Intangible investments and voluntary delisting: Mass exodus of Chinese firms from US stock exchanges

Abstract

Purpose

Drawing on a cost-benefit perspective, this paper explores the relation between information asymmetry and the decision to delist from stock exchanges during periods of uncertainty. Specifically, it investigates the role of firms' intangible investments and the availability of alternative sources of finance on the decision to delist from foreign stock markets.

Design/Methodology/Approach

The study takes advantage of a natural experiment in which cross-listed Chinese firms facing uncertainty in US markets due to widespread allegations of accounting fraud, decide on whether to remain listed or voluntarily delist. Here, the decision to delist is modeled as a function of the level of information asymmetry between firms and their stakeholders, and the availability of alternative financing, while controlling for other drivers of firms' delisting decision. The data used in the empirical analyses covers a hand-collected sample of 91 Chinese firms voluntarily delisting from US stock markets between 2010 and 2016. This sample is matched with an equal sample of Chinese firms, which remained listed in US stock markets during the same period. A probit regression model accounting for fixed-effects is used. The study also uses probit model interaction effects to capture the mediating effect of alternative financing on the intangibles-delisting nexus.

Findings

There is a significant positive relationship between investments in intangible assets and firms' decision to delist. Moreover, the evidence suggests that the positive intangibles-delisting nexus is accentuated by the availability of alternative sources of financing. Collectively, the results are consistent with the theoretical argument that the higher information asymmetry associated with intangible assets may increase the cost of staying listed on stock exchanges, particularly, in periods of uncertainty (captured in this study by accounting fraud allegations targeting cross-listed firms). The results have important implications for corporate managers, capital market participants, and policy makers.

Originality/Value

The study exploits a unique natural experimental setting to explore why cross-listed firms delist. The underlying theoretical framework to explain delisting is new. This framework captures the role of information asymmetry, uncertainty and alternative financing in explaining the cost and benefits of remaining listed on a foreign market.

Key words: Voluntary delisting; Intangible assets; Information asymmetry; US stock exchange; China.

1. Introduction

The liberalisation of capital markets, as well as, technological progress over the last three decades has created new opportunities for firms to seek development and growth beyond their national borders. Prior studies (see e.g., Merton, 1987; Stulz, 1999; Errunza and Miller, 2000; Karolyi, 2006; Bharath and Dittmar, 2010; Eng and Ling, 2012) have explored the motivations of foreign firms listing in US stock markets. The extant research suggests that foreign firms cross-list into the US market to gain access to lower cost of capital (Errunza and Miller, 2000; Bharath and Dittmar, 2010), greater investor recognition (Merton, 1987), or as a commitment mechanism to the stricter US regulations and investor protection rights (Stulz, 1999; Karolyi, 2006; Eng and Ling, 2012). Clearly, besides stricter regulations, there are other costs associated with listing on more sophisticated markets, most notably, greater information disclosure requirements (Eng and Ling, 2012) and increased scrutiny by stakeholders such as analysts and the press. While the extant research explores the motivations underlying firms' listings in foreign markets, it is unclear how these associated cost influences delisting decisions. The case of cross-listed Chinese firms in US markets provides a natural setting to explore this issue.

The China Securities Regulatory Commission, established in 1992, allowed Chinese firms to cross-list. This led to a surge in the number of Chinese firms listing in foreign markets, particularly in the US. As in Figure 1, the number of Chinese firms listing on US markets increased successively each year from 2001, reaching its peak in 2007. Noticeably, Chinese firms' listings on US markets significantly reduced to 11 in 2011, representing a 96% decline from the previous year. Concurrently, as shown in Table 2, a wave of voluntary delisting also emerged.[1] Recent figures suggest that between 2010 and 2015, there were over 80 delisting announcements from US stock exchanges involving Chinese firms. This wave of delisting has been attributed to loss of investor confidence following reports of fraudulent

accounting practices in some Chinese US-listed firms (Song and Zeng, 2012).

[INSERT FIGURE 1]

Notably, a survey report released by Muddy Waters Research Company in June 2010 suggested that some US-listed Chinese firms (e.g. Orient Paper) were involved in fraudulent financial reporting. Similarly, Citron Research reported accounting fraud and bribery scandals involving Evergrande Real Estate Group (a high profile Chinese firm). Even though these claims were unsubstantiated, Evergrande Real Estate Group lost HK$8 billion of its market value. Arguably, these scrutiny, allegations, exposure and suspicion relating to accounting fraud instigated a mass exodus of Chinese firms from US stock markets (see Song and Zeng, 2012; Liu *et al.,* 2016; Zhang, 2012). Interestingly, some Chinese firms maintained their US listing.

The case of Chinese firms delisting from US exchanges between 2010 and 2016 creates a natural experimental setting to explore the decisions of cross-listed firms under uncertainty. This article, therefore, examines whether firms with a higher perceived cost of cross-listing embark on delisting for precautionary reasons. Here, the paper utilises firm-level intangible investments (which capture the level of information asymmetry between firms and stakeholders) to proxy for the level of scrutiny that firms potentially face when investors suspect accounting fraud. Drawing from the cost-benefit perspective on why firms become public (see, Maupin *et al*., 1984; Kaplan, 1991; Bharath and Dittmar, 2010; Chaplinskya and Ramchand, 2012), the paper argues that when investors (notably US-based) associate cross-listed (Chinese) firms with accounting fraud, the cost of remaining listed becomes asymmetrically higher for those firms with high information asymmetry (proxied by intangibles).[2] Consequently, it is posited that the presence of intangible assets increases (reduces) the costs (net benefits) of being listed on overseas' markets, resulting in a higher propensity to delist in times of

uncertainty (i.e., when cross-listed firms are susceptible to accounting fraud allegations). To corroborate this benefit-cost argument, the paper considers how the delisting decision is shaped by a firm's propensity to secure alternative private funding.

The present article contributes to the scant but growing literature on public-to-private transactions (PTPs) by providing evidence that possibly explains why cross-listed firms faced with uncertainty respond differently, i.e., some remain listed while others delist. Thus, the study's analysis documents the fundamental drivers (beyond the investor confidence crisis) of firms' voluntary delisting decisions. Moreover, it contributes to this PTPs literature which has largely focused on transactions of firms in the advanced economies of the US and the UK, often using dated data (see, e.g. Renneboog et al., 2007; Marosi and Massoud, 2007; Pour and Laser, 2013), with empirical studies on firms from emerging economies like China being rare.[3]

This paper relates to, but also differs from recent research by Chaplinskya and Ramchand (2012) and Pour and Laser (2013). Chaplinskya and Ramchand (2012) examine the factors motivating foreign firms to delisting from US stock exchanges over the period 1962-2006, while the current article specifically considers the delisting decisions of Chinese firms from US markets for a more recent period (2010-2016) when there was a foreign investor confidence crisis. Similarly, Pour and Laser (2013) analyse the motives and market valuations of voluntary delisting from the London Stock Exchange during 1995-2009. They mainly focus on firms' capital structure rebalancing as a driver of their delisting decisions, whereas the primary focus of the current study is on the role of intangible assets in driving the delisting decisions of Chinese firms from US stock exchanges. Focusing on intangible assets is important given the increasing prominence of intangible assets vis-à-vis investments in capital expenditure by firms in recent years (Anagnostopoulou, 2008; Borisova and Brown, 2013). For

example, Borisova and Brown (2013) report the ratio of R&D spending to total assets in 2008 to be around 10% compared to a capital expenditure ratio of about 4% for publicly listed companies with coverage in the *Compustat* database.

The results, based on a probit analysis of 91 voluntary delisting announcements by Chinese firms listed on US markets during the seven-year period, 2010 to 2016, and a carefully selected control sample, show that investments in intangible assets are a significant driver of firms' voluntary delisting decisions, after controlling for other determinants of the delisting decision. Specifically, the results show a delisting probability of 11% for an average firm in the sample that undertakes average levels of intangible investments. The paper further finds the delisting probability to be even higher, ranging from 20-22%, for those firms with the topmost intangible investments (e.g. firms with above-median or top 25% investments in intangibles). Moreover, the evidence suggests that firms with higher intangible investments are more likely delist from stock markets when they have alternative sources of financing such as a prior successful equity issue or a thriving internal capital market.

The results align with the article's proposed theoretical framework. The framework contends that the higher information asymmetry and valuation challenges associated with intangible investments (Anagnostopoulou, 2008) increase (decrease) the costs (net benefits) of remaining listed on stock exchanges, particularly when there is market uncertainty. The results are consistent with prior studies (e.g. Maupin *et al*., 1984; Kaplan, 1991; Bharath and Dittmar, 2010; Chaplinskya and Ramchand, 2012) suggesting that firms tend to consider both costs and benefits in making their delisting decisions. Finally, the results have important implications for corporate managers, capital market participants, and policy makers.

The rest of the paper is organised as follows. Sections 2 and 3 describe the context of the study and

develop testable hypotheses. Section 4 describes the data and empirical methods. Section 5 presents and discusses the results, and Section 6 concludes the paper.

2. The impact of accounting fraud on investor confidence

2.1 US analysts and accounting fraud

One of the features of becoming a public firm in advanced economies is the intense media and analysts' coverage/scrutiny (Eng and Ling, 2012). These analysts together with the press play an important role as an information intermediary in financial markets by often identifying corporate financial malfeasance and broadcasting them. Miller (2006) describes them as the "watchdog" of corporate America. Existing research on the relations between information intermediaries (e.g. the press, analysts, etc.) and commerce suggests that these "watchdogs" do not only shape public perceptions of firms, but they also have a significant influence on financial market participants (Zingales, 2000; Jensen, 1979; Miller, 2000). Miller (2000) shows that in 29% of the cases of accounting violations that he studied in his US sample, the press had published articles regarding accounting fraud prior to a public acknowledgment by the firm or US Securities and Exchange Commission, and the markets reacted negatively in most cases. He concludes that the press, through its exposure of accounting fraud, actually provides investors with valuable information, especially when their reports are backed by some investigations/research.

Prior literature suggests that analysts' and press reports on accounting irregularities in public corporations adversely affect the fortunes of the public firm through loss of reputation (Karpoff *et al.,* 2008), and ultimately, substantial decreases in stock prices (Feroz *et al.,* 1991; Dechow *et al.,* 1996; Miller, 2000). This suggests that besides the upfront cost of going public (e.g. admission fees), firms

face additional risk/cost of intense scrutiny, particularly in relation to potential accounting fraud. Clearly, these additional costs may eventually outweigh the benefits of remaining listed (for example, in periods of high uncertainty), motivating some listed firms to delist.

2.2 Recent US analysts' reports of accounting frauds in listed Chinese firms

High-profile allegations of accounting fraud involving Chinese firms in US stock markets in 2010 and 2012 increased levels of uncertainty and, perhaps, the fraud-related listing cost, for this particular group of firms. The first major allegation was published on 28th June 2010[4] by Muddy Waters Research LLC (Muddy Waters), a US privately-held investment firm that specialises in conducting investigative research and due diligence on public companies. Muddy Waters reported of egregious accounting fraud in Orient Paper Inc. (ONP)[5], a Chinese company listed on the New York Stock Exchange, and boldly concluded as follows: "*We are confident that ONP is a fraud. Its purpose is to raise and misappropriate tens of millions of dollars.*" The report cited specific accounting irregularities including ONP overstating its 2008 and 2009 revenue by 27 and 40 times respectively, overvaluing its assets by at least 10 times, and misappropriating approximately US$30 million since October, 2009, among others. The report concluded with a "*strong sell*" recommendation. This incident did not just cause substantial damage to ONP, but it also heightened market fears that other Chinese public corporations may be involved in similar fraudulent accounting practices (Zhang, 2012).

Two years later (on 21st June 2012[6]), Citron Research, a US-based analyst, made another high profile financial fraud allegation against Evergrande Real Estate Group Limited (Evergrande), a public Chinese firm. Citron Research claimed that: "…*Evergrande is essentially an insolvent company that has consistently presented fraudulent information to the investing public*". The report detailed that

Evergrande used bribery of local government officials and various "*accounting tricks*" to hide its insolvency, and that a total write-down of RMB 71 billion is required to move the company's reported equity from RMB 35 billion to *negative* RMB 36 billion. While the report was unsubstantiated, on the day of the accounting fraud allegation, the company's share closed 11.4% down, compared to only a 1.3% decline on the market index. The allegation wiped-off over HK$8 billion from Evergrande's market value, causing panic among some Chinese public companies and possibly motivating them to exit US stock exchanges (Liu *et al.,* 2016). What followed these allegations was a reduction in the number of Chinese firms listing on US stock exchanges and a concurrent increase in the number of voluntary delisting.

3. Related literature and hypotheses development

3.1 Why do firms delist?

The extant literature advances several reasons to explain firms' decision to delist. Firstly, from an agency perspective, managers with free-cash flows and low growth prospects might chose to waste cash on non-value-increasing projects (Jensen, 1986; Elmagrhi *et al.,* 2017). Delisting can curb agency conflicts by paying out excess cash or leveraging to repurchase stock (Lehn and Poulsen, 1989; Kieschnick, 1998). Secondly, from a governance perspective, powerful CEOs might delist, possibly, to avoid the intense scrutiny and regulation associated with being a public firm (Weir *et al.,* 2005a; Weir *et al.,* 2005b; Manuela and Giovanna, 2012).

Thirdly, from an information asymmetry perspective, managers may choose to delist when they perceive their stock as being undervalued, limiting their ability to raise finance (e.g. Maupin *et al.,* 1984, Renneboog *et al.,* 2007; Weir *et al.,* 2005b). Firms have also been shown to delist for pragmatic reasons,

e.g., low trading volumes in US markets, the ability of home markets to meet capital their capital needs, and increased cost and complexity of US market regulations such as the Sarbanes-Oxley Act (Marosi and Massoud, 2007; Chaplinsky and Ramchand, 2012; Bharath and Dittmar, 2010; Pour and Laser, 2013).

3.2 The role of intangible investments in corporate delisting decisions and hypotheses

Firms, perhaps, evaluate the net benefit of remaining listed in a dynamic context where both firm-level and country-level (both home and foreign) factors change over time, when deciding whether to remain listed. Within this context, the allegations of accounting fraud involving Chinese firms listed on US markets may have increased investors' uncertainty over the true value of Chinese public firms, particularly, for firms with high levels of difficult-to-value intangible assets. Chinese firms, within this context, also face heightened uncertainty due to increased scrutiny by analysts who may provide wrong forecasts (Anagnostopoulou, 2008). These information asymmetries and uncertainties reduce investors' willingness to fund investments, and consequently reducing firms' access to new equity and/or increasing their underlying cost of capital. This paper argues that this tension, partly, offsets the expected benefits of remaining listed on US markets.

Empirical evidence on the role of intangible assets on corporate delisting decisions is rare in the US- and UK-focused literature, and virtually non-existent for emerging economies. The few studies that include R&D or intangibles in their analysis have them as control variables to proxy for information asymmetry, and report mixed results. For example, Pour and Laser (2013) provide weak evidence for a positive association between intangible assets and firms' delisting decisions, but Bharath and Dittmar (2010) and Marosi and Massoud (2007) find that the estimated coefficients for intangible asset ratios

are insignificant, implying that information asymmetry is not a factor in the delisting decision.

The current article contributes to this literature by hypothesising that, within the context of heightened uncertainty in US stock markets over Chinese public firms following recent series of reports of accounting fraud, the levels of intangible investments played a crucial role in Chinese firms' decision to delist from the US stock exchanges. This is primarily because firms' intangible investments, within this context, impede their ability to issue new equity at a reasonable cost (i.e. one of the benefits of being listed), thereby, shaping their overall costs and net benefits of remaining listed. By their very nature, intangible investments attract greater analyst coverage and are more susceptible to analyst forecast errors, thereby, having serious consequences on firm valuations (Anagnostopoulou, 2008). Barth *et al.* (2001) find that analyst coverage is significantly greater for R&D-intensive firms and industries. Amir *et al.* (2003) also find analyst forecast errors to be positively related to investments in intangibles, demonstrating analysts' lack of understanding of the implications of intangibles on firms' future profitability.

Further and in response to the valuation difficulties associated with intangible assets, accounting rules tend to be stringent on intangible investments, requirement frequent assessments and charging impairment losses, but also creates room for managerial manipulations of financial statements. Watts (2003) notes that that the current global accounting standard on goodwill and impairment (IFRS 3) which allows for managerial discretion may motivate managerial optimism and earnings management, and worsen investors' suspicion of fraud in connection with intangible assets. Consistent with this prediction, Sun and Zhang (2017) find a negative relationship between goodwill impairment losses and bond credit ratings, suggesting that firms with goodwill impairment losses (i.e. high intangible-firms) obtain lower credit ratings. In an attempt to avoid credit ratings downgrade, for example, managers may

be motivated to understate impairment losses. Based on a sample of Australian firms, Bepari and Mollick (2017) report that the adoption of goodwill impairment approach (under IFRS 3) has decreased the frequency and the amount of goodwill write-offs that would have been required under the systematic amortisation regime (old standard).

Collectively, the literature suggests that investments in intangibles are inherently risky, more susceptible to managerial manipulation and accounting fraud, attract greater analyst coverage, and are subject to greater analysts' forecast errors. Therefore, in periods of general market uncertainty, public firms with higher investments in intangibles may incur greater costs of remaining listed, and are (thus) more likely to delist. Accordingly, the first hypothesis is formulated as follows:

H1: *Investment in intangible assets is positively associated with corporate delisting decisions.*

3.3 Intangibles-delisting nexus: The accentuating effect of alternative financing sources

The nexus between the decision to delist and intangible investments is likely to be accentuated by the availability or otherwise of alternative sources of financing for firms. For listed firms with high intangibles but without the ability to fund their intangible investment projects internally or from external debt, their net benefits for remaining listed may be relatively higher, making them less likely to delist. On the contrary, when firms have suitable and less costly means of financing (e.g., from accumulated reserves, prior equity issues, or even from banks), their net benefit of remaining listed is reduced, making them more likely to delist from stock markets, in periods of high market uncertainty. Since large, mature, and established firms tend to be able to access alternative funding sources (Muller and Zimmermann, 2008; Czarnitzki and Hottenrott, 2011), we expect such firms to have a greater likelihood to delist when they have high levels of intangible assets. Therefore, the second hypothesis is proposed

for testing:

H2: *The positive intangibles-delisting nexus is accentuated by firms' ability to finance investments from alternative sources (e.g. accumulated profit, prior equity issues, etc.).*

4. Data and Methods

4.1 Data

To test Hypotheses 1 and 2, a sample of all privatisation announcements over seven fiscal years (2010 and 2016) by Chinese firms listed on major US stock exchanges is collected, regardless of whether the privatisation process completed successfully. This was to reflect the objective of investigating the role of intangible investments on firms' *decision to delist*. It is considered that public privatisation announcements by firms are preceded by an earlier decision to delist. However, for simplicity, the paper refers to these firms making privatisation announcements as delisting firms (or delist sample).

The data on Chinese firms delisting from US stock exchanges, specifically information on firms' name and dates of delisting announcement, are hand-collected from three prominent Chinese financial web-based platforms (*iMeigu*, *Hexun* and *Sina Finance*).[7] All the other data for the study including the IPO dates and financial/accounting data are collected from the *Wind Financial Database.*[8] The search identified 94 US-listed Chinese companies that had publicly announced their decision to delist during 2010-2016, an average of 13 per year. It is worth noting that Chaplinsky and Ramchand (2012) report an average annual delisting of 16 *foreign* firms from US markets between 1962 and 2006. These statistics suggest disproportionately higher delisting announcements by Chinese firms from US exchanges in recent years relative to other foreign firms.

Due to data constraints, three of the 94 delisting firms drop out of the sample, leaving a final sample of 91 Chinese firms delisting from four major US stock exchanges[9] over the 2010-2016 period. Table 1 presents the distribution of the sample by stock exchange and industry of the delisting firms. Over half of the sample firms (58%) exit the NASDAQ, with another 32% exiting the NYSE. The remaining 10% of the sample predominantly delist from other OTC markets. Perhaps, the relatively less restrictive listing requirements of NASDAQ make it a preferred capital market for Chinese firms. Noticeably, almost half (44%) of the sample firms are from the Information Technology industry which generally tends to be R&D-intensive. This provides some early anecdotal evidence of a possible link between intangible investments and corporate delisting transactions.

[INSERT TABLE 1 HERE]

Table 2 displays the sample distribution by year of delisting announcement, year of listing (i.e. IPO), as well as, by the number of trading years firms had been on the stock exchange before delisting. As can be seen, the highest number of delisting announcements (30) was observed in 2015, which coincides with the year immediately following the accounting fraud allegation by Citron Research against Evergrande. Similarly, the second and third highest numbers of delisting announcements were observed within the two-year period (2011-2012) after Muddy Waters reported of fraudulent accounting in Orient Paper Inc. in 2010. These statistics, perhaps, provide some basis for public opinion that the recent wave of delisting of Chinese firms from US exchanges is a response to the accounting fraud allegations involving Chinese firms.

IPO information suggests that the sample firms were listed in US stock exchanges between 2000 and 2014, with the highest listing in any single year (27 firms) observed in 2007. Only 17 firms (19%) listed on US markets after 2010 (post-ONP fraud allegations) and none listed after 2014 (post-

Evergrande fraud allegations). Again, these statistics suggest that the accounting fraud allegations might have reduced the appetite of Chinese firms for US stock markets. Finally, at the time of delisting, majority of sample firms (almost 70%) had traded on the US markets for five years or less, suggesting that most sample firms may lack sufficient experience of operating in US stock exchanges.

[INSERT TABLE 2 HERE]

4.2 Empirical model

The main empirical approach of the paper is a probit regression model predicting the probability of a firm delisting from the stock exchange conditional on its intangible investments and a set of control variables. The dependent variable is equal to one for voluntary delisted firms and zero for control firms. Similar to previous studies (e.g. Pour and Laser, 2013), each Chinese delisted firm (delist sample) is matched with a Chinese firm that remained listed (control sample) on US markets based on industry, size, and IPO date. The final empirical analysis is based on a sample of 91 delisting firms and 91 non-delisting controls, i.e., an overall sample of 182 observations.

The baseline probit model for the empirical analysis is specified below in Eq. (1):

$$P_{it}(Delist = 1) = \beta_1 + \beta_2 IAR_{it-1} + \sum_{k=1}^{k} X^1_{kit-1}\beta_k + u_{it} \qquad \text{Eq. (1)}$$

where: P_{it} refers to the probability of firm *i* delisting from the US stock exchange, the β s represent the intercept (β_1), the coefficient for intangible assets ratio (IAR) (β_2), and for the control variables (β_k). The u_{it} is the random error term assumed to be serially uncorrelated and homoscedastic. IAR_{it-1} represents a one-period lagged value of the firm's intangible investments, the primary variable of interest, which is predicted to be positively related to corporate delisting decision (*H1*). Finally, X_{kit-1} in Eq. (1) represents one of the following lagged *k* control variables that may affect firms' decision to

delist. The explanatory variables are lagged to minimize reverse causality problems and to increase the likelihood that causality flows from the explanatory variables to the dependent variable (endogeneity).

The control variables are defined in Table 3. First, the number of listing years (i.e. the period between the IPO date and the delisting date) is included to control for two effects; the experience effect and the stability/financing effect. Firms that have been on the market for long may be more experienced in dealing with crisis and may thus be less likely to panic and exit the stock market in challenging times. Alternatively, these firms may represent mature, established firms with more analysts' coverage and alternative funding sources (Merton, 1987; Baker *et al.* 2002; Lang *et al.,* 2003), and may therefore have a higher likelihood to delist should they consider the cost of remaining listed to be too high. The financing effect is further controlled for by including additional variables that may capture varying aspects of firms' ability to source alternative capital since obtaining financing is one of the primary reasons why firms become public (Reese and Weisbach, 2002). The financing variables include: (1) return on equity, proxying for current profitability, which may contribute to retained earnings for internal financing; (2) financial leverage to proxy for borrowing ability; (3) seasoned equity offerings as a proxy for firms' attractiveness to investors and possible presence of reserves from prior equity issues; and (4) log of total assets as a proxy for the size of firms' internal capital market.[10]

[INSERT TABLE 3 HERE]

Another set of controls included in the regression aims to account for firms' growth prospects. Firms with higher growth prospects may need more funds to finance their growth opportunities and may thus be less willing to delist (Bancel and Mittoo, 2008; Aslan and Kumar, 2011; Chaplinsky and Ramchand, 2012). Chaplinsky and Ramchand (2012) show that growing firms from emerging market economies that need external funding to support their growth are willing to incur higher costs of listing

in the US. This effect is captured by including the 3-year average operating profit growth rate, capital expenditure intensity, net assets per share, and market-to-book ratio. The market-to-book ratio may also proxy for misvaluation (i.e. over- or under-valuation) of the firm resulting from information asymmetry.

Further, as discussed in sub-section 3.1, public firms potentially suffer from agency problems that emanate from excessive CEO power and/or free cash flow (Jensen, 1986; Elmagrhi *et al.,* 2017), and privatisation may serve as a tool for aligning managerial interests with those of shareholders. Therefore an indicator variable for CEO duality (i.e. CEOs doubling up as the Board Chair) and free cash flow variable are included to control for the agency effect on delisting. The free-cash flow variable may also pick up some alternative financing effect. Lastly, year fixed-effect is controlled for by including dummies for the delisting years to account for macroeconomic factors that may influence corporate delisting transactions. Industry fixed-effect was not controlled for in the regression model since the peer firms were selected from the same industries as the delist sample.

The baseline probit regression model in Eq. (1) is modified when testing *H2* and when conducting additional robustness checks. For example, the model for testing *H2* contains an additional interaction term between IAR and a financing variable, as shown in Eq. (2):

$$P_{it}(Delist = 1) = \beta_1 + \beta_2 IAR_{it-1} + \beta_3 (IAR * Financing)_{it-1} + \sum_{k=1}^{k} X^1_{kit-1}\beta_k + u_{it} \qquad \text{Eq. (2)}$$

5. Empirical results and discussion

5.1 Descriptive statistics and bivariate analyses

Panel A of Table 4 summarises the descriptive statistics for the study's variables for the full sample and also separately for the delist and control samples. As displayed in the Table, the firms in the delist sample have a substantially higher investments in intangible assets compared with their counterparts in

the control sample. Specifically, the intangible assets as a proportion of total assets is 11% for the delist sample relative to 7.9% for the control sample, with the difference of 3.1% being statistically significant at the 10% level. This again provides early evidence in support of *H1*, in that, intangible investments seem to be positively associated with firms' delisting decisions.

Although the differences between the delist and control sample for the other variables were not statistically significant, firms that delisted from the stock exchanges generally had lower listing years, market-to-book ratio, profitability growth rate, free cash flow, net assets per share, and capital expenditure intensity. These statistics suggests that delisting firms may be more naïve (inexperienced in stock market dealings), undervalued, with limited growth prospects. However, delisting firms appear to have better prospects of obtaining alternative financing by being larger and more attractive to investors (due to recent success in seasoned equity offerings), as well as having greater current profitability and leverage levels. These patterns are largely in line with *H2*.

[INSERT TABLE 4 HERE]

In Panel B of Table 4, the correlation matrix for the variables is presented, and observably, there is a statistically significant positive association between intangible investments and delisting transactions. There also seem to be a positive (negative) association between corporate delisting activities and CEO duality, profitability, leverage, firm size, and seasoned equity offerings (listing years, market-to-book ratio, profitability growth, free-cash flow, net assets per share, and capital expenditure), albeit not statistically significant. Panel B of the table also shows low levels of correlation among the explanatory variables (all correlation coefficients are below 0.5), suggesting that multicolinearity may not pose any serious limitations on the multivariate regression analysis in the next section.

5.2 *Multivariate analysis and discussions*

Table 5 presents the results for the probit regressions for the effect of intangibles on corporate delisting decisions. The marginal effects (reported in the Table), relate to the partial effect of each explanatory variable on the probability of delisting, and help to directly interpret the coefficients as probabilities (see Agyei-Boapeah, 2017; Pour and Lasfer, 2013). In Model 1, the intangible asset ratio (IAR) is positive and statistically significant at the 1% level (coefficient=0.029; *p-value*=0.002), suggesting that Chinese firms with high levels of intangible investments were more likely to delist from the US stock exchanges during the sample period. The marginal effect of the intangibles (IAR) is 0.011, implying that a unit increase in intangible investment increases the probability of delisting by 1.1%, on average. With the average sample firm having 9.5% of assets in intangibles, this result suggests a delisting probability of 11% (i.e. 0.011*9.5) for a firm undertaking average levels of investments in intangible assets.

The positive relationship between intangible investments and the delisting decision is consistent with theoretical predictions. That is, increased levels of intangible investments appear to be associated with increased cost of remaining listed on stock exchanges, which emanates from an increased risk of financial statement manipulations by managers (Watts, 2003), greater analyst coverage (Barth *et al.,* 2001) as well as higher analysts' forecast errors (Amir *et al.*, 2003), and higher information asymmetry (Muller and Zimmermann, 2009; Czarnitzki and Hottenrott, 2011), leading to the undervaluation/mispricing of such firms (Anagnostopoulou, 2008) and potential losses to their shareholders (Weir *et al.,* 2005b). In addition, the difficulties in objectively valuing intangible assets as well as their lack of collateral value appear to make it difficult for high-intangible firms to access capital from investors when the market faces heightened uncertainty. Consequently, these factors together

increase (reduce) the costs (net benefits) of staying listed on the exchange for high-intangible firms, causing them to delist from the stock exchange.

Overall, the broad implications of the findings are consistent with the generic cost-benefit theoretic framework for understanding public-to-private transactions (see Marosi and Massoud, 2007; Bharath and Dittmar, 2010). For example, Bharath and Dittmar (2010) posit that since the decision to go public is a trade-off between the costs and benefits of listing, the delisting decision is also likely to be taken when the costs of listing exceed the benefits.

[INSERT TABLE 5 HERE]

In the next three Models of Table 5, tests for robustness of the results are conducted by measuring the primary explanatory variable, intangible investments, using different indicator variables. First, in Model 2, high-intangible firms are defined to include a dummy for firms with above-median intangible investments. Similarly, in Models 3 and 4, the definition of high-intangible firms is restricted to include only firms in the top 40% and 25% brackets for intangible investments, respectively. The results, reported in Table 5, confirm the strong positive impact of intangibles on the ultimate delisting decisions of firms. Specifically, the probability of delisting from stock exchanges increases by between 19-22% if firms are within the top tier for intangible investments. Collectively, these results offer empirical support for *H1*, as well as provide further support to the findings of previous studies (e.g. Marosi and Massoud, 2007; Chaplinskya and Ramchand, 2012; Pour and Laser, 2013), which suggest that firms consider the costs and net benefits of listing in deciding whether to remain or delist from stock markets. Pour and Laser (2013) provide evidence to suggest that firms delist voluntarily from the London Stock Exchange when they fail to benefit from listing by not raising sufficient equity capital to rebalance their capital structure. In the US, Marosi and Massoud (2007) and Chaplinskya and Ramchand (2012) find

that the Sarbanes–Oxley Act (SOX) and the associated compliance costs are major determinants of corporate delisting decision by increasing the listing costs of public firms. In comparison, the findings of the present paper imply that listing costs (benefits) are higher (lower) for firms with higher investments in intangible assets.

In terms of the control variables, firms that have been listed for more years and those with higher growth prospects (i.e., market-to-book value, operating profit growth, net assets per share) seem to have a significantly reduced probability of delisting. Also, current profitability (measured as return on equity) appears to consistently have a positive and significant impact on the decision to delist. These results are generally in line with prior studies such as Bharath and Dittmar (2010) and Pour and Lasfer (2013).

Turning attention to the second empirical issue (H2), there is evidence that the presence of alternative sources of financing intangible projects may influence the intangibles-delisting nexus, as shown in Table 6. As noted in section 4 [in specifying Eq. (2)], the IAR is interacted with each of the explanatory variables which could represent an alternative source of financing, namely; listing years, return on equity, free cash flow, leverage, firm size, and seasoned equity offerings. The results are reported in Models 1-6 of Table 6. First, the number of years for which a firm has been listed (listing years) is negative and statistically significant at 99% confidence level, implying that Chinese firms with more experience of the stock exchange dealings are more likely to remain listed. More importantly, the coefficient of the interaction term (IAR*Listing years) is positive and statistically significant at 5% level, suggesting that even the experienced firms decide to delist when they have high investments in intangible assets. To the extent that these experienced firms with greater listing history, analyst coverage, and market exposure are more attractive to investors and could easily obtain capital elsewhere (see Agyei-Boapeah, 2015), then these results provide empirical support for *H2*. Agyei-Boapeah (2015)

finds UK acquiring firms with significant experience in foreign markets to reap some financing advantages over their inexperienced counterparts.

However, in Models 2-4, the interaction terms [(IAR*Return on Equity); (IAR*Free cash flow); and (IAR*Financial leverage)] though positive, lack statistical significance at conventional levels, and therefore inconsistent with *H2*. It is, however, possible that the current levels of profitability and free cash flow are not sufficient to fund intangible investment projects, thus, making firms reluctant to delist. Similarly, it may be that bondholders are less willing to fund intangible investments because of their lack of collateral value. Consequently, borrowing may not really be an alternative source of financing intangible assets. However, Czarnitzki and Hottenrott (2011) show that R&D projects are more likely to be funded from internal capital markets that are associated with large, diversified firms (Agyei-Boapeah, 2017). Consistent with this conjecture and *H2*, the results in Model 5 show that high-intangible firms are more likely to delist from stock exchanges when they are large and likely to have a sizeable pool of internal capital market to finance their intangible investments internally. Moreover, the individual effect of intangibles (without internal capital market) and firm size (without high intangible investments) on delisting decision are statistically negative, suggesting that even the high-intangible firms stay listed if they may not be able to fund their intangible investments from their internal capital markets. These findings offer further support for *H2*.

Finally, the influence of financing from a prior equity issue on the intangibles-delisting nexus is considered. Reese and Weisbach (2002) find that firms raise a substantial amount of equity following cross-listings in the US, which helps them to build up a pool of reserves to fund future projects. Accordingly, *H2* predicts that prior equity issues should reduce the net benefits of remaining listed, and thus increase the likelihood for such firms to delist when they carry high intangible assets. The results

in Model 6 support this conjecture, with a positive and significant positive coefficient for the interaction term (IAR*Seasoned equity offerings) (coefficient=0.071; *p-value*=0.005). This implies that when firms are likely to have a pool of equity capital from past equity issues, they are more likely to delist from stock markets when they have high levels of current intangible investments.

Taken together, the results in Table 6 generally support the predictions of the proposed theoretical framework for this study which incorporates uncertainties in markets and valuation difficulties associated with intangible assets with the generic cost-benefit theoretic framework of studies such as Bharath and Dittmar (2010) and Chaplinskya and Ramchand (2012). That is, the information asymmetry associated with intangible assets increases (reduces) the costs (net benefits) of remaining listed for firms with high levels of intangible investments. Thus, such firms tend to delist from the stock markets to protect their shareholders from losses, especially when they have alternative and potentially less costly ways of financing their intangible investment projects.

6. Conclusion and implications

Unlike current studies on the motives behind firms' delisting decisions, which tend to focus largely on firms in developed economies and often ignoring the role of intangible assets, this study examines the predictive effect of intangible investments on corporate delisting decisions. In addition, it seeks to ascertain whether alternative sources of financing (other than raising new equity from the stock exchange) have a moderating effect on the intangibles-delisting nexus. A peculiar feature of the paper is that it is conducted within the context of Chinese firms listed on US markets and focused on delisting announcements made during the recent period of 2010-2016. This period is characterised by heightened uncertainty in US stock markets over Chinese public firms due to a series of accounting fraud

allegations made against Chinese public firms by US analysts. Given that intangible assets attract more analyst coverage/attention, and are associated with greater analyst forecast errors, as well as present managers with opportunities to manipulate financial statements, US-listed Chinese firms with large amounts of intangibles risk having their shares mispriced/undervalued and incurring significant losses. All else equal, such firms acting reasonably should have a greater incentive to delist from the stock market.

Based on probit regression analysis controlling for a number of variables and year fixed-effects, and insights drawn from the asymmetric information and cost-benefit theories of listing, the results are summarized as follows. Firstly, the results suggest that investment in intangible assets is a strong predictor of corporate delisting decisions for emerging market firms cross-listing on stock exchanges in advanced countries. This implies that emerging market firms with large intangibles do face additional listing costs on advanced markets when there is greater market uncertainty relating to accounting fraud. Secondly, the finding indicates that the relationship between intangible assets and the likelihood for emerging market firms to exit advanced stock markets is contingent on the availability of alternative funding sources, particularly internal funding and prior equity issues. More specifically, the results show that the positive impact of intangibles on firms' probability to delist is higher for larger firms with greater internal capital market, more listing years, and more reserves built up from prior seasoned equity issues. Thus, without surplus internal funds, high-intangibles emerging market firms cross-listing on advanced markets may be forced to accept significant shareholder losses in periods of greater market uncertainty. The interpretation and implications of our results are largely consistent with expectations of the theoretical framework, which is based on insights from the asymmetric information, and cost-benefit theories of listing.

We make new contributions to the existing literature. Specifically, we contribute to the debate on the motivations behind the recent wave of delisting by Chinese firms from US markets by providing evidence to suggest that the reportage of US analysts on accounting fraud involving Chinese public firms may have increased the cost of remaining listed for firms with high investments in intangible assets. An implication of the finding is that in periods of high market uncertainty, firms with a significant investment in intangible assets risks destroying shareholders' wealth if they remain listed on the stock exchange. Given the importance of intangible investments in promoting innovation and economic growth, this finding should be worrisome to policy makers. Accordingly, policy makers and standard setters must continue to work to improve the accounting regulations of intangible assets and to promote the adoption of global accounting standard across both emerging and advanced economies. Another key finding of the study is that the presence of alternative sources of funding helps to mitigate the listing costs in turbulent times. An important implication flowing from this finding is that public firms planning huge investments in intangibles should build up a reserve of internal funds as a hedge against any increased future costs of remaining listed should the market become more turbulent. Not having any funding reserves appears to leave public firms with no option but to remain on the stock exchange and reluctantly accept the underpricing of their shares. Therefore, market participants must keep an eye on the internal reserves of those public firms with huge investments in intangibles.

Finally, inasmuch this paper makes important extensions to the literature, it is based on a limited sample and the specific context of Chinese firms listed on US markets during a period of heightened uncertainty due to accounting fraud allegations. Therefore, generalising the results outside this context should be done cautiously. Further studies could offer additional insights by utilizing a larger sample that considers several cases of accounting fraud allegations across countries over time for an analysis

that will permit generalisation to a larger extent. In addition, the focus of this paper did not extend to the valuation implications of the delisting firms, making it unclear whether the market considers delisting by high-intangible firms to be the "best" (value-enhancing) decision. This could again serve as a potential avenue of future research, which could utilise event-study methodologies to examine this issue.

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Figure 1 - The number of Chinese firms listing on US stock markets from 1992-2016

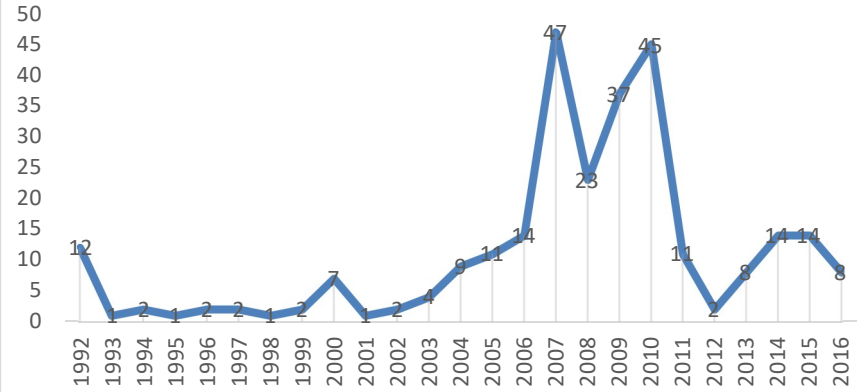

Table 1: Sample distribution by industry and stock exchange

	Stock exchange				
Industry	**AMEX**	**NASDAQ**	**NYSE**	**Other OTC**	**Total**
Daily consumer products		3	3		6
Energy			1	1	2
Finance		1			1
Healthcare	1	6	5	1	13
Heavy industrial		3	3		6
Information technology		29	9	2	40
Materials		3	1	1	5
Optional consumer products		8	5	2	15
Public utility				1	1
Real estate			2		2
Total	**1**	**53**	**29**	**8**	**91**

Table 2: Annual sample distribution by delisting and listing years and number of listing years

	Number of firms by delisting and listing		Listing years and number of firms	
Year	**Delisting**	**Listing**	**Listing years**	**Number of firms**
2000		2	+1	9
2003		1	+2	10
2004		5	+3	16
2005		5	+4	13
2006		6	+5	15
2007		24	+6	4
2008		3	+7	5
2009		11	+8	8
2010	6	17	+9	5
2011	14	8	+10	1
2012	24	2	+11	2
2013	7	2	+12	2
2014	4	5	+14	1
2015	30		**Total**	**91**
2016	6			
Total	**91**	**91**		

Delisting represent Chinese firms announcing privatisation from US markets during 2010-2016. Listing refers to firms undertaking IPOs. Listing years refer to the period between the IPO date and the delisting date.

Table 3: Variable definition

Variables	Descriptions	Proxy for:	Sign
Market-to-book ratio (M/B)	Market capitalisation / total asset	Growth prospects/underpricing	-
Listing years	Number of days between IPO date and delisting announcement date / 365	Market knowledge or experience / alternative financing source	-/+
Intangible asset ratio (IAR)	Intangible assets / total assets	Intangible investments/asymmetric information	+
Free cash flow (FCF)	Free cash flow / total assets	Agency costs/alternative financing source	+
CEO duality	A dummy equal to one if firm has the same person occupying the positions of CEO and Board Chairperson, and zero otherwise	Agency costs	+
Capital expenditure intensity (CAPEX)	Capital expenditure / total sales	Growth prospects	-
Financial leverage (LEV)	Total debt / total assets	Alternative financing source	+
Seasoned equity offerings (SEO)	A dummy equal to one if the company raised equity capital after its IPO but prior to delisting, and zero otherwise.	Alternative financing source	-/+
Operating profit growth	Average of annual growth rate for operating profit for the last 3 years	Growth prospects	+
Return on equity (ROE)	After-tax profit / equity	Profitability/alternative financing source	+
Net assets per share	Net assets / number of shares	Growth prospects	-
Firm size	Natural log of total assets	Internal capital market/alternative financing source	+

Table 4: Descriptive statistics and correlation matrix

Panel A: Descriptive statistics

Variables	Full sample		Delist sample (D)		Control sample (C)		Difference (D-C)	
	Mean	STD	Mean	STD	Mean	STD	Mean	p-value/t-test
Intangible asset ratio (%)	9.456	12.824	11.044	13.263	7.868	12.237	3.176	0.0949*
Listing years	5.149	3.623	4.725	2.882	5.574	4.211	-0.849	0.1142
Price-book ratio	2.491	4.061	2.225	4.094	2.757	4.032	-0.533	0.3776
CEO duality	0.610	0.489	0.626	0.486	0.593	0.494	0.033	0.6506
Operating profit growth (%)	46.517	451.252	6.691	213.432	86.342	600.631	-79.650	0.2348
ROE (%)	1.568	51.463	6.519	39.810	-3.384	60.762	9.903	0.1951
Free cash flow	1.418	13.864	1.308	10.615	1.527	16.548	-0.220	0.9152
Net assets per share	4.970	7.981	4.327	5.382	5.612	9.915	-1.284	0.2790
Leverage (%)	35.967	22.554	36.270	23.364	35.663	21.839	0.607	0.8566
Firm size	10.555	1.399	10.580	1.152	10.530	1.615	0.050	0.8105
Capex (%)	16.980	31.116	14.918	29.478	19.043	32.704	-4.125	0.3726
Seasoned equity offerings	0.225	0.419	0.242	0.431	0.209	0.409	0.033	0.5969

Panel B: Correlation matrix (In bold are statistically significant at conventional levels, 10% and below).

Delist **(1)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Intangible assets ratio (%) **(2)**	**0.1242**	1.0000										
Listing years **(3)**	-0.1175	0.0348	1.0000									
Market-to-book ratio **(4)**	-0.0658	0.0649	-0.0553	1.0000								
CEO duality **(5)**	0.0338	-0.0719	-0.1124	0.0137	1.0000							
Operating profit growth (%) **(6)**	-0.0885	-0.0090	-0.0782	0.0216	-0.0394	1.0000						
ROE (%) **(7)**	0.0965	**-0.3795**	-0.0714	**0.1677**	**-0.1572**	0.0770	1.0000					
Free cash flow **(8)**	-0.0079	-0.1171	0.0794	**0.1963**	-0.0720	0.1093	**0.4549**	1.0000				
Net assets per share **(9)**	-0.0807	0.0980	**0.1787**	0.0877	0.0299	-0.0299	**0.1225**	**0.1227**	1.0000			
Leverage (%) **(10)**	0.0135	-0.0192	**0.2374**	**0.1827**	0.0030	-0.0816	-0.1052	-0.1072	-0.0299	1.0000		

Firm size **(11)**	0.0179	-0.0467	0.2480	**0.1773**	-0.1085	-0.0402	**0.2571**	**0.3433**	**0.2794**	**0.2375**	1.0000	
Capex (%) **(12)**	-0.0665	0.0038	-0.0209	0.0127	0.0243	-0.0963	-0.0280	**-0.2681**	-0.0082	0.0571	-0.0511	1.0000
Seasoned equity offerings **(13)**	0.0395	0.0116	0.1067	0.0061	0.0538	0.0965	-0.0380	-0.0791	-0.0042	0.1075	**0.1563**	-0.0609

Variables are defined in Table 4. In Panel A, ***, **, and * indicate statistical significance of 1%, 5%, and 10% respectively. In Panel B, figures in bold denote statistical significance at conventional levels (i.e. 10% or below).

Table 5: Probit regression analysis of the probability of delisting

Explanatory variables	**(1)**	**Marginal effect**	**(2)**	**Marginal effect**	**(3)**	**Marginal effect**	**(4)**	**Marginal effect**
Intangible asset ratio (IAR)	0.0286***	0.011						
	(0.002)							
Above-median IAR firm dummy			0.5685***	0.224				
			(0.006)					
Top 40% IAR firm dummy					0.5018**	0.198		
					(0.018)			
Top 25% IAR firm dummy							0.4955**	0.195
							(0.040)	
Listing years	-0.0499*	-0.020	-0.0483*	-0.019	-0.0455	-0.018	-0.0468*	-0.019
	(0.071)		(0.093)		(0.111)		(0.097)	
Market-to-book value	-0.0488*	-0.019	-0.0500*	-0.020	-0.0451*	-0.018	-0.0426*	-0.017
	(0.056)		(0.055)		(0.091)		(0.098)	
CEO duality	0.2361	0.094	0.2062	0.082	0.1543	0.061	0.1888	0.075
	(0.266)		(0.318)		(0.450)		(0.365)	
Average operating profit growth	-0.0005*	0.000	-0.0005**	0.000	-0.0005**	0.000	-0.0005*	0.000
	(0.054)		(0.034)		(0.040)		(0.084)	
Return on equity	0.0080***	0.003	0.0061**	0.002	0.0061**	0.002	0.0061**	0.002
	(0.001)		(0.023)		(0.019)		(0.014)	

Free cash flow	-0.0051	-0.002	-0.0046	-0.002	-0.0060	-0.002	-0.0058	-0.002
	(0.568)		(0.607)		(0.501)		(0.507)	
Net assets per share	-0.0228*	-0.009	-0.0198	-0.008	-0.0211*	-0.008	-0.0198	-0.008
	(0.088)		(0.101)		(0.083)		(0.114)	
Financial leverage	0.0035	0.001	0.0038	0.002	0.0031	0.001	0.0028	0.001
	(0.451)		(0.416)		(0.504)		(0.546)	
Firm size	0.0402	0.016	0.0306	0.012	0.0378	0.015	0.0412	0.016
	(0.630)		(0.713)		(0.644)		(0.617)	
Capital expenditure intensity	-0.3765	-0.002	-0.4339	-0.002	-0.3591	-0.001	-0.3730	-0.001
	(0.333)		(0.262)		(0.350)		(0.326)	
Seasoned equity offerings	0.1212	0.048	0.1654	0.066	0.1057	0.042	0.1316	0.052
	(0.609)		(0.491)		(0.657)		(0.575)	
Year fixed-effect	Yes		Yes		Yes		Yes	
	…		…		…		…	
Constant	-0.4851		-0.5059		-0.4192		-0.3751	
	(0.593)		(0.578)		(0.640)		(0.679)	
No. of observations	182		182		182		182	
R-square	0.092		0.084		0.075		0.070	

The dependent variable takes a value of one if a firm publicly announced its decision to delist, otherwise zero. All other variables are defined in Table 4. Robust standard errors are utilised in the probit regressions. ***, **, and * indicate statistical significance of 1%, 5%, and 10% respectively.

Table 6: Probit regression analysis incorporating alternative financing sources

Explanatory variables	(1)	(2)	(3)	(4)	(5)	(6)
Intangible asset ratio (IAR)	-0.0007	0.0304***	0.0291***	0.0131	-0.3408***	0.0179*
	(0.961)	(0.002)	(0.002)	(0.369)	(0.000)	(0.080)
IAR * Listing years	0.0059**					
	(0.014)					
IAR * Return on equity		0.0001				
		(0.363)				
IAR * Free cash flow			0.0007			
			(0.224)			
IAR * Financial leverage				0.0005		
				(0.220)		
IAR * Firm size					0.0356***	
					(0.000)	
IAR * Seasoned equity offerings						0.0711***
						(0.005)
Listing years	-0.1064***	-0.0490*	-0.0504*	-0.0480*	-0.0535*	-0.0487*
	(0.003)	(0.078)	(0.071)	(0.086)	(0.075)	(0.082)
Market-to-book value	-0.0559**	-0.0428	-0.0410	-0.0611**	-0.0377	-0.0443*
	(0.034)	(0.129)	(0.136)	(0.037)	(0.197)	(0.086)
CEO duality	0.3002	0.2363	0.2177	0.2412	0.3157	0.2689
	(0.163)	(0.265)	(0.308)	(0.253)	(0.152)	(0.205)
Average operating profit growth	-0.0006*	-0.0005*	-0.0005*	-0.0005**	-0.0006*	-0.0006**
	(0.061)	(0.058)	(0.060)	(0.047)	(0.073)	(0.031)
Return on equity	0.0097***	0.0058	0.0063*	0.0101***	0.0068*	0.0076***
	(0.000)	(0.159)	(0.052)	(0.001)	(0.055)	(0.002)
Free cash flow	-0.0063	-0.0047	-0.0093	-0.0064	-0.0064	-0.0078

	(0.486)	(0.599)	(0.333)	(0.475)	(0.528)	(0.380)
Net assets per share	-0.0263*	-0.0230*	-0.0204*	-0.0220*	-0.0258*	-0.0204
	(0.066)	(0.087)	(0.098)	(0.090)	(0.082)	(0.116)
Financial leverage	0.0048	0.0041	0.0036	0.0004	0.0046	0.0043
	(0.302)	(0.384)	(0.438)	(0.946)	(0.360)	(0.354)
Firm size	0.0421	0.0330	0.0274	0.0398	-0.2231**	0.0359
	(0.617)	(0.695)	(0.743)	(0.630)	(0.023)	(0.668)
Capital expenditure intensity	-0.4872	-0.3080	-0.3258	-0.4276	-0.3761	-0.4150
	(0.218)	(0.439)	(0.404)	(0.285)	(0.339)	(0.292)
Seasoned equity offerings	0.1213	0.1032	0.0921	0.1434	0.0731	-0.3843
	(0.618)	(0.666)	(0.700)	(0.549)	(0.771)	(0.228)
Year fixed-effect	Yes	Yes	Yes	Yes	Yes	Yes
	…	…	…	…	…	…
Constant	-0.2055	-0.4475	-0.3691	-0.3570	2.0449*	-0.3478
	(0.823)	(0.622)	(0.684)	(0.694)	(0.051)	(0.705)
No. of observations	182	182	182	182	182	182
R-square	0.112	0.094	0.096	0.097	0.163	0.117

The dependent variable takes a value of one if a firm publicly announced its decision to delist, otherwise zero. All other variables are defined in Table 4. Robust standard errors are utilised in the probit regressions. ***, **, and * indicate statistical significance of 1%, 5%, and 10% respectively.

[1]As discussed in Pour and Lasfer (2015), a voluntary delisting is one that is initiated by a firm upon agreement with its shareholders (concurring votes from 75% of shareholders at a general meeting).

[2]Intangible assets are more difficult to value resulting in high information asymmetry between firms and investors (see Anagnostopoulou's (2008)'s review). International Accounting Standard (IAS) 38 sets out the recognition and measuring criteria, as well as, the disclosure requirements for intangible assets, defined as identifiable non-monetary assets without physical form. Examples of intangible assets include computer software, licenses, trademarks, patents, copyrights, goodwill, research and development (R&D) expenditure, etc.

[3]The few available Chinese studies are either theoretical in nature or based on single case study analysis, thus, lacking empirical analysis to provide persuasive evidence to

support those theories/perspectives (e.g. Liu *et al.,* 2016; Zhang, 2012).
[4]The full report can be accessed via this link: http://www.muddywatersresearch.com/content/uploads/2010/06/ONP_Report_June2010.pdf
[5]Orient Paper Inc. (ONP) forms part of our control sample for the empirical analysis. ONP listed on the New York Stock Exchange on 17th December 2009 and remained listed as at the time of our data collection.

[6]Detailed report can be obtained from this link: http://www.mmt.gov.hk/eng/reports/Evergrande_Report.pdf
[7]iMeigu (http://www.imeigu.com/), Hexun (http://www.hexun.com/), and Sina Finance (http://finance.sina.com.cn/stock/usstock/).
[8]The *Wind* financial database is a leading source of economic and financial data on China and Chinese firms. It integrates the most comprehensive and accurate market data, fundamental data, research, news, and analytics tools across all asset classes in China, and provides investment professionals with the data and insights they need to understand China's complex capital markets and economy.

[9]These include the New York Stock Exchange (NYSE), American Stock Exchange (AMEX), National Association of Securities Dealers Automatic Quotation System (NASDAQ), and other Over the Counter (OTC) markets.
[10]Dropping firm size as a control variable from the regression model did not change our results and conclusions qualitatively. We decide to include it to limit the possibility of omitted variable problems. More so, models including the firm size variable seemed to have higher explanatory power (as indicated by the Pseudo R-square statistic) compared with those without firm size.