0.31 (5.44)
Legal rating	41.66 (5.14)	32.11 (8.94)	28.72 (8.33)	34.84 (5.99)
GDP per capita	29,983 (5,181)	25,643 (12,652)	31,168 (12,206)	33,031 (4,224)
Stock mkt. cap. / GDP	1.26 (0.31)	1.52 (1.61)	1.38 (0.62)	1.27 (0.28)

Table 5. Determinants of Listing

The table reports estimates obtained from a multinomial logit model on the probability of foreign firms listing on AIM, U.S. exchanges (NYSE and NASDAQ) or continental Europe exchanges (Euronext and Deutsche Börse). The simultaneous regression equation reports the probability of listing on a particular exchange relative to the base case of staying non-listed. Mathematically, this relative change in the listing probability (relative risk ratio) corresponds to $\exp(X\beta_j)$, which is reduced to $\exp(\beta_j)$ when the covariate changes by one unit (not marginal change). Variables are averaged across time and defined similarly as in table 4 (summary statistics), although for ease of interpretation the independent variables are standardized such that they are measured in units of standard deviations. ROA stands for return on assets (net income + interest expense / total assets). Constants are excluded as they provide no economic interpretation. The sample includes all foreign firms with total assets below \$5 billion (in year 2000 dollars) and the sample period is 1995-2009 (annual data). The analysis includes 104 AIM listings, 321 U.S. listings, 68 continental Europe listings. Robust standard errors are given in parenthesis and significance is reported at the 10% (*), 5% (**) and 1% (***) level, indicating rejection of the null hypothesis that the relative risk ratio is equal to one.

	Multinomial logit (1)			Test of relative risk equivalence		
	U.K. AIM	U.S.	Cont. Europe	U.K. – U.S.	U.K. – Europe	U.S. – Europe
Ln(assets)	0.72*** (0.06)	3.91*** (0.50)	0.84* (0.09)	-3.19*** (0.49)	-0.12 (0.10)	3.07*** (0.50)
Asset growth	1.11*** (0.04)	1.05 (0.04)	1.05 (0.04)	0.06 (0.05)	0.06 (0.05)	0.00 (0.05)
ROA	1.43*** (0.12)	1.07 (0.15)	2.66*** (0.62)	0.36* (0.20)	-1.23* (0.63)	-1.59** (0.64)
Leverage	0.95* (0.03)	1.02 (0.03)	0.96* (0.02)	-0.07** (0.03)	-0.00 (0.01)	0.06*** (0.02)
Legal rating	0.85* (0.08)	1.21*** (0.07)	0.35*** (0.09)	-0.36*** (0.10)	0.50*** (0.12)	0.86*** (0.12)
GDP per cap.	0.59*** (0.04)	0.49*** (0.03)	1.30 (0.24)	0.10** (0.04)	-0.71*** (0.24)	-0.81*** (0.24)
Stock.mkt./GDP	0.93 (0.17)	1.08*** (0.03)	1.16** (0.08)	-0.15 (0.17)	-0.23 (0.18)	-0.08 (0.08)
No. subjects		3,062				
Log p-likelih.		-1,416				
Wald Chi2		422.4				
Pseudo R2		0.207				

Table 6. Determinants of Listing - Robustness

The table reports estimates obtained from i) a multinomial probit, ii) a Cox proportional hazard model and iii) a multinomial logit model that uses the repeated cross-section (panel) as separate firm observations. The table reports estimates on the probability of foreign firms listing on AIM, U.S. exchanges (NYSE and NASDAQ) or continental Europe exchanges (Euronext and Deutsche Börse). The simultaneous multinomial probit regression reports the probability of listing on a particular exchange relative to the base case of staying non-listed, where the change in the listing probability is associated with a marginal change in covariates (hence no constant reported). Thus for regression (1) a positive (negative) estimate corresponds to a positive (negative) effect on the listing probability relative to the choice of staying non-listed. This contrasts the coefficient representation in regressions (2)-(5), which depict estimates using a Cox proportional hazard model and a multinomial logit model. There the relative hazard is again reported (as in table 5) and an estimate above (below) one corresponds to a positive (negative) effect on the listing probability. Regressions (2)-(4) report the Cox proportional hazard model estimates of the probability of listing on a particular exchange in year t , given that the firm has not yet listed. In all Cox regressions the hazard ratios are reported (i.e. $\exp(\beta)$, not β), which report the effect on the listing probability of changing a covariate by one unit (not marginally). Since each type of exchange listing is analyzed in a separate regression in the Cox model, the baseline hazard is naturally allowed to differ across listing types. The Cox model does not estimate a constant. For regressions (1)-(4) the variables are averaged across time, whereas in regression (5) the variables are time-variant, such that a separate observation (i.e. later in time) for the same firm is effectively taken to be an observation for a different firm. In other words, in contrast to the cross-sectional multinomial logit estimates reported in table 5, here the full panel is used in order to enlarge the sample size (i.e. a repeated cross-section is taken as a separate firm observations), which now includes 16,722 observations (instead of 3,062). Thus, regression (5) also includes time trends to control for variation across time and constants are excluded from reported results as they provide no economic interpretation. In all regressions the independent variables are standardized such that they are measured in units of standard deviations (for ease of interpretation). Also, for all regressions the underlying sample includes all foreign firms with total assets below \$5 billion (in year 2000 dollars) and the sample period is 1995-2009 (annual data). This amounts to 104 AIM listings, 321 U.S. listings and 68 continental Europe listings (which effectively increases in regression (5)). Robust standard errors are given in parenthesis and significance is reported at the 10% (*), 5% (**) and 1% (***) level, indicating rejection of the null hypothesis that the odds ratio (hazard ratio) is equal to one (estimates are naturally compared to zero in the probit model). For regression (5) the standard errors are adjusted for clustering on firms, i.e. we take into account that the errors for the same firm may not be independent across time.

	Multinomial probit (marginal effects)			Cox proportional hazard model (relative risk)			Multinomial logit (relative risk, using full panel)		
	(1)			(2)	(3)	(4)	(5)		
	U.K. AIM	U.S.	Europe	U.K. AIM	U.S.	Europe	U.K. AIM	U.S.	Europe
Ln(assets)	-0.014*** (0.003)	0.063*** (0.006)	-0.004** (0.002)	0.85 (0.10)	3.40*** (0.38)	1.00 (0.09)	0.76*** (0.05)	3.37*** (0.45)	0.92 (0.06)
Asset growth	0.004** (0.001)	0.000 (0.002)	0.001 (0.001)	1.10*** (0.03)	0.99 (0.04)	1.05 (1.03)	1.13*** (0.03)	0.42*** (0.05)	0.99 (0.02)
ROA	0.011*** (0.003)	-0.002 (0.006)	0.013*** (0.002)	1.32*** (0.04)	1.01 (0.09)	1.96*** (0.30)	1.28*** (0.08)	0.92** (0.03)	1.44*** (0.13)
Leverage	-0.002** (0.001)	0.001 (0.001)	-0.001** (0.000)	0.96* (0.10)	1.03 (0.02)	0.96 (0.02)	0.94** (0.02)	0.63 (0.27)	0.92 (0.07)
Legal rating	-0.006** (0.003)	0.010*** (0.003)	-0.012*** (0.002)	0.85 (0.27)	1.14*** (0.05)	0.30*** (0.04)	1.24* (0.14)	1.78*** (0.13)	0.47*** (0.11)
GDP per cap.	-0.016*** (0.002)	-0.031*** (0.004)	0.002 (0.002)	0.64*** (0.03)	0.57*** (0.02)	0.83*** (0.07)	0.53*** (0.05)	0.39*** (0.03)	1.18 (0.22)
Stock.mkt./GDP	-0.002 (0.003)	0.003** (0.001)	-0.002** (0.001)	0.78 (0.76)	1.11*** (0.02)	3.58*** (0.85)	0.98 (0.05)	1.03 (0.03)	1.06 (0.05)
Time trend							1.76*** (0.06)	1.33*** (0.02)	1.05 (0.03)
No. subjects		3,062		2,569	2,791	2,532		3,037	
Log p-likelih.		-1422		-751.6	-2,221	-477.4		-7,296	
Wald Chi2		458.5		490.0	490.2	227.4		1,234	
Pseudo R ²								0.310	

Figure 6. Delistings from U.K. AIM

The figure shows the reason given for delisting from AIM among approximately seven hundred firms over the 1995-2009 sample period. The merger and acquisition (M&A) category represents so-called ‘reverse takeovers’, which are cases where a listed AIM firm takes over another firm that is (typically) relatively large in size, which calls for considerable restructuring within the listed firm. This type of “delist” implies that the firm effectively stays listed, but under another identity. Delistings that are reported as voluntary are split into two groups, where those with ‘bad returns’ are those that experience a statistically lower stock returns than firms delisting for other well established reasons (i.e. due to merger or transferral to the main market), and vice versa. Involuntary delists occur in cases where the firm fails to keep a nominated advisor, not enough capital raised to be classified as a publicly held company, not complying with disclosure rules, etc. Sources: AIM market statistics, monthly reports.

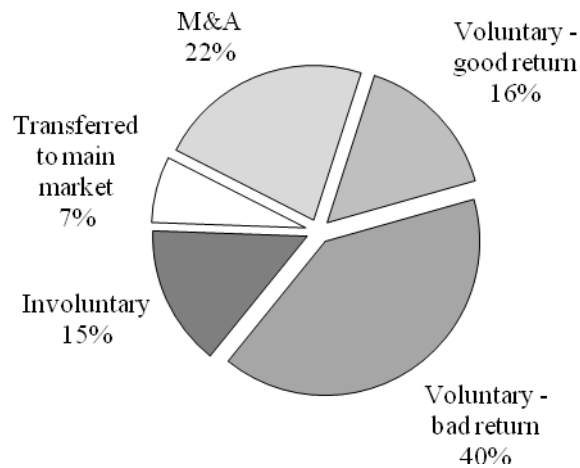


Table 7. Determinants of Delisting from U.K. AIM, by Type

The table reports estimates obtained from a multinomial logit model on the probability of firms delisting from AIM across different reported delisting reasons. The simultaneous regression equation reports the probability of particular delisting types, relative to the base case of staying listed. Mathematically, this relative change in the listing probability (relative risk ratio) corresponds to $\exp(X\beta_j)$, which is reduced to $\exp(\beta_j)$ when the covariate changes by one unit. The sample includes all delisting AIM firms and variables are averaged across time and defined similarly as in table 4 (summary statistics). Since the analysis only examines the AIM market, variables are denominated in U.K. pounds, although as before all independent variables are (for ease of interpretation) standardized such that they are measured in units of standard deviations. The analysis includes 40 firms transferring to the main market, 146 firms engaged in merger, 43 firms voluntarily delisting with relatively good returns (compared to firms delisting due to merger or tranferral to the main market), 91 firms voluntarily delisting with relatively bad returns, 79 firms involuntarily delisting and 897 firms that stay listed. Robust standard errors are given in parenthesis and significance is reported at the 10% (*), 5% (**) and 1% (***) level, indicating rejection of the null hypothesis that the relative risk ratio is equal to one.

	Multinomial logit (1)				
	Transferred to main market	Mergers & acquisitions	Voluntary, good returns	Voluntary, bad returns	Involuntary
Tobin's q	1.00 (0.01)	1.01 (0.01)	0.95 (0.05)	1.00 (0.02)	0.97 (0.02)
Ln(assets)	5.40*** (1.55)	0.68* (0.15)	1.63 (0.59)	0.56* (0.19)	0.26*** (0.09)
Asset growth	1.05** (0.02)	1.03* (0.02)	1.04* (0.02)	1.03 (0.02)	0.94 (0.04)
ROA	1.05 (0.59)	1.12 (0.27)	0.59 (0.26)	0.61* (0.16)	1.20 (0.39)
Leverage	0.57 (0.69)	0.06* (0.10)	1.10 (0.99)	3.09 (3.74)	6.39*** (5.22)
Ln(Capital raised)	1.12 (0.22)	1.36** (0.17)	1.12 (0.26)	1.58** (0.33)	1.43* (0.27)
Legal rating	0.80 (0.33)	3.17 (2.57)	0.81 (0.38)	0.52*** (0.13)	6.89 (9.09)
GDP per capita	1.63 (0.66)	1.57 (0.76)	1.64 (0.85)	2.30** (0.75)	0.49*** (0.12)
Stock mkt. cap. / GDP	0.61 (0.19)	0.71 (0.19)	0.73 (0.25)	0.94 (0.16)	0.90 (0.23)
No. subjects	1,296				
Log pseudo-likelihood	-1,321				
Wald chi2	186.3				
Pseudo R ²	0.0548				

Table 8. Valuation Differences (Listing Premium)

The table presents valuation differences (listing premiums) of foreign firms listing on AIM or in the U.S.. The dependent variable in each regression is Tobin's q (mkt.value / assets). The control sample is continental Europe listed firms (Euronext and Deutsche Börse) in panels A and B, while both cont. Europe and U.S. listed firms serve as a control sample in panel C. In panel A and B the dummy variables 'AIM listed' and 'U.S. listed' equal one if a firm has a listing of that type – and the difference in these coefficients estimates is reported in the last row of the table. In panel C the dynamics of the AIM listing premium are estimated, where for every AIM listing firm the dummy variable "AIM listing year 0-1" equals one in year of listing and the following year; the dummy variable "AIM listing year 2-3" equals one in the second and third year of listing; and the last dummy equals one in subsequent listing years. The analysis in panel C excludes firms that delist in the sample period, since this may occur systematically among firms with low valuations and at specific times in the life cycle of the firm, which would bias the estimates. Variables are defined as in table 4 (summary statistics), where growth variables are measured in percentage terms. Robust standard errors are given in parenthesis in panel B and in between regressions, while in regressions (1), (2), (10) and (11) the errors are clustered at the firm level to take account of potential error dependence across time within each firm. Significance is reported at the 10% (*), 5% (**), and 1% (***) level.

	Panel A: 2001-09			Panel B: pre vs. post 2007						Panel C: AIM 2001-06		
	(1) Pooled OLS	(2) Random effects	(3) Between estimation	(4) P. OLS pre-2007	(5) P. OLS post-2007	(6) R.effects pre-2007	(7) R.effects post-2007	(8) Betw.est. pre-2007	(9) Betw.est. post-2007	(10) Pooled OLS	(11) Random effects	(12) Between estimation
AIM listed	0.60** (0.29)	0.55* (0.30)	0.51 (0.32)	1.32*** (0.50)	-0.03 (0.33)	1.39** (0.55)	-0.21 (0.62)	1.45** (0.56)	-0.30 (0.67)			
U.S. listed	0.18 (0.16)	0.09 (0.18)	0.02 (0.22)	0.15 (0.17)	0.22 (0.30)	0.01 (0.23)	-0.09 (0.58)	0.01 (0.25)	-0.19 (0.64)			
Industry q	0.01* (0.00)	0.01 (0.00)	0.01 (0.00)	0.02 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.02 (0.01)	0.02 (0.01)	0.02* (0.01)
Sales growth	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	0.09 (0.07)	0.00 (0.00)	0.07 (0.06)	-0.00 (0.00)	0.10 (0.07)	-0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
Asset growth	0.02 (0.02)	-0.01 (0.02)	0.01 (0.02)	-0.01 (0.01)	0.09 (0.06)	-0.05* (0.03)	0.02 (0.06)	-0.00 (0.02)	0.10 (0.09)	0.15** (0.08)	-0.07 (0.08)	0.15 (0.12)
Income growth	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
AIM listing year 0-1										0.23 (0.45)	0.99** (0.44)	0.57 (0.90)
AIM listing year 2-3										8.45 (5.94)	3.61 (3.02)	11.31 (8.08)
> 3 y. after AIM listing										0.72 (1.00)	0.63 (0.55)	0.63 (1.17)
Constant	1.28*** (0.16)	1.45*** (0.18)	1.46*** (0.21)	1.27*** (0.17)	1.55*** (0.33)	1.50*** (0.24)	1.90*** (0.56)	1.51*** (0.25)	1.53** (0.61)	1.34*** (0.09)	1.48*** (0.10)	1.45*** (0.07)
No. observations	5,194	5,194	5,194	3,260	1,934	3,260	1,934	3,260	1,934	2,816	2,816	2,816
No. of firms	790	790	790	688	712	688	712	688	712	552	552	552
R-squared	0.02	0.02	0.01	0.03	0.09	0.03	0.08	0.04	0.03	0.05	0.03	0.10
Year FE	Yes	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No
AIM prem. – U.S. prem.	0.42* (0.21)	0.46* (0.25)	0.49* (0.26)	1.17** (0.50)	-0.25 (0.17)	1.38*** (0.52)	-0.12 (0.23)	1.44*** (0.53)	-0.11 (0.25)			

Table 9. Capital Raised Across Exchanges

The table reports the proportion of firms raising capital and the average amount raised per firm (in inflation adjusted USD dollars) in an average year over the 2001-09 period by i) small firms (total assets below \$5 billion), ii) small, foreign firms and iii) small, foreign firms from countries with poor financial quality ratings, i.e. the variable “legal rating” being lower than 25 which holds true for a quarter of the sample (this indicator variable is defined in table 4 as the combination of shareholder protection rights and the home country’s law and order). The proportion of firms raising capital is calculated among those firms with minimum level of data reporting, i.e. those firms at least reporting annual income. The amount and proportion raised are averages taken only across actual capital raising firm-year observations in the corresponding sub-group, i.e. it excludes firm-year observations where no capital is raised (we exclude zero entries since otherwise our estimate could be biased if e.g. average duration of listing is different across exchanges, which would imply that the number of zero entries is likely to be higher on exchanges that hosts longer listed firms). Likewise, the amount raised in proportion to total assets is calculated using average assets of only capital raising firms within the corresponding sub-group. The *t*-statistics are reported at the 10% (*), 5% (**) and 1% (***) levels, indicating a rejection of the null hypothesis that the amounts/proportions raised are the same across exchanges.

	Small firms			Test of significance (<i>t</i> -stat)		
	U.K. AIM	U.S.	Cont. Europe	U.K. – U.S.	U.K. - Europe	U.S. - Europe
% firms raising capital	56%	53%	33%			
Raised per firm (\$)	10,314,916	44,984,676	21,607,164	-17.60***	-9.99***	9.87***
Raised / Assets	9.7%	2.4%	3.1%	16.01***	17.47***	-2.85**
	Small, foreign firms					
	U.K. AIM	U.S.	Cont. Europe			
% firms raising capital	58%	55%	57%			
Raised per firm (\$)	14,822,131	49,330,940	25,038,798	-5.59***	-2.54***	3.39***
Raised / Assets	12.2%	2.7%	5.3%	15.73***	4.79***	-4.95***
	Small, foreign firms with low legal rating					
	U.K. AIM	US	Cont. Europe			
% firms raising capital	46%	32%	49%			
Raised per firm (\$)	14,890,107	95,240,680	13,870,211	-3.14***	0.14	2.20**
Raised / Assets	10.5%	5.6%	7.1%	2.18**	0.75	-0.51