

# **SMEs' REVERSE TAKEOVERS ON THE ALTERNATIVE INVESTMENT MARKET (AIM): FAMILY HOLDERS and FINANCIAL CRISIS**

## **Abstract**

The aim of this study is to analyze the determinants of undertaking a reverse takeover on the Alternative Investment Market (AIM) in London (United Kingdom) for Small Medium Enterprises (SMEs), examining the differences between family and non-family firms in addition to the impact of the financial crisis.

We examine the SMEs listed on the AIM during the period 1999-2012. We propose a *probit model* and a *survival analysis (Cox's proportional hazard model)*.

Our findings show that the higher the percentage of ownership held by family holders, the lower the probability of undertaking a reverse takeover on the AIM. The influence of family holders works in accordance with long-term aims and more conservative behavior. The family holders' effect is maintained during the crisis period, working in tandem with strong corporate governance in family business and higher financial restrictions (higher cost of equity and debt issues and bank debt).

## **Key Words:**

Alternative Investment Markets (AIM); Small Medium Enterprises (SMEs); family firms; crisis period; reverse takeovers; delisting.

**JEL Codes:** G15; G30; G32; G34; F30.

## 1. INTRODUCTION

The aim of this study is to analyze the determinants of Small Medium Enterprises' (SMEs') delisting decisions through a reverse takeover on the Alternative Investment Market (AIM) in London (UK), examining the differences between family and non-family firms in addition to the impact of the financial crisis.

The Alternative Investment Market (AIM) in London (UK) is an international market for smaller, growing companies. A wide range of businesses, including early stage, venture capital-backed businesses and more established companies, join the AIM seeking access to growth capital. This market is one of the most successful growth markets in the world. Since its launch in 1995, over 3,000 companies from across the globe have chosen to join the AIM. The AIM helps smaller and growing companies raise the capital they need for expansion. This financing has enabled AIM companies to fund their development and pursue their growth ambitions. Additionally, this market provides companies with the opportunity to raise capital on a market with a pragmatic approach to regulation. The AIM also benefits from being an integral part of the portfolio of the markets offered by the London Stock Exchange. To join the AIM, companies are not required to have a particular financial track record or trading history. The AIM's balanced regulatory regime was designed specifically for smaller, growing companies, offering opportunities to both companies and investors. The AIM has a large, diverse and committed community of stakeholders. Specialist advisers are crucial to the market's success and range from dedicated Nominated Advisers (Nomads) who play a central role in the life of an AIM company, to lawyers, accountants and brokers. Other important participants include public relations and investor relations agencies that help companies join the market and make the most of their AIM quotation (*London Stock Exchange website*).

Although today there are other alternative investment markets around the world, including (i) the TSX Venture Exchange in Canada, created in 1998; (ii) the Growth Enterprise Market in Hong Kong, created in 1999; (iii) Alternext in France, Belgium and Netherlands, created in 2005; (iv) Entry Standard in Germany, created in 2005; (v) First North in Iceland, Sweden and Finland, created in 2005; (vi) the Spanish Alternative Market (MAB) in Spain, created in 2008; and (vii) the Italian Alternative Market (MAC) in Italy, created in 2008, London's AIM is the most relevant and representative market.

SMEs have cited various reasons for their decisions to delist from the Alternative Investment Market (AIM) in the period 1999-2012: i) they decide to quote on the official market and continue the growth cycle; ii) they undertake a merger, an acquisition or a reverse takeover in order to grow, which motivates a new listing on the AIM or on a Main Market, or even going private; iii) there is a firm request or some legal requirement that motivates SMEs to delist.

According to AIM statistics, the market began trading 10 SME firms from various countries in June 1995. In 1999, there were 347 SMEs, with the number of firms peaking in 2007, when 1,694 SMEs were trading. As of December 31<sup>st</sup>, 2012, there were only 1,096 SMEs. The number of firms listed on the AIM has decreased from 2007, following the financial crisis. Previous studies analyzing the decision to go private from the Main market focus on both the U.S. and the U.K. They associate this decision with asymmetric information problems and agency conflicts within firms. Renneboog *et al.* (2007) analyze the decision to go private in the U.K. through a Leverage Buyout (LBO), Management Buyout (MBO) or Management Buyin (MBI).<sup>1</sup> The premium is determined by tax benefits, incentive realignment and the undervaluation of the firm. Firms with higher levels of managerial ownership pay higher premiums to delist. Aslan and Kumar (2011) focus on U.K. non-financial and non-utilities firms in the AIM and Main market. They claim that managers may obtain private benefits from investing and managing large assets and that it is therefore costly to provide managerial incentives in those firms with dispersed ownership. Delisting may

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<sup>1</sup> LBO is the acquisition of another company using a significant amount of borrowed money to meet the cost of acquisition. Often, the assets of the company being acquired are used as collateral for the loans, in addition to the assets of the acquiring company. MBO is a form of acquisition where a company's existing managers acquire a large part or all of the company from either the parent company or the private owners. MBI is the acquisition in which there are a wide range of management teams, such as hedge funds and other companies that look for undervalued companies to purchase. They will often purchase the company and make it private to unlock the value. More often than not, they replace the management team with their own, which they feel will do a better job of running the company (Brealey and Myers, 2006).

improve efficiency through the divestment of value-reducing assets and reduced investment in negative net present value in firms with agency conflicts between managers and dispersed shareholders. Therefore, they conclude that the most significant motivation for delisting reducing the managerial agency costs.

Kasheri-Pour and Lasfer (2011, 2013) study the impact of debt financing on the voluntary delisting decision by AIM companies (voluntary meaning at the request of the company or through transfer to the Main market). They find that firms with higher leverage, lower growth opportunities and lower capital expenditure are more likely to voluntarily delist from the AIM. Consistent with the asymmetric information prediction, they also find that smaller firms with a large proportion of intangible assets are more likely to delist.

In addition to agency conflicts and asymmetric information problems, other aspects such as regulatory issues can determine the delisting decision. The survival analysis of Gerakos *et al.* (2013) shows that AIM firms are much more likely to fail than firms on other markets, supporting the notion that the AIM's more relaxed regulations damage its firms. Carpentier and Suret (2011) find that the survival of new issuers is associated with their characteristics at the IPO and the level of initial requirements in the Canadian penny stock IPOs. Espenlaub *et al.* (2012) find that the higher the reputation of a firm's nominated adviser, the lower the probability of that firm delisting from the AIM, consistent with the fact that reputation may reduce informational problems and incentive conflicts. Amini and Keasy (2013) find that geographic proximity to London and operating in the financial sector increases the probability of IPO failure on the AIM.

Therefore, previous studies show that agency conflicts, asymmetric information, market regulatory issues, geographic proximity and industry type are relevant in explaining the delisting decision on the AIM markets.

On the other hand, studies focused on the delisting decision in Main markets show that the existence of controlling shareholders reduces the likelihood of private equity acquisitions (Achleitner *et al.* 2010). Also, other studies (Holmen and Nivorozhkin, 2007; Capri *et al.*, 2011) focus on the mergers and acquisition decisions show that the presence of family members with high levels of ownership reduces the probability of being acquiring, given that these shareholder are more reluctant to sell their firm. To our knowledge there are no studies considering all the determinants of the delisting decision through reverse takeovers on the AIM together (agency conflicts, asymmetric information, market regulatory issues, geographical proximity and the type of industry), nor do any existing studies examine whether the reverse takeover decision varies based on the type of majority shareholder, especially when they are family holders. Family holders may have additional aims compared to other major shareholders. In particular, they may be more reluctant to dilute the ownership structure and may have more long-term aims than other types of holders, which may influence the probability of delisting, even more through reverse takeovers. Although the AIM is in the U.K. (a country characterized by firms with dispersed ownership structures), the firms listed on it come from many different countries and their ownership structures may be heterogeneous.

Furthermore, several quoted firms were delisted following private transactions in Europe during the years leading up to the financial crisis (Renneboog *et al.* 2007). The current financial crisis may affect the delisting decision through reverse takeovers, given that it is more difficult for firms to find alternative sources of funding and private firms have more restriction and difficulties to undertake IPOs. These financial restrictions are more severe for SMEs.

Taking into account all these aspects, the motivation of this research is to cover this gap in the financial literature, considering all delisting decision determinants together and examining the influence of family control and the financial crisis on the reverse takeover decision. We empirically analyze the following research questions: 1) Are there any differences between family and non-family firms with respect to delisting decisions through reverse takeovers on the AIM?; 2) Do the determinants of the delisting decision through reverse takeovers vary during non-crisis and crisis periods for Small Medium Enterprises (SMEs)?

To answer these research questions, we consider that opposite negative effect could be established in relation to family firms: family firms usually have long-term aims, which would reduce the probability of delisting once they have decided to be quoted on the market or undertaking a reverse takeover, given that they prefer to avoid diluting the ownership structure and the entry of new shareholders in their firm. We also consider the relevance of the financial crisis on the delisting decision, proposing that the cost of accessing funds is higher during periods of financial instability. The reduction in the credit supply makes it more difficult to find funding for firms. Additionally, during the financial crisis it could be more difficult to find bank debt for SMEs. Therefore, firms listed avoid leaving the AIM market and private firms is more likely to undertake a reverse takeover in order to go the public market without undertaking an IPO. We

expect the probability of delisting through reverse takeovers to be higher during financial crisis. However, this positive effect could be negative if the firm is holder by a family, given that these firms would be more reluctant to restructuring their firm in crisis period with more uncertainty.

Our findings show that the influence of family holders is consistent with the argument of their long-term aims and interests for continuing on the AIM. The influence of family holders on the delisting decision through reverse takeovers is maintained during the crisis period, in accordance with their long-term aims and the higher financial restrictions that they would face outside the AIM (higher cost of equity, debt issues, and bank debt).

This paper contributes to several streams of literature, namely i) the literature on SMEs listed on the alternative investment markets because in contrast to previous studies, we analyze the determinants of delisting decisions through reverse takeovers of SMEs on the AIM market; ii) family business literature because we examine the possible effect of family ownership on delisting decisions; and iii) the financial literature because we examine the relevance of crisis periods on corporate decisions.

The remainder of the paper is structured as follows. Section 2 provides a review of the literature and establishes the hypotheses. Section 3 presents the data and methodology. Section 4 discusses the main results, and Section 5 concludes.

## 2. RELATED LITERATURE

In the U.K., in accordance with Rule 41 (February, 2010),<sup>2</sup> a firm must notify the London Stock Exchange of its decision to cancel its trading on the AIM at least 20 days in advance of cancellation. This is conditional on the approval of a minimum of 75% of the votes cast by shareholders at the general meeting. This process is very different from the delisting process in the U.S., which must follow two steps. First, the companies need to delist from the Stock Exchange (NYSE, AMEX, or NASDAQ), which may take up to 21 days depending on the Exchange. During this period, they trade over the counter or on the Pink Sheets. Firms must then fill out Form 15 to deregister from the SEC, a step that takes approximately 60 days to complete. Once they register, they are not required to provide public information (see Marosi and Massoud 2007 and Macey *et al.* 2008 for more information).

The delisting transaction in the U.S. is different from that of other markets. Firm deregister with the SEC but remain publicly traded over-the-counter (OTC) on the Pink Sheets (Marosi and Massoud 2007). Regarding the U.S. market, Marosi and Massoud (2007) find that the Sarbanes-Oxley Act (SOX)<sup>3</sup> (2002) (<http://www.soxlaw.com/>) and its associated compliance costs are the major determinants of the delisting decision in the U.S. Similarly, Leuz *et al.* (2008) find that the SOX (2002) has an important impact on the delisting decision, as well as the free cash flow misuse associated with the agency cost. Both studies focus solely on larger firms.

After SOX (2002), many firms decided to list in the U.K. market to avoid the increased listing requirements in the U.S. markets. U.K. firms that delist become private and do not change their market quotation. The AIM has lower listing and disclosure requirements than the main markets.

A reverse takeover could be an alternative method for private firms to go public, instead of undertaking an IPO. In a reverse takeover, private firms' owners gain control of a public firm (called a shell) by merging and then the private firm becomes a public one. A reverse takeover implies low cost and short processing duration, being an attractive means of going public, especially for small firms, and in addition could enable firms which are otherwise not ready for the market to go public. It is a "black door listing method" (Adjei, Cyree, and Walker, 2008; Capentier and Suret, 2010). Furthermore, there are differences between UK and other countries, such as the US, in terms of Reverse Takeovers' regulation.

### 2.1. The delisting decision on the Main markets

Previous studies suggest that the firms that go private (typically through buy-outs and takeovers, after which their shareholders are no longer able to trade their stocks in the open market) differ from those that decide to delist voluntarily (companies cease trading on the market by their own request). Marosi and Massoud (2007) and Leuz *et al.* (2008) analyze U.S. firms and find that voluntarily delisting firms are

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<sup>2</sup> <http://www.londonstockexchange.com/companies-and-advisers/aim/advisers/rules/aim-rules-for-companies.pdf>

<sup>3</sup> <http://www.soxlaw.com/>

smaller and have lower free cash flows than those firms that go private. They argue that firms decide to delist by their own request when the costs of being public firms exceed the benefits.

Renneboog *et al.* (2007) analyze the decision to go private in the U.K. during the period 1997-2003. They find that shareholders obtain positive returns around the announcement of the delisting transaction through a Leverage Buyout (LBO), Management Buyout (MBO) or Management Buyin (MBI). The premium is determined by the tax benefits, incentive realignment and the undervaluation of the firm. They also show that the premium may vary depending on the ownership structure of the firm. Firms with higher levels of managerial ownership pay higher premiums. In contrast, the premium is lower in those firms held by outside shareholders, which is consistent with the greater managerial control in these firms.

Aslan and Kumar (2011) focus on both decisions, going public and private, for U.K. non-financial and non-utilities firms in the AIM and Main market. Analyzing the period 1996-2006, they find that low-visibility firms with high information costs, placed in underpriced industries and controlled by owners with private benefits of control, are more likely to go private. After going private, firms decrease investment, size, and sales growth, but increase profits, especially those firms bought out by private equity investors. Aslan and Kumar's (2011) results support the view that firms that are economically underperforming because of agency conflicts between managers and dispersed shareholders, for example, are more likely to go private to improve efficiency through divesting value-reducing assets and reducing investment in negative net present value. They conclude that the most significant motivation for going private is the reduction of managerial agency costs.

## 2.2. *The delisting decision on the Alternative Investment Market*

Kasheri-Pour and Lasfer (2011, 2013) study the impact of debt financing on the voluntary delisting decision by AIM companies. They consider that a company is voluntarily delisted when the firms are delisted "at the request of the company" or "transferred to the Main market", excluding firms delisted for other reasons (takeovers and involuntary circumstances). Their findings show that firms with higher leverage, lower growth opportunities and lower capital expenditures are more likely to voluntarily delist from the AIM. For firms that are unable to raise equity capital and rebalance their leverage as public firms, the cost of maintaining their places on the AIM exceeds the benefit. Consistent with the asymmetric information prediction, they also find that smaller firms with a large proportion of intangible assets are more likely to delist.

In addition to agency conflicts and asymmetric information problems, other aspects such as regulatory issues can determine the delisting decision. Gerakos *et al.* (2013) compare the characteristics and performance of AIM companies with those on "traditionally regulated" markets, specifically, the Nasdaq and OTC Bulletin Board (OTCBB) in the U.S. and the U.K. returns and liquidity. They focus on the influence of the nominated adviser, given that the AIM market provides regulatory flexibility and these adviser oversight firms in this market. The survival analysis of Gerakos *et al.* (2013) focused on a cross-market comparison to discover whether private sector regulation in the AIM (established by the nominated adviser) is better for firms than "traditional" regulation in other markets (established by regulators and public institutions). Their findings show that AIM firms perform poorly on almost every dimension and that the information asymmetry component of the bid-ask spread tends to be larger. Furthermore, AIM firms are much more likely to fail than firms on other markets, supporting the idea that more relaxed regulation on the AIM damages these firms. Carpentier and Suret (2011) analyze the survival and success of Canadian penny stock IPOs. They find that the survival of new issuers is associated with their characteristics at the IPO and the level of initial requirements. Espenlaub *et al.* (2012) develop a detailed survival analysis of all AIM IPOs, focusing on the reputations of nominated advisers because this reputation could be crucial in limiting informational problems and incentive conflicts. The AIM listed firms must maintain a nominated adviser (Nomad) at all times (Espenlaub *et al.* 2012). Therefore, the AIM has been called a "reputational market", given that regulatory agents certify and control the quality of the listed firms (Mendoza, 2008; Espenlaub *et al.*, 2012). Espenlaub *et al.* (2012) find that the higher the nominated adviser's reputation, the lower the probability of delisting, although company age, size, pre-IPO sales and insider ownership also reduce this probability.

According to Espenlaub *et al.* (2012) the role of nomads has been criticized after recent corporate scandals, as it appears some advisers fail in their duty to monitor firms. These authors also find that firms with more insider ownership have a longer survival period, in accordance with lower agency conflicts. They compare survivors to companies that delist because of a merger and acquisition or negative circumstances (liquidation or permanent suspension), but they do not include those firms that delist voluntarily (transfer to main market) or due to market regulation.

Amini and Keasy (2013) analyze the influence of a firm's geographical proximity to London and its operating in the financial sector on IPO survival, and find that these aspects increase the probability of IPO failure on the AIM.

### *2.3. The influence of ownership structure on the delisting decision*

Studies that focus on the delisting decision in Main markets show that the existence of controlling shareholders reduces the likelihood of private equity acquisitions (Achleitner *et al.* 2010). Bebchuck (1999) predicts a positive relationship between the control exercised by large shareholders and the size of their private benefits. A block-holder will only sell his stake in the case of receiving a premium that compensates for foregoing the private benefits of control. Companies being monitored by a large shareholder are expected to be managed more efficiently and therefore, should be less attractive targets for private equity investors given their lower potential to reduce agency costs between managers and shareholders (Achleitner *et al.* 2010). However, controlling shareholders may have private information about positive future performance that the market does not expect and therefore does not incorporate into the market price. In this situation, controlling shareholders might delist the firm in order to avoid sharing this future performance improvement with other shareholders (Bebchuck and Kahan, 2000). Moreover, controlling shareholders who delist and take their firm private may not need to pay a premium (or only a low premium) to minority shareholders given their bargaining position. This lack of competition from outside bidders should result in few buyout offers to minority investors in the delisting transactions carried out by controlling shareholders (Crocì and Del Giudice, 2012). Empirical evidence for this argument has not been found, however. Families are more attached to firm control than other types of controlling shareholders, and as the persistence of family control attests (Franks *et al.* 2012), they are also more risk averse and enjoy large private benefits of control (Bianco *et al.* 2009). Other studies (Holmen and Nivorozhkin, 2007; Capri *et al.*, 2011) focus on the mergers and acquisition decisions show that the presence of family members with high levels of ownership reduces the probability of being acquiring, given that these shareholder are more reluctant to sell their firm.

To our knowledge, there are no studies that analyze the relevance of the type of majority shareholder to explain why firms leave the Alternative Investment Market, which is a less-regulated market through reverse takeovers. In particular, family owners are supposed to be more reluctant to dilute the ownership structure in comparison to other type of major shareholders. This will reduce the probability of delisting the firm through reverse takeovers avoiding the entry of a new group of control coming from the private firm. Agency problems between majority and minority shareholders would appear. Family owners usually have greater incentives to control managers than other types of majority shareholders. For this reason, the delisting decision may not have any advantage in terms of reducing agency conflicts (either between managers and shareholders or between majority and minority shareholders) in these firms. Additionally, firms with family holders usually have more long-term aims and attribute more importance to firm survival, even over wealth maximization (Steier 2005; Tsai *et al.* 2009; Hamelin 2013). Firms may achieve the survival aim more easily by remaining on the AIM than by delisting. Thus, we establish the following hypotheses:

**Hypothesis 1. Family Control and Long-Term Aims:** *The probability of delisting through reverse takeover is lower for firms with family majority shareholders (family holders avoid losing firm control, family holders reduce agency conflicts in the firm, avoiding opportunistic decisions and maintaining long-term aims).*

### *2.4. Effect of the financial crisis on the delisting decision*

During the financial crisis it could be more difficult for firms to find bank debt, especially for SMEs. Thus, we expect the probability of delisting to be lower during times of financial crisis, given that firms do not have alternative sources of funding. Historically, second markets in Europe have grown in hot periods and have collapsed in decreasing ones, as shown by the lower number of IPOs during these periods (Vismara *et al.* 2012). However, reverse takeover undertaking for private firms as an alternative to IPOs could be increased during this period. There is no empirical evidence concerning the influence of the current financial crisis on delisting decisions on the AIM neither through reverse takeovers. This study seeks to cover this gap. Therefore, we establish the following hypothesis:

**Hypothesis 2. Financial Instability:** *The probability of delisting through reverse takeover is higher during crisis periods.*

### 2.5. Effect of the family majority shareholders and financial crisis on the delisting decision

This hypothesis may vary if the listed firm in the AIM is held by a family firm which has more conservative behavior and try to avoid restructuring their firm in uncertainty periods. Therefore, we establish the following hypothesis in relation to the interaction term between family and crisis period.

**Hypothesis 3. Family Firms and Financial Instability:** *The probability of delisting through reverse takeover is lower for firms with family majority shareholders during crisis periods.*

## 3. DATA AND METHODOLOGY

Most of the stock exchanges in Europe have a second market for particular classes of firms. We focus on the AIM because it is the most developed of the European alternative markets. Moreover, although the AIM is located in a country (the U.K.) with firms characterized by dispersed ownership structures, the firms listed on it come from different countries around the world with heterogeneous ownership structures. Therefore, the AIM analysis allows us to consider a variety of ownership structures.

### 3.1. Data

The database to test the theoretical proposals considers the SMEs listed on the AIM during the period 1999-2012<sup>4</sup>. The number of firms listed on the AIM varies according to the period, being higher in 2000 and from 2004 to 2006 (years in which there were between 1,021 and 1,634 firms listed), and lower after 2007 (1,143 firms in 2011). The data comes from the *London Stock Exchange (LSE)* website<sup>5</sup> and the international database *DataStream*<sup>6</sup>. The London Stock Exchange (LSE) website provides information about the firms listed and delisted on the AIM and data detailing these decisions. This website also provides information about the nominated adviser, the number of clients at each firm and the industries and countries from which AIM firms originate before being listed on the AIM. We use *DataStream* to collect the accounting data on the balance sheets and income statements. Ownership information also comes from *DataStream*. *DataStream* does not contain balance sheet and ownership information for all firms and the sample is reduced accordingly. In order to focus on reverse takeovers we delete other delisting decision (transfer to the Main Market, firm request or some legal requirement).

### 3.2. Methodology

The empirical methodology of the study is described in this section. We estimate the probability that a firm undertakes a delisting decision through reverse takeovers using a *Probit model*. We also estimate the *Cox proportional hazard model* (1972) to analyze the survival time of the firm. The advantage of the Cox proportional hazard model over other techniques is that it models the expected time to failure. In this study the risk of failure is the risk that a firm listed in the AIM decides to be delisted. Therefore, the Cox model proxies how an independent variable may influence the risk of failure conditioned by the time to the event (the delisting decision). We use panel data to control for the unobservable heterogeneity at the firm level.

#### 3.2.1. Delisting decision: Probit model

$$\begin{aligned} \text{Pr ob}( \text{Delisted} )_i = & \phi_0 + \phi_1 \text{Owners}_i + \phi_2 \text{Crisis}_i + \phi_3 \text{Owners} * \text{Crisis} + \phi_4 \text{Leverage}_i + \phi_5 \text{GrowthOpportunities}_i + \\ & + \phi_6 \text{ROA}_i + \phi_7 \text{Size}_i + \phi_8 \text{Volatility}_i + \phi_9 \text{EarningChange}_i + \phi_{10} \text{Age}_i + \phi_{11} \text{Nomad}_i + \\ & + \sum_k \varphi_k \text{Industry} + \sum_m \delta_m \text{Country} + \sum_t \psi_t \text{Year} + \varepsilon_{i,j} \text{ (Eq.1) } \end{aligned}$$

<sup>4</sup> 1998 is the first year that the information is available on the AIM, but its information is incomplete. 2012 is the most recent year for which data are complete.

<sup>5</sup> <http://www.londonstockexchange.co.uk> (section Alternative Investment Market).

<sup>6</sup> <https://forms.thomsonreuters.com/datastream>.

The dependent variable is a dummy variable that takes the value of 1 if a firm listed on the Alternative Investment Market (AIM) is delisted through a reverse takeover and 0 otherwise. As explained below, we consider as independent variables the type of shareholder (family, financial firms (including institutional investors), non financial firms, governments, and foreign investors), crisis vs. non-crisis period and other firm characteristics such as leverage, growth opportunities, free cash flow, size, volatility, growth, and age. We also include the Nominated Adviser's (*Nomad*) reputation and control for the industry and original country of the AIM firms.

*Independent variables (See Appendix):*

- *Type of shareholder (Owners<sup>7</sup>):* percentage of ownership held by those shareholders with more than five percent of the ownership (source *DataStream*). They are classified in five groups: (i) an *individual or family*, (ii) *financial firms* (including *institutional investors*), (iii) *non-financial firms*, (iv) *government*, and (v) *foreign investors*. According to our hypotheses, we focus on the effect of family holders on the delisting decision, controlling for other types of shareholders. Family holders with more concentrated ownership may have more incentives to avoid the entry of new shareholders in the firm and they usually have long-term aims and lower private benefit incentives than other types of majority shareholders, which together reduces the likelihood of delisting (*H.1. Family Control and Long-Term Aims*).
- *Crisis:* a dummy variable that takes the value of 1 from 2008 (the financial crisis began in September 2008) to 2012, and zero otherwise (1999-2007). The crisis period creates more financial constraints and more difficulties for firms. Therefore, we expect more reverse takeovers as IPOs alternative (*H.2. Financial Instability*). Raising the funds needed for a buyout becomes extremely difficult, which negatively affects the probability of a voluntary delisting (Crocchi and Del Giudice 2012).
- *Owners\*Crisis:* interaction term between owners and crisis variable. We expect that reverse takeovers will be less probable if the firms are held by a family during the crisis period (*H.3. Family Firms and Financial Instability*).
- *Leverage:* debt or debt+equity. Firms with more debt are more likely to delist. Their increased financial restrictions will reduce their investment opportunities, making the costs of being listed higher than the benefits (Aslan and Kuman 2011; Kashefi-Pour and Lasfer 2012).
- *Growth opportunities: market to book ratio.* Alternatively, we proxy growth opportunities considering the variable *Capital expenditure*<sup>8</sup> (capital expenditures/total assets). Firms with lower growth opportunities are more likely to delist, given that they may exploit mispricing (Aslan and Kuman 2011; Kashefi-Pour and Lasfer 2012).
- *Return on assets (ROA):* EBIT/total assets or, alternatively, *free cash flow*<sup>9</sup>: free cash flow/total assets. Firms with higher ROA (or more free cash flow) are more likely to delist given the possible existence of the free *cash flow agency problem* (Aslan and Kuman 2011; Kashefi-Pour and Lasfer 2012). Listed firms potentially suffer from agency conflicts between managers and shareholders deriving from the excess of free cash flow managers may use to undertake discretionary non-value creation decisions (Jensen and Meckling 1976). These managers may avoid delisting. The effect of this variable is not clear.
- *Size: ln total assets* (alternatively, *ln market value*). Larger firms have less asymmetric information with investors. In contrast, smaller firms have higher costs of information generation, and the probability of delisting will therefore be higher for these firms (Aslan and Kuman 2011; Kashefi-Pour and Lasfer 2012). According to agency theory, however, large firms are more likely to have dispersed ownership structures and high levels of free cash flow, both of which increase agency costs. These firms would be more likely to delist in order to reduce the agency costs,

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<sup>7</sup> We also consider the percentage of ownership held by the ultimate shareholder. This information comes from *Osiris, Bureau Van Dijk Database*.

<sup>8</sup> This variable is highly correlated with *market to book ratio*. Therefore, they are included in the *probit* regressions alternatively.

<sup>9</sup> This variable is highly correlated with *ROA*. Therefore, they are included in the *probit* regressions alternatively.



increasing the ownership concentration. Therefore, the effect of size on the delisting decision is not clear *a priori*.

- *Volatility*: the within-firm standard deviation of earnings. Firms with high volatility are more likely to delist because they present higher risk (Aslan and Kuman 2011).
- *Earnings growth*: the percentage of annual change in earnings. Firms with high earning growth (sales growth) are less likely to delist because they have positive perspectives in the market (Aslan and Kuman 2011).
- *Age*: This variable is measured as the *number of years from incorporation on AIM until delisting*. To calculate the age of non-delisted firms we consider 31<sup>st</sup> December 2013 as the end of the firm life. According to the cost of information production, young firms have a higher cost of staying public, increasing the probability of delisting (Alsan and Kumar 2011; Espenlaub *et al.* 2012). We also consider a dummy variable that takes the value of 1 if the age of the firm is above the sample median, and zero otherwise.
- *Nominated Adviser (Nomad) reputation*: the nomad's reputation may have a negative impact on the delisting decision, given that the AIM requires firms to retain the Nomad at all times. These advisers are hired and paid by the firms and their role has come under close scrutiny after several scandals involving corporate fraud and failure, as well as allegations that Nomads failed in their duties to appropriately monitor firms. In response, the LSE introduced a new rule in February 2007 (Espenlaub *et al.* 2012). To proxy reputation, we have found information about the Nomad's caseload, measured by a Nomad's number of clients. The relationship between the reputation and the Nomad's caseload is not clear. Nomads with more clients may have more experience, expertise and reputational concern, thus providing better oversight. However, Nomads with a large number of clients have fewer resources available to monitor clients individually, providing lower levels of oversight. Therefore, the effect of a Nomad's reputation, measured through a Nomad's caseload, is not clear *a priori*. We also consider a dummy variable that takes the value of 1 if the Nomad's number of clients is above the median of the sample, and zero otherwise
- *Financial firms*: this is a dummy variable that takes the value of 1 if the firm is in the financial sector (Amini and Keasy 2013). *Domestic firm* is a dummy variable that takes the value of 1 if the firm comes from the UK, and zero otherwise (Espenlaub *et al.* 2012). Amini and Keasy (2013) show that the probability of delisting is higher when firms belong to the financial sector and this effect is maintained if the firms are located in or around London. Firms from the U.K. can access market-based equity finance more easily. Therefore, both financial firms and domestic firms may positively influence the delisting decision.

We also control for year fixed effects. To control for industry fixed effects we include dummy variables for industries other than the financial sector. The classification is based on the FTSE global industry classification and we distinguish among: (i) *oil and gas*, (ii) *basic materials*, (iii) *industrials*, (iv) *consumer goods*, (v) *health care*, (vi) *consumer services*, (vii) *telecommunications*, (viii) *utilities*, and (ix) *technology*. We also include country fixed effects. The country classification corresponds with the firm's country of origin.

### 3.2.2. Survival analysis: Cox proportional hazard model

We also develop a survival analysis. Survival analysis is a statistical method for data analysis where the outcome variable of interest is the time to the occurrence of an event. Hence, survival analysis is also referred to as "time to event analysis". We estimate the *Cox proportional hazard model* (1972) to investigate the determinants of the delisting decision through reverse takeovers conditioned to the time to the event. The Cox model makes no assumption about the failure distribution.

$$h(t, X(t)) = h(t,0) \exp(BX(t)) \text{ (Eq.2)}$$

The dependent variable in the Cox model measures the risk of failure distribution. Expression  $h(t, X(t))$  is the hazard rate at time  $t$  for a firm with covariate  $X(t)$ . We include the variables defined above as independent variables (*section 3.2.1.*). In the Cox model, the marginal effect of an independent variable is measured by the so-called hazard ratio ( $\exp(B)$ ). A positive coefficient implies a hazard ratio (calculated as the exponential coefficient from the Cox model) greater than one, suggesting that an increase in the covariate increases the failure rate. A negative coefficient implies a hazard ratio of less than one, indicating that an increase in the covariate reduces the failure rate.

For continuous explanatory variables, the hazard ratio measures the marginal effect of a unit increase in the independent variable. For discrete explanatory variables, the hazard ratio indicates the marginal effect when the event occurs. A hazard ratio greater than one indicates that the reference category has a shorter time to the event. If the hazard ratio is equal to one, it indicates that there is no difference between the two groups of firms (delisting and survival).

#### **4. MAIN RESULTS: DETERMINANTS OF THE DELISTING DECISION**

##### **4.1. AIM descriptive analysis**

In this section we present the descriptive statistics. There are many admissions to the AIM in 2000 and also between 2003-2006, from the UK as well as from other countries. At the end of 2006, 304 of the 1,634 companies on the AIM were foreign companies, while 1,330 were British companies. These data are consistent with a period of global economic growth and also with higher transaction costs and increased regulation in terms of disclosure to list on the U.S. markets after the passage of the Sarbanes-Oxley Act (SOX) in 2002. The post-Enron context in the U.S., which led to the introduction of SOX, discouraged many companies from trying to list in the U.S. and caused a resultant surge in overseas interest in the U.K.'s AIM. However, the number of firms that decided to list through IPOs on the AIM decreased after 2007 as a consequence of the financial crisis.

Table 1 shows the descriptive statistics (mean and median value, standard deviation, minimum and maximum values) for AIM firm characteristics. Family holders held on average 18.65% of the ownership, financial firms 8.05%, non-financial firms 7.92%, government holders 0.04%, and foreign holders 12.86%.

Firms listed on the AIM have a leverage ratio valued at 19%, on average. The mean and median of Capital Expenditure (CAPEX) and ROA are negative.

When we divide the sample between listed and delisted AIM firms, we observe that delisted firms have more leverage and lower assets. These differences are statistically significant and consistent with the argument of higher asymmetric information and higher costs of continuing being listed. The Nomads of delisting firms have more clients (66.23. firms) than those of listed firms (54.16). This difference is also statistically significant, in accordance with the difficulties of monitoring firms individually for Nomads with many clients.

**Table 1. AIM firms' descriptive statistics**

The sample is composed of the AIM firms for the period 1999-2012. The type of major shareholders distinguishes the percentage of ownership held by: *Family* (family holders), *Financial firms (including Institutional Investors)*, *Non-financial firms*, *Government* (government holders), and *Foreign* (foreign holders). *Firm characteristics* consists of *Leverage* (total debt divided by total assets at the end of the previous year), *Growth opportunities* (the book value of the total assets minus the book value of equity plus the market value of equity divided by the book value of total assets), *CAPEX* (capital expenditures divided by total assets), *ROA* (EBIT divided by total assets), *Free Cash flow* (EBITDA over total assets of the firm), *Total Assets*, *Volatility* (the within-firm standard deviation of earnings), *Earning growth* (percentage of annual change in earnings), *Age* (number of years that the firm is listed), and *Nominated Adviser* (number of clients of the Nominated Adviser). We also divided the sample into listed and delisted AIM firms. We use the non-parametric Wilconxon rank test to compare the means of the variables. Data source: Own calculation based on *DataStream*. Currency: GBP (£).

Variable	Mean	Median	Std. dev.	Max	Min.	Obs.
<b>All AIM firms</b>						
<b>Panel A: Type of major shareholder</b>						
Family	18.65	12	20.74	93	0	4,838
Financial Firms	8.05	5	11.70	89	0	4,838
Non-financial firms	7.92	0	14.55	88	0	4,838
Government	0.04	0	0.92	40	0	4,838
Foreign	12.86	0	20.31	95	0	4,838
<b>Panel B: Firm characteristics</b>						
Leverage	0.19	0.03	1.09	72.75	0	6,526
Growth opportunities	0.003	0.001	0.02	1.25	-0.18	5,319
CAPEX	-0.43	0.01	38.21	128	-2,951.95	5,978
ROA	-0.26	-0.007	3.09	7.14	-176	6,254
Free cash flow	1.13	-0.01	117.94	9,055.95	-1,006.61	5,918
Total assets	164,524.20	13,976	2,268,537	74,450,000	0	6,548
Volatility	0.98	0.82	0.62	4.20	0.02	6,272
Earning growth	0.05	0.02	0.28	5.13	-1	1,999
Age	10.23	10	3.79	19	1	4,970
Nominated Adviser	54.24	100	49.82	100	0	10,920

**Table 1. AIM firms descriptive statistics (continued)**

Variable	Mean	Obs.	Mean	Obs.	Wilconxon Test
	Listed Firms		Delisted Firms		
<b>Panel A: Type of major shareholder</b>					
Family	18.70	4,788	14.28	50	(p=0.183)
Financial firms	8.50	4,788	8.50	50	(p=0.842)
Non-financial firms	7.90	4,788	8.82	50	(p=0.553)
Government	0.04	4,788	0	50	(p=0.723)
Foreign	12.86	4,788	13.56	50	(p=0.482)
<b>Panel B: Firm characteristics</b>					
Leverage	0.19	6,460	0.21	66	(p=0.023)**
Growth opportunities	0.003	5,264	0.003	55	(p=0.473)
CAPEX	-0.43	5,919	0.06	59	(p=0.215)
ROA	-0.26	6,190	-0.52	64	(p=0.111)
Free cash flow	1.13	5,918	-0.25	59	(p=0.152)
Total assets	164,524.20	6,482	23,617.17	66	(p=0.028)**
Volatility	0.98	6,224	0.99	48	(p=0.938)
Earning growth	0.05	1,986	0.05	13	(p=0.661)
Age	10.23	4,927	10.23	43	(p=0.959)
Nominated Adviser	54.16	10,843	66.23	77	(p=0.034)**

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05.

In table 2 we present the distribution of firms by their country of origin. According to Vismara *et al.* (2012), firms in the AIM come from tax-haven British Territories such as Bermuda, the British Virgin Islands, and the Isle of Man, among others, and from countries with historical ties to Britain (Australia, Canada, Hong Kong, and the U.S.). In our sample we also find that many firms from Eastern European countries go public on the AIM. The majority of the firms come from the U.K. (6,650), which is line with Amini and Keasey (2013). There are also many firms from the U.S., coinciding with the stricter rules to list on the U.S. markets after the passage of the SOX in 2002.

**Table 2. AIM listed firms and delisted country distribution**

The sample is composed of the AIM firms during the period 1999-2012.

Country	Obs.	#Delisted	Country	Obs.	#Delisted
Algeria	14		Liechtenstein	14	1
Argentina	42		Luxemburg	14	
Australia	322	1	Macedonia	14	
Austria	14		Madagascar	14	
Azerbaijan	14		Malaysia	98	
Bahamas	14		Mali	14	
Bangladesh	14		Mauritius	14	
Belize	14		Mexico	28	
Botswana	28		Mongolia	42	1
Brazil	14		Morocco	28	
British Virgin Islands	42		Mozambique	56	
Cameroon	14		Namibia	14	
Canada	140		Nicaragua	14	
Cayman Islands	14		Niger	14	
Channel Islands	98	1	Nigeria	28	
Chile	14		Norway	28	
China	252	2	Papua New Guinea	14	
Colombia	28		Peru	56	1
Congo (Republic)	14		Philippines	14	
Cyprus	14		Poland	28	
Ecuador	14		Portugal	14	
Falkland Islands	28		Russia	126	
Fiji	14		Sierra Leone	70	
Finland	28		Singapore	28	
France	14		Slovak Republic	14	
Georgia	14	1	Somalia	28	
Germany	84	2	South Africa	126	2
Gibraltar	28		Sweden	28	
Greece	70	1	Switzerland	14	
Guinea	28	2	Tajikistan	14	
Hong Kong	14		Tanzania	56	1
Hungary	28		Thailand	14	
India	238	1	The Netherlands	14	
Indonesia	70	1	Turkey	42	
Iraq	14		UK	6,650	49
Ireland	154	1	USA	476	2
Isle of Man	84	4	Ukraine	56	
Israel	70	1	Unit. Arab Emirates	14	
Italy	42		Uruguay	14	
Japan	14		Uzbekistan	14	
Kazakhstan	112	1	Zambia	42	1
Kyrgystan	42	1	Zimbabwe	28	
Liberia	28				
<b>Total</b>				10,752	77

Table 3 shows the industry distribution for the available firms. The majority of the observations and the majority of the delisted firms are in the basic materials, financial, and oil and gas industries.

**Table 3. Industry distribution**  
AIM during the period 1999-2012.

<b>Industry</b>	<b>#Obs. AIM</b>	<b>#Delisted</b>
Basic materials	1,834	16
Consumer goods	602	4
Consumer services	994	10
Financial	1,568	12
Health care	728	4
Industrials	1,932	7
Oil and gas	1,540	13
Technology	1,260	8
Telecommunication	140	-
Utilities	168	3
<b>Total</b>	<b>10,766</b>	<b>77</b>

#### 4.2. AIM delisting determinants

In this section, we present the results of the analysis of the determinants of the delisting decision for AIM firms.

Table 4 shows the results of the probit model analyzing the probability of AIM firms delisting. Model (1) includes as explanatory variables: the *interaction term* between family or individual and crisis, family or individual, crisis, leverage, growth opportunities, ROA, size, volatility and earnings growth lagged one year. The estimation shows that there is a negative relationship between family holders during crisis period and the delisting decision through reverse takeovers. This result is consistent with *H.3. Family Firm and Financial Instability*. Family holders have more incentives to avoid the entry of new shareholders and long-term aims, reducing the likelihood of delisting through reverse takeovers. More control over the firm reduces the agency conflict between managers and shareholders being less beneficial the delisting decision for these firms.

There is also a negative relationship between ROA and the delisting decision. This result is contrary to the argument of the *free cash flow problem*. The greater the firm size, the lower the likelihood of delisting. This result is in agreement with the argument that in larger firms there is less asymmetric information with investors, which reduces the probability of delisting to expropriate wealth from minority shareholders. In contrast, this result does not support the agency conflicts motivation for delisting, according to which larger firms would have increased incentives to delist in order to reduce the agency conflicts between managers and shareholders if the firm has a dispersed ownership structure. These results are in line with those of Aslan and Kuman (2011) and Kashefi-Pour and Lasfer (2012). Furthermore, these firms may be more reluctant to sell their shares in a reverse takeover.

Model (2) adds the type of major shareholder (*individual or family, financial firms, non-financial firms, government, foreign investors*). The remaining variables show the same effect as model (1).

Model (3) adds the interaction term between the type of major shareholder and crisis. We observe that non-financial firm owners reduce the probability to undertake a reverse takeover during the crisis period.

We divide the sample into two sub-samples, separating crisis and non-crisis periods. The results in model (4) are similar to those of the first model. Again, there is a negative relationship between the delisting decision and family holders, ROA, and size. In non-crisis periods, however, these variables are not significant. The negative effect of family holders on the delisting decision in a period of financial instability is in accordance with their financial advantage over non-family firms, given their access to family financial capital (Hamelin 2013). The extended family represents a resource to generate capital and survive

downturns (Sorenson and Bierman 2009; Danes *et al.* 2009) and they are more reluctant to undertake restructuration in their business during crisis periods.

Table 5 controls for the age of the firm ,the quality of the Nomads, financial industry and domestic firm dummy variables.. The results are similar to table 6.

The results are robust when we run a *logit* model, and also when the cross-sectional regression is estimated. We also run the models including a dummy variable to control for the SOX (2002) effect that takes a value of 1 after 2002, and zero otherwise. However, this variable is dropped in the regressions.

**Table 4. Determinants of delisting AIM firms (Probit estimation)**

The sample is composed of the AIM firms during the period 1999-2012. Dependent variable: delisting decision. Type of major shareholders distinguishes the percentage of ownership held by: *Family* (family holders), *Financial firms (include Institutional Investors)*, *Non-financial firms*, *Government* (government holders), *Foreign* (foreign holders). *Crisis* is a dummy variable that takes the value of 1, zero otherwise. *Firm characteristics* consist of *Leverage* (total debt divided by total assets at the end of the previous year), *Growth opportunities* (book value of the total assets minus book value of equity plus market value of equity divided by book value of total assets), *CAPEX* (capital expenditures divided by total assets), *ROA* (EBIT divided by total assets), *Free Cash flow* (EBITDA over total assets of the firm), *Size* (ln total assets), *Volatility* (the within-firm standard deviation of earnings), and *Earning growth* (percentage of annual change in earnings). Data source: Own calculation based on *Datastream*. Currency: GBP (£).

<i>Dep. variable: Delisted</i>	(1)	(2)	(3)	(4) Non-Crisis	(5) Crisis
Family holders*Crisis	-3.0105*	-3.1211**	-3.8139**		
	(-1.92)	(-1.97)	(-2.15)		
Financial firms *Crisis			1.9130		
			(0.46)		
Non financial firms *Crisis			-6.5153**		
			(-1.99)		
Government holders*Crisis					
Foreign holders*Crisis			2.7742		
			(1.12)		
Family holders	0.5261	0.4603	0.7022	0.4624	-3.3911**
	(0.55)	(0.47)	(0.64)	(0.40)	(-2.25)
Financial Firm holders		-0.4680	-2.4504	-1.7299	-0.6293
		(-0.39)	(-0.61)	(-0.43)	(-0.44)
Non financial firms holders		-0.6481	3.0937	3.0546	-3.6845
		(-0.61)	(1.62)	(1.55)	(-1.33)
Government holders		-68.8113	-66.4970		-66.3469
		(-0.00)	(-0.00)		(-0.00)
Foreign holders		-0.1270	-2.1423	-1.8961	0.6638
		(-0.15)	(-1.00)	(-0.90)	(0.53)
Crisis	0.2181	0.2499	0.5855		
	(0.34)	(0.39)	(0.74)		
Leverage	-0.3171	-0.3282	-0.5088	-0.3598	-0.5646
	(-0.39)	(-0.40)	(-0.57)	(-0.20)	(-0.51)
Growth opportunities	-2.5272	-1.7934	1.3340	2.6016	1.9427
	(-0.12)	(-0.09)	(0.06)	(0.05)	(0.07)
ROA	-4.6764*	-4.7251*	-4.7887*	-2.2789	-7.2506*
	(-1.87)	(-1.87)	(-1.83)	(-0.55)	(-1.92)
Size	-0.2481**	-0.2516**	-0.2959**	-0.2698	-0.3779**
	(-2.07)	(-2.06)	(-2.30)	(-1.05)	(-2.22)
Volatility	-0.1381	-0.1498	-0.1953	-0.5204	-0.0926
	(-0.56)	(-0.61)	(-0.77)	(-0.65)	(-0.33)
Earning growth	0.2223	0.2153	0.2342	0.0239	0.7447
	(0.41)	(0.39)	(0.48)	(0.02)	(0.96)
Constant	-169.1340	-170.4570	-149.3993	-478.8951	-59.4430
	(-0.85)	(-0.84)	(-0.71)	(-0.84)	(-0.25)
# Observations	1,531	1,531	1,531	481	1,050
# Firms	371	371	371	192	355
Industry FE	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Wald Chi2	10.97	11.36	14.58	4.69	10.40

z-statistics in parentheses \*\*\* p<0.001, \*\* p<0.01, \* p<0.05.

**Table 5. Determinants of delisting AIM firms (Probit estimation)**

The sample is composed of AIM firms during the period 1999-2012. Dependent variable: delisting decision. Type of major shareholders distinguishes the percentage of ownership held by *Family* (family holders), *Financial firms (include Institutional Investors)*, *Non-financial firms*, *Government* (government holders), *Foreign* (foreign holders). *Crisis* is a dummy variable that takes the value of 1, zero otherwise. *Firm characteristics* consist of *Leverage* (total debt divided by total assets at the end of the previous year), *Growth opportunities* (book value of the total assets minus book value of equity plus market value of equity divided by book value of total assets), *CAPEX* (capital expenditures divided by total assets), *ROA* (EBIT divided by total assets), *Free Cash flow* (EBITDA over total assets of the firm), *Size* (ln total assets), *Volatility* (the within-firm standard deviation of earnings), *Earning growth* (percentage of annual change in earnings), *Age* (number of years that the firm is listed), and *Nomad* (number of clients of the Nominated Adviser). Data source: Own calculation based on *DataStream*. Currency: GBP (£).

<i>Dep. variable: Delisted</i>	(1)	(2)	(3)	(4) Crisis	(5) Crisis
Family holders*Crisis	-2.8669*	-3.7200**	-3.0548*		
	(-1.88)		(-1.92)		
Financial firms *Crisis		1.9839			
		(0.47)			
Non financial firms *Crisis		-6.5902**			
		(-2.07)			
Government holders*Crisis					
Foreign holders*Crisis		3.0195			
		(1.22)			
Family holders	0.5243	0.6874	0.5742	-2.9107**	-3.9449**
	(0.55)	(0.63)	(0.59)	(-2.01)	(-2.19)
Financial firms holders		-2.3831			-0.2423
		(-0.60)			(-0.14)
Non financial firms holders		3.0972			-4.1059
		(1.62)			(-1.47)
Government holders		-71.9921			-82.5016
		(-0.00)			(-0.00)
Foreign holders		-2.4504			0.3157
		(-1.14)			(0.21)
Crisis	0.1826	0.5067	0.2125		
	(0.29)	(0.64)	(0.33)		
Leverage	-0.4199	-0.6608	-0.3010	-0.2106	-0.3957
	(-0.49)	(-0.72)	(-0.36)	(-0.17)	(-0.30)
Growth opportunities	-3.8514	1.1444	-2.5810	-1.5765	0.7030
	(-0.18)	(0.05)	(-0.12)	(-0.06)	(0.03)
ROA	-4.3728*	-4.4671*	-4.6137*	-7.9163*	-8.5208**
	(-1.79)	(-1.73)	(-1.82)	(-1.95)	(-1.99)
Size	-0.2571**	-0.3026**	-0.2491**	-0.3362**	-0.4266**
	(-2.14)	(-2.40)	(-2.01)	(-2.11)	(-2.36)
Volatility	-0.1103	-0.1632	-0.1139	-0.0276	-0.0508
	(-0.43)	(-0.61)	(-0.44)	(-0.08)	(-0.15)
Earning growth	0.1990	0.1706	0.2182	0.6104	0.6775
	(0.37)	(0.34)	(0.41)	(0.78)	(0.80)
Age	-0.1092	-0.3260	-0.0665	-0.1619	-0.4378
	(-0.32)	(-0.87)	(-0.19)	(-0.42)	(-0.99)
Nomad	0.2724	0.3020	0.2961	0.5859	0.7115
	(0.91)	(0.95)	(0.96)	(1.23)	(1.29)
Financial	-0.2569	-0.1655	-0.0655	-6.1444	-6.4492
	(-0.62)	(-0.38)	(-0.13)	(-0.00)	(-0.00)
Domestic	-0.0653	-0.1057	-0.2561	-0.4430	-0.6183
	(-0.19)	(-0.29)	(-0.61)	(-0.88)	(-1.10)
Constant	-173.1351	-147.6364	-159.6864	-35.0263	-8.2334
	(-0.85)	(-0.68)	(-0.78)	(-0.14)	(-0.03)
# Observations	1,561	1,561	1,531	1,050	1,050
# Firms	377	377	371	355	355



Industry FE	NO	NO	YES	YES	YES
Country FE	NO	NO	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Wald Chi2	11.53	15.78	12.01	10.50	11.93

z-statistics in parentheses \*\*\* p<0.001, \*\* p<0.01, \* p<0.05.

### 4.3. AIM survival analysis

In this section, we present the results of the survival analysis of AIM firms. Table 6 shows the results following the *Cox proportional hazard model* (1972). The dependent variable in the Cox model measures the risk of failure distribution. We consider the age as the survival time. This variable is measured as the number of years from incorporation until AIM delisting. To calculate the age of non-delisted firms, we consider 31<sup>st</sup> December 2013 as the end of the firm life. We include the independent variables used previously (*section 4.2.*). A positive coefficient implies a hazard ratio (calculated as the exponential coefficient from the Cox model) that is greater than one, suggesting that an increase in the covariate increases the failure rate. A negative coefficient implies a hazard ratio of less than one, indicating that an increase in the covariate reduces the failure rate.

Model (1) shows that the probability of delisting through reverse takeovers is lower for firms with majority family shareholders (*H.1..Family Control and Long-Term Aims*). This result support the argument that family firms are more reluctant to sell their firm and have long-term aims. The hazard rate of family holders (0.1131) suggests that the failure risk of family holder IPOs is 11.31% of the failure risk of other IPOs.

There is also a negative relationship between ROA and size and the delisting decision. These results are robust to those presented in the previous *probit* model.

Model (2) also includes the nomad reputation variable. The results are similar to those shown in model (1).

Model (3) adds the variables that control if the firms are from the financial industry and domestic (from U.K.). The results show that the probability of undertaking a reverse takeover is higher when the firm is a financial firm. This result is in line with Amini and Keasy (2013).

Table 7 shows the results including only the variable family holders. The results are similar to those shown in Table 6.

Table 8 adds the interaction term between family or individual and crisis. The results show that the probability of undertaken a reverse takeover is lower if the firm is hold by a family during crisis period (*H3. Family Firm and Financial Instability*). Also, the results show that during crisis period the probability of delisting decision through reverse takeovers is higher according to the argument that reverse takeover are an IPO alternative to go public (*H.2. Financial Instability*).

**Table 6. Cox Proportional Hazard model**

The sample is composed of the AIM firms during the period 1999-2012. Dependent variable: age of the firm in years. The type of major shareholders distinguishes the percentage of ownership held by: *Family* (family holders), *Financial firms (include Institutional Investors)*, *Non-financial firms*, *Government* (government holders), *Foreign* (foreign holders). *Crisis* is a dummy variable that takes the value of 1, zero otherwise. *Firm characteristics* consist of *Leverage* (total debt divided by total assets at the end of the previous year), *Growth opportunities* (book value of the total assets minus book value of equity plus market value of equity divided by book value of total assets), *CAPEX* (capital expenditures divided by total assets), *ROA* (EBIT divided by total assets), *Free Cash flow* (EBITDA over total assets of the firm), *Size* (ln total assets), *Volatility* (the within-firm standard deviation of earnings), *Earning growth* (percentage of annual change in earnings), *Age* (number of years that the firm is listed), and *Nomad* (number of clients of the Nominated Adviser). Data source: Own calculation based on *DataStream*. Currency: GBP (£).

<i>Dep. variable: Delisted</i>	(1)		(2)		(3)	
	Coeff.	Hazard Ratios	Coeff.	Hazard Ratios	Coeff.	Hazard Ratios
Family holders	-2.1796*** (-3.19)	0.1131	-2.1984*** (-3.20)	0.1110	-2.5432*** (-3.42)	0.0786
Financial firms holders	0.9730 (0.96)	2.6458	0.8853 (0.87)	2.4237	-0.1096 (-0.10)	0.8962
Non- financial firms holders	0.1131 (0.11)	1.1198	0.0975 (0.10)	1.1024	0.2381 (0.24)	1.2689
Government holders	-101.2006 (.)		-100.9780 (.)	1.40e-44	-100.2325 (.)	2.95e-44
Foreign holders	-0.8179 (-1.07)	0.4414	-0.8143 (-1.07)	0.4430	-0.9470 (-1.22)	0.3879
Crisis	0.5873 (1.14)	1.7991	0.6004 (1.16)	1.8229	0.6350 (1.20)	1.8871
Leverage	-0.2419 (-0.34)	0.7851	-0.2304 (-0.32)	0.7942	-0.3240 (-0.48)	0.7233
Growth opportunities	25.7956*** (2.68)	1.60e+11	25.8154*** (2.71)	1.63e+11	28.4860*** (3.03)	2.35e+12
ROA	-7.5560*** (-4.04)	0.0005	-7.6536*** (-4.09)	0.0005	-7.1611*** (-3.86)	0.0008
Size	-0.1705* (-1.71)	0.8433	-0.1707* (-1.71)	0.8431	-0.1735* (-1.75)	0.8407
Volatility	0.3815** (1.99)	1.4645	0.3982** (2.06)	1.4891	0.2007 (1.03)	1.2222
Earning growth	0.4343 (1.21)	1.5438	0.4214 (1.18)	1.5240	0.4428 (1.27)	1.5571
Nomad			0.1585 (0.65)	1.1717	0.0930 (0.37)	1.0974
Financial Firms					1.6580*** (3.89)	5.2486
Domestic Firm					-0.3040 (-0.74)	0.7378
# Observations	710		710		710	
Industry FE	YES		YES		YES	
Country FE	YES		YES		YES	
Year FE	YES		YES		YES	
Wald Chi2	66.71		67.13		83.36	

z-statistics in parentheses \*\*\* p<0.001, \*\* p<0.01, \* p<0.05.

**Table 7. Cox Proportional Hazard model**

The sample is composed of AIM firms for the period 1999-2012. Dependent variable: age of the firm in years. Type of major shareholders distinguishes the percentage of ownership held by *Family* (family holders). *Crisis* is a dummy variable that takes the value of 1, zero otherwise. *Firm characteristics* consist of *Leverage* (total debt divided by total assets at the end of the previous year), *Growth opportunities* (book value of the total assets minus book value of equity plus market value of equity divided by book value of total assets), *CAPEX* (capital expenditures divided by total assets), *ROA* (EBIT divided by total assets), *Free Cash flow* (EBITDA over total assets of the firm), *Size* (ln total assets), *Volatility* (the within-firm standard deviation of earnings), *Earning growth* (percentage of annual change in earnings), *Age* (number of years that the firm is listed), and *Nomad* (number of clients of the Nominated Adviser). Data source: Own calculation based on *DataStream*. Currency: GBP (£).

<i>Dep. variable: Delisted</i>	(1)		(2)		(3)	
	Coeff.	Hazard Ratios	Coeff.	Hazard Ratios	Coeff.	Hazard Ratios
Family holders	-2.4029*** (-3.83)	0.0905	-2.4095*** (-3.83)	0.0899	-2.6757*** (-3.99)	0.0689
Crisis	0.6102 (1.20)	1.8408	0.6209 (1.22)	1.8607	0.5760 (1.11)	1.7790
Leverage	-0.2649 (-0.37)	0.7673	-0.2449 (-0.34)	0.7828	-0.3513 (-0.52)	0.7036
Growth opportunities	23.5306** (2.38)	1.66e+10	23.7020** (2.41)	1.97e+10	27.0228*** (2.79)	5.44e+11
ROA	-7.5226*** (-4.06)	0.0005	-7.6629*** (-4.12)	0.0005	-7.2941*** (-3.96)	0.0007
Size	-0.1699* (-1.77)	0.8437	-0.1726* (-1.79)	0.8415	-0.1906** (-1.96)	0.8264
Volatility	0.3900** (2.04)	1.4770	0.4096** (2.13)	1.5062	0.2129 (1.10)	1.2373
Earning growth	0.4574 (1.33)	1.5780	0.4474 (1.30)	1.5642	0.5052 (1.50)	1.6573
Nomad			0.1841 (0.76)	1.2022	0.0779 (0.31)	1.0810
Financials					1.6151*** (3.93)	5.0286
Domestic Firm					-0.2527 (-0.63)	0.7767
# Observations	710		710		710	
Industry FE	YES		YES		YES	
Country FE	YES		YES		YES	
Year FE	YES		YES		YES	
Wald Chi2	64.31		64.91		81.36	

z-statistics in parentheses \*\*\* p<0.001, \*\* p<0.01, \* p<0.05.

**Table 8. Cox Proportional Hazard model**

The sample is composed of AIM firms for the period 1999-2012. Dependent variable: age of the firm in years. Type of major shareholders distinguishes the percentage of ownership held by *Family* (family holders). *Crisis* is a dummy variable that takes the value of 1, zero otherwise. *Firm characteristics* consist of *Leverage* (total debt divided by total assets at the end of the previous year), *Growth opportunities* (book value of the total assets minus book value of equity plus market value of equity divided by book value of total assets), *CAPEX* (capital expenditures divided by total assets), *ROA* (EBIT divided by total assets), *Free Cash flow* (EBITDA over total assets of the firm), *Size* (ln total assets), *Volatility* (the within-firm standard deviation of earnings), *Earning growth* (percentage of annual change in earnings), *Age* (number of years that the firm is listed), and *Nomad* (number of clients of the Nominated Adviser). Data source: Own calculation based on *DataStream*. Currency: GBP (£).

<i>Dep. variable: Delisted</i>	(1)		(2)		(3)	
	Coeff.	Hazard Ratios	Coeff.	Hazard Ratios	Coeff.	Hazard Ratios
Family holders*Crisis	-2.5973* (-1.75)	0.0745	-2.6781* (-1.81)	0.0687	-3.2424** (-2.11)	0.0391
Family holders	-0.3147 (-0.24)	0.7300	-0.2630 (-0.20)	0.7687	-0.0630 (-0.05)	0.9390
Crisis	1.2251* (1.90)	3.4045	1.2585* (1.94)	3.5202	1.3121** (1.99)	3.7141
Leverage	-0.3054 (-0.43)	0.7368	-0.2888 (-0.40)	0.7491	-0.4168 (-0.62)	0.6592
Growth opportunities	19.2497* (1.86)	2.29e+08	19.7850* (1.94)	3.91e+08	24.1408** (2.46)	3.05e+10
ROA	-7.4933*** (-4.01)	0.0006	-7.6665*** (-4.08)	0.0005	-7.2827*** (-3.91)	0.0007
Size	-0.1781* (-1.85)	0.8369	-0.1811* (-1.86)	0.8344	-0.1994** (-2.04)	0.8192
Volatility	0.3834** (2.03)	1.4673	0.4071** (2.14)	1.5025	0.2086 (1.09)	1.2320
Earning growth	0.3864 (1.16)	1.4717	0.3738 (1.13)	1.4533	0.3938 (1.22)	1.4826
Nomad			0.2110 (0.87)	1.2349	0.1066 (0.42)	1.1125
Financials					1.6660*** (4.05)	5.2909
Domestic Firm					-0.2553 (-0.64)	0.7747
# Observations	710		710		710	
Industry FE	YES		YES		YES	
Country FE	YES		YES		YES	
Year FE	YES		YES		YES	
Wald Chi2	67.22		67.99		85.49	

z-statistics in parentheses \*\*\* p<0.001, \*\* p<0.01, \* p<0.05.

#### 4.4. Robustness

Several studies note that the relationship between family firms and firm performance is non-monotonic (Maury 2006; Sciascia *et al.* 2012). A possible non-monotonic relationship might also be associated with the delisting decision through reverse takeovers. To check for robustness we run the regression considering the variables family and family squared. The results are not statistically significant, meaning that there is a negative relationship between the delisting decision and family holders.

#### 5. MAIN CONCLUSIONS

This study analyzes the determinants of Small Medium Firms (SMEs) delisting from the U.K.'s Alternative Investment Market (AIM) through reverse takeovers during the period 1999-2012, comparing family and non-family firms in addition to non-crisis and crisis periods. Previous studies focus on the decision to go public or private in a main market. To the best of our knowledge, there have been no previous studies focusing on the effect of family holders and financial crisis as determinants of the delisting decision through reverse takeovers for SMEs on the AIM. The findings of previous studies suggest that access to capital markets is the main motivation for firms to go public. Going public may be a more complicated decision for family firms because of the risk of losing control of the firm; at the same time, during crisis periods, firms face greater financial restrictions. For these reasons, we expect a different impact on the probability of going private for family firms than non-family firms and during non-crisis periods than during crisis periods.

Our findings show that the higher the percentage of ownership held by family owners and the greater the size and the ROA of the firm, the lower the probability of delisting on the AIM. The lower probability of delisting for firms with majority family shareholders supports the argument that these firms are reluctant to sell their shares in a reverse takeover and they place more importance on long-term aims, reducing their incentives to go private. This negative effect is maintained during the crisis period. These results are maintained when we apply the survival analysis, following a *Cox proportional hazard model*. The advantage of the Cox proportional hazard model over other techniques is that it models the expected time to failure. In this study, the risk of failure is the risk that a firm listed on the AIM decides to be delisted.

This study contributes to the Small Medium Enterprises (SME) and financial literature. The alternative investment markets, the family business and the financial crisis have recently attracted the attention of academics and regulators. Thus far, the empirical studies that focus on alternative investment markets analyze periods characterized by financial stability and do not focus on family firms. They do not consider the importance of access to capital markets through alternative markets for family firms and especially in periods characterized by financial instability. We contribute to previous studies analyzing these aspects, taking into account the current financial crisis.

Promoting global entry to the AIM for SME and their maintenance in these types of markets may be an alternative source of funding in a period characterized by financial instability. Therefore, this study provides new evidence in relation to the relevance of the development of alternative markets for SMEs around the world.

The relevance of this financial research can be summarized in the importance of the Alternative Investment Market (AIM): i) as a source of funds for Small Medium Enterprises (SME); ii) that is cheaper than the Main Markets and iii) that other alternative investment markets could imitate; iv) especially because the AIM provides funds for firms' growth that the financial system, via credit, does not provide.

The survival of firms could be a benchmark for regulators to measure the success of the rules that they impose on firms planning to be listed or undertake a reverse takeover. Additionally, firms and policy markets are interested in IPO survival, given that as long as a firm remains listed, it can raise funding from public markets.

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### Appendix. Variable Description

Variable	Exp. Sign	Description	Previous Studies	Source
<i>Type of Shareholder</i>				
<b>Family</b>	+/-	Percentage of ownership held by an individual, family or employee.		DataStream
<b>Financial firms</b>	+/	Percentage of ownership held by financial firms and institutional investors.		DataStream
<b>Non financial firms</b>	+/	Percentage of ownership held by non-financial firms.		DataStream
<b>Government</b>	+/	Percentage of ownership held by governments.		DataStream
<b>Foreign</b>	+/	Percentage of ownership held by foreign investors.		DataStream
<b>Crisis</b>	-	Dummy variable that takes value 1 from 2008 to 2012, zero otherwise (1999-2007).		Own elaboration
<i>Firm Characteristics</i>				
<b>Leverage</b>	-	Debt/debt+equity	<i>Aslan and Kuman (2011)</i> <i>Kashefi-Pour and Lasfer (2012)</i>	DataStream
<b>Growth opportunities</b>	-	Market to book ratio.		DataStream
<b>ROA</b>	+	EBIT/total assets	<i>Aslan and Kuman (2011)</i> <i>Kashefi-Pour and Lasfer (2012)</i>	DataStream
<b>Size</b>	-	Ln total assets	<i>Aslan and Kuman (2011)</i> <i>Kashefi Pour and Lasfer (2012)</i>	DataStream
<b>Volatility</b>	+	Within-firm standard deviation of earnings.	<i>Aslan and Kuman ( 2011)</i>	DataStream
<b>Earning growth</b>	-	Percentage of annual change in earnings	<i>Aslan and Kuman (2011)</i>	DataStream
<b>Age</b>	-	Number of years from incorporation until AIM delisting and a dummy variable that takes the value 1 of the year is above the median of the sample.	<i>Alsan and Kumar ( 2011)</i> <i>Espenlaub et al.(2012)</i>	LSE website
<b>Nominated Adviser (Nomad) Reputation</b>	-	Number of clients and dummy variable that takes the value 1 if the number of Nomad's clients is above the median of the sample and zero	<i>Espenlaub et al. (2012)</i>	LSE website
<b>Financial Sector</b>	-	Dummy variable that takes value 1 if the firms is in the financial sector	<i>Amini and Keasy ( 2012)</i>	LSE website
<b>Domestic Origin</b>	-	Dummy variable that takes value 1 if the firms come from the U.K., zero otherwise	<i>Amini and Keasy (2012) and</i> <i>Espenlaub et al. (2012)</i>	LSE website