

Investigating the Valuation Effects of Reverse Takeovers: Evidence from Europe

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Abstract This study examines a European sample of 222 private firms that opted for going public through a reverse takeover transaction during the period 1992-2011. In particular, our study investigates whether reverse takeovers announcements are value-increasing transactions, especially in countries that follow strong governance structures. Moreover, the post-reverse takeover stock price and operating performance is also at the epicenter of the current study. Employing the classical event study methodology, we document significant wealth gains for the shareholders of public firms involved in reverse takeovers. The market reaction is stronger when stricter corporate governance structures prevail in the countries where public firms trade. However, the short-term gains seem to revert to substantial losses over the long-term lending support to the overreaction phenomenon. We further detect negligible improvement in the post-reverse takeover financial performance of the new entity raising further concerns over the efficacy of such transactions.

Keywords Reverse takeovers · Operating performance · Market reaction · Going public

JEL Classifications: G30 · G33 · G34

1 Introduction

The decision to go public has spurred bulk of research in the past and still attracts the intense interest of academics and practitioners alike. Easy access to cheap capital, increased liquidity, publicity and media coverage, diversification of risk, broad investor base, growth opportunities and reduction of information asymmetry are the most distinct advantages of going public. The traditional mechanism for a firm to go public is through an initial public offering (IPO) provided that all listing criteria are met. However, this process is considered to be quite expensive and time-consuming due to the high registration and underwriting fees as well as the time needed to be completed. The introduction of alternative mechanisms of going public was a natural response to the concerns regarding the high cost of IPOs. More recently, a number of companies have been using roll-ups, outright-sellouts, reverse leveraged buyouts (RLBOs) and reverse takeovers (or reverse mergers or reverse acquisitions in the US) as alternative routes of getting a listing status.

Despite the recent waves of negative publicity in the US and the UK, reverse takeovers have witnessed tremendous growth in the last years as many private firms around the world found the reverse takeover to be a suitable short-cut route to obtain public listing. Consequently, reverse takeovers are receiving more and more publicity as investors are more aware of the transaction, financial press writes more about them and most importantly, companies are carrying them out more frequently today due to the lower cost¹ and the less time needed² compared to traditional IPOs.

According to Greene (2016, p. 56), “in a reverse takeover, the private firm merges with a public firm and the private firm owners control the combined publicly-traded firm”. At the consummation of the deal, the combined firm changes its name and reinvents itself. The publicly-traded company, often characterized as a shell company,³ is small in terms of turnover and market value, with little or none ongoing business. In many cases the only value left for the shell company is the listing place, which can be utilized by a private company to go public.

The outbreak of the global credit crunch of 2008 has inflicted most of the developed capital markets by squeezing the disposal income of investors and shareholders. The immediate consequences were the dearth of the necessary money to be raised by companies through IPOs and equity issuing. Under these harsh economic times, reverse takeovers emerged as an alternative conduit of going public for many private firms seeking a public status and at the same time a convenient way of staying alive for a number of shell companies⁴. Prior research (i.e. Aydogdu et al. 2007; Floros and Sapp 2011) points out the scarcity of data regarding shell companies as these firms are small, infrequently traded and difficult to track. This paucity of data leaves reverse takeover transactions largely under-researched and the current study aims to fill this gap.

¹ Aydogdu et al. (2007) estimated a reverse takeover cost between \$75,000 and \$100,000, while Lee et al. (2015) estimated it between \$50,000 and \$500,000.

² Brenner and Schroff (2004) estimated the time needed to carry out a reverse takeover at 45 days compared to a year or more for an IPO.

³ The term is commonly used in the context of reverse takeovers meaning firms that may have had operations once which have narrowed down significantly today, thus appearing to only serve the role of offering a listing status to a private company.

⁴ According to Faelten et al. (2013) during the recent financial crisis (2007-2009), the number of IPOs dropped by 96% while that of reverse takeovers remained almost stable in the UK market.

Employing a sample of 222 reverse takeovers that took place in Europe between 1991 and 2011, our study examines whether reverse takeovers are value-increasing transactions, especially for the shareholders of public firms as well as for those of the new entities emerged. Hence, our paper intends to bring about evidence from a sample of firms that are thinly traded, barely followed or analyzed by professional analysts, suffering also from stock price manipulation that may adversely affect market efficiency. Using the classical event study methodology, we explore the short-run market reaction around reverse takeovers as well as the market reaction in the post-reverse takeover era. We also examine the market response to reverse takeover deals in countries with different corporate governance structures in order to assess their role in explaining stock price movements in markets where the protection of investors and minority shareholders differs considerably. Finally, we explore the long-term operating performance of those firms engaged in reverse takeovers by employing a gamut of fundamentals such as performance, liquidity and capital structure ratios.

To the best of our knowledge, this is the first study that probes into the wealth effects of reverse takeovers using pan-European data. The previous geographical preference to the US and Chinese⁵ market leaves ample space for exploring the UK and continental Europe, which are considered heterogeneous markets in terms of capital market culture and developments, legal framework and regulation and corporate governance mechanisms (LaPorta et al. 1998). Based on these marked differences, we are motivated to investigate reverse takeovers under the diverse corporate governance structures among European countries, thus allowing us to bring new insights from the interaction of corporate governance and corporate actions. Furthermore, we contribute to the pertinent literature by providing evidence from the post-reverse takeover era and relate our results with business diversification (focus vs. non-focus business activities), shareholder and investor protection in countries that host reverse takeovers.

The empirical findings of the current research could be appealing to stock market authorities, firm managers and investors alike. In specific, our results from the short-run stock price reaction to reverse takeovers in association with corporate governance standards will help policy makers to optimize relevant regulations to ensure market fairness and proper investor protection. Our results will also be useful to private firms which seek less complex and time-consuming sources of financing. Additionally, our results for the long-term performance of the new entities will enable firm managers to look for value-increasing investment strategies and optimal corporate structures. Finally, our results could serve as a guide for those firms considering a listing status by investing in financially distressed companies.

The paper is organized as following. Section 2 presents the process of reverse takeovers, the regulation that encompasses such transactions and the pertinent literature. Section 3 describes the data selection process and the methodology employed. Section 4 reports the empirical results, while Section 5 summarizes the conclusions of the study.

⁵ A recent strand of studies by Chen et al. (2013), Darrrough et al. (2013), Siegel and Wang (2013), and Lee et al. (2015) have explored various characteristics (i.e. financial reporting quality, corporate governance structures, performance, survivability, etc) of the Chinese reverse mergers seeking a listing status in the USA. Lee et al. (2015) reports that 85% of all foreign reverse takeovers in the US market today involve Chinese acquirers.

2 Theoretical background

2.1 The reverse takeover process

The probability of a private company seeking listing status is directly related to the firm life cycle (Owen and Yawson 2010). For a private firm the conventional way of having a listing status and raising capital from the market is through an IPO. This process requires the hiring of underwriters, lawyers and auditors. Moreover, the firm gets the benefit of underwriter marketing to institutional investors, aftermarket stabilization and certification (Gompers and Lerner 1999). The direct costs could be substantial since these include the payment of underwriting fees, legal and auditor's fees, prospectus costs and other expenses. Though there is no consensus regarding the direct cost of an IPO, prior studies estimate this cost at as little as \$400,000⁶ (Aydogdu et al. 2007). Indirect costs such as underpricing, regulatory requirements and time spent by management in the IPO process should also be considered in calculating the overall total cost of an IPO (Song et al. 2014). In addition to the IPO cost, one should take into account the time length for an IPO to be consummated. This could be a minimum of six months (Gleason et al. 2005) and in some cases, more than one year⁷ (Brenner and Schroff 2004), long enough for the review process and the appropriate subscriptions to purchase the company's shares to be completed. Finally, the market conditions at the time of IPO consummation (Ball et al. 2011) as well as the IPO underpricing issue (Akyol et al. 2014) are further important factors that may affect the proceeds and performance of IPOs.

The aforementioned parameters of IPOs as well as the fulfillment of certain listing criteria requirements discourage many private firms from going public. As a result, alternative routes for going public emerged such as roll-ups, sellouts or reverse takeovers. The use of reverse takeovers as a mechanism of going public dates back to the 1950s in the US (Adjei et al. 2008) though private firms started making extensive use of reverse takeovers in the 1980's and 1990's as a legitimate alternative way of going public vis-a-vis the traditional route of an IPO. A reverse takeover is a transaction where "an existing public shell company, which is a public reporting company with few or no operations, acquires a private operating company – usually one that is seeking access to funding in the US (or other) capital markets" (SEC 2011, p.1). Companies may become shells either intentionally or unintentionally. In the former case, firms are purposely formed as a public shell with the sole intent of being merged with another firm. These shells are known as special purpose acquisitions (SPACs) or "virgin shells". However, in the UK reverse takeovers do not necessarily involve strictly defined shell companies in terms of intention to be acquired by other companies (Faelten et al. 2013).

In a reverse takeover process, a consulting firm may provide additional information for the suitable shell company. In some cases, small investment companies and/or clearinghouses are hired to handle the transaction completely (Gleason et al. 2005). When the appropriate shell company is found and a financial strategy is planned, the private firm contacts the shareholders of the shell company to investigate whether they are willing to participate in this takeover or not and determine the post-event ownership structure of the new entity (Brenner and Schroff 2004). Then, the initial agreement is signed by the two parties and their auditors conduct due diligence to certify the exact ownership structure in the new entity (Floros and Shastri 2010). Henceforth, the private firm has a majority stake in the newly acquired public entity, offering cash and/or stock

⁶ Lee et al. (2015) estimated the underwriting cost for an IPO between 7% and 12% of the total offer.

⁷ A reverse takeover takes between 2 to 9 months to be consummated (Brenner and Schroff 2004).

to the shareholders of the shell company. Once the private firm gets the listing status, the new entity usually operates under the management of the former private company. In most cases, the new firm takes the name of the private company or an entirely new name.

2.2 UK regulation

The public entity that participates in a reverse takeover transaction is usually a shell company which has no assets or operations, probably following a bankruptcy or just because it was established with the sole intent of merging with another company (Aydogdu et al. 2007). In many cases, despite the fact that they are legal entities, shell companies are associated with fraud and more particularly with “pump-and-dump” schemes and persistent insider trading (ibid). Therefore, reverse takeover mechanisms quite often are under regulatory authorities’ scrutiny, thus initiating the conversation over the rules embracing reverse takeover transactions.

The existing UK regulatory framework surrounding reverse takeovers differs significantly from that of the US in terms of types of transaction, shareholder approval, documentation requirements, raising capital at the time of the listing and corporate governance. In terms of shareholder approval and disclosure requirements, the UK regulation treats reverse takeovers in a similar way as IPOs. In January 2012, Financial Service Authority (FSA) published a consultation paper (CP12/2) proposing changes, among others, to the existing reverse takeover rules (FSA 2012b) taking into account market developments (FSA 2012a). The proposed changes aimed at ensuring that the reverse takeover process is used only by eligible companies. Moreover, they described the role of the sponsor as one that guarantees that the companies involved in reverse takeovers understand the regulatory framework and provide assurance to the UK Listing Authority (UKLA) that these companies satisfy the requirements. Moreover, the role of external managed companies was specified and the criteria for premium listing were revised. However, allegations of market irregularities in recent reverse takeovers⁸ prompted UK stock market authorities to tighten the rules for this kind of transactions in terms of corporate governance, in October 2012 (Appadu et al. 2014). Clearly enough, the FSA tried to keep pace with the market development of reverse takeovers and calls for more transparency in order to better protect shareholders and potential investors. Therefore, the recent boom of reverse takeovers as a “back door” listing, along with the distinct regulatory differences in the treatment of European, and especially UK, reverse takeovers vis-à-vis US peers, provides the proper laboratory for testing the potential implications of reverse takeovers.

2.3 Prior literature

Prior literature on reverse takeovers is mainly confined to the US market and more recently to the Chinese one. The first thorough examination of the wealth effects emanating from reverse takeovers is that of Gleason et al. (2005) which utilized 121 reverse takeovers that took place in the US between 1987 and 2001. The authors showed that the shareholders of public firms⁹ can benefit from the announcement of a reverse takeover. Moreover, they showed that the public firms participating in a reverse takeover were generally poor performers

⁸ The rules were tightened as a result of a reverse transaction between Vallar Plc, a listed shell company, and Bumi Resources, an Indonesian venture, that launched an inquiry into \$500m of alleged irregularities in subsidiaries (Oakley 2012).

⁹ Public firms were not exclusively shell firms, but large firms with existing business operations.

prior to the deal. Finally, the authors displayed that only 46% of the sample of reverse takeovers survived two years after the transaction and concluded that these transactions are risky as they failed to yield long-term wealth to shareholders.

Aydogdu et al. (2007) investigated the stock price response to the announcement of 23 reverse takeovers that occurred in the US market from 1999 to 2001. The authors reported sporadic, but statistically significant positive returns around the reverse takeover transaction reflecting the increase in value of the shell companies.

Gleason et al. (2008) explored the characteristics of firms that use reverse takeovers (127 cases) and self-underwritten IPOs¹⁰ (53 cases) to go public. They found that reverse takeover and self-underwritten firms had a significantly lower ROA in the year of going public, but showed no difference in ROE compared with a matched sample of firms that used an IPO in the same year. In addition, reverse takeovers and self-underwritten firms displaying significantly lower balance sheet liquidity, were more likely to experience financial distress and had greater financial leverage than a control sample of IPOs in the year of going public.

Floros and Sapp (2011) studied 585 trading shell companies involved in a reverse takeover over the period 2006-2008 and reported three-month abnormal returns of 48.1% to shell shareholders surrounding the consummation of the deal. They found that shell firms had no systematic risk, were typically dormant with minimal assets or operations, and their returns tended to decline over time. On the other hand, private firms that chose to take part in a reverse takeover were mostly unprofitable and illiquid and held minimal assets and few capital expenditures.

Song et al. (2014) investigated the characteristics of firms that obtained exchange listings in Korea between 2000 and 2010 using one of the following listing methods: IPOs, sellouts and reverse takeovers. The authors reported that VC-backed reverse takeover firms displayed higher leverage, lower profitability and higher information asymmetry vis-à-vis VC-backed IPO firms. Finally, the mean three-day market reaction to reverse takeover announcements was 9%, 8% for non-VC-backed reverse takeovers and 12% for VC-backed ones.

Over the last decade, there has been a tremendous increase in the number of private firms that were involved in reverse takeovers (Givoly et al. 2014)¹¹. This was evident in the case of Chinese private firms seeking a listing status in a more developed market such as that of the US (Wu 2014). Recent studies show that more than 100 Chinese firms got listed in a US stock market via a cross-border reverse takeover. However, the proliferation of Chinese reverse takeovers in the US market soon raised concerns about the reporting quality of these firms. Recent allegations of fraudulent practices on the part of Chinese reverse takeovers prompted the SEC to gradually tighten the regulations, disclosure and reporting requirements associated with reverse takeovers (Givoly et al. 2014). These concerns motivated a handful of researchers to assess the impact of Chinese reverse takeovers on the US market by probing into several aspects such as earnings quality (see Givoly et al. 2014; Chen et al. 2015), corporate governance outcomes (see Siegel and Wang 2013) or spillover effects (see Darrrough et al. 2013). Pollard (2016) interestingly found that lower financial reporting of reverse merger firms in the US market was not driven by Chinese reverse mergers.

¹⁰ A firm goes public without the use of underwriters.

¹¹ Givoly et al. (2014) reported that the number of reverse takeovers that took place in the US has quadrupled and that of foreign reverse takeovers has grown ten-fold over the last decade.

Lee et al. (2015) examined the financial health and performance of Chinese reverse takeovers that became active on US stock markets for the period 2001-2010. They observed that Chinese reverse takeovers tended to be more mature than either their US counterparts or a group of matched firms based on exchange, industry and size. Moreover, the authors found that reverse takeover targets were small, financially constrained with illiquid stocks and more likely to default. They also showed that over the post-reverse takeover period, Chinese reverse takeovers performed far better than their US counterparts or a group of exchange-industry-date-size matched firms especially when they had received private-equity (PIPE) financing.

More recently, Greene (2016), using US data from 2005 to 2010, compared the wealth of private firm owners that exit their firms through reverse takeovers to the wealth that could have been obtained in IPOs, sellouts, or by remaining private. The author found that typical reverse takeover firm owner had less (same or greater) post-exit wealth than the wealth that could be obtained in an IPO (sellout). This result was driven by differences in pre-exit characteristics (e.g., information asymmetry and growth potential) that led private firm owners to choose one exit mechanism over another.

3 Research design

3.1 Data

Reverse takeovers announcements were culled from Thomson One supplemented by Bloomberg newswire. Each reverse takeover announcement was further checked by extensive news searches such as LexisNexis and Perfect Filings. The focus of our study is on completed reverse takeovers that took place between 1992 and 2011 in Europe¹². We considered reverse takeovers the deals where a private firm merges with a public one; the combined firm is a public firm and carries on the business of the private firm, and after the deal the private firm controls the combined firm. Similar to Gleason et al. (2005), we excluded those cases where the takeover was considered an ordinary acquisition¹³ and those reverse takeovers that had missing stock price data. After imposing the above criteria, the final sample consisted of 222 reverse takeover deals. Fundamentals and stock prices¹⁴ for public firms were derived from Bloomberg.

Table 1 presents the distribution of reverse takeovers over the period 1992-2011. At first glance, the number of reverse takeovers seems to follow market cyclicity. More specifically, during the period 1999-2002 reverse takeovers display an unprecedented growth which was fuelled by the buoyant stock market conditions. A relatively quiet period of reverse takeover deals followed between 2003 and 2004 and then a flourishing period commenced in 2005 and ended in 2010. Interestingly, the number of reverse takeovers still remained high subsequent to the outbreak of the global financial crisis in 2008. This can be partly attributed to the low issuing cost and the high speed of completion of reverse takeovers in a period that the market did not favor new listings.

¹² We required both private and public firms to be located in Europe.

¹³ In the UK, under the new proposals which prevent UK companies from buying listed firms merely as a back door to change their listing category, an acquisition of a listed issuer by another listed issuer falling into the same listing category is not considered a reverse takeover (Appadu et al. 2014). Instead this is considered an ordinary acquisition.

¹⁴ In order to assess the long-term stock price and operating performance two years after reverse takeovers, we extend our dataset up to 2013.

[Insert Table 1 here]

Table 2 presents the sample distribution of reverse takeovers across countries of origin. UK seems to be the most popular host country of reverse takeovers with 145 private and 160 public firms involved in a reverse takeover deal. Sweden and France follow the UK market by holding the second and third place, respectively. Considering the motive of expansion to other countries, our results depict that 33 out of 222 firms (14.9%) merge with a company from a different country. This cross-border reverse takeover implies that the private company's motives to merge with a company from another country could be the expansion of its operations to that country or its access to a different capital market. Specifically, 13 out of these 33 cross-border reverse takeovers are non-UK companies that gained access to the London Stock Exchange. However, the vast majority of listed firms (189) decided to expand domestically by acquiring a private firm operating in the same country.

[Insert Table 2 here]

Panel A of Table 3 displays the distribution of reverse takeovers among industries and sectors. 106 firms involved in a reverse takeover, or approximately 47.75% of the sample firms, opted to merge with a company that operates in the same industry. Moreover, 74 firms operate in the same sector or in the same mid-industry and 32 operate in the same industry, but in a different sector. The above results suggest that the main motive of almost half of the firms involved in a reverse takeover is to expand their operations within the same industry or sector with the eventual prospect of broadening their market share (both cases are called industrial focus). Moreover, most of the firms, public and private, that participate in a reverse takeover deal, come from a wide spectrum of industries where some display good growth opportunities (i.e. energy and power, healthcare). This is at odds with the widespread view that the market of reverse takeovers consists of small private firms in speculative sectors merging with public firms that come from low growth opportunity industries (Gleason et al. 2005). Panel B indicates that 16.22% of the private firms and 28.38% of the public ones come from the financial sector. Moreover, 14.41% of the listed firms and 13.51% of the private ones belong to the high technology industry.

[Insert Table 3 here]

Panel A of Table 4 presents some fundamentals of the reverse takeover transactions. The average deal value to sales ratio is 26.45%. This ratio indicates the deal value divided by the product of the percentage of shares acquired and the public firms' net sales for the last 12 months prior to the announcement of the deal. The percentage of the shares acquired through the reverse takeover transaction is 97.46%. Panel B presents information about the number of firms involved in a reverse takeover that look for consultation from a financial advisor. Obviously the public entity of the transaction seeks for a consultation more often than the private firm does and in some cases firms receive consultation from more than one advisor.

[Insert Table 4 here]

Prior studies (i.e. Gleason et al. 2005) have argued that the good financial position of the private company is the lure for public firms to initiate a reverse takeover transaction and improve their financial and operating status. Table 5 illustrates some descriptive statistics for the public firms one year prior to the reverse takeover transaction. The results indicate that public firms have, on average, total assets of 2.22 million Euros and a market value of equity of 1.12 million Euros. Moreover, the negative sign of return on assets (-9.48%), return on equity (-12.07%) and net profit margin (-18.90%) explicitly warrants that public firms are poor performers. In addition, public firms demonstrate low liquidity levels as indicated by the average cash to total assets ratio (21.60%). Finally, the debt to total assets ratio (19.28%) demonstrates that public firms do not make extensive use of borrowing in order to finance day-to-day business¹⁵.

[Insert Table 5 here]

3.2 Methodology

To gauge the stock price reaction to the announcement of reverse takeovers, we employ the classical event study methodology. This method allows us to measure market efficiency and uncover wealth effects surrounding corporate events. For our purpose, we use the market model as a return-generating approach. According to the market model, abnormal returns are calculated as follows:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \quad (1)$$

where AR_{it} is the abnormal return, R_{it} is the security return i at time t , R_{mt} is the market return at time t as provided by each country's main index¹⁶. The parameters α_i and β_i are estimated using the Scholes and Williams (1977)¹⁷ technique which accounts for the thin trading problem, a commonly detected problem in shell companies or companies with low trade. Market model parameters are estimated by regressing (using OLS) the stock returns on the market return for the estimation period that ranges from $t-250$ to $t-11$, where $t=0$ is the announcement date.

We compute average abnormal returns (AAR) of the sample as below:

$$AAR_t = \sum_{i=1}^N \frac{AR_{it}}{N} \quad (2)$$

where N is the number of public firms announcing a reverse takeover.

¹⁵ Gleason et al. (2005) find negative ROA, ROE and NPM, an average cash to total assets ratio of 22% and a mean debt to total assets ratio of 20%.

¹⁶ FTSE all shares index for UK stocks, CAC 40 index for French stocks, etc.

¹⁷ Similar approach was adopted by Gleason et al. (2005). Based on Scholes and Williams (1977) returns are calculated as follows:

$$R_{it} = \alpha_{1t} + \beta_{1t}(R_{mt-1}) + \varepsilon_{it}, R_{it} = \alpha_{2t} + \beta_{2t}(R_{mt}) + \varepsilon_{it}, R_{it} = \alpha_{3t} + \beta_{3t}(R_{mt+1}) + \varepsilon_{it}$$

$$\hat{\beta}_{SW} = \frac{\hat{\beta}_{1t} + \hat{\beta}_{2t} + \hat{\beta}_{3t}}{1 + 2\hat{\rho}_m}$$

where ρ_m is the first-order autocorrelation of R_m .

We also calculate cumulative abnormal returns (CARs) as the sum of the abnormal returns for a specific period T:

$$CAR_{iT} = \sum_{t=1}^T AR_{it} \quad (3)$$

Cumulative abnormal returns (CARs) are computed for the following event windows: (-10, -1), (+1, +10), (-5, -1), (+1, +5), (-1, +1) and (-1, 0). We compute CARs prior and post-reverse takeovers in order to capture possible information leakages or sluggish market reaction to reverse takeover announcements.

We also gauge long-run stock price performance based on the buy-and-hold abnormal returns (BHARs) method. BHARs are computed using daily data for 6, 12, 18 and 24 months, subsequent to the reverse takeover announcement month, as the difference between the compounded actual return of the announcing firm and the compounded return of the market.

$$BHAR_{it} = \prod_{t=0}^T [1 + R_{it}] - \prod_{t=0}^T [1 + R_{mt}] \quad (4)$$

where

R_{it} is the time t arithmetic return on security i.

R_{mt} is the time t arithmetic return on the benchmark (value-weighted stock index).

To test the statistical significance of BHARs, we first compute t-statistics for the different normal return estimation procedures. Due to the employment of reference portfolio (market returns) to estimate normal returns, the distribution of long-run abnormal returns is positively skewed, which results in misspecified t-statistics. For this reason, we calculate the skewness-adjusted t-statistic (Pastor-Llorca and Martin-Ugedo, 2004) as follows:

$$t_{Skewness-adjusted} = \sqrt{N} \left(S + \frac{1}{3} \hat{\gamma} S^2 + \frac{1}{6N} \hat{\gamma} \right) \quad (5)$$

where

N is the number of public firms announcing a reverse takeover in the sample,

$$S = \frac{ABHAR_t}{[\sigma(BHAR_t)]}, \hat{\gamma} \text{ is the coefficient of skewness, estimated as } \sum_{i=1}^N \frac{(BHAR_{i,t} - ABHAR_t)^3}{[N\sigma(BHAR_t)^3]},$$

and $ABHAR_t$ and $\sigma(BHAR_t)$ are the sample mean and cross-sectional standard deviation of buy-and-hold returns for the sample of N, respectively.

Probing deeper into the valuation effects of RTs, we employ a pooled cross-section model using CARs of three days (-1, 1) as dependent variable and a gamut of independent variables such as the log of total assets, return on assets, cash to total assets, corporate governance structures and a dummy variable that takes the value of 1 for private and public firms belonging to different industries (industrial non-focus), and 0 otherwise. The selection of control variables is based on prior studies investigating reverse takeovers (see, for example, Gleason et al. 2005). The main purpose of the regression analysis is to figure out whether CARs are related to some characteristics of the acquirer or each country's corporate governance implementation.

Finally, we assess the long-term performance of reverse takeovers following the deal. In particular, we employ a number of financial ratios for the year in which the event occurred and the following two years.

Using equality testing, we examine whether there is an improvement in the financial performance of the surviving firms after the event. Mean and median differences in ratios between the periods (-1, 0), (0, 1), (-1, +1) and (-1, 2) are tested employing the two-tailed t-statistic and the Wilcoxon signed rank test, respectively. To reduce the effects of outliers, we trim all financials by 1.5% based on the final reverse takeover population.

4 Empirical results

4.1 Stock price reaction

The announcement of an acquisition or takeover of a firm is considered a major news event that has a significant impact on the stock price of the target firm. Acquisition or takeover announcements are far less predictable than other corporate activities, such as earnings announcements, and can render noteworthy capital gains to investors who anticipate them (Gao and Oler, 2012). In this section we examine the short-term impact of reverse takeover deals on public companies' stock price. Table 6 reports the results from the analysis of the 20 days surrounding reverse takeovers. We observe that the announcement provokes abnormal returns of 1.82%, 3.09% and 4.65% for days -1, 0 and +1, respectively, all statistically significant at the 1% level. Though the market reaction on day 0¹⁸ is less than that (10.84%) found for the whole sample by Gleason et al. (2005), however, it is comparable to the abnormal return found for distressed firms in the same study (3.43%). Looking at the cumulative abnormal returns (CARs) for the (-1, +1) and (-1, 0) event windows, we find that these are equal to 9.56% and 4.91%, respectively, both significant at the 1% level. Intriguingly, pre- and post-market reaction to reverse takeovers appears to display positive excess returns implying that information leakage and/or illiquidity price manipulation is a wide phenomenon in stocks that are thinly traded and communication is conveyed through informal channels (Aydogdu et al. 2007). In fact, CARs of 10-days in the pre-event period exceed 4%, while those subsequent to the deal (+1, +10) are approximately 3%, all statistically significant at conventional levels. Overall, the above results show that the public status of a distressed company or without real business is enough to attract the interest of private companies to pay a

¹⁸ To get an idea how the market reaction to reverse takeover announcements compares to that of typical IPOs, we refer to some recent studies conducted in the US, Europe and Asia. For example, Chua (2014) examined the first day return of US IPOs for the period 1980-2012 and found an excess return of 19.4% and a median of 6.9%. During the low valuation period, the mean and median first day returns were 11.9% and 5.2%, respectively. During the high valuation period, the mean and median first day returns were 21.7% and 7.6%, respectively. Zhen Li et al. (2016), using a large sample of IPOs in the US, estimated first-day underpricing based on tax rates and found that the mean first-day return was 11.28% for the period 2003-2010 compared to 9.97% in 2002, 17.32% in 2001 and 27.46% during 1993-2000. Ozdemir and Upneja (2016) investigated the market reaction to 1,822 service firms that were taken public during the period of 1980-2009 and found an average initial return of 22.74%. On the other hand, examining 740 European IPOs, Jenkinson et al. (2005) found an average initial announcement return of 22.3% (15.2% for 174 French IPOs, 47.5% for 224 German IPOs, 4.8% for 51 Italian IPOs, 9.0% for 124 UK IPOs, and 14.3% for 50 Dutch IPOs). Moreover, Gajewski and Gresse (2006) reported initial average returns of 22.06% for 2,104 IPOs from 15 countries (5.36% for 363 French IPOs, 38.93% for 415 German IPOs, 10.26% for 135 Italian IPOs, 21.27% for 454 UK IPOs, and 22.92% for 47 Dutch IPOs). Dorsman and Gounopoulos (2013) explored the performance of Dutch IPOs during the period 1990 to May 2012 and confirmed the underpricing phenomenon (i.e. initial excess returns of 8.31%). Chong et al. (2010) found that the average IPO underpricing level of H-shares in Hong Kong was about 16.8% for the period 1993-2003.

takeover premium in order to get an easy and fast way of listing. Apart from the listing status, some legitimate business activities or assets (i.e. patents) or some accumulated tax advantages (i.e. past operating losses to offset against future profits) could be the lure for private companies to bid for a shell company. Therefore, it is not surprising that a strong and positive market reaction occurs in such kind of deals provoking upward movements in the price of stocks that are thinly traded.

To probe deeper into the wealth effects of reverse takeovers and detect whether the aforementioned abnormal returns sustain throughout the 20-year period under examination, we partition our full sample of reverse takeovers into two sub-samples surrounding the outbreak of the subprime mortgage crisis that burst in September 2008 with the collapse of several major financial institutions in the US and Europe. Hence, the first sub-sample covers the period from 1992 up to August 2008 (before the subprime crisis period) and the second sub-sample comprises all deals that occurred subsequent to the onset of the credit crunch. Untabulated results show that the market reaction on day 0 is 2.39% in the first period and 6.31% in the second period. Moreover, the three-day CAR (-1, +1) is 9.78% and 15.54% for the first and second sub-samples, respectively. Differences in CARs between the two sub-samples are statistically significant at the 1% level. These results signify the role of prevailing market conditions in explaining the heterogeneous market reaction to corporate decisions in periods of financial distress. In specific, both investors and shareholders conceive the deal of acquiring and restructuring a shell company more positive when the markets are in distress and the possibility of cashing out initial investments in financially-constrained companies is less likely. In other words, markets give more credits to deals aiming to the rescue of shell companies in periods of financial turmoil.

Comparing our results with the prior evidence in the US, we see that the wealth effect of reverse takeovers announcements in Europe is smaller in magnitude. For instance, Gleason et al. (2005), for the period 1987-2001, find excess returns of 25.10%, 15.60% and 10.84% for the (-1, +1), (-1,0) and (0, 0) event windows, respectively. Employing data from 23 reverse mergers that occurred between 1999 and 2001, Aydogdu et al. (2007) document an abnormal return of 1.6% on the announcement date and an upward movement in the CAR (-1, +1) of 2.31%. For the period 2006-2008, Floros and Sapp (2011) report an eleven-day (-5, +5) mean CAR of 28.94% as opposed to ours (untabulated) of 10.63%. Looking at the Chinese companies seeking a public listing in a US stock exchange through a cross-border reverse takeover, we come across the study of Darrough et al. (2013) who examine the announcement returns of a sample of Chinese reverse takeovers that went public in the US and find a CAR (-1, +1) of 0.6%. Finally, using data from Korea, Song et al. (2014) report a three-day CAR of 9% which is very close to that found in the current study.

We claim that the observed smaller impact of European reverse takeover deals on CARs relative to US samples could be attributed to the lack of transparency, reduced institutional trading and meager media and professional analyst coverage offered to European shell companies. However, our results confirm that the announcement of a reverse takeover notably increases the wealth of the shareholders of the public firm, at least in the few days surrounding the announcement date. Nevertheless, this is the first study that examines reverse takeovers in the European market, which is characterized by fragmentation and heterogeneous stock market regulations and the UK is the first market that has recently responded to calls for better shareholder protection from fraudulent accounting practices spotted in reverse takeovers (see section 2.2). Moreover, the UK market seems to host an overwhelming number of European reverse takeovers during our sample period. Taken together, we believe that a separate investigation of European reverse takeovers population partitioned by a UK

vis-à-vis non-UK sample of reverse takeovers could help us discern whether the stock price appreciation to reverse takeover announcements is a widespread phenomenon or UK-driven.

Panels B and C report the market reaction to those shells domiciled in the UK and in the rest of European markets, respectively. The results show that reverse takeover announcements yield considerable stock price appreciations to UK public companies on the three event days (-1, 0, +1). Taken together, the three-day CAR for the event window (-1, +1) is 13.30%, much higher than that of the whole sample. Turning to the pre- and post-reverse takeover period, both appear to elicit greater in magnitude abnormal returns as opposed to those of the whole sample. On the other hand, the non-UK sample of reverse takeovers also produces significant abnormal returns on day 0 (3.51%); however, this significant positive reaction is confined to the event day. Moreover, this market reaction does not differ significantly from that of the UK (see Panel F where differences are displayed). Nevertheless, when we examine the entire 3-day event window the CAR is 5.54% (t-statistic = 2.93), which is less than half of that of the UK sample of reverse takeovers. Panel F shows that the three-day CARs (-1, +1) between UK and non-UK samples of reverse takeovers are statistically significant at the 1% level. The fact that the 3-day CAR of the non-UK sample is notably smaller than the overall sample of reverse takeovers and especially the UK ones, further supports the thin trading aspect of reverse takeovers as suggested by Aydogdu et al. (2007). Finally, CARs are marginally positive in the periods preceding the announcement, but the absence of statistical significance does not allow us to make direct inferences of information leakage. Overall, we conclude that reverse takeovers in capital markets outside the financial Mecca of London also attract investors' interest by yielding, at least in the short-run, significant capital gains for investors with long positions in firms that are used by private firms as vehicles in getting a listing status.

We delve even deeper into the wealth effects of European reverse takeovers by taking into consideration the intention of the bidder firms to concentrate on their core business (industrial focus)¹⁹ or expand in unrelated lines of business (industrial non-focus). For this purpose, we investigate whether reverse takeovers that increase their industrial focus bring about greater market reaction vis-a-vis reverse takeovers which do not increase industrial focus. Consequently, we split our sample into deals within the same industry (industrial focus) sample and those where the operational focus of the two parties involved in the deal is different (industrial non-focus sample). Our results (Panels D and E) show that the abnormal return for different industry focus deals is equal to 3.19% on the announcement date (day 0), whereas deals with the same focus elicit an abnormal return of 2.61%. Differences between the two sub-samples are notable when examining the 3-day event window surrounding the event date. In specific, for the sample of different industry focus deals abnormal returns exhibit a substantial jump on the day that follows the announcement (7.51% compared to 1.11% for the same industry focus transactions). The former group of reverse takeovers displays persistent positive excess returns in the 10-day post-event period (CARs of 6.52%), while industrial focus deals bring about negative abnormal returns (though not significant) for the same period. Panel G reports the differences in average abnormal returns between the two sub-samples. It is shown that in all single days as well as in the three- and two-day periods, the market reaction is stronger for the industrial non-focus sample. However, only the difference in CARs of (-1, +1) is statistically significant at the 1% level. These results are indicative of the greater emphasis placed by market participants on deals involving acquirers and targets from

¹⁹ An increase in industrial focus is defined as when the public firm operates in the same two-digit SIC code with the private firm.

different business sectors. The source of these value creation effects can be attributed to the risk diversification benefits of investing in unrelated lines of business and the avoidance of a suboptimal capital allocation to same (failed) business sectors.

[Insert Table 6 here]

The recent allegations that some reverse takeovers have been associated with fraudulent reporting and opaque disclosures have shifted both regulators' and investors' attention. The natural response was the establishment of stronger securities regulations in treating reverse takeovers leaving aside corporate governance structures. However, Siegel and Wang (2013) demonstrated that factors such as corporate governance and the auditor quality of shell companies are linked with manifestations of poor financial reporting. Therefore, there is solid ground to believe that corporate governance structures could play significant role in construing shareholder wealth gains in corporate events that are associated with alterations in ownership, management and capital structure such as reverse takeovers. In this respect our study analyzes the impact of several corporate governance mechanisms on short-term announcement returns of European reverse takeovers. In specific, we employ four key corporate governance indices in country (macro) level such as efficacy of corporate boards, protection of minority shareholders' interests, strength of investor protection and strength of auditing and reporting standards. These indices²⁰ are culled from the annual World Economic Forum's Global Competitiveness Report Index. According to this report, many European countries (i.e. UK, Finland, Norway, Sweden, and Netherlands among others) experience higher protection of minority shareholders' interest and/or stronger investor protection compared to other European countries suggesting that minority shareholders' interests and investors in these countries are better protected by law and governance structures. We expect that the market reaction to reverse takeover announcements will be higher in countries with stronger protection of all shareholders and more efficient corporate board composition. According to Rossi and Volpin (2004), there are two reasons why the premium paid by private firms might be higher in countries with stronger shareholder protection. First, shareholder protection has been found to reduce the cost of capital and escalate competition among bidders and the premium paid by the winning bidder. Second, dispersed ownership is more common in countries with higher shareholder protection. In fact, diluted ownership makes more evident the free-rider problem in takeovers coercing acquirers to pay a higher takeover premium than otherwise (Grossman and Hart 1980).

Table 7 reports the market reaction to reverse takeover announcements based on corporate governance structures of public companies. Results from minority shareholders protection²¹ (Panel A) demonstrate a strong market response on three days (-1, 0, +1) surrounding the announcement date (2.13%, 3.63% and 6.41%, respectively). Moreover, the two-day CAR (-1, 0) is 5.76%, while that of three days (-1, +1) is 12.17%, both statistically significant at the 1% level. Notably, the strong positive excess returns are well acknowledged before and after the three-day window. Turning to the sample of reverse takeovers in countries with low

²⁰ Each index ranges from 1 to 7, with higher values indicating more protected minority shareholders' interests, or stronger investor protection or management that is highly accountable to investors and boards, or stronger financial auditing and reporting standards.

²¹ The results from minority shareholder protection mirror the results from the market reaction to reverse takeover announcements according to strength of auditing and reporting standards. Therefore, the sample of high minority shareholder protection coincides with that of high strength of auditing and reporting standards.

minority shareholders protection, we observe weaker market reaction in all days around the event date. In specific, the two- (three) day CAR is 3.49% (5.40%) statistically different and lower than the corresponding CAR of the sample of high minority protection.

Panel B highlights the stock price behavior around reverse takeovers announcements taking into account the efficacy of corporate boards in countries that public companies reside. Results from days -1, 0 and +1 reveal statistically significant abnormal returns for each day, which when taken together yield a CAR of 9.56%. Pre- and post-announcement CARs are also positive and significant implying that the market reacts proactively and this reaction is sustained for several days. In those cases that the management has little accountability to investors and boards (low efficacy of corporate boards) the stock price response is significant in two out of three days, while that of CAR of two and three days is lower (2.34% and 7.85%, respectively) than that of high efficacy of corporate boards. In fact, the two-day CAR (-1, 0) is statistically different between the two sub-samples (z-statistic =2.02).

Panel C reports the results from the two sub-samples based on the strength of investor protection. In line with our conjecture, abnormal returns are significantly positive in the three announcement days when investor protection is strong. In fact, CARs in all pre- and post-event windows are positive and statistically significant reaching peak levels (13.26%) in the three-day window (-1, +1). On the other hand, the market reaction to reverse takeovers from countries with low levels of investor protection is apparently lower in the same window (-1, +1). Overall, the above results from the relationship between reverse takeovers and corporate governance structures suggest that reverse takeover firms receive significantly higher premiums when deals are originated in countries with strong minority shareholders' and investor protection. Moreover, when management is highly accountable to investors and boards and has adopted strong financial auditing and reporting standards this adds value to public firms seeking a corporate restructure through reverse takeovers. In other words, in countries with a shareholder-friendly environment, where managers are considered to act towards shareholder value creation, while legislation and stock exchange authorities ensure a more protective investor environment against fraudulent and detrimental practices, corporate restructurings can readily lead to wealth gains (Moerland 1995).

[Insert Table 7 here]

Table 8 illustrates the long-term impact of reverse takeovers on the stock price behavior of the new (combined) entity. Our computations span evaluation periods of 6, 12, 18 and 24 months. We find that buy-and-hold abnormal returns (BHARs) are negative and statistically significant for all time horizons in line with prior evidence (i.e. Floros and Sapp 2011; Appadu et al. 2014). This finding applies for both the total sample and the sub-samples identified with the exception of 24-month mean BHAR for the non-UK sample results. Statistical significance is less pronounced for all time windows of the latter sub-sample. The wider the time horizon investigated the most notable the negative price impact of the reverse takeover on the stock price. In this respect, we observe a negative return (-11.16%) in the first 6 months after the reverse takeover, while collectively for the first 24 months after the reverse takeover returns are -24.04%²². For the 12 and 18 months

²² Similar findings are observed in the long-run performance of IPOs. In specific, Dorsman and Gounopoulos (2013), using a sample of Dutch IPOs for the period from January 1990 to May 2012, found adjusted BHARs

following the deal, returns for the reverse takeover are -17.32% and -22.99%, respectively. For their sample of UK reverse takeovers, Appadu et al. (2014) find a 24-month BHAR of -33.40% based on a value-weighted portfolio, which partly matches with our UK evidence (a 24-month BHAR of -28.74%). In the US, Floros and Sapp (2011) for analogous observation periods (the +31, +390 post-event window) report a mean BHAR of -60.90%. Moreover, Song et al. (2014), using data from Korea, find a mean BHAR of -21%, -44% and -67% for the 6, 12 and 18 months following the reverse takeover announcement. According to Lee et al. (2015), China has less stringent corporate governance rules and weaker minority shareholder laws compared to the most developed countries. On the other hand, the IPO markets in China are highly competitive where the listing criteria require bright-line profitability tests that are much more stringent compared to those required by the US stock exchanges. Based on the above characteristics of the Chinese market, Lee et al. (2015) investigate the long-term stock price behavior of a sample of Chinese and US reverse takeovers and find that Chinese (US) reverse takeovers lose 17% (32%) of shareholders' value in the three years following the announcement of deals. Semenenko (2011) attribute the considerable underperformance of reverse takeovers to their initial overvaluation, lending support to the market underreaction phenomenon on the post-event period. When comparing the significantly higher CARs in the short-run in the U.S. vis-à-vis our sample, we deduce that our European sample results cause significantly smaller investor adrenaline rushes both on the upside (short-term price reaction) and the downside (long-term post-event price behavior).

The same pattern of collective long-term losses is observed, though smaller in magnitude, for the 6-month post-event window and gradually becoming greater over longer time horizons for all examined sub-samples. Panel B of Table 8 shows that the stock price underperformance subsequent to reverse takeover deals is stronger for the UK deals compared to the non-UK ones. In specific, in all event windows BHARs of the UK sample are higher in absolute value compared to BHARs of the non-UK sample. Furthermore, the differences in mean BHARs for the 18 and 24 months subsequent to reverse takeover deals are statistically significant between the two sub-samples. Similar stock price patterns following the announcement of reverse takeover deals are observed between the industrial focus and non-focus sub-samples, though the magnitude of the stock price reversal is stronger in the latter sub-sample, especially 24-months subsequent to reverse takeover deals. The fact that both the UK sample and that of industrial non-focus display larger losses than their comparative sub-samples corroborates our CARs findings for the short-term impact on the public firm's stock price around the announcement date. In other words, these sub-samples appear to outperform their counterparts both to the positive (short-term performance) and to the negative (long-term performance) side. Apparently, this finding enables us to infer that notable differences exist with respect to the geographic and industrial focus of reverse takeovers in the European region. This finding can be useful in the context of investment strategies employed by professionally managed portfolios and independent investors considering reverse takeover deals as investment alternatives.

Looking at the corporate governance structures prevailing in the hosting countries of reverse takeovers, we observe that the underreaction phenomenon in the post-reverse takeover era is more evident in those countries that adopt stricter protection for minority shareholders and investors alike. In particular, the

of -7.48% (-26.27%) one (two) year(s) after the first trading day. Amor and Kooli (2016) examined the post-IPO performance of 5,055 US IPOs taken place between 1980 and 2006 and found a 24-month market-adjusted BHAR of -28.46% for frequent acquirers (firms making multiple acquisitions after the IPO) and -12.40% for infrequent acquirers (firms making a single acquisition after the IPO).

downward stock price adjustment of reverse takeovers is apparent even 6 months following the deals in countries that have adopted sufficient protection measures for minority shareholders. As the time passes from the announcement of the reverse takeover deal, the difference in the stock price reaction between the two sub-samples (high vs. low minority protection) is stronger and economically significant. Similar patterns are observed when contrasting BHARs in high versus low investor protection environments. These results can be explained by the breakdown of market expectations that occurs in sufficiently protected environments since market participants will continuously sustain capital gains from the announcement of a corporate restructuring that a reverse takeover causes. In other words, in forming expectations, market participants give too much weight to the protection of shareholders and too little to the fact that public (shell) firms are usually poor performers prior to the reverse takeover. When the reverse takeover deal is consummated and the initial enthusiasm fades out the new shareholders of the combined firm realize the difficulties in restructuring a company with little or no real business. For instance, reverse takeovers may bear significant risks associated with the past record of the public company. Examples of typical risks are the current sloppy records, pending lawsuits and other unforeseen liabilities. Additionally, the public companies may sometimes have to handle disheartened shareholders who are ready to get rid of their stock at the first chance they get. Additional costs may occur during the alteration between the old and the new management such as extra auditing or advisory costs and the change of the established corporate philosophy that can threaten the relationship between them. Moreover, the old management could have also launched a performance based incentive program (e.g. stock options) that the new management might not endorse. In addition, there is high probability that new creditors may come to the light when the new company is created and new capital is injected into the new business. Altogether may result in downward price adjustment in the post-reverse takeover period that may offset the initial announcement returns.

[Insert Table 8 here]

4.2 Post-reverse takeover operating performance

In Table 9, we report financial and performance characteristics in the pre and post-reverse takeover period (year -1 through year +2). Panels A and B display accounting performance, measured by ROA and ROE, respectively. Both ratios have negative sign in all years surrounding the reverse takeover year (year 0). In fact, ROA takes rock-bottom value in year 0 (an average of -14.11%) and then gradually gets better up to the second year (-6.34%). Similar pattern is detected when examining ROE. In both performance ratios the difference between the first post-reverse takeover year and the actual year of transaction is statistically significant implying that the post-performance improvement is economically meaningful. The above evidence reveals the difficulties of private firms in reversing the poor financial performance of public companies as well as the risk that they undertake by investing in financially distressed firms.

Looking at the liquidity of reverse takeovers as measured by the cash to total assets ratio we see that it deteriorates year by year, taking its lowest value two years after the reverse takeover transaction (12.13%). Compared to the pre-reverse takeover year all post-reverse takeover years display a statistically significant reduction in the cash levels suggesting that either the new entity is running out of money needed to operate or

is heavily investing in its restructuring. This is a common phenomenon occurring in post-M&A periods where the combined firm struggles to follow a homogeneous corporate strategy by implementing centralized information systems, monitoring and auditing processes in an attempt to achieve economies of scale. However, this harmonization process requires time and money, thus affecting the liquidity of the new firm. Turning to debt levels of the new entity, we observe that debt to total assets ratio remains almost unaltered close to 20% in all years surrounding the reverse takeover year. Taken together the two ratios, we can conjecture that the combined firm prioritizes the use of cash available rather than the use of further debt to finance day-to-day business.

Another ratio that is analyzed is that of sales to total assets, which is an indicator of the efficiency a company deploys in its assets. Panel E of Table 9 shows that the mean sales to total assets ratio is less than unity during the examination period, however, the median of the ratio is getting better year by year implying an improvement in the post-reverse takeover era. In order to identify whether reverse takeovers have the appropriate liquidity to meet their short-term obligations, we compute three liquidity ratios, that is, current, quick and cash ratio. Panels F, G and H corroborate our earlier evidence that the reverse takeover firms undergo significant liquidity drains in the years subsequent to the transaction. In fact, both mean and median liquidity ratios take their lowest prices in the second year suggesting marginally acceptable liquidity levels for this year. Similar patterns²³ are observed (untabulated results) for all sub-samples already examined, however, the statistical differences are more evident for the UK, industrial non-focus sub-samples and those with high investor and minority protection.

In sum, the new entities emerged from a reverse takeover experience poor financial performance after the transaction year. On the one hand, profitability levels remain negative in all post-event years, though with a positive outlook. On the other hand, the new combined firms are seeking ways to reduce operating costs through the establishment of new corporate systems and practices that, in the short-run, require capital expenditure. This has an immediate adverse impact on liquidity, thus depriving reverse takeover firms of the necessary funds to expand and grow their operations. Our results are consistent with those of Gleason et al. (2005) who demonstrated that the new entities continue to have negative values in various profitability ratios and are characterized by decreasing cash liquidity and increasing debt ratios.

[Insert Table 9 here]

4.3 Multivariate regression results

In order to identify the factors that construe the reaction of market participants to the reverse takeover announcement, we regress the three-day CAR of (-1, +1) against a number of firm- and country-specific variables. These include firm size as proxied by the log value of total assets of the public firm, cash to total assets to control for liquidity/cash constraints, the return on equity which measures public firm's profitability, debt to total assets as a proxy of leverage, a dummy (IF) which shows whether the private and public firms that participated in the reverse takeover transaction come from different industries, a UK dummy that captures reverse takeovers taken place in the UK and four corporate governance variables (i.e. strength of auditing and

²³ The results from the UK, non-UK, industrial focus and non-focus and corporate governance structures are available upon request.

reporting standards, efficacy of corporate boards, strength of investor protection and protection of minority shareholders' interests). Due to high correlation among corporate governance measures as well as with the UK dummy, we report 5 models, in which each model contains one of the four corporate governance characteristics and the UK dummy.

Table 10 presents the results from the regression analysis. We observe that the coefficient for firm size is negative and significant at least at the 10% level for 5 out of 6 models. This adverse relationship between firm size and abnormal returns indicates that the bigger the public firm prior to reverse takeover deals the smaller the market reaction to reverse takeover announcements, lending support for the so-called firm size phenomenon where smaller firms outperform larger ones. Moreover, Aydogdu et al. (2007) claimed that firm size is negatively related to information asymmetry. Since small companies are highly information asymmetric, investors may not be provided with the appropriate information about the private firm and thus the stock might be undervalued prior to the event.

Another coefficient that displays statistical significance at the 5% level in all models is that of debt to total assets. In fact, its sign is positive implying that the higher the debt levels as a proportion to total assets the stronger the market reaction to reverse takeover announcements. The reasoning behind this relationship is the expectations that public firms will benefit from a debt restructuring through a reverse takeover and the expertise conveyed by private firms on similar situations. The remaining firm-specific control variables are not statistically significant at any conventional level. However, looking at the corporate governance standards of the countries of origin of public firms we see that apart from the variable that measures board efficacy, all the other variables are positive and statistically significant at the 10% level. These results corroborate our earlier evidence that in countries with better corporate governance mechanisms reverse takeover transactions generate stronger wealth gains for public firm shareholders. Finally, we analyze the wealth effects emanated from the UK public firms vis-à-vis the continental Europe sample and identify stronger market reaction for the former group of reverse takeovers as shown by the UK coefficient in Model 5. Overall, the above results signify the role of corporate governance, even in a macro level, in explaining the market reaction to reverse takeover announcements in countries that shareholder and investor protection is at the top of their agenda.

[Insert Table 10 here]

5 Conclusions and recommendations

During the last two decades many firms have opted to go public through alternative mechanisms to IPOs such as reverse takeovers. Despite their recent growing popularity, the wealth effects of reverse takeovers remain largely under-researched due to the difficulties in identifying their nature and characteristics. So far, academic research has mainly focused on the US market which has attracted a considerable number of domestic and cross-border reverse takeovers (i.e. Chinese reverse mergers). However, the proliferation of reverse takeover companies has raised concerns about their reporting quality and disclosure policy (Givoly et al. 2014) and their significant post-reverse takeover underperformance (Gleason et al. 2005; Adjei et al. 2008). These concerns necessitated the implementation of stricter securities regulations regarding the fair treatment of reverse takeovers vis-à-vis IPOs or other alternative routes of going public. Though corporate governance mechanisms

are in the arsenal of market regulators to combat corporate scandals, academic evidence has shown that corporate governance could be further used as an effective mechanism of preventing profit expropriation around corporate events.

Our study is the first academic endeavor to analyze the wealth effects of reverse takeovers from a market, the European one, which is entirely different from the US in terms of regulatory framework and corporate governance standards. In specific, the protection of minority shareholders through binding corporate governance standards is weaker in Europe compared to the US (La Porta et al. 1998). The current study contributes to the ongoing debate on the wealth effects of reverse takeovers by providing evidence from a market that has never been examined taking into account corporate governance structures as well as business sector concentration.

Our results demonstrate that reverse takeovers send a positive signal to the market participants that the private firm will help financially distressed public companies to restructure their operations and the new merged entity will prosper in the future. This positive signal takes the form of statistically significant abnormal returns surrounding the announcement dates. In fact, the sample reverse takeover firms experience a three-day announcement CAR of 9.56% which is equivalent to an increase in market value by almost 100,000 Euros for a public firm with an average market value of 1 million Euros prior to the announcement. The market response to reverse takeovers is heterogeneous when splitting the sample of reverse takeovers between those residing in the UK and in the continental Europe. In specific, the excess returns are greater in magnitude and persistent in the UK compared to the rest of the European countries. However, in continental Europe the market response is also economically significant proving that reverse takeover announcement effects are not UK driven, but a wider phenomenon. To further explore the market reaction around reverse takeovers, we consider business activities alignment between public and private firms. The results reveal that the market rewards with greater abnormal returns those deals that involve acquirers and targets from different business sectors (industrial non-focus).

Motivated by the recent instances of fraudulent accounting practices and calls for further examination, we investigate the role of corporate governance structures in explaining market behavior surrounding reverse takeover deals. The results signify the importance of corporate governance mechanisms in construing higher takeover premiums paid in countries that offer high shareholder and investor protection as well as strong auditing and financial standards. In other words, the market reaction to reverse takeover deals is in parallel with the degree of shareholder protection in the acquirer country.

In line with prior evidence (e.g. Floros and Sapp 2011; Appadu et al. 2014) reverse takeovers are associated with significant underperformance in the two years following the consummation of such transactions. This phenomenon is very common in studies that assess the short- and long-run impact of IPOs or SEOs on stock prices (Fama 1998). Looking at the long-term stock price behavior of the UK deals, in the 18-month post-takeover time horizon stock price losses are significantly larger compared with those sustained in the non-UK reverse takeover deals. The same is valid for the sub-sample of deals between firms with different business operations before the takeover vis-à-vis the same industry focus deals and in countries that provide strong investor and minority shareholders protection. Finally, we examine the long-term pre- and post-reverse takeover operating performance surrounding the year of event (year 0). The results show marginal post-takeover improvement in operational, liquidity and profitability measures over the subsequent two-year period.

Our results have important managerial implications both for takeover participants, that is, public and private firms. On the one hand, financially distressed or operationally inactive public firms can rejuvenate their business through a less costly and time-consuming process such as a reverse takeover. Public firms' shareholders can save their investment by allowing a sound private company to undertake the control of the public company and restructure its operations probably within a different business sector. On the other hand, private firms find an alternative route of going public overcoming the scrutiny of local market regulators at the expense of a higher premium paid to public firm shareholders. However, the cost for both market participants is the considerable risk associated with such transactions (i.e. low survivability rates) and their inability to generate long-term wealth for the post-event firm shareholders.

Our study could be the avenue for future research in corporate finance literature and especially in the hot topic of raising capital. For example, a comparison of short- and long-term stock price performance of European reverse takeovers with an up to date sample of IPOs or sellouts would provide new evidence from the alternative ways of going public. Moreover, the consideration of firm-specific corporate governance characteristics (i.e. duality, number of independent and non-executive board member, remuneration packages, etc) would further strengthen the role of governance features in firm valuation. Finally, a survival analysis (i.e. Cox proportional hazard model) that could assess the probability of delisting of reverse takeovers versus IPOs or sellouts could be an interesting aspect for future investigation.

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Table 1 Distribution of reverse takeovers announcements in Europe 1992-2011

Year	No. of reverse takeovers	%
1992	1	0.45
1993	4	1.8
1994	2	0.9
1995	6	2.7
1996	5	2.25
1997	12	5.41
1998	6	2.7
1999	14	6.31
2000	17	7.66
2001	21	9.46
2002	10	4.5
2003	9	4.05
2004	8	3.6
2005	25	11.26
2006	20	9.01
2007	17	7.66
2008	14	6.31
2009	9	4.05
2010	17	7.66
2011	5	2.25
Total	222	100

The table shows the distribution of reverse takeovers throughout the sample period.

Table 2 Distribution of private and public firms by country of origin

Panel A: Description of private and public firms		
Country	Private Firm	Public Firm
Austria	3	2
Belgium	3	3
Czech Republic	1	-
Denmark	2	1
Finland	5	5
France	11	15
Germany	5	5
Gibraltar	-	1
Ireland-Rep	3	-
Isle of Man	2	-
Italy	1	1
Luxembourg	2	-
Netherlands	3	-
Norway	6	4
Poland	3	4
Russian Fed	1	-
Spain	5	4
Sweden	13	16
Switzerland	5	-
Turkey	2	1
Ukraine	1	-
United Kingdom	145	160
Total	222	222

Panel B: Distribution of reverse takeovers		
	No.	%
Cross-border reverse takeovers	33	14.9%
Domestic reverse takeovers	189	85.1%
Total	222	100%

The table shows the distribution of sample firms based on the country of origin and the type of reverse takeover transaction.

Table 3 Distribution of reverse takeovers among industries and sectors

Panel A: Distribution of reverse takeovers within industries and sectors

	Industry	Sector	
	Same	Same	Different
Consumer Products and Services	-	-	-
Consumer Staples	8	8	-
Energy and Power	11	9	2
Financials	22	12	10
Healthcare	5	4	1
High Technology	14	4	10
Industrials	6	3	3
Materials	11	10	1
Media and Entertainment	9	9	0
Real Estate	10	6	4
Retail	5	5	0
Telecommunications	5	4	1
Total	106	74	32

Panel B: Distribution of private and public firms between industries and sectors

	Private firm		Public firm	
	No.	%	No.	%
Consumer Products and Services	14	6.31	11	4.95
Consumer Staples	11	4.95	13	5.86
Energy and Power	18	8.11	14	6.31
Financials	36	16.22	63	28.38
Healthcare	12	5.41	7	3.15
High Technology	32	14.41	30	13.51
Industrials	21	9.46	22	9.91
Materials	19	8.56	19	8.56
Media and Entertainment	22	9.91	15	6.76
Real Estate	13	5.86	15	6.76
Retail	8	3.6	6	2.7
Telecommunications	16	7.21	7	3.15
Total	222	100	222	100

The table depicts the distribution of sample firms based on their sector classification and their status before the transaction.

Table 4 Transaction characteristics of reverse takeovers

Panel A: Description of the transaction characteristics						
	No.	Mean	Median	Maximum	Minimum	St. Dev
Ratio of Deal Value to Sales	118	26.45	13.22	4,500	0.10	43.87
% of Shares Acquired	217	97.46	85.10	100	54.8	15.98
Enterprise value at Announcement (in 000' €)	193	1,640.67	45,271	27,4759.5	2.403	27,707.35
Market Value at Announcement (in 000' €)	192	958.80	441.056	95,824.58	3.84	9,956.99
Panel B: Financial Advisors						
	Private Firm	Public Firm				
Financial Advisor	97	139				
No Financial Advisor	125	83				

This table outlines basic transaction characteristics.

Table 5 Descriptive statistics of the public firms one year prior to reverse takeover

	No.	Mean	Median	Maximum	Minimum	St. Deviation
Total assets (€ millions)	163	2.22	0.32	448.39	0.049	672.23
Market value of equity (€ millions)	144	1.12	0.15	198.87	0.08	327.02
Return on Assets (%)	142	-9.48	0.12	40.25	-183.98	32.45
Return on Equity (%)	126	-12.07	2.47	86.82	-330.63	58.66
Net Profit Margin (%)	128	-18.90	1.29	312.38	-805.85	108.84
Cash to Total Assets (%)	162	21.60	9.38	100.00	0.00	29.65
Debt to Total Assets (%)	165	19.28	14.53	140.63	0.00	22.21

This table contains the number of observations fluctuates from ratio to ratio due to data unavailability

Table 6 Abnormal and Cumulative abnormal returns around reverse takeovers

Panel A: Full sample of reverse takeovers (N=222)		
	AR%	t-statistic
-1	1.82***	7.46
0	3.09***	12.64
1	4.65***	19.02
Interval	CAR %	t-statistic
(-10 -1)	4.35***	3.35
(-5 -1)	3.36***	3.66
(+1 +5)	4.18***	4.56
(+1 +10)	3.02**	2.33
(-1 +1)	9.56***	13.45
(-1 0)	4.91***	8.46
Panel B: UK sample of reverse takeovers (N = 160)		
	AR%	t-statistic
-1	2.21***	8.57
0	3.36***	13.04
1	7.73***	30.03
Interval	CAR %	t-statistic
(-10 -1)	5.08***	6.24
(-5 -1)	3.89***	6.76
(+1 +5)	7.79***	13.53
(+1 +10)	7.02***	8.62
(-1 +1)	13.30***	29.82
(-1 0)	5.56***	15.28
Panel C: Non-UK sample of reverse takeovers (N = 62)		
	AR%	t-statistic
-1	1.60	1.46
0	3.51***	3.22
1	0.44	0.40
Interval	CAR %	t-statistic
(-10 -1)	2.31	0.67
(-5 -1)	2.60	1.07
(+1 +5)	-1.93	-0.79
(+1 +10)	-4.55	-1.32
(-1 +1)	5.54***	2.93
(-1 0)	5.10***	3.31
Panel D: Industrial focus sample of reverse takeovers (N = 106)		
	AR%	t-statistic
-1	1.05***	3.02
0	2.61***	7.50
1	1.11***	3.17

Interval	CAR %	t-statistic
(-10 -1)	3.09***	2.80
(-5 -1)	2.49***	3.20
(+1 +5)	-0.20	-0.26
(+1 +10)	-1.37	-1.24
(-1 +1)	4.77***	7.90
(-1 0)	3.66***	7.43

Panel E: Industrial non-focus sample of reverse takeovers (N = 116)

	AR%	t-statistic
-1	2.46***	7.23
0	3.19***	9.38
1	7.51***	22.09

Interval	CAR %	t-statistic
(-10 -1)	5.54***	5.15
(-5 -1)	3.98***	5.23
(+1 +5)	7.68***	10.10
(+1 +10)	6.52***	6.06
(-1 +1)	13.16***	22.35
(-1 0)	5.65***	11.75

Panel F: Differences between UK and Non-UK samples

Days	Mean	p-value
-1	0.61	0.638
0	-0.15	0.951
1	7.29	0.177

Interval		Z-statistic
(-1 +1)	7.75	4.41***
(-1 0)	0.46	0.31

Panel G: Differences between industrial focus and non-focus

Days	Mean	p-value
-1	-1.41	0.157
0	-0.58	0.791
1	-6.41	0.104

Interval		Z-statistic
(-1 +1)	-8.40	-3.64***
(-1 0)	-1.99	-1.20

This table contains abnormal returns that are calculated as follows: $AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$

where AR_{it} is the abnormal return, R_{it} is the security return i at time t , R_{mt} is the market return at time t as provided by each country's main index. The parameters α_i and β_i are estimated using the Scholes and Williams (1977) technique. Industrial focus (non-focus) is the sample where the public firm operates in the same (different) two-digit SIC code with the private firm. *, ** and *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 7 Corporate governance and market reaction around reverse takeovers

Panel A: Minority shareholders' protection and reverse takeovers					
	High minority protection (N = 186)			Low minority protection (N = 36)	
	AR%	t-statistic		AR%	t-statistic
-1	2.13***	7.87	-1	1.31	0.80
0	3.63***	13.44	0	2.17	1.33
1	6.41***	23.72	1	1.92	1.17
Interval	CAR %	t-statistic	Interval	CAR %	t-statistic
(-10 -1)	4.74***	5.54	(-10 -1)	2.98	0.57
(-5 -1)	3.74***	6.19	(-5 -1)	2.16	0.59
(+1 +5)	6.41***	10.60	(+1 +5)	-3.00	-0.82
(+1 +10)	5.35***	6.26	(+1 +10)	-3.96	-0.76
(-1 +1)	12.17***	26.00	(-1 +1)	5.40*	1.90
(-1 0)	5.76***	15.06	(-1 0)	3.49	1.50
Differences H and L	Mean	p-value			
-1	0.82	0.587			
0	1.46	0.623			
1	4.50	0.495			
Interval		Z-statistic			
(-1 +1)	6.77***	5.17			
(-1 0)	2.27**	2.08			
Panel B: Corporate board efficacy and reverse takeovers					
	High corporate board efficacy (N = 180)			Low corporate board efficacy (N = 42)	
	AR%	t-statistic		AR%	t-statistic
-1	1.93***	7.28	-1	0.07	0.09

0	3.13***	11.85	0	2.28***	3.06
1	4.60***	17.38	1	5.51***	7.40
Interval	CAR %	t-statistic	Interval	CAR %	t-statistic
(-10 -1)	4.61***	5.52	(-10 -1)	-2.99	-1.27
(-5 -1)	3.36***	5.69	(-5 -1)	-2.47	-1.48
(+1 +5)	4.18***	7.07	(+1 +5)	0.68	0.41
(+1 +10)	3.02***	3.62	(+1 +10)	-0.15	-0.06
(-1 +1)	9.56***	20.87	(-1 +1)	7.85***	6.09
(-1 0)	4.91***	13.13	(-1 0)	2.34**	2.23
Differences H and L	Mean	p-value			
-1	1.86	0.384			
0	0.86	0.851			
1	-0.91	0.915			
Interval		Z-statistic			
(-1 +1)	1.71	1.14			
(-1 0)	2.57**	2.02			

Panel C: Investor protection and reverse takeovers

	High investor protection (N = 161)			Low investor protection (N = 61)	
	AR%	t-statistic		AR%	t-statistic
-1	2.17***	8.45	-1	1.68	1.53
0	3.37***	13.12	0	3.48***	3.17
1	7.72***	30.07	1	0.35	0.32
Interval	CAR %	t-statistic	Interval	CAR %	t-statistic
(-10 -1)	5.02***	6.19	(-10 -1)	2.40	0.69
(-5 -1)	3.86***	6.73	(-5 -1)	2.65	1.08

(+1 +5)	7.76***	13.52	(+1 +5)	-2.02	-0.82
(+1 +10)	6.99***	8.61	(+1 +10)	-4.67	-1.34
(-1 +1)	13.26***	29.82	(-1 +1)	5.51***	2.90
(-1 0)	5.54***	15.25	(-1 0)	5.16***	3.32
Differences H and L	Mean	p-value			
-1	0.49	0.705			
0	-0.12	0.962			
1	7.37	0.175			
Interval		Z-statistic			
(-1 +1)	7.75***	5.08			
(-1 0)	0.38	0.26			

This table contains abnormal returns that are calculated as follows: $AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt})$ where AR_{it} is the abnormal return, R_{it} is the security return i at time t , R_{mt} is the market return at time t as provided by each country's main index. The parameters α_i and β_i are estimated using the Scholes and Williams (1977) technique. Minority shareholders' protection, corporate board efficacy and investor protection are corporate governance variables in a country level as derived by the World Economic Forum's Global Competitiveness Report Index. Each variable takes values between 1 and 7. The results from minority shareholder protection mirror the results based on the strength of auditing and reporting standards. *, ** and *** denote statistical significance at the 10, 5 and 1 percent levels, respectively.

Table 8 Buy-and-Hold (BHARs) in the post-reverse takeover period

Panel A: Full sample	BHARs %	Adjusted t-statistic			
24 months mean	-24.04***	-4.42			
18 months mean	-22.99***	-6.22			
12 months mean	-17.32***	-5.87			
6 months mean	-11.16***	-5.17			
		UK sample	Non-UK sample		Difference in means
Panel B: UK vs. Non-UK	BHARs %	Adjusted t-statistic	BHARs %	Adjusted t-statistic	p-value
24 months mean	-28.74***	-4.62	-11.38	-1.02	0.055
18 months mean	-24.90***	-5.7	-17.84***	-2.56	0.097
12 months mean	-18.70***	-5.36	-13.55**	-2.44	0.441
6 months mean	-11.71***	-4.82	-9.69**	-2.10	0.679
		Industrial focus sample	Industrial non-focus sample		Difference in means
Panel C: Industrial focus vs. Industrial non-focus	BHARs %	Adjusted t-statistic	BHARs %	Adjusted t-statistic	p-value
24 months mean	-20.22***	-2.59	-27.63***	-3.61	0.050
18 months mean	-21.73***	-4.08	-24.19***	-4.68	0.740
12 months mean	-16.26***	-4.06	-18.31***	-4.22	0.729
6 months mean	-11.54***	-3.91	-10.82***	-3.43	0.867
		High minority protection sample	Low minority protection sample		Difference in means
Panel D: High vs. Low minority protection	BHARs %	Adjusted t-statistic	BHARs %	Adjusted t-statistic	p-value
24 months mean	-29.40%***	-5.11	-20.76%	-2.22	0.027
18 months mean	-25.39%***	-6.15	-10.49%	-1.34	0.014
12 months mean	-18.80%***	-5.75	-9.74%	-1.43	0.026
6 months mean	-12.41%***	-5.29	-4.93%	-0.9	0.020
		High corporate board efficacy sample	Low corporate board efficacy sample		Difference in means
Panel E: High vs. Low corporate board efficacy	BHARs %	Adjusted t-statistic	BHARs %	Adjusted t-statistic	p-value
24 months mean	-23.24%**	-2.35	-24.23%***	-3.83	0.943
18 months mean	-20.45%***	-2.57	-23.61%***	-5.65	0.734
12 months mean	-15.73%***	-2.65	-17.70%***	-5.23	0.792

6 months mean	-13.98%***	-2.86	-10.49%***	-4.35	0.525
	High investor protection sample		Low investor protection sample		Difference in means
Panel F: High vs. Low investor protection	BHARs %	Adjusted t-statistic	BHARs %	Adjusted t-statistic	p-value
24 months mean	-28.74%***	-4.62	-11.38%	-1.02	0.055
18 months mean	-24.90%***	-5.7	-17.84%***	-2.56	0.097
12 months mean	-18.70%***	-5.36	-13.55%**	-2.44	0.441
6 months mean	-11.71%***	-4.82	-9.69%**	-2.10	0.679

This table reports BHARs which are computed using daily data for 6, 12, 18 and 24 months, subsequent to the reverse takeover announcement month, as the difference between the compounded actual return of the announcing firm and the compounded return of the market. Adjusted t-statistic is calculated as in Pastor-Llorca and Martin-Ugedo (2004). P-values are referred to differences in means. *, ** and *** denote statistical significance at the 10, 5 and 1 percent levels, respectively

Table 9 Post-reverse takeover operating performance

Panel A: Return on Asset surrounding the announcement of reverse takeover year									
Years	-1	0	1	2	Period	(-1, 0)	(0, +1)	(-1, +1)	(-1, +2)
Mean	-9.48	-14.11	-7.60	-6.34	Change	-4.63	6.51	1.88	3.13
Median	0.12	0.60	0.91	0.91	p-value	0.358	0.050*	0.337	0.208
N	142	148	166	165	Wilcoxon p-value	0.725	0.448	0.608	0.714
Panel B: Return on Equity surrounding the announcement of reverse takeover year									
Years	-1	0	1	2	Period	(-1, 0)	(0, +1)	(-1, +1)	(-1, +2)
Mean	-12.07	-16.97	-8.53	-9.56	Change	-4.90	8.44	3.54	2.51
Median	2.47	2.35	3.58	2.90	p-value	0.433	0.021**	0.528	0.571
N	126	133	152	155	Wilcoxon p-value	0.538	0.616	0.965	0.559
Panel C: Cash to Total Assets surrounding the announcement of reverse takeover year									
Years	-1	0	1	2	Period	(-1, 0)	(0, +1)	(-1, +1)	(-1, +2)
Mean	21.60	15.32	13.99	12.13	Change	-6.29	-1.33	-7.62	-9.47
Median	9.38	7.97	7.09	6.36	p-value	0.022**	0.424	0.003***	0.000***
N	162	176	182	176	Wilcoxon p-value	0.406	0.343	0.113	0.033**
Panel D: Debt to Total Assets surrounding the announcement of reverse takeover year									
Years	-1	0	1	2	Period	(-1, 0)	(0, +1)	(-1, +1)	(-1, +2)
Mean	19.28	19.65	20.00	20.56	Change	0.37	-27.24	-26.88	1.28
Median	14.53	14.95	16.08	17.68	p-value	0.961	0.919	0.884	0.723
N	165	176	183	176	Wilcoxon p-value	0.537	0.768	0.377	0.295
Panel E: Sales to Total Assets surrounding the announcement of reverse takeover year									

Years	-1	0	1	2	Period	(-1, 0)	(0, +1)	(-1, +1)	(-1, +2)
Mean	0.72	0.61	0.87	0.80	Change	-0.11	0.26	0.15	0.08
Median	0.53	0.39	0.68	0.69	p-value	0.281	0.258	0.986	0.327
N	155	172	177	170	Wilcoxon p-value	0.933	0.003***	0.023**	0.018**

Panel F: Current Ratio surrounding the announcement of reverse takeover year

Years	-1	0	1	2	Period	(-1, 0)	(0, +1)	(-1, +1)	(-1, +2)
Mean	4.60	2.20	1.96	1.86	Change	-2.40	-0.24	-2.64	-2.75
Median	1.31	1.23	1.22	1.21	p-value	0.066*	0.471	0.048*	0.048**
N	147	160	167	161	Wilcoxon p-value	0.122	0.943	0.094*	0.027**

Panel G: Quick Ratio surrounding the announcement of reverse takeover year

Years	-1	0	1	2	Period	(-1, 0)	(0, +1)	(-1, +1)	(-1, +2)
Mean	3.79	1.76	1.50	1.38	Change	-2.03	-0.26	-2.29	-2.41
Median	0.83	0.79	0.78	0.80	p-value	0.010**	0.505	0.004***	0.003***
N	147	160	167	161	Wilcoxon p-value	0.300	0.636	0.118	0.065*

Panel H: Cash Ratio surrounding the announcement of reverse takeover year

Years	-1	0	1	2	Period	(-1, 0)	(0, +1)	(-1, +1)	(-1, +2)
Mean	3.45	1.38	1.10	0.96	Change	-2.07	-0.28	-2.35	-2.48
Median	0.36	0.30	0.23	0.24	p-value	0.009***	0.486	0.003***	0.002***
N	147	160	167	161	Wilcoxon p-value	0.391	0.161	0.040**	0.015**

The report shows the operating performance of the combined entities. *, ** and *** denote statistical significance at the 10, 5 and 1 percent levels, respectively

Table 10 Multivariate regression of 3-day CARs

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.32 (-1.29)	0.014 (0.06)	-0.422 (-1.41)	-0.156 (-0.86)	0.013 (0.17)
Log of firm size	-0.07 (-1.93)*	-0.078 (-1.98)**	-0.042 (-1.63)	-0.076 (-1.96)*	-0.051 (-1.76)*
Cash to Total assets	-0.001 (-0.57)	-0.001 (-0.57)	-0.001 (-0.51)	-0.001 (-0.60)	-0.001 (-0.49)
ROE	0.001 (0.22)	0.001 (0.20)	0.001 (0.21)	0.001 (0.23)	0.001 (0.19)
Debt to Total Assets	0.006 (2.11)**	0.005 (2.08)**	0.006 (2.11)**	0.005 (2.11)**	0.005 (2.10)**
IF	-0.042 (-0.52)	-0.040 (-0.49)	-0.044 (-0.55)	-0.042 (-0.52)	-0.047 (-0.57)
Auditing	0.079 (1.74)*				
Board efficacy		0.024 (0.56)			
Investor protection			0.069 (1.69)*		
Minority protection				0.057 (1.68)*	
UK					0.111 (1.74)*
Year dummies	Yes	Yes	Yes	Yes	Yes
Adjusted R ²	0.072	0.067	0.090	0.071	0.078
F-statistic	2.62***	2.50**	2.07**	2.61***	1.79*
No. of obs.	183	183	183	183	183

This table reports the multivariate regression estimates for the 3-day CAR. The dependent variable is the three-day cumulative abnormal return ($CAR_{-1, +1}$) for the sample of reverse takeovers. Cash to total assets proxies liquidity of the public firm. Debt to total assets is a measure of leverage. Return on Equity (ROE) controls profitability. Firm size is proxied by the logarithm of total assets. IF is a dummy that takes a value of 1 for private and public firms from different industry (industrial non-focus) and 0 otherwise. Auditing, Board Efficacy, Investor Protection and Minority Protection are corporate governance variables at a country level as derived by the World Economic Forum's Global Competitiveness Report Index. Each variable takes values between 1 and 7. UK is a dummy that takes a value of 1 UK firms and 0 otherwise. T-statistics are shown in parentheses. *, ** and *** denote statistical significance at the 10, 5 and 1 percent levels, respectively