

## Reverse takeover: the moderating role of family ownership

Isabel Feito-Ruiz<sup>a</sup>, Clara Cardone-Riportella<sup>b</sup> and Susana Menéndez-Requejo<sup>c</sup>

<sup>a</sup>Universidad de León, León, España; <sup>b</sup>Universidad Pablo de Olavide, Sevilla, España; <sup>c</sup>Universidad de Oviedo, Oviedo, España

### ABSTRACT

The aim of this study was to analyse the determinants of reverse takeovers, examining the influence of target firm shareholders' type in the agreement. We examine reverse takeovers implemented in the Alternative Investment Market between 1999 and 2012, paying special attention to the differences between family and non-family target firms, as well as the impact of the financial crisis.

We propose that family firms have a lower probability of accepting a reverse takeover ('shell' firm), to avoid both diluting the ownership structure (loss of control) and new shareholders entering their firm. Our main findings show that the higher the percentage of ownership held by family holders, the lower the probability of their being the target firm in a reverse takeover. This effect is maintained during the crisis period, in accordance with the expectation that family firms will have fewer financial constraints.

### KEYWORDS

Reverse takeover; family firm; global financial crisis; alternative investment market; shell firm; back door listing

### Introduction

The aim of this study was to analyse the determinants of reverse takeovers (RTs), examining the differences between family and non-family listed firms in accepting these deals. We also consider the impact of the financial crisis.

A RT is an alternative method for private firms to go public, instead of undertaking an Initial Public Offering (IPO), usually shortening the process and reducing costs. In a RT, private firms' owners gain control of a listed firm (called a 'shell') by merging, becoming a public firm. Therefore, the RT implies a share exchange and a change of control in the listed firm. RTs are also used as a cross-listing mechanism, enabling foreign firms to gain a listing in another country by acquiring a local firm. RTs are also known as a 'back door' listing method.

Gleason, Rosenthal, and Wiggins (2005) published the first research focused on RTs 10 years ago, analysing why firms choose them for going public. Gleason, Rosenthal, and Wiggins (2005) examine 121 RTs on the NASDAQ, NYSE and AMEX, showing that public 'shells' are generally poor performers. RT allows target firm shareholders to recover some of their investments, many of which took place during the IPO bubble. Adjei, Cyree, and Walker (2008) find that private firms that use a reverse merger to go public are smaller, younger and have poorer ex-ante performance on average than those using IPOs, in the US capital markets. Achleitner et al. (2013) study the motives behind private equity acquisitions of publicly listed firms in continental Europe. They show that the likelihood of a firm being taken over by a private equity investor depends on the ownership structure, with regard to the incentives for large shareholders to monitor the management and the potential private benefits of control. Floros and Sapp (2011) analyse shell firms that have no operations and no assets involved in reverse merger agreements in the USA, showing them to

be an interesting choice for investors as an alternative investment, besides providing an important mechanism for a private firm to go public.

What little previous research there is has analysed RT as a mechanism for private firms going public. We have not found research analysing RTs from the target firm's point of view. Why do listed firms accept a RT deal? Even more, are there differences among listed firms deciding about a RT offer? We propose that the ownership structure in the potential target firm may be relevant in RT. Specially, we expect that family ownership in the listed firm may discourage RT agreements, based on family businesses' typical long-term orientation and interest in maintaining firm control (Chrisman et al. 2012). Our analysis also contributes to the study of the relevance of ownership and control on private equity investment deals, typically ignored apart from Maupin, Bidwell, and Ortegren (1984), Weir, Laing, and Wright (2005) and Achleitner et al. (2013). We also consider the relevance of the financial crisis on the RT decision, taking into account the reduction in the credit supply and the higher financial costs during financial crisis periods. We expect that private firms will be more likely to undertake a RT in crisis periods to enter the public market, avoiding an IPO, which implies higher costs and requirements. Moreover, RT target firms are supposed to suffer greater financial problems during financial crises. Nevertheless, family businesses show better performance (Van Essen et al. 2015) and better access to credit (Crespí and Martín-Oliver 2015; D'Aurizio, Oliviero, and Romano 2015) in crisis periods.

To test the hypotheses, we examine RTs implemented in the Alternative Investment Market (AIM) in the UK in the period of 1999–2012. AIM is the London Stock Exchange's international market for smaller growing companies from across the globe. We choose the most representative European alternative stock market, instead of a main market, given that RTs are more affordable deals for private and listed companies in this market. Therefore, we can better analyse this corporate finance decision.

This article contributes to several streams of literature, namely (1) the literature on the AIMs, filling the gap for studies on RT; (2) family business literature, examining the potential influence of family ownership on RT decisions; and (3) corporate finance literature because we study the RT corporate decision from the target firm's perspective, taking into account the effect of crisis period.

The remainder of the article is structured as follows. [Section II](#) provides a review of the literature and establishes the hypotheses. [Section III](#) presents the data and methodology. [Section IV](#) discusses the main results, and [Section V](#) concludes the article.

## Literature review and hypotheses

### *The ownership structure's influence on delisting decisions*

Some papers have analysed the influence of ownership structure on corporate delisting decisions, as ownership structure influences other corporate finance decisions (Jensen and Meckling 1976). Their results show that firms pay higher premiums if there is less managerial control. Additionally, they show that one of the main motives for firms, which have dispersed ownership structures, to decide on delisting is to reduce the agency conflicts between managers and shareholders. Renneboog, Simons, and Wright (2007) analyse the shareholder gains in UK public to private transactions in the second wave from 1997 to 2003. They find that shareholders obtain positive returns around the announcement of the delisting process through a Leverage Buyout (LBO), Management Buyout (MBO) or Management Buying (MBI). The premium is determined by the tax benefits, incentive realignment and the under-valuation 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 external shareholders, which is consistent with the greater managerial control in these firms.

Aslan and Kumar (2011) have analysed both decisions, going public and private, for UK non-financial and non-utilities firms in the AIM and the Main Market during the period of 1996–2006. They find that firms that are economically underperforming because of agency conflicts between managers and dispersed shareholders are more likely to go private. These firms try 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.

In addition to this, Achleitner et al. (2013) show that the existence of controlling shareholders reduces the likelihood of private equity acquisitions in Main Markets given that there are fewer agency conflicts to reduce in these cases. Bebchuk (1999) predicts a positive relationship between the control exercised by large shareholders in the case of receiving a premium that compensates for foregoing the private shareholders and the size of their private benefits. A blockholder will be interested in selling his stake when he receives control benefits. However, controlling shareholders may have private information about positive future performance that the market does not expect and, therefore, it is not incorporated in the market price. In this situation, controlling shareholders might delist the firm to avoid sharing this future performance improvement with other shareholders (Bebchuk 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 2014). Other studies (Holmen and Nivorozhkin 2007; Caprio, Crocì, and Del Giudice 2011) focused on the merger and acquisition decision, showing that the presence of family members with high levels of ownership reduces the probability of being acquired, given that these shareholders are more reluctant to sell their controlling stakes to outsiders than other types of shareholders (Holderness and Sheehan 1988; Klasa 2007; Bauguess and Stegemoller 2008).

We expect a lower probability of accepting a RT for listed family firms. We take into account that family owners are usually more interested in maintaining firm control than other types of controlling shareholders, as the persistence of family control attests (Franks et al. 2012). Then, we expect that family shareholders will tend to avoid RT deals coming from a private firm, which would determine the entry of a new control group. Moreover, family firms usually show risk aversion and conservative behaviour in corporate decisions (La Porta, López De Silanes, and Shleifer 1999; Gomez-Mejía, Makri, and Larraza 2010; Hiebl 2013), so they are expected to be reluctant to accept RT agreements. Furthermore, given the family owners' greater incentives to monitor the management, potential advantages of RT in terms of agency conflict reduction and future value creation will be lower. Additionally, family shareholders' long-term and survival aims (Steier 2005; Tsai, Kuo, and Hung 2009; Hamelin 2013) may be achieved more easily by maintaining firm control. Thus, we establish the following hypothesis:

*Hypothesis 1. Family Control: The probability of accepting a RT is lower for family firms than for non-family firms.*

### *The influence of the global financial crisis*

The Global Financial Crisis (GFC) hindered firm financing and increased firms' financial distress. We expect the probability of accepting a RT to increase with target firm financial difficulties, therefore, with the GFC. Thus, we establish the following hypothesis:

Hypothesis 2. Financial Crisis: *The probability of accepting a RT is higher during global financial crisis periods.*

However, we also propose a moderating role of family ownership. Some recent papers have shown the different impact of GFC on family business financial structure compared to non-family firms. D'Aurizio, Oliviero, and Romano (2015) and Stacchini and Degasperri (2015) show less sharp credit contraction to Italian family firms during the 2007–2009 financial crisis compared with non-family firms. Even more, banks further increased the discount to the interest rates charged to family firms (Stacchini and Degasperri 2015). Crespi and Martín-Oliver (2015) also conclude there was better access to credit for Spanish family firms during the GFC. Fewer borrower and lender agency conflicts for family businesses explain this better access to bank financing, linked to family businesses' conservative attitudes towards risk and investment, together with their long-term orientation and interest in firm continuity through generations. Starting from family businesses' better resilience to the effects of financial shocks, we propose that family firms will also be more reluctant than non-family businesses to accept a RT during crisis periods. Therefore, we establish the following hypothesis regarding the interaction between family ownership and the GFC period:

Hypothesis 3. Family Firms and Financial Crisis: *The probability of accepting a RT is lower for family firms than non-family firms during the global financial crisis.*

## Data and methodology

### *Data*

The database to test the theoretical proposals considers the firms listed on the AIM during the period 1999–2012<sup>1</sup>. We analyse the most representative European alternative stock market, instead of a main market, given that RTs are more affordable deals for private and listed companies in this market.

The data come from the London Stock Exchange (LSE) website<sup>2</sup> and the international database DataStream<sup>3</sup>. The LSE website provides information about the firms listed and delisted on the AIM and data detailing these transactions. 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 come from 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. This database does not contain balance sheet and ownership information for all firms and the sample is reduced accordingly. The lack of SEDOL code in some firms from the LSE website and the name changes do not allow us to do a complete matching with the information from Datastream (accounting data and ownership information), and again, our

---

<sup>1</sup> 1998 is the first year that the information is available on the AIM, but its information is incomplete. The number of firms listed on the AIM varies according to the period, and is 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).

<sup>2</sup> <http://www.londonstockexchange.co.uk> (section Alternative Investment Market).

<sup>3</sup> <https://forms.thomsonreuters.com/datastream>.

sample is reduced. Nielsson (2013) also explains this problem. To focus on RTs, we do not consider other delisting decisions (transfer to the Main Market, firm request or some legal requirements). Therefore, we consider unbalanced panel data from 1999 to 2012 for those firms with SEDOL codes.

### Methodology

We analyse the probability of being a target in a RT by estimating a Probit model. We use panel data to control for the unobservable heterogeneity at the firm level.

#### Reverse takeover decision: probit model

$$\begin{aligned} \text{Pr ob}(RT)_{it} = & \varphi_0 + \varphi_1 \text{Owners}_{it} + \varphi_2 \text{Crisis}_{it} + \varphi_3 \text{Owners} * \text{Crisis}_{it} + \varphi_4 \text{Leverage}_{it} + \varphi_5 \text{GrowthOpportunities}_{it} + \\ & + \varphi_6 \text{ROA}_{it} + \varphi_7 \text{Size}_{it} + \varphi_8 \text{Volatility}_{it} + \varphi_9 \text{EarningChange}_{it} + \varphi_{10} \text{Age}_{it} + \varphi_{11} \text{Nomad}_{it} + \\ & + \sum_k \delta_k \text{Industry} + \sum_m \delta_m \text{Country} + \sum_t \psi_t \text{Year} + \varepsilon_{it} \text{ (Eq.1)} \end{aligned} \quad (1)$$

The dependent variable is a dummy variable that takes the value of 1 if a firm listed on the AIM is a target in a RT and 0 otherwise. As explained below, we consider as independent variables the type of shareholder (family, institutional investors [including financial firms], non-financial firms, governments and foreign investors), crisis versus 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.

#### Independent variables:

- *Type of shareholder (Owners<sup>4</sup>)*: percentage of ownership held by those shareholders with more than 5% of the ownership, which represents significant shareholders (source *Datastream*). This percentage represents strategic shareholders. They are classified in the following five groups: (1) an *individual or family*, (2) *institutional investors* (including *financial firms*), (3) *non-financial firms*, (4) *government* and (5) *foreign investors*. According to our hypotheses, we focus on the effect of family holders on the RT, 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. They usually have long-term aims and lower private benefit incentives than other types of majority shareholders, which together we expect to reduce the likelihood of accepting a RT (*H.1. Family Control*).
- *Crisis*: a dummy variable that takes the value of 1 from 2008 to 2012, and zero otherwise (1999– 2007). The crisis period creates more financial constraints and more difficulties for firms. Raising the funds needed for a buyout becomes extremely difficult, which negatively affects the probability of a voluntary delisting (Crocì and Del Giudice 2014). In contrast, we expect more RTs as an alternative to IPOs and a higher probability of firms accepting being a target, given the increase of financial constraints (*H.2. Financial Crisis*).
- *Owners\*Crisis*: interaction term among owners and crisis variables. We expect RTs to be less probable during GFC period when the majority shareholder is a family group, given their expected better access to financing and their goal to maintain their stake in the firm (*H3. Family Firms and Financial Crisis*).
- *Leverage*: debt over debt+equity. Firms with more debt are more likely to accept a RT. Their greater financial restrictions will reduce their investment opportunities, making the costs of

<sup>4</sup> We also consider the percentage of ownership held by the ultimate shareholder. This information comes from *Osiris, Bureau Van Dijk Database*.

being listed higher than the benefits (Aslan and Kumar 2011; Kashefi-Pour and Lasfer 2013).

- *Growth opportunities: market to book ratio.* Firms with lower growth opportunities are more likely to accept a RT, given that they may exploit mispricing (Aslan and Kumar 2011; Kashefi-Pour and Lasfer 2013).
- *Return on assets (ROA):* EBIT/total assets; or, alternatively, *free cash flow*<sup>5</sup>: free cash flow/total assets. Firms with higher ROA have more financial resources and are, therefore, less likely to be interested in a RT.
- *Size: In total assets* (alternatively, *In market value*). Larger firms have less asymmetric information with investors. In contrast, smaller firms have higher costs of information generation, which favours delisting decisions (Aslan and Kumar 2011; Kashefi-Pour and Lasfer 2013). In addition to this, small firms are expected to have more financial constraints, which increase the probability of being the target in a RT.
- *Volatility:* the within-firm standard deviation of earnings. Firms with high volatility are more likely to be a target in a RT, given their higher risk (Aslan and Kumar 2011).
- *Earnings growth:* the percentage of annual change in earnings. Firms with high earnings growth (sales growth) are less likely to be a target in a RT because they have a positive prospective in the market (Aslan and Kumar 2011).
- *Age:* This variable is measured as the *number of years from incorporation on the AIM until RT*. To calculate the age of non-delisted firms, we consider 31 December 2013 as the final date. Younger firms have a higher cost of staying public, given their higher cost of information generation, which increases the probability of delisting (Aslan and Kumar 2011; Espenlaub, Khurshed, and Mohamed 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. 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 (Esenlaub, Khurshed, and Mohamed 2012). Nomads with more clients are expected to have more experience, expertise and reputational concern and thus will provide 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 case-load, 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 Keasey 2013). *Domestic firm* is a dummy variable that takes the value of 1 if the firm comes from the UK, and zero otherwise (Esenlaub, Khurshed, and Mohamed 2012). Amini and Keasey (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 UK can access market-based equity finance more easily. Therefore, both financial firms and domestic firms may positively influence the delisting decision.

---

<sup>5</sup> This variable is highly correlated with ROA. Therefore, they are included in the *probit* regressions alternatively.



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: (1) *oil and gas*, (2) *basic materials*, (3) *industrials*, (4) *consumer goods*, (5) *health care*, (6) *consumer services*, (7) *telecommunications*, (8) *utilities* and (9) *technology*.

## Main results: determinants of the reverse takeover decision

### *Descriptive analysis*

There were many admissions to the AIM in 2000 and also between 2003 and 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 US markets after the passage of the Sarbanes-Oxley Act (SOX<sup>6</sup>) in 2002. The post-Enron context in the USA, which led to the introduction of SOX, discouraged many companies from trying to list in the USA and caused a resultant surge in overseas interest in the UK'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, institutional investors 8.05%, non-financial firms 7.92%, government holders 0.04% and foreign holders 12.86%. Firms listed on the AIM had a leverage ratio valued at 19%, on average. The mean and median of Capital Expenditure (CAPEX) and ROA were negative.

When we divide the sample between listed and delisted firms accepting a RT, we observe that firms accepting a RT have more leverage and fewer assets. These differences are statistically significant and consistent with the argument that higher financial constraints make firms more attractive as a target in a RT. In general, these firms are poor performers. The Nomads of delisted 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.

In Table 2, we present the distribution of firms by their country of origin. According to Vismara, Paleari, and Ritter (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 USA). We also observe that many firms from Eastern European countries go public on the AIM. The majority of the firms come from the UK (6,650), which is in line with Amini and Keasey's findings (2013). There are also many firms from the USA, coinciding with the stricter rules for listing on the US markets after the passage of the SOX in 2002. After SOX, many firms decided to list in the UK market to avoid the increased listing requirements in the US markets. UK firms that delist become private and do not change their market quotation. The AIM has lower listing and disclosure requirements than the Main Markets (Mallin and Ow-Yong 2012).

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.

---

<sup>6</sup> <http://www.soxlaw.com/>.

### *Reverse takeover determinants*

In this section, we present the results of the analysis of the determinants of accepting a RT by AIM firms. Table 4 shows the results of the *probit* model, analysing the probability of AIM firms accepting a RT. Model (1) includes as explanatory variables: family ownership, crisis period, leverage, growth opportunities, ROA, size, volatility, earnings growth lagged one year, age, nomad, financial and domestic firms. The estimation shows that there is a negative relationship between family ownership and accepting a RT. This result is consistent with *H.1. Family Control*. Family holders have long-term aims and more incentives to avoid the entry of new share- holders, which reduces the likelihood of accepting a RT. Family holders attribute more importance to firm survival, even over wealth maximization (Steier 2005; Tsai, Kuo, and Hung 2009; Hamelin 2013). More control over the firm reduces the agency conflict between managers and shareholders, making the delisting decision less beneficial for these firms. GFC is not significant in these models.

There is also a negative relationship between ROA and the probability of accepting a RT. This result is in line with a better financial situation of the firm, which lowers the interest in a RT. The greater the firm size, the lower the likelihood of being a target in a RT. 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. Furthermore, these firms face fewer financial constraints. Therefore, these results support asymmetric information and financial constraints arguments in line with those of Aslan and Kumar (2011) and Kashefi-Pour and Lasfer (2013). Model (2) adds the type of major shareholder (*individual or family, institutional investors, non-financial firms, government, foreign investors*). The results are similar to Model (1).

Models (3) and (4) replicate Models (1) and (2), respectively and only for the crisis period. The results are consistent with *H.3. Family Firm and Financial Crisis*. Family holders have long-term aims and more incentives to avoid the entry of new shareholders, which reduces the likelihood of accepting a RT, also during the GFC period. Family owners usually have more conservative behaviour than their non-family counterparts, which is consistent with avoiding restructuring their firm in uncertain periods. Furthermore, family firms are expected to have better access to credit during crisis periods (Crespí and Martín-Oliver 2015; D'Aurizio, Oliviero, and Romano 2015). Therefore, family firms could be considered as more creditworthy in general than non-family firms.

Table 5 includes the *interaction term* between family ownership (and the rest of majority shareholder types) and crisis period. We do not observe differences in RT decisions during crisis periods in general, so we do not find support for *H.2. Financial Crisis*. However, the estimation shows that there is a negative relationship between family ownership during a crisis period and the decision of accepting a RT. This result is consistent with *H.3. Family Firm and Financial Crisis*, as we find for the crisis period subsample in Table 4 (Models 4 and 5).

In addition to this, again the results show that firms with higher ROA and size are less likely to accept a RT, which is consistent with the expected lower financial constraints for these firms, and therefore, they may better resist being acquired by a private firm.

Model (2) adds the interaction term between the type of major shareholder and crisis period. We observe that firms with non-financial owners have a lower probability of undertaking a RT during a crisis period.



Models (3) and (4) replicate previous models controlling for the industry fixed effects. The results are consistent with those in the previous models. Again, there is a negative relationship between the delisting decision and family ownership, ROA and size.

*Robustness: survival analysis (cox proportional hazard model)*

To consider the time to the occurrence of an event, we estimate the *Cox proportional hazard model* (1972) to investigate the determinants of accepting a RT conditioned to the time to the event, as robustness check. 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 may be a target in a RT. Therefore, the Cox model proxies how an independent variable may influence the risk of failure conditioned by the time to the event (the RT decision). The Cox model makes no assumption about the failure distribution.

$$h(t, X(t)) = h(t, 0) \exp(BX(t)) \quad (2)$$

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 (Reverse Takeover decision: *Probit* model). 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 (RT and survival). Table 6 shows the results of 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 December 2013 as the end. We include the independent variables considered previously (Reverse Takeover determinants). 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 accepting RTs is lower for firms with majority family shareholders (*H.1. Family Control*). This result supports the argument that family owners are more reluctant to sell their firm to a private firm. The hazard rate of family holders (0.115) suggests that the failure risk of family holder IPOs is 11.5% of the failure risk of other IPOs.

There is also a negative relationship between ROA and size and the RT decision. These results are robust to those presented in the previous *probit* model and in line with the fact that firms with fewer financial constraints are less likely to accept a RT. In addition to this, volatility has a positive effect, indicating that firms with more risk in earnings are more likely to accept a RT, which is in line with the results of Aslan and Kumar (2011).

Model (2) also includes the Nomad reputation variable. The results are similar to those shown in Model (1). Model (3) adds variables controlling if the firms are from the financial industry and

domestic (from the UK). The results show that the probability of accepting a RT is higher when the firm is a financial firm. This result is in line with Amini and Keasey (2013) who find that firms in the financial industry are more likely to go private.

Table 7 shows the results including only the variable family ownership. Again, the results show that firms held by family groups are less likely to accept a RT. The rest of the results are also similar to those shown in Table 6.

Table 8 adds the interaction term between family ownership and crisis period. The results show that the probability of accepting a RT is lower during crisis periods if the firm is held by a family group (*H.3. Family Firm and Financial Crisis*). Additionally, the results show that during a crisis period, the probability of accepting a RT is higher, in agreement with the greater financial constraints for public firms in these periods, favouring RT agreements. Additionally, during crisis periods a RT becomes more interesting as alternative to IPOs for private firms going public (*H.2. Financial Crisis*). Model (3) shows the results only for the crisis period, which are consistent with the previous ones.

Another robustness check that we perform is to run regressions controlling for the SOX (2002) effect. Regarding the US market, Marosi and Massoud (2007) find that the SOX (2002) and its associated compliance costs are the major determinants of delisting decisions in the USA. Similarly, Leuz, Triantis, and Wang (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 large firms. However, this variable is dropped in our regressions.

We also run the regressions including the variables of family ownership and family ownership squared to consider possible non-monotonic relationships, such as between family ownership and firm performance (Maury 2006; Sciascia et al. 2012). However, the results are not statistically significant.

## Main conclusions

This study analyses the determinants of accepting a RT for listed firms, considering the relevance of target firm shareholder type, especially family ownership. We examine RTs on the AIM in the UK during the period of 1999–2012, which allows us to examine the effect of the GFC period. Our findings show that the probability of accepting a RT is lower when the major shareholder is a family group. This result is in agreement with the family businesses long-term orientation and their interest in maintaining firm control. This inverse relationship is maintained during the GFC period, in accordance with the expected better access of family businesses to financial resources in crisis periods. The greater the size and the ROA of the firm the lower the probability of accepting a RT, in line with the reluctance of less financially constrained firms to accept a RT.

This article contributes to several streams of literature, namely (1) the literature on the AIMs, filling the gap of studies on RT deals; (2) family business literature, examining the potential influence of family ownership on RT decisions; and (3) corporate finance literature, given that we study the RT corporate decision from the target firm perspective, taking into account the effect of crisis periods.

The characteristics of survival firms to the RT 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 RT.

## Acknowledgments

We acknowledge the helpful comments and suggestions from Pedro García-Teruel, the participants of the *3rd Workshop of Small and Medium Enterprises and Entrepreneurial Initiatives* Madrid, Spain, 2013, the seminar at the Universidad Pública de Navarra, Spain, 2014 and the *XXII Finance Forum*, Zaragoza, Spain, 2014. The usual disclaimer applies.

## Funding

This work was funded by the Spanish Ministry [grant number ECO2012-31772] and by the Regional Government of Asturias [grant number Project SV-PA-13\_ECOEMP-19].

## References

- Achleitner, A., A. Betzer, M. Goergen, and B. Hinterramskogler. 2013. "Private Equity Acquisitions of Continental European Firms: The Impact of Ownership and Control on the Likelihood of Being Taken Private." *European Financial Management* 19 (1): 72–107. doi:10.1002/eufm.v19.1.
- Adjei, F., K. B. Cyree, and M. M. Walker. 2008. "The Determinants and Survival of Reverse Mergers Vs Ipos." *Journal of Economics and Finance* 32: 176–194. doi:10.1007/s12197-007-9012-4.
- Amini, S., and K. Keasey. 2013. "The Failure of Small British Initial Public Offerings on the UK Alternative Investment Market: A Research Note on Spatial and Industry Effects." *International Small Business Journal* 31 (6): 722–733. doi:10.1177/0266242612458301.
- Aslan, H., and P. Kumar. 2011. "Lemons or Cherries? Growth Opportunities and Market Temptations in Going Public and Private." *Journal of Financial and Quantitative Analysis* 46: 489–526. doi:10.1017/S0022109010000761.
- Bauguess, S., and T. Stegemoller. 2008. "Protective Governance Choices and the Value of Acquisition Activity." *Journal of Corporate Finance* 14: 550–566. doi:10.1016/j.jcorpfin.2008.09.011.
- Bebchuk, L. A. 1999. "A Rent-Protection Theory of Corporate Ownership and Control." *Working paper, National Bureau of Economic Research*.
- Bebchuk, L. A., and M. Kahan. 2000. "Adverse Selection and Gains to Controllers in Corporate Freezeouts." In *Concentrated Corporate Ownership*, edited by Morck, R., 247–259. Chicago: University of Chicago Press.
- Caprio, L., E. Croci, and A. Del Giudice. 2011. "Ownership Structure, Family Control, and Acquisition Decisions." *Journal of Corporate Finance* 17: 1636–1657. doi:10.1016/j.jcorpfin.2011.09.008.
- Chrisman, J. J., J. H. Chua, A. W. Pearson, and T. Barnett. 2012. "Family Involvement, Family Influence and Family-Centered Non-Economic Goals in Small Firms." *Entrepreneurship Theory and Practice* 36 (2): 267–293. doi:10.1111/etap.2012.36.issue-2.
- Cox, D. 1972. "Regression Models and Life Tables." *Journal of Statistics Society* 34: 187–220.
- Crespí, R., and A. Martín-Oliver. 2015. "Do Family Firms have Better Access to External Finance during Crises?" *Corporate Governance: An International Review* 23: 249–265. doi:10.1111/corg.12100.
- Croci, E., and A. Del Giudice. 2014. "Delisting, Controlling Shareholders and Firm Performance in Europe." *European Financial Management* 20: 374–405. doi:10.1111/j.1468-036X.2011.00640.x.
- D'Aurizio, L., T. Oliviero, and L. Romano. 2015. "Family Firms, Soft Information and Bank Lending in a Financial Crisis." *Journal of Corporate Finance* 33: 279–292. doi:10.1016/j.jcorpfin.2015.01.002.
- Espenlaub, S., A. Khurshed, and A. Mohamed. 2012. "IPO Survival in a Reputational Market." *Journal of Business Finance & Accounting* 39 (3): 427–463. doi:10.1111/j.1468-5957.2012.02280.x.
- Floros, I. V., and T. R. A. Sapp. 2011. "Shell Games: On the Value of Shell Companies." *Journal of Corporate Finance* 17: 850–867. doi:10.1016/j.jcorpfin.2011.03.004.

- Franks, J., C. Mayer, P. Volpin, and H. Wagner. 2012. "The Life Cycle of Family Ownership: International Evidence." *Review of Financial Studies* 25 (6): 1675–1712. doi:10.1093/rfs/hhr135.
- Gleason, K. C., L. Rosenthal, and R. A. Wiggins. 2005. "Backing into Being Public: An Exploratory Analysis of Reverse Takeovers." *Journal of Corporate Finance* 12: 54–79.
- Gomez-Mejía, L. R., M. Makri, and M. Larraza. 2010. "Diversification Decisions in Family-Controlled Firms." *Journal of Management Studies* 47 (2): 223–252.
- Hamelin, A. 2013. "Influence of Family Ownership on Small Business Growth. Evidence from French Smes." *Small Business Economics* 41: 563–579. doi:10.1007/s11187-012-9452-x.
- Hiebl, M. 2013. "Risk Aversion in Family Firms: What Do We Really Know?" *The Journal of Risk Finance* 14 (1): 49–70. doi:10.1108/15265941311288103.
- Holderness, C. G., and D. P. Sheehan. 1988. "The Role of Majority Shareholders in Publicly Held Corporations: An Exploratory Analysis." *Journal of Financial Economics* 20: 317–346. doi:10.1016/0304-405X(88)90049-9.
- Holmen, M., and E. Nivorozhkin. 2007. "The Impact of Family Ownership and Dual Class Shares on Takeover Risk." *Applied Financial Economics* 17: 721–741. doi:10.1080/09603100500461694.
- Jensen, M. C., and W. Meckling. 1976. "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure." *Journal of Financial Economics* 3: 305–360. doi:10.1016/0304-405X(76)90026-X.
- Kashefi-Pour, E., and M. Lasfer. 2013. "Why Do Companies Delist Voluntarily from the Stock Market?" *Journal of Banking & Finance* 37: 4850–4860. doi:10.1016/j.jbankfin.2013.08.022.
- Klasa, S. 2007. "Why Do Controlling Families of Public Firms Sell Their Remaining Ownership Stake?" *Journal of Financial and Quantitative Analysis* 42: 339–368. doi:10.1017/S0022109000003306.
- La Porta, R., F. López De Silanes, and A. Shleifer. 1999. "Corporate Ownership around the World." *Journal of Finance* 54: 471–517. doi:10.1111/0022-1082.00115.
- Leuz, C., A. Triantis, and T. Y. Wang. 2008. "Why Do Firms Go Dark? Causes and Economic Consequences of Voluntary SEC Deregistration." *Journal of Accounting and Economics* 45: 181–228. doi:10.1016/j.jacceco.2008.01.001.
- Mallin, C., and K. Ow-Yong. 2012. "Factors Influencing Corporate Governance Disclosures: Evidence from Alternative Investment Market (AIM) Companies in the UK." *The European Journal of Finance* 18 (6): 515–533. doi:10.1080/1351847X.2011.601671.
- Marosi, A., and N. Massoud. 2007. "Why Do Firms Go Dark?" *Journal of Financial and Quantitative Analysis* 42: 421–442. doi:10.1017/S0022109000003331.
- Maupin, R. J., C. M. Bidwell, and A. K. Ortegren. 1984. "An Empirical Investigation of the Characteristics of Publicly-Quoted Corporations Which Change to Closely-Held Ownership through Management Buyouts." *Journal of Business Finance & Accounting* 1: 435–450. doi:10.1111/j.1468-5957.1984.tb00762.x.
- Maury, B. 2006. "Family Ownership and Firm Performance: Empirical Evidence from Western European Corporations." *Journal of Corporate Finance* 12: 321–341. doi:10.1016/j.jcorpfin.2005.02.002.
- Nielsson, U. 2013. "Do Less Regulated Markets Attract Lower Quality Firms? Evidence from the London AIM Market." *Journal of Financial Intermediation* 22: 335–352. doi:10.1016/j.jfi.2012.11.005.
- Renneboog, L., T. Simons, and M. Wright. 2007. "Why Do Public Firms Go Private in the UK? the Impact of Private Equity Investors, Incentive Realignment and Undervaluation." *Journal of Corporate Finance* 13: 591–628. doi:10.1016/j.jcorpfin.2007.04.005.
- Sciascia, S., P. Mazzola, J. Astrachan, and T. Pieper. 2012. "The Role of Family Ownership in International Entrepreneurship: Exploring Nonlinear Effects." *Small Business Economics* 38: 15–31. doi:10.1007/s11187-010-9264-9.
- Stacchini, M., and P. Degasperi. 2015. "Trust, Family Businesses and Financial Intermediation." *Journal of Corporate Finance* 33: 293–316. doi:10.1016/j.jcorpfin.2015.01.006.
- Steier, L. 2005. "Executive Succession in Entrepreneurial Business." In *The Blackwell Encyclopedic Dictionary of Entrepreneurship*, edited by Hitt, M. and D. Ireland, (2nd ed. Vol. 2). Oxford: Blackwell.

- Tsai, W. H., Y. C. Kuo, and J. H. Hung. 2009. "Corporate Diversification and CEO Turnover in Family Businesses: Self-Entrenchment or Risk Reduction?" *Small Business Economics* 32: 57–76. doi:[10.1007/s11187-007-9073-y](https://doi.org/10.1007/s11187-007-9073-y).
- Van Essen, M., V. M. Strike, M. Carney, and S. Sapp. 2015. "The Resilient Family Firm: Stakeholder Outcomes and Institutional Effects." *Corporate Governance (Oxford)* 23 (3): 167–183. doi:[10.1111/corg.12087](https://doi.org/10.1111/corg.12087).
- Vismara, S., S. Paleari, and J. R. Ritter. 2012. "Europe's Second Markets for Small Companies." *European Financial Management* 18 (3): 352–388. doi:[10.1111/eufm.2012.18.issue-3](https://doi.org/10.1111/eufm.2012.18.issue-3).
- Weir, C., D. Laing, and M. Wright. 2005. "Incentive Effects, Monitoring Mechanisms and the Market for Corporate Control: An Analysis of the Factors Affecting Public to Private Transactions in the UK." *Journal of Business Finance & Accounting* 32: 909–943. doi:[10.1111/j.0306-686X.2005.00617.x](https://doi.org/10.1111/j.0306-686X.2005.00617.x).

**Table 1.** 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), *Institutional investors* (including *Financial firms*), *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), *Earnings' 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	SD	Max.	Min.	Obs.
<i>All AIM firms</i>						
<i>Panel A: Type of major shareholder</i>						
Family	18.65	12	20.74	93	0	4,838
Institutional investors	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
<i>Panel B: Firm characteristics</i>						
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
Earnings' 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
Variable	Mean	Obs.	Mean	Obs.	Wilconxon test	
<i>Panel A: Type of major shareholder</i>						
Family	18.70	4,788	14.28	50	$(p = 0.183)$	
Institutional investors	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	$(p = 0.482)$	
<i>Panel B: Firm characteristics</i>						
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	$(p = 0.938)$	
Earnings' 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	$(p = 0.034)**$	

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



**Table 2.** Reverse takeover firm country distribution. The sample is composed of the AIM firms during the period 1999-2012.

Country	Obs.	RT	Country	Obs.	RT
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	United Arab Emirates	14	
Italy	42		Uruguay	14	
Japan	14		Uzbekistan	14	
Kazakhstan	112	1	Zambia	42	1
Kyrgystan	42	1	Zimbabwe	28	
Liberia	28				
			Total	10,752	77

**Table 3.** Reverse takeover firm industry distribution. AIM during the period 1999-2012.

Industry	Obs. AIM	Delisted through a reverse takeover
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
Total	10,766	77

**Table 4.** Determinants of the reverse takeovers (Probit estimation). The sample is composed of the AIM firms during the period 1999–2012. Dependent variable: reverse takeover decision. Type of major shareholders distinguishes the percentage of ownership held by: *Family* (family holders), *Institutional investors (including Financial firms)*, *Non-financial firm*, *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 *Earnings' growth* (percentage of annual change in earnings). Data source: Own calculation based on *DataStream*. Currency: GBP (£).

<i>Dep. variable: Delisted</i>	(1)	(2)	(3) Crisis	(4) Crisis
Family holders	-1.2918 (-1.62)	-1.4941* (-1.77)	-3.5063* * (-2.12)	-4.2243* * (-2.28)
Institutional investor holder		-0.7336		-0.1143
Non financial firm holder		(-0.52)		(-0.06)
Foreign holders		-0.8783 (-0.74)		-4.2999 (-1.41)
		-0.1852 (-0.20)		0.4930 (0.29)
Crisis	-0.2819 (-0.66)	-0.2936 (-0.67)		
Leverage	-0.1942 (-0.22)	-0.2378 (-0.27)	0.5873 (0.43)	0.2332 (0.15)
Growth opportunities ROA	-1.8353	-1.0805	-8.1552	-5.1651
Size	(-0.07)	(-0.04)	(-0.24)	(-0.15)
Volatility	-4.7475* (-1.81)	-4.9233* (-1.83)	-8.3005* (-1.84)	-9.7060* (-1.96)
	-0.2393* (-1.88)	-0.2482* (-1.93)	-0.3722* * (-2.21)	-0.4664* * (-2.37)
	-0.1030 (-0.38)	-0.1137 (-0.42)	0.0064 (0.02)	-0.0223 (-0.06)
Earnings' growth	0.1124 (0.20)	0.1185 (0.21)	0.3099 (0.33)	0.2474 (0.25)
Age	-0.1093 (-0.30)	-0.2369 (-0.62)	-0.2938 (-0.71)	-0.3855 (-0.78)
Nomad	0.2631 (0.84)	0.2609 (0.83)	0.5216 (1.06)	0.4395 (0.84)
Financial	-0.2343 (-0.52)	-0.1540 (-0.33)		
Domestic	-0.0966 (-0.26)	-0.1262 (-0.33)	-0.4320 (-0.91)	-0.6111 (-1.08)
Constant	1.3150 (0.82)	1.7285 (1.03)	3.1321 (1.44)	4.8809* (1.81)
# Observations	1,097	1,097	615	615
# Firms	356	356	253	253
Industry FE	YES	YES	YES	YES
Country FE	NO	NO	NO	NO
Year FE	YES	YES	YES	YES
Wald $\chi^2$	11.11	11.61	10.39	11.21

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

**Table 5.** Determinants of reverse takeovers (probit estimation with interaction terms). 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), *Institutional investors* (including *Financial firms*), *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), *Earnings' 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)
Family holders × Crisis	-2.5734 (-1.55)	-3.5407* (-1.84)	-2.8659* (-1.65)	-3.9913* (-1.94)
Institutional investor × Crisis		2.8576 (0.58)		3.3079 (0.64)
Non financial firms × Crisis		-6.9596* * (-2.02)		-7.5045* * (-2.00)
Foreign holders × Crisis		2.4486 (1.06)		2.7657 (1.15)
Family holders	0.0650 (0.06)	0.1910 (0.15)	0.2209 (0.20)	0.4022 (0.31)
Institutional investor holders		-3.3389 (-0.71)		-3.9108 (-0.80)
Non-financial firm holders		2.9360 (1.56)		3.5039 (1.62)
Foreign holders		-1.7223 (-0.88)		-1.8613 (-0.93)
Crisis	0.2834 (0.49)	0.6296 (0.82)	0.3129 (0.54)	0.6856 (0.87)
Leverage	-0.2376 (-0.28)	-0.4308 (-0.46)	-0.0729 (-0.08)	-0.1287 (-0.13)
Growth opportunities ROA	-5.7890 (-0.21)	-0.6375 (-0.03)	-4.0582 (-0.17)	-0.6238 (-0.03)
Size	-4.3214* (-1.73)	-4.9009* (-1.76)	-4.9647* (-1.81)	-5.5757* (-1.85)
Volatility	-0.2953* * (-2.26)	-0.3611* * (-2.56)	-0.2786* * (-2.05)	-0.3407* * (-2.36)
Earnings' growth	-0.1307 (-0.48)	-0.1974 (-0.68)	-0.1293 (-0.46)	-0.1964 (-0.65)
Age	0.1713 (0.29)	0.0995 (0.17)	0.2183 (0.37)	0.1431 (0.25)
Nomad	-0.0554 (-0.15)	-0.2494 (-0.62)	-0.0954 (-0.26)	-0.2641 (-0.63)
Financial	0.2894 (0.91)	0.3191 (0.93)	0.2541 (0.79)	0.2556 (0.73)
Domestic			-0.3341 (-0.70)	-0.2865 (-0.55)
			-0.1135 (-0.30)	-0.1686 (-0.40)
Constant	-0.39 1.4047 (0.88)	-0.48 2.3949 (1.35)	-0.30 1.3668 (0.81)	-0.40 2.2836 (1.22)
# Observations	1,110	1,110	1,097	1,097
# Firms	360	360	356	356
Industry FE	NO	NO	YES	YES
Year FE	YES	YES	YES	YES
Wald $\chi^2$	11.67	15.41	11.47	14.68

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

**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), *Institutional investors (including Financial firms)*, *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), *Earnings' 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)	Hazard Ratios	Coeff.	Hazard Ratios
	Coeff.	Hazard Ratios	Coeff.			
Family holders	-2.1634** * (-3.10)	0.115	-2.2265** * (-3.13)	0.108	-2.8830** * (-3.51)	0.0974
Institutional investor holders	0.9610 (0.93)	2.614	0.8179 (0.78)	2.266	-0.1711 (-0.14)	1.927
Non-financial firms holders	0.1477 (0.15)	1.159	0.1157 (0.12)	1.123	0.6155 (0.49)	1.133
Foreign holders	-0.7315 (-0.92)	0.481	-0.7424 (-0.94)	0.476	-1.0385 (-1.18)	0.265
Crisis	0.7143 (1.41)	2.043	0.7132 (1.41)	2.041	0.6579 (1.30)	1.998
Leverage	-0.1397 (-0.19)	0.870	-0.1273 (-0.18)	0.880	-0.3860 (-0.60)	0.690
Growth opportunities	23.6792** (2.44)	1.922e+10	23.7591** (2.48)	2.082e+10	14.3008 (1.16)	1.644e+11
ROA	-8.0044** *	0.0003	-8.1071** *	0.0003	-6.1544*** (-4.13)	0.0035
Size	-0.1948* (-1.94)	0.823	-0.1938* (-1.92)	0.824	-0.2987*** (-2.61)	0.753
Volatility	0.4324** (2.28)	1.541	0.4607** (2.43)	1.585	-0.0029 (-0.01)	0.978
Earnings' growth	0.5859 (1.61)	1.797	0.5623 (1.54)	1.755	0.6422* (1.76)	1.463
Nomad			0.2516 (1.04)	1.286	0.0240 (0.09)	1.326
Financial Firms					1.0181*** (3.22)	3.112
Domestic Firm					-3.2606 (-1.54)	0.789
# Observations	712		712		710	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Wald $\chi^2$	66.03		67.13		148.14	

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), *Earnings' 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)	Hazard Ratios	Coeff.	Hazard Ratios
	Coeff.	Hazard Ratios	Coeff.			
Family holders	-2.3748***	0.0930	-2.4207** *	0.0889	-2.6561***	0.0702
	(-3.73)		(-3.76)		(-3.79)	
Crisis	0.7246	2.064	0.7275	2.070	0.7211	2.057
	(1.45)		(1.46)		(1.43)	
Leverage	-0.1350	0.874	-0.1098	0.896	-0.3697	0.691
	(-0.19)		(-0.15)		(-0.56)	
Growth opportunities	21.6837**	2.613e+09	21.9279**	3.336e+09	22.9535**	9.302e+09
	(2.22)		(2.27)		(2.33)	
ROA	-7.9807***	0.0003	-8.1371** *	0.0003	-6.2214***	0.002
	(-4.14)		(-4.22)		(-3.49)	
Size	-0.1975**	0.821	-0.2003**	0.819	-0.2983***	0.742
	(-2.03)		(-2.03)		(-2.80)	
Volatility	0.4413**	1.555	0.4736**	1.606	0.0120	1.012
	(2.33)		(2.50)		(0.06)	
Earnings' growth	0.6079*	1.837	0.5938*	1.811	0.4772	1.612
	(1.71)		(1.67)		(1.28)	
Nomad			0.2698	1.310	0.2817	1.325
			(1.13)		(1.06)	
Financials					1.1365***	3.116
					(3.71)	
Domestic Firm					-0.0711	0.931
					(-0.20)	
# Observations	712		712		712	
Industry FE	NO		NO		YES	
Year FE	YES		YES		YES	
Wald $\chi^2$	64.29		65.58		104.51	

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), *Earnings' 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) Crisis	
	Coeff.	Hazard ratios	Coeff.	Hazard ratios	Coeff.	Hazard ratios
Family holders X Crisis	-2.8907*	0.0555	-2.8992*	0.0551		
	(-1.76)		(-1.77)			
Family holders	-0.3258	0.722	-0.2989	0.742	-3.3277**	0.0359
					*	
Crisis	(-0.22)		(-0.20)		(-4.23)	
	1.5149**	4.549	1.5090**	4.522		
	(2.09)		(2.08)			
Leverage	-0.3830	0.682	-0.3718	0.690	-0.6075	0.545
	(-0.58)		(-0.56)		(-0.83)	
Growth opportunities	18.4411*	1.021e+08	18.3776*	9.579e+07	-30.2922	0
	(1.79)		(1.77)		(-0.95)	
ROA	-5.9238***	0.0027	-5.9414***	0.0026	-5.6090**	0.0037
					*	
Size	(-3.31)		(-3.32)		(-2.88)	
	-0.3025***	0.739	-0.3016***	0.740	-0.2891**	0.749
	(-2.80)		(-2.80)		(-2.49)	
Volatility	0.0129	1.013	0.0164	1.017	0.1258	1.134
	(0.06)		(0.08)		(0.59)	
Earnings' growth	0.3980	1.489	0.3923	1.480	0.4512	1.570
	(1.09)		(1.07)		(0.81)	
Nomad	0.2947	1.343	0.3011	1.351	0.4373	1.548
	(1.11)		(1.13)		(1.46)	
Financials	1.1321***	3.102	1.1391***	3.124	0.9828**	2.672
					*	
Domestic Firm	(3.72)		(3.73)		(3.07)	
			-0.0869	0.917	0.0289	1.029
			(-0.25)		(0.08)	
# Observations	712		712		548	
Industry FE	YES		YES		YES	
Year FE	YES		YES		YES	
Wald $\chi^2$	107.45		107.51		81.54	

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