Stockholm School of Economics
Department of Finance
Master of Finance, 2019

Corporate Window-Dressing: A Study of Earnings Management Across Ownership Groups in European IPOs

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ABSTRACT

This paper studies earnings management in European IPOs and examines how it differs by three groups of issuers: private equity-backed, venture capital-backed, and non-sponsored. Using a sample of 2,126 IPOs between 1995 and 2015, we find compelling evidence of earnings management around the time of issuance. Moreover, we find significant differences in the magnitude and frequency of earnings management across ownership group, with non-sponsored firms exhibiting higher levels than private equity- and venture capital-backed issuers. The differences between ownership groups persist and are statistically significant after controlling for size, book-to-market, and industry-fixed effects. Finally, we validate our proxy for earnings management by comparing the 36-month performance of "aggressive" earnings managers with that of "conservative" earnings managers. Our results indicate that the quartile of aggressive earnings managers performs 28.6 percent worse in market-adjusted returns than the conservative quartile.

Keywords: *Earnings Management, Initial Public Offerings, Private Equity, Venture Capital, Accounting Accruals, Anomalies*

Acknowledgements: First and foremost, we would like to thank our thesis supervisor, Vincent Maurin, for his unwavering support and constructive feedback. We would also like to thank our peers, Tina Einsiedler and Eid Jazairi, for taking the time to read and provide invaluable feedback on how we could progress with our paper.

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Section 1: Introduction

"We all know why companies manipulate their earnings. They do it because they can. And there are rewards for manipulation."

The Financial Times, 7th September, 2017

Corporate earnings manipulation is a phenomenon that has long attracted media and regulatory attention. The practice of earnings manipulation is exemplified in the HealthSouth Corporation scandal of 2003, in which authorities uncovered fraudulent accounting entries that systematically overstated the firm's earnings by at least $1.4 billion to meet Wall Street earnings expectations. Auditors found that the company engaged in "aggressive accounting" by, for example, booking fabricated accounts receivable on money owed to HealthSouth as revenue. Upon regulatory intervention, the company's share price fell from $18 in December, 2002 to 11 cents a share in March, 2003, wiping out shareholders (LA Times, 2003). Such practices can still be seen in companies today, albeit on a lower scale.

Earnings window-dressing is made possible by the financial reporting conventions outlined in Generally Accepted Accounting Practices (GAAP) and International Financial Reporting Standards (IFRS), which give managers discretion in conveying firm performance to the public. While it is considered common practice to make earnings adjustments, enabled by accrual accounting, to more accurately capture firm performance (e.g., rapidly growing firms that have not received cash payments from their sales can report the full amount as revenue by increasing accounts receivable), managers may, however, exploit this opportunity to mislead investors and financial authorities for their own gain. Earnings management is further facilitated by the informational asymmetry between firms' managers and investors about the economic reality of the firm. This disparity in information is especially high in the period leading up to an initial public offering (IPO). In the case of an IPO, managers have an incentive to inflate company earnings to obtain the highest possible valuation.

Not all firms, however, are equally incentivized nor have the opportunity to manipulate their reported earnings. The owners of a firm may be more or less inclined to window-dress earnings, or engage in earnings management, than others. Financial sponsors such as venture capitalists (VCs) and private equity (PE) firms, for example, are exposed to reputation effects, implying that earnings manipulation scandals in their portfolio companies may negatively impact their ability to source future business deals. Firms that are not backed by financial

sponsors (non-sponsored), however, are less exposed to such risks and face less resistance in managing their earnings. In this paper, we focus on whether firm ownership can explain the magnitude and frequency of earnings management. We use the below definition of earnings management from Healy (1999):

"The use of judgement in financial reporting and to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers."

Previous literature (Teoh et al. 1998; DuCharme et al., 2001) has studied the occurrence of earnings management in IPOs. The methods employed in estimating earnings management frequency are, however, subject to much controversy (Fields et al., 2001; Owens et al., 2017). Yet another branch of the earnings management literature questions whether earnings manipulation takes place altogether (Ljungqvist, 2007; Ball and Shivakumar, 2008). Further, there is a noticeable gap in the literature on the comparative evidence of earnings management tendencies in sponsored (VC- and PE-backed) and non-sponsored IPOs (Levis, 2011). Though studies have shed light on earnings management tendencies in VC- and PE-backed equity issuers in an American context, little has been studied on this phenomenon in European companies. With this study, we aim to answer the following research question:

"*Does the magnitude and frequency of earnings management in European IPOs differ across ownership groups?*"

To answer the above research question, we employ Teoh et al.'s cross-sectional adaptation of the modified Jones (1991) model to estimate firms' discretionary current accruals to proxy for earnings management, as outlined in the methodology section of this paper. Subsequently, we observe whether there are consistent differences in earnings management tendencies based on previous ownership. Lastly, we validate the earnings management proxy by measuring the impact discretionary current accruals have on the long-term performance of issuing firms.

This paper proceeds as follows. Section 2 outlines the motivation for and theory underlying the hypotheses presented in Section 3. In Section 4, we describe the research design employed, which covers the methodology used, data collection process, and sample selection. Section 5 presents the findings of our study, robustness tests, and the analysis of our results. We conclude this paper with final remarks and suggestions for future research in Section 6.

Section 2: Theoretical Framework

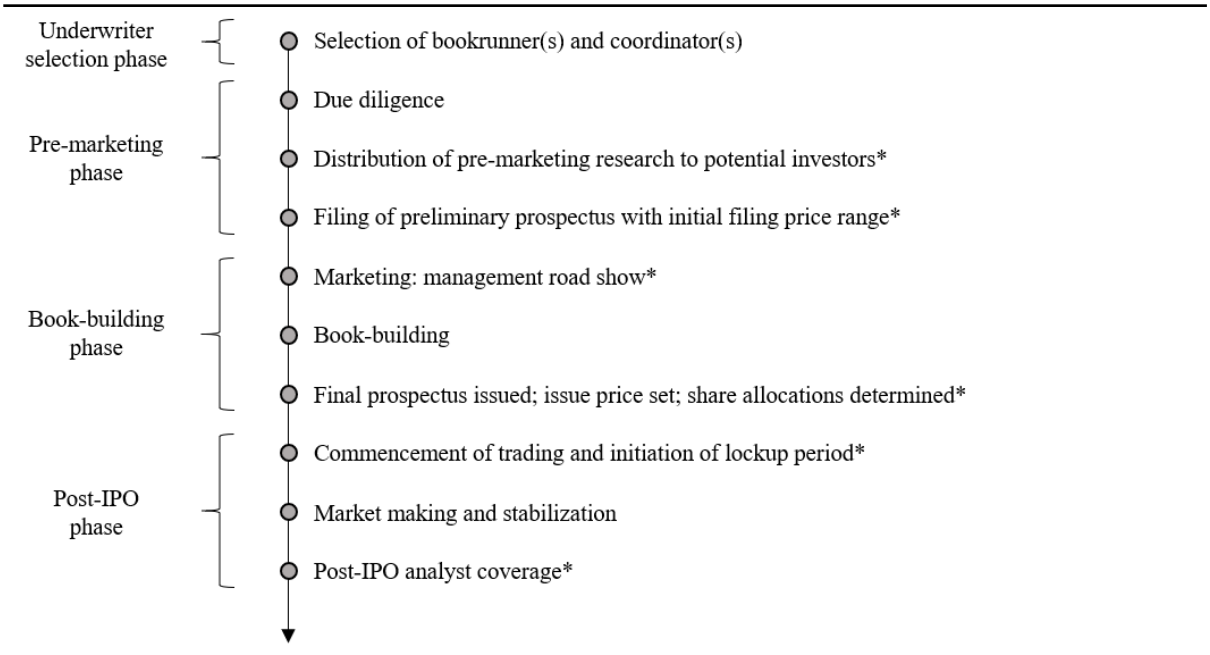
This section outlines the theoretical background and concepts that underlie the focus of this paper. We set the context of this study on earnings management by first shedding light on the general IPO process. This is followed by a presentation of other relevant IPO-related theories. After, the earnings management phenomenon is described and the incentives different owners face in managing their earnings are discussed with the help of previous literature.

2.1 Initial public offerings

2.1.1 Background on the European IPO process

The European IPO process can be split up into four major phases: the underwriter selection phase, the pre-marketing phase, the book-building phase, and the post-IPO phase. Figure 1 breaks down the four phases into detailed steps.

Figure 1 – Overview of the IPO process (Jenkinson et al., 2006)



The steps marked with * represent stages in the IPO process that are important to the earnings management process.

In the underwriter selection phase, the issuing firm invites candidate underwriters to present their proposed IPO strategy, after which the firm selects one or more to form an underwriting syndicate consisting of a bookrunner(s) and a global coordinator(s). Subsequently, the pre-marketing phase is initiated, where the selected underwriters lead and appoint advisors for the legal, commercial, and financial due diligence process. This information is eventually compiled to create the preliminary prospectus of the issuing firm, which also typically includes one to three years of financial statements. The prospectus is then sent to potential investors to test the level of interest in the public offering. Once the prospectus is deemed sufficient in accordance with information quality and content standards, it is submitted to the relevant financial authority for regulatory approval.

During the book-building phase, the IPO underwriters and the executive management team of the issuer attend formal meetings with potential investors in so called "management road shows" to generate further interest in the offering. Following the road show, potential investors submit non-binding indications of interest, which reveal the number of shares and price at which they would be willing to acquire. These bids are used to build the order book. Following this step, the prospectus of the issuer is finalized and submitted to the listing authority of the target stock exchange. Finally, the last phase is initiated and the trading of shares is commenced along with the contractual lockup period (refer to Section 2.1.2 for a detailed breakdown of the IPO lockup period). During this phase, investment banks provide post-IPO coverage on the issuing firm, which include earnings forecasts, valuation estimates, and investment recommendations, which decreases informational asymmetry between the issuing firm and investors.

2.1.2 The lockup period of IPOs

Lockup agreements are voluntary contracts between the underwriting firm and the pre-IPO shareholders that restrict the ability of the latter from selling their shares during a specified period following the offering, typically 180 days. These agreements, however, often mention unspecified exceptions to the prohibition of early sales at the discretion of the underwriter. Parties that are affected by the lockup period are typically insiders such as a company's founders, owners, managers, and employees. Other private investors, such as venture capitalists and private equity firms, are also subject to this contractual restriction. The primary purpose of the IPO lockup period is to reassure the market that key employees will continue to exert

themselves for at least a few months following the public offering. It also provides a credible signal that insiders of the issuing firm are not attempting to sell their shares in anticipation of imminent bad news (Casares-Field and Hanka, 2001).

Brav and Gompers (2003) explore the reason behind the existence of underwriter lockups. They find support for the idea that lockups serve as a commitment device for firms to overcome moral hazard risks following the IPO (e.g., through alarmingly high insider sales, earnings inflation in IPO prospectuses, etc.). Brav and Gompers argue that companies more exposed to this risk include younger firms, firms with greater stock price volatility, and firms with low book-to-market ratios and cash flow margins. They propose that these firms communicate quality and commitment to act in the interest of shareholders by agreeing to longer lockup periods. Vice versa, firms that have other forms of certification, such as a favorable reputation, venture backing, or a high-quality underwriter may have shorter lockup periods and potentially allow for the early release from the lockup contract. The authors' claims are supported by their findings, which show that unprofitable firms, low book-to-market firms, firms that mandate lower-quality underwriters, and non-VC-backed firms have significantly longer lockup periods.

Lockups attract a fair amount of attention from investors primarily due to the fear that pre-IPO shareholders will initiate a massive share sell-off upon the expiration of the lockup period, which would likely heavily depress the share price. In their study featuring 1,948 IPO lockup agreements from 1988 to 1997, Casares-Field and Hanka (2001) find a permanent increase in trading volumes of 40 percent and a statistically significant three-day abnormal return of –1.5 percent immediately after the lockup period. They add that these effects are approximately three times larger in VC-backed firms than non-VC-backed firms. In their sample of IPOs, they observe that 6 percent of their firms disclose early sales of locked-up shares by at least one insider, typically a venture capitalist. They reason this may be explained by venture capitalists' tendencies to distribute their shares to their limited partners immediately after lockup expiration as a matter of policy. The authors also cite a number of factors that may drive the overall negative return results obtained in their study, such as a downward sloping demand curve (i.e., that an increase in supply of shares lowers the equilibrium share price) and worse-than-expected news about insider sales on the lockup expiry day.

2.1.3 The underpricing phenomenon and information asymmetry in IPOs

The underpricing of stock offerings is the practice of listing an IPO at a price below its intrinsic value in the stock market. A stock is considered to be underpriced if it closes above of its set IPO price on its first day of trading. In Ibbotson's (1975) pioneering study on underpricing, he shows that average initial (first-day) returns of IPOs are 11.4 percent. He argues that since his findings indicate few departures from efficiency in the aftermarket, positive initial performance must be attributable to a downward bias in the set IPO price. Ibbotson cites possible reasons for the underpricing of IPOs, such as the popularized notion on Wall Street that issuers may want to "leave a good taste in investors' mouths so that future underwritings from the same issuer could be sold at attractive prices."

Asymmetric information theory posits that IPO underpricing stems from information asymmetries between the key parties involved in the transaction, primarily the issuing firm, the underwriter, and the investors participation in the IPO. Several studies claim that this informational disparity is to blame for the underpricing of IPOs (Rock, 1986; Allen and Faulhaber, 1989; Welch, 1992). Rock (1986) creates an equilibrium model for the underpricing phenomenon, whereby uninformed investors are subject to a "winner's curse" when they submit an order for IPO shares. He argues that informed investors will refrain from acquiring IPO shares if the issue price exceeds its intrinsic value, resulting in the allocation of the overpriced issues to the uninformed investor. To account for this adverse selection, firms are incentivized to compensate uninformed investors by underpricing their IPOs. In contrast, Welch (1989) argues instead that the informational asymmetry is due to the firm owner knowing more about the firm's quality than investors. Welch suggests that high-quality firms are confident in their ability to recoup the costs incurred from intentionally "leaving money on the table" in future seasoned offerings. Firms may therefore purposely underprice their initial offering price and decrease IPO proceeds to communicate quality to investors.

These theories depict how firms utilize informational asymmetry to compensate investors in the short-run by underpricing their IPOs, often resulting in high initial returns. Contrastingly, in the earnings management process, firms are incentivized to inflate earnings until after the expiration of the lockup period (see Section 2.2.3). Since one of the objectives of our paper is to study the impact of earnings management on post-IPO long-term performance, we exclude the effect of underpricing on the returns of our issuing firm sample. We further motivate this in Section 4.2.

2.1.4 Long-term underperformance in IPOs

The tendency of IPOs to underperform in the long-run is a phenomenon that has been rigorously studied in finance literature (e.g., Ritter, 1991; Loughran and Ritter, 1995; Brav and Gompers, 1997). Using a sample of 1,526 firms that went public in the U.S. from 1975 to 1984, Ritter (1991) finds that these firms significantly underperform peers matched by size and industry in the three years after going public. Ritter suggests that the long-run underperformance of IPOs hints at investors being periodically overoptimistic about the earnings potential of young growth companies, where the long-term underperformance seems to be concentrated most. He adds that issuers may attempt to time their IPO to coincide with periods in which investor optimism is high, or so called "hot issue markets." Theorists (Loughran and Ritter, 1995; Lerner, 1994) view hot IPO markets as the result of wild bullishness from investors, and that managers may take advantage of this window of opportunity by conducting an IPO.

Loughran and Ritter (1995) find further support for post-IPO long-term underperformance in American firms. They observe that the average annual return during the five years after an IPO is 5 percent, significantly lower than the 12 percent return obtainable through investing in a non-issuing firm with approximately the same market capitalization over the same period. Similarly, the authors point out that firms typically conduct IPOs after recent improvements in their operating performance. They add that investors appear to overweight this recent performance of the issuer and underweight the long-term mean-reverting tendencies of operating performance metrics (Loughran and Ritter, 1995). This notion is supported by Jain and Kini (1994), who find that their sample of 682 issuing firms in the 1976 to 1988 period experience a dramatic fall in their median operating cash flow to assets ratio three years after the IPO.

Levis (1993) shows the persistent underperformance of IPOs in the long-run is not confined to the US market. With his sample of 712 IPOs listed on the London Stock Exchange in 1980 to 1988, Levis documents that IPOs in the UK. underperform several relevant benchmarks in the 36 months following the firms' first day of trading. He cites market overreaction to new equity issues as a likely factor behind this phenomenon. Bergström et al. (2006) also find clear evidence in the long-run underperformance of IPOs in the UK and France. Their study shows, however, that PE-backed IPOs exhibit lower degrees of long-term

underperformance than non-PE-backed IPOs. We further discuss the effects of PE and VC ownership in the long-term performance of IPOs below.

2.1.5 The impact of ownership on long-term IPO performance

Brav and Gompers (1997) show that VC-backed IPOs outperform non-sponsored IPOs by a significant margin, but still slightly underperform the market as a whole. They attribute this outperformance to better management teams and corporate governance structures that are set in place by VCs. In support of this notion, Krishnan et al. (2011) find that reputable VCs exhibit post-IPO involvement in their portfolio companies primarily through shareholdings and board directorships, which in turn positively influence post-IPO performance. Brav and Gompers (1997) add that VCs have ties with top-tier investment banks and can arrange for higher quality analysts to provide coverage on their portfolio companies, thereby reducing informational asymmetry. Yet another explanation they list is VCs' reputational concerns, which implies that they may face greater difficulty taking companies public if they are associated with consistently underperforming IPOs.

In comparing the long-run underperformance of venture-backed IPOs with non-sponsored IPOs, Brav and Gompers (1997) attribute the underperformance of the latter to the high representation of small issuers, i.e., companies with market capitalizations of less than $50 million. They further posit that the shares of smaller non-sponsored IPOs are more likely to be held by individuals as opposed to institutional investors, and are thus more exposed to individual investor sentiment. The authors add that private individuals are more likely to lack complete information or be influenced by fads.

Bergström et al. (2006) observe that though both PE-backed and non-PE-backed IPOs show evidence of long-run underperformance, the former exhibit markedly less over all time horizons. The authors bring up a number of reasons in explanation of their results. Firstly, PE-backed issuers' shares may take longer time to underperform because of the unwillingness of institutional investors (who generally represent a larger portion of PE-backed IPO shareholders) to sell shares in PE-backed IPOs due to their interest in being allocated shares in future PE-backed public offerings. This may induce them to hold on to the issuers' shares over a longer period than non-PE-backed IPOs. Secondly, they argue that underwriters may stimulate the price of the IPO shares during lockup periods to encourage continued collaboration in subsequent equity offerings. Finally, they propose that larger IPOs, a common

characteristic of PE-backed issues, are less subject to overoptimistic investors who eventually adjust their expectations downwards.

2.2 Earnings management

2.2.1 The earnings management process

Managers have strong incentives to adjust their firms' reported earnings for certain dates and events. Healy and Wahlen (1999) summarize in their comprehensive review of earnings management literature that companies manage earnings to window-dress financial statements prior to public securities' offerings, to avoid violating loan covenants, to increase managers' compensation and job security, or to gain regulatory benefits. Other studies find that managers are incentivized to manage earnings upwards to avoid dividend reductions when reported earnings would otherwise fall below acceptable levels outlined by covenant terms (Watts and Zimmerman, 1986; Daniel et al., 2008).

The subjectivity in reporting a firm's earnings as described above is made possible by the "accrual accounting system" mandated by Generally Accepted Accounting Principles (GAAP) and International Financial Reporting Standards (IFRS). Under this framework, revenues are recognized on the day they are earned and expenses on the day they are incurred, not when there is a cash transaction. The differences between income statement items and actual cash flows are known as accruals. Accruals can be split into short-term and long-term components. Short-term (current) accrual adjustments relate to the short-term assets and liabilities that support the daily operations of the firm.

The role of the financial reporter is to convey information about a firm's underlying economic performance to external capital providers and stakeholders in an accurate and timely manner. For financial reports to communicate managers' information on their firms' performance, managers must be allowed to exercise judgement in selecting reporting methods, estimates, and disclosures that most accurately speak to the firm's economic performance (Healy and Wahlen, 1999). This convention gives rise to possibilities of earnings management, or financial reporting that disguises a firm's underlying performance. In the context of an IPO, company-specific information is conveyed to investors prior to the IPO date through a prospectus of the firm, which typically includes a financial summary of the firm's performance over the past one to three years. Given that pre-IPO companies are private, they may have less

resources available to hire high-quality auditors. As a result, the earnings quality in these reports may be lower than those of public firms that hire higher-quality auditors.

2.2.2 The measurement of earnings management

In her seminal study on earnings management, Jones (1991) finds that domestic U.S. Firms that would benefit from protectionist measures (e.g., tariff increases and quota reductions against foreign exporters) manage their earnings downwards during import relief investigations. In the study, Jones (1991) developed the earnings management model frequently used in other studies by estimating the discretionary component of a firm's total accruals rather than a single accrual, which more likely captures a larger portion of managers' earnings manipulations. The author applies a cross-sectional model to estimate total discretionary accruals (i.e., income statement adjustments made at the discretion of the manager), or abnormal accruals, to test her earnings management hypothesis.

Teoh et al. (1998) further develop the Jones (1991) model by applying data on all firms in the same industry in the estimation of abnormal accruals. The appeal in implementing the accruals method to gauge earnings management is its applicability to large sample sizes due to its reliance on generally available data on operating metrics (e.g., change in sales). Limitations to this approach include its failure to capture the underlying economic circumstances surrounding firms' performance (Owens et al., 2017). For instance, two firms that experience equal sales growth through differing means (i.e., longer credit sales terms, resulting in increased accounts receivable, and increased customer demand, leading to lower inventory levels) may not experience the same changes in current accruals. Furthermore, this cross-sectional approach relies on the assumptions of firm stationarity (i.e., firms' accruals are reasonably stable over time) and intra-industry homogeneity (i.e., industry peers have relatively similar accrual levels) (Owens et al., 2017).

2.2.3 Earnings management in IPOs

The IPO setting gives rise to a motive and an opportunity for the owners of firms to manage their earnings. Since pre-IPO owners of a firm typically hold relatively large equity stakes, inflating the IPO offer price substantially increases their wealth (DuCharme et al., 2001). Managers may be encouraged to act on these wealth-maximizing incentives by the opacity surrounding the private firm, which ultimately gives rise to informational asymmetry between

the firm and investors (Schipper, 1989). DuCharme et al. (2001) note that there is extremely limited publicly available information about the firm at the time of the IPO other than that contained in the offering prospectus. They argue that these prospectuses, however, reveal little about a firm's offering price or future prospects. Investors may thus be forced to rely on information communicated by the issuing firm itself. Moreover, Teoh et al. (1998) argue that in subsequent financial reports, issuing firms generally do not highlight earnings adjustments (i.e., increasing accounts receivable through early revenue recognition) that reflect their desire to achieve more favourable share price performance, making it difficult for investors to detect any earnings inflation.

Teoh et al. (1998) study companies that window-dress their earnings by increasing their discretionary current accruals (DCA) at the time of their initial public offering and the corresponding impact on those firms' long-run market performance. They argue that IPO firms can report abnormally high earnings by adopting discretionary accounting accrual adjustments that boost reported earnings without impacting its actual cash flows. The authors add that immediate accrual reversals following a public offering attract unwanted attention from financial regulators, and that they are thus likely to continue to manage earnings upwards in the period after. Moreover, they find that the greater the earnings management, ceteris paribus, the larger the eventual share price correction. They attribute this outcome to a progressive reversal of abnormal accruals over time and investors' recognition of the decelerating momentum in earnings growth. Investors are able to recognize earnings manipulation over time due to increased post-IPO analyst coverage (Xin et al., 2006), which likely reveals any inflation in firm valuation caused by aggressive earnings management.

Another branch of the literature posits that IPO firms are unlikely to manage earnings altogether. Ball and Shivakumar (2008) question the existence of earnings management due to the resulting scrutiny firms would attract from market monitors such as analysts, underwriters, auditors, regulators, the press and other parties involved in the transaction. In addition, poor financial reporting quality may lead to a higher cost of capital, which may hinder firms from turning to the capital markets for financing, and adversely impact the reputations of the advisors and intermediaries involved in the IPO. We conjecture, however, that not all firms are equally exposed to these risks, as discussed below.

2.3 Ownership effects on earnings management in IPOs

2.3.1 Earnings management in non-sponsored firms

Given that non-sponsored firms are typically smaller than their PE- and VC-backed counterparts (Brav and Gompers, 1997), they likely have less sophisticated financial reporting and governance systems in place. Megginson and Weiss (1991) document that institutional shareholdings in IPOs are significantly higher for sponsored IPOs (i.e., backed by a financial sponsor) than non-sponsored IPOs. We argue that their non-professional owner status (i.e., that they are not professional repeat-owners like PE firms and VCs) and limited institutional shareholding renders non-sponsored issuers less likely to be represented by top-tier underwriters, which may imply reduced third-party monitoring in the financial reporting process due to fewer underwriter reputational concerns. This is supported by Barry et al. (1990), who find that small non-sponsored firms typically go public with lower tier underwriters. These firms may also receive markedly less analyst coverage, increasing the informational asymmetry between managers and investors. As a result, earnings management practices in non-sponsored firms may go undetected for longer periods of time. These factors provide a plausible explanation for the greater incidence of earnings management in non-sponsored issuers.

2.3.2 Earnings management in private equity-backed firms

Katz (2009) finds that American private equity-backed firms generally have higher earnings quality than management-backed (i.e., non-sponsored) firms, engage in less income-increasing earnings management, and report more conservatively prior to and after an IPO. She adds that since PE sponsors typically buy relatively mature businesses with longstanding governance and reporting systems in place (which we refer to as professional owner effects), there are limited opportunities for them to make income-increasing adjustments. Yet another theory that points to reduced earnings management activity in PE-backed issuers is agency theory, more specifically, greater goal congruence between owners and management, stronger incentives to create shareholder value given management's increased ownership stake, and the disciplinary influence of higher leverage (Kaplan, 1991; Bruton et al., 2002). Once PE-backed firms go through an IPO process and become non-sponsored, these forces become less prominent as managerial and ownership interests are less aligned, monitoring costs are likely higher, and

leverage decreases (Bruton et al., 2002). These factors point to the existence of built-in control measures that tightly restrict PE sponsors from manipulating earnings to obtain higher valuations for their portfolio companies.

Another branch of earnings management literature, however, suggests greater earnings management in PE-backed firms than non-PE-backed firms. Degeorge and Zeckhauser (1993) suggest that if PE-backed firms go public because they have fully exhausted the benefits of the leveraged buyout (LBO) ownership structure or that their returns do not cover their leverage load, the PE firm may be incentivized to manage earnings upwards to boost IPO proceeds. Degeorge and Zeckhauser argue that some degree of performance manipulation likely occurs in any firm. They add that the easiest way for managers to inflate earnings is to borrow performance from other periods (e.g., defer expenses related to R&D or employee development).

2.3.3 Earnings management in venture capital-backed firms

Tian et al. (2016) study the reputation damage that VC firms in the US are exposed to if portfolio company IPOs underperform, which may jeopardize their ability to take firms public in the future. An unfavorable reputation formed by tendencies to fool investors may drastically impact a VCs chances of participating in future sponsorship syndicates. As outlined in Section 2.2.5, any investor over-optimism rooted in inflated earnings will likely be corrected over time, leading to a downward price adjustment. Since the VCs' profits and their ability to raise additional funds from investors is highly dependent on their fund performance (Hochberg, 2011), they may be discouraged from inflating their portfolio firms' earnings.

Morsfield and Tan (2006) predict and find that abnormal accruals in the year of the IPO are lower in the presence of VC ownership in US firms. In their comprehensive study, they control for variables such as auditor quality, underwriter ranking, sales growth (i.e., growth firms), leverage, size, etc. They argue that their findings are largely in line with existing theories of professional owner effects in VCs, which posit that VCs appoint boards with greater independence and oversight (Baker and Gompers, 2003), which by extension reduces earnings management. Given that VCs generally retain large equity stakes for substantial periods of time following the IPO of portfolio companies (Barry et al., 1990), they are incentivized to maintain transparent governance and reporting systems to preserve the value of their investments until they are fully exited.

Contrastingly, another branch of empirical evidence suggests that VCs exit investments immediately after the expiration of the lockup period in order maximize the value of their shares and repatriate the profits to their limited partners (Casares-Field and Hanka, 2001; Healy, 2002). The relatively short duration of the lockup period (and the slim chance of getting exposed) creates an opportunity for VCs to inflate earnings until the expiration of the lockup period to maximize their return on investment (Biddle, 2001). Morsefield and Tan (2006) find, however, that the presence of a lockup agreement and its duration are not significantly associated with the IPO-year earnings management behavior of VC-backed firms. On another note, while Wongsunwai (2007) finds that issuing companies backed by higher quality VCs generally have low discretionary accruals, he also finds issuers backed by lower-tier VCs behave as aggressively as non-VC-backed firms in their financial reporting and are almost 50 percent more likely to restate their financials in any post-IPO fiscal quarter. This seems to indicate that the enforcement of financial reporting quality may be linked to the reputation of the VC.

Section 3: Research Question and Hypotheses

We contribute to earnings management literature by attempting to showcase the existence of ownership differences in earnings management engagement in European companies. As outlined in Section 2.2.1, firms may be incentivized to manage their earnings because of managerial incentives facilitated by information asymmetry in the context of a public offering. We therefore have reason to believe that earnings management does indeed occur in IPOs. This leads us to our first hypothesis:

H1*: **There is, on average, earnings management in IPOs***

If we are able to find support for H1, we can take a step deeper into the earnings management phenomenon by testing potential differences in propensity to manage earnings in non-sponsored, PE-backed, and VC-backed issuing firms. In doing so, we address the controversy behind corporate earnings manipulation and attempt to identify whether certain parties are more inclined to manage their earnings. This brings us to our research question:

"Does the magnitude and frequency of earnings management in European IPOs differ across ownership groups?"

We argue that the three ownership groups face markedly different circumstances that shape their incentives to partake in earnings management. Namely, we conjecture that non-sponsored firms are less exposed to reputational risks as they require less access to the capital markets. These owners are likely more inclined to sell their shares upon the expiration of the lockup period and be less concerned about how the unraveling of earnings management practices affects the long-term performance of the firm. This effect is magnified by these firms being more likely to hire lower-tier auditors and underwriters in the IPO process, which gives rise to greater informational asymmetry, further prompting owners to manage earnings upwards.

In contrast, private equity firms and venture capitalists will need future access to capital markets. Any attempt to deceive the market through earnings manipulation may drastically hurt their reputation. Since private equity firms and venture capitalists are exposed to similar risks with regards to earnings management, we argue that they are equally unlikely to manage their earnings. This is manifested in our second hypothesis:

H2*: **There are, on average, higher levels of earnings management in non-sponsored IPOs than in PE- and VC-backed IPOs***

After testing H2, we validate the proxy for earnings management (i.e., discretionary current accruals) by investigating its impact on the long-run performance of issuing firms. Prior studies (Teoh et al., 1998; DuCharme et al., 2001) demonstrate that pre-issue and post-issue income-increasing abnormal accruals are linked to long-term underperformance. As outlined in Degeorge and Zeckhauser (1993), by inflating reported net income through earnings management, companies essentially borrow from future firm performance. Subsequent financial reports will reflect this in the form of reduced earnings, which should prompt investors to adjust their expectations downwards and result in a depressed share price. Accordingly, we hypothesize that issuing firms with greater levels of earnings management will experience greater long-term underperformance than firms who manage earnings the least. This brings us to our third and final hypothesis:

H3*: **Issuers with higher levels of earnings management exhibit, on average, greater long-term underperformance than issuers with lower levels of earnings management***

The approach we employ in testing these hypotheses is outlined in Section 4.

Section 4: Research Design

4.1 Discretionary current accruals methodology

The primary objective of this paper is to investigate the differences in earnings management in IPOs depending on the previous ownership. Several methods to quantify earnings management have been employed in previous research, such as the accruals method, changes in capital structure, and changes in accounting methods (Jones, 1991). We use the accruals method to gauge the level of managers' earnings manipulation in the year of an IPO, a methodology frequently employed in previous earnings management literature (Jones, 1991; Teoh et al., 1998; Kothari et al., 2005). Accruals are defined as revenues earned or expenses incurred that impact a company's net income without impacting its cash flow. Given how managers generally have greater discretion on short-term accruals than on long-term accruals (Guenther, 1994), we focus on current (i.e., short-term) accruals as these are more easily managed.

We employ Teoh et al.'s (1998) adaptation of the cross-sectional modified Jones (1991) model, an approach that separates a firm's current accruals into a discretionary and nondiscretionary component, where the discretionary component is constructed to proxy for earnings management. Nondiscretionary current accruals are first estimated using a cross-sectional regression featuring industry peers that measures the impact of change in sales on growth in current accruals. Discretionary current accruals are then calculated as the difference between nondiscretionary current accruals and total current accruals (Teoh et al., 1998). This paper follows accounting literature (Jones, 1991; Teoh et al., 1998) in calculating current accruals, as shown below.

$$CA \equiv \Delta[accounts\ receivables + inventory + other\ current\ assets] - \Delta[accounts\ payable + tax\ payable + other\ current\ liabilities] \quad \text{(A1)}$$

The first step is to estimate each issuer's expected, or nondiscretionary, current accruals. To do so, a cross-sectional regression is conducted featuring all European firms in the same two-digit SIC industry code as the issuer. The industry peers' current accruals are

regressed on their change in sales and all variables are scaled by lagged total assets to reduce heteroskedasticity. This step is performed for each industry and year for which we have an IPO from 1995 to 2015 using the following OLS regression:

$$\frac{\mathrm{CA_{j,t}}}{\mathrm{TA_{j,t-1}}} = \alpha_0\left(\frac{1}{\mathrm{TA_{j,t-1}}}\right) + \alpha_1\left(\frac{\Delta\ \mathrm{Sales_{j,t}}}{\mathrm{TA_{j,t-1}}}\right) + \varepsilon_{j,t}$$

(A2)

$CA_{j,t}$ = Current accruals of industry peer *j* at year *t*, where year *t* represents the year of the issuing firm's IPO
$TA_{j,t-l}$ = Total assets of industry peer *j* at year *t-1*[1]
$\Delta\ Sales_{j,t}$ = Change in sales of industry peer *j* from year *t-1* to year *t*

The fitted coefficients α_0 and α_1 in (A2) are then used to estimate nondiscretionary current accruals in the following formula:

$$\mathrm{NDCA_{i,t}} = \hat{\alpha}_0\left(\frac{1}{\mathrm{TA_{i,t-1}}}\right) + \hat{\alpha}_1\left(\frac{\Delta\ \mathrm{Sales_{i,t}} - \Delta\ \mathrm{TR_{i,t}}}{\mathrm{TA_{i,t-1}}}\right)$$

(A3)

$NDCA_{i,t}$ = Nondiscretionary current accruals of issuer *i* at year *t*
$\hat{a}_0$ = Estimated intercept
$TA_{i,t-l}$ = Total assets of issuer *i* at year *t-1*.
$\hat{a}_1$ = Estimated slope coefficient
$\Delta\ TR_{i,t}$ = Change in trade receivables for IPO firm *i* in year *t*

Trade receivables are subtracted from the change in sales to account for the possibility of the issuer manipulating sales figures through, for example, generous credit terms. The discretionary current accruals are then calculated by subtracting the nondiscretionary current accruals from the asset scaled total current accruals as shown below.

[1] We note that Datastream occasionally has faulty data on total assets, where total assets can be ten thousand times greater than lagged total assets. In these rare instances, the variables are not scaled correctly and we observe extreme values such as CA to TA figures in the thousands, which creates a lot of noise in our estimation of discretionary current accruals. In each (A2) regression (i.e. for each year and industry), we therefore trim the data by excluding the industry peers with CA scaled by lagged TA above the 95th percentile and below the 5th percentile before running the regression.

$$DCA_{i,t} = \frac{CA_{j,t}}{TA_{j,t-1}} - NDCA_{i,t}$$

(A4)

When DCAs are estimated, we calculate the t-statistic of the difference between the means of the three ownership groups. We compute this by dividing the difference between means by the square root of the combined variance of the samples as shown below.

$$T - statistic = \frac{u_1 - u_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

(A5)

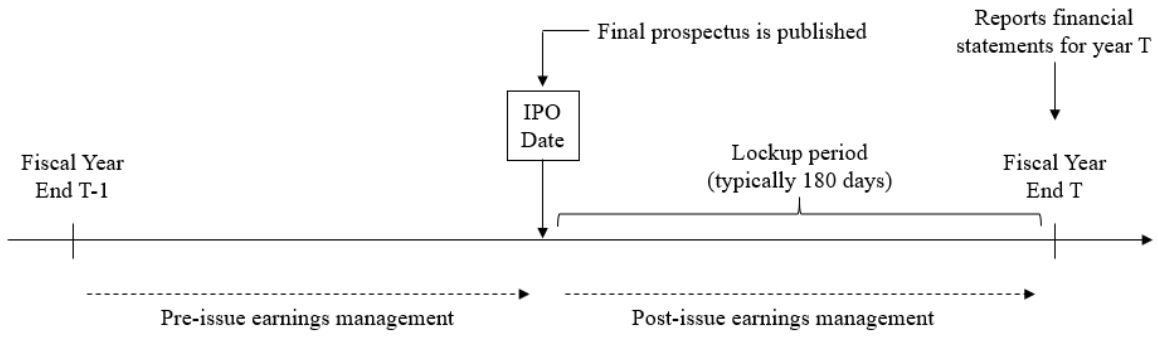
u_i = mean DCA of owner group *i*
s_i^2 = variance of DCA in owner group *i*
n_i = number of observations in owner group *i*

To illustrate the process, consider the fictional construction company ABC Construction. ABC Construction goes public in May 2005, has SIC code 15, and its fiscal year ends in December. First, the cross-sectional regression (A2) is run on all publicly listed European firms within the construction industry (SIC codes 15-19). Second, ABC Construction's nondiscretionary current accruals as of December 2005 (which marks the end of the fiscal year in which it went public) are calculated using the parameter estimates from the prior regression as shown in formula (A3). Third, discretionary current accruals as of December 2005 are calculated as the difference between ABC Construction's reported current accruals in December 2005, scaled by its total assets in December 2004, and the nondiscretionary current accruals as shown in (A4). This results in an estimate of ABC Construction's discretionary current accruals in 2005 as a percentage of prior year's total assets.

An important aspect of this methodology is the timing of earnings management. As outlined in the example above, we calculate discretionary current accruals in the IPO year (i.e., after the firm has already gone public). Previous literature documents the existence of pre-issue and post-issue earnings management (e.g. Teoh et al., 1998), where our method measures the

latter. Managers have an incentive to manage earnings prior to an issue to disguise a sudden jump in abnormal accruals at the time of the IPO. They are also incentivized to manage earnings directly after to maintain a high share price through the lockup period to enable them to "cash out" upon lockup expiration. Post-issue earnings management is therefore a highly relevant proxy for overall earnings management around the time of an IPO. We illustrate the exact time period in which we observe earnings management in IPO firms in Figure 2.

Figure 2 – Timeline of the earnings management process in IPOs



Illustrates the timing of earnings management. The figure was created by the authors of this paper.

4.1.1 Robustness of the DCA variable

In this section, we control that the estimate of discretionary current accruals is robust and not proxying for some other firm characteristic. Given how our sample includes IPOs from 1995 to 2015 (shown further in Section 4.4), a time period with two financial crises, we will likely find substantial heterogeneity over the period. To control for such time effects and to better understand trends in earnings management over time, we report DCAs both for the entire period and for five distinct time periods: 1995 to 1998, 1999 to 2001, 2002 to 2006, 2007 to 2008, and 2009 to 2015. These time periods separate IPOs that went public in the one or two years leading up to a financial crisis from IPOs that did not experience a financial crisis in their first 24 months of trading. In doing so, we control the robustness of the measure over time, identify time-related effects that could be driving any differences in earnings management, and reduce the risk of running linear regressions over a period with structural breaks.

Teoh et al.'s (1998) cross-sectional adaptation of the modified Jones (1991) model scales all parameters by lagged total assets and estimates non-discretionary current accruals using industry peers, which is a built-in control mechanism for size and industry characteristics. However, there are still concerns that discretionary current accruals could be proxying for issuer firm characteristics. For instance, Dechow et al. (1995) show that the discretionary

current accrual models are less well-specified for growth firms, particularly in distinguishing between abnormal accruals that are due to rapid growth and those due to earnings management. Furthermore, Brav and Gompers (1997) suggest that non-sponsored IPOs are typically smaller in size than their PE- and VC-backed counterparts, and that small firms generally have lower earnings quality.

We address these concerns by regressing the DCA variable on a set of control variables in a manner similar to the method employed by Morsfield and Tan (2006). We use the natural logarithm of issuers' market capitalization to control for size, book-to-market to control for differences in growth, and industry-fixed effects to control for industry characteristics. We also include two binary variables equal to one if the issuer is PE- or VC-sponsored. By including the PE and VC variables in the regression, we test the effect of PE and VC ownership on the DCA variable when effects of size, book-to-market and industry are accounted for. The regression is shown below.

$$DCA_i = \alpha_i + \beta_1 LMVE_i + \beta_2 BTM_i + \beta_3 PE_i + \beta_4 VC_i + \theta_1 Industry_i + \varepsilon_i \quad \text{(A6)}$$

DCA_i = Discretionary current accruals of firm *i*
$LMVE_i$ = The natural logarithm of firm *i*'s market capitalization
BTM_i = The book-to-market of firm *i*
PE_i = Binary variable equal to one if the issuer is PE-sponsored
VC_i = Binary variable equal to one if the issuer is PE-sponsored
$Industry_i$ = Industry fixed effects; a set of binary variables where the industry that firm *i* belongs to is equal to one and the rest are equal to zero

4.2 Measuring DCA impact on long-term share performance

If discretionary current accruals are a good proxy for earnings management, we would expect issuers with high DCA in relation to lagged total assets to experience worse long-term performance than other issuers. To test this, we assort the 2,126 IPOs into quartiles based on their DCA. We label the quartile with the lowest DCA (Q1) as "Conservative" and the quartile with the highest DCA (Q4) as "Aggressive."

To evaluate the performance of the four DCA-sorted portfolios, we calculate raw returns, market-adjusted returns and Fama-French (1993) 3-factor-adjusted returns. We first compare the 36-month raw returns of the portfolios to show the actual performance of the portfolios. We then use Ibbotson's (1975) Returns Across Time and Securities (RATS) model (explained in detail in Section 4.2.1) to estimate market-adjusted abnormal returns, using the

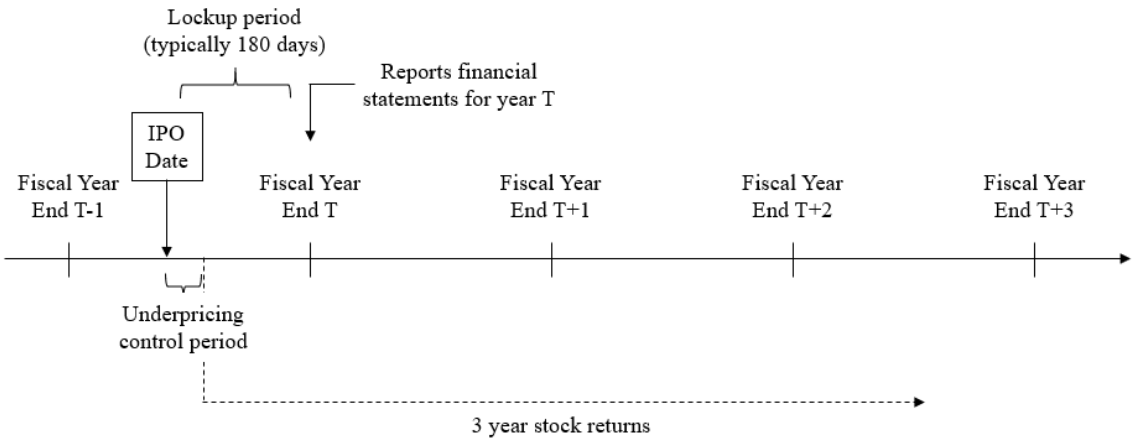
equal-weighted MSCI Europe as the benchmark, and the Fama-French 3-factor-adjusted returns to account for differences in size and book-to-market.

All returns are calculated by equal-weighting the stocks in each quartile and cumulating abnormal returns (CAR). Firms that are delisted are excluded the month following the delisting and all portfolios are rebalanced each month to exclude any delisted firms.

We split the issuers into the same five time periods as described in Section 4.1.1 where we control for time-fixed effects relating to discretionary current accruals, namely, 1995 to 1998, 1999 to 2001, 2002 to 2006, 2007 to 2008, and 2009 to 2015. The rationale for choosing these time periods is the same as in Section 4.1.1: they separate issuers that went public in the one to two years preceding a financial crisis from issuers that went public in periods not affected by financial crises. By doing so, we avoid (or decrease) issues with linear parameterization across longer periods of time.

As noted by most previous literature on the topic, IPOs are on average underpriced and see high first-day returns (see Section 2.1.3). To evaluate the validity of discretionary current accruals as a proxy for earnings management, we are more concerned with the long-term performance than with the initial underpricing. As outlined in Section 2.1.3, there is a myriad of factors that drive underpricing, most of which are inherently different from those affecting the propensity to manage earnings. We thus measure the 36-month returns starting one month after the IPO date to isolate the long-term returns from any underpricing effects. We choose a 36-month window because it is likely long enough for the majority of earnings management to revert back to normative levels and thus result in significant underperformance. We illustrate our timing convention below.

Figure 3 – Illustration of the timing convention used in measuring long-term returns



This figure was created by the authors of this paper.

4.2.1 Benchmark-adjusted returns

To estimate benchmark-adjusted abnormal returns, Ibbotson's (1975) RATS model is used. In this procedure, security excess returns are cross-sectionally regressed each month in event time on the equal-weighted MSCI Europe index (A7) and the three Fama-French (1993) factors (A8). The market-factor in the Fama-French (1993) factor-model is the value-weighted return of all stocks with available returns from 16 developed European countries. Given how we equal-weight the returns in our quartiles, we find it important to compare with an equal-weighted benchmark as well, such as the equal-weighted MSCI Europe index. The intercept in each regression is the abnormal return for event month *t*.

$$R_{i,t} - R_{f,t} = \alpha_t + \beta_t(R_{MSCI,t} - R_{f,t}) + \varepsilon_{i,t} \quad \text{(A7)}$$

$$R_{i,t} - R_{f,t} = \alpha_t + \beta_t(R_{m,t} - R_{f,t}) + s_t SMB + h_t HML + \varepsilon_{i,t} \quad \text{(A8)}$$

$R_{i,t}$ = monthly return for IPO *i* in event month *t*
$R_{f,t}$ = risk-free rate for the calendar month corresponding to event month *t*[2]
α_t = intercept for event month *t* (represents the abnormal return)
B_t = cross-sectional beta-factor for event month *t*
$R_{MSCI,t}$ = return on the equal-weighted MSCI Europe index

[2] Fama-French use the 1-month U.S. T-Bill to calculate their market excess return and, for the sake of consistency and comparability, we do the same to calculate the EW MSCI Europe excess return

$R_{m,t}$ = value-weighted Fama-French market return
SMB = return of Fama-French small-minus-big portfolio
HML = return on Fama-French high-minus-low portfolio

The alphas in regressions (A7) and (A8) are cumulated to get cumulative abnormal returns (CAR) for 36 months. The CAR t-statistic is the 36-month CAR divided by the square root of the sum of squares of the monthly standard errors over the event-time period.

4.3 Data collection

For the first step of the data collection process, European IPO firms from 1995 to 2015 are collected from SDC Platinum. After removing duplicates and issues that are not ordinary shares, such as preference shares, trust units, closed-end funds etc., we are left with 5,065 IPOs. All data related to the calculation of the issuers' discretionary current accruals and monthly returns as well as the monthly total return index of the equal-weighted MSCI Europe are extracted from Thomson Reuters Datastream. Fama-French's (1993) 3-factor returns are gathered from Kenneth French's official website. The accounting data used in this study are based on annual reports rather than quarterly reports. While quarterly data would allow us to more accurately capture the magnitude of discretionary current accrual buildup after the IPO, it also introduces the issue of cyclicality between firms. Further, the databases available to us had limited data on the quarterly reports of our issuing firm sample.

4.3.1 Issuing firms sample selection

After gathering the initial sample of European IPOs, we use a combination of SEDOLs and ISINs to match the IPOs with the corresponding firms in Datastream to obtain accounting data and monthly returns. We exclude firms that have neither an ISIN nor a SEDOL. In some instances, the IPO date reported by SDC Platinum does not correspond with the first available month of returns from Datastream. In such instances, we treat the *latter* of the two as the first IPO month. In cases where the lag is greater than a year, we exclude the IPO altogether. We further require that the observations have the accounting data needed for the calculation of current accruals (A1), that the IPO takes place before December 31st, 2015, and has a market capitalization of no less than $20 million to exclude the effect of microcaps, as done in Teoh et al. (1998). Given that Datastream reports company-specific data in the local currency of the firm's jurisdiction, we apply historical exchange rates (obtained from the International

Monetary Fund) to convert all figures to USD. The USD is used instead of the EUR (Euro) since we have data on IPO firms before 1999, the year the Euro was established as a currency.

We assort the issuing firms into non-sponsored, PE-backed, and VC-backed. After, we exclude IPOs that were backed by both PE and VC firms (five companies) as we do not want observations with overlapping ownership groups. Finally, we trim the dataset and drop the observations with the top and bottom 1% of DCA, motivated by extremely inflated values likely caused by data issues from Datastream. The aforementioned steps are summarized in Appendix 1.

These selection criteria yield a final issuer sample size of 2,126 firms. Table 1 shows the post-IPO firm characteristics of firms in our final sample.

Table 1 – Issuing firm characteristics USDm

	N		Market Capitalization	Book value	Total Assets	Book-to-market	Sales growth
All	2,126	Mean	622	199	762	0.36	71%
		Median	166	37	52	0.30	23%
Non-Sponsored	1,652	Mean	573	177	769	0.35	75%
		Median	142	34	46	0.29	24%
Private Equity	233	Mean	1,210	418	1,347	0.34	41%
		Median	578	115	361	0.30	15%
Venture Capital	241	Mean	381	131	143	0.39	79%
		Median	144	35	26	0.32	30%

The mean and median values of each issuing firm characteristic depicted above are listed for each of the three ownership groups.

Appendix 2 illustrates the time distribution of the IPOs. To no surprise, the number of IPOs observed in our sample is highest in the 1999 to 2000 and 2006 to 2007 periods, the years preceding the dot-com bubble and subprime mortgage crises, respectively. Further, the IPO count can be seen to drop significantly in the years following financial crises. By including IPOs in pre- and post-crisis periods, we capture a more accurate picture of how the share price of European firms that engage in earnings management performs in various states of the economy.

The industry distribution of issuing firms included in the final sample is presented in Appendix 3. To differentiate between industries, we downloaded each issuer's two-digit SIC code from Datastream and sorted them into industry clusters. This is carried out to ensure the existence of a large enough sample of industry peers for each respective issuer in the DCA estimation process (see equation A2). The Computer hardware and software is by far the largest

industry, followed by All others (includes industries such as agricultural production, forestry, tobacco products, postal services, repair services, etc.). The smallest industry clusters are Eating and drinking establishments followed by Mining. These sample characteristics are largely similar to those obtained by Teoh et al. (1998) and Loughran and Rither (1995).

4.3.2 Industry peers sample selection

In order to estimate the discretionary current accruals of issuing firms, data on companies in the same two-digit SIC industry code (i.e., industry peers) is gathered. The initial sample of industry peers consisted of 79,768 firms, which represents all firms registered on Datastream. After eliminating non-European industry peers, we are left with 18,299 peers.

As seen in Appendix 4, the SIC distribution of the industry peers is relatively similar to that of the issuing firms sample, where Computer hardware and software is the largest and Eating and drinking establishments is among the smallest. Yet another observation is that the smallest industry cluster in this sample, Health, is comprised of 184 companies, a quantity considered sufficient to yield valid results in the DCA estimation step. Appendix 5 provides a more detailed breakdown of the minimum, mean, maximum, and total number of industry peer observations seen in the aforementioned procedure. The largest number of industry peers observed in all years is 1,062 firms, whereas the fewest is 14 firms. We require a minimum of 5 industry peers for any given IPO in the year of the IPO, similar to Teoh et al. (1998).

4.4 Empirical limitations

As previously mentioned, current accruals are easier to manage than non-current accruals (Guenther, 1994), which motivates this paper's emphasis on current accruals. However, non-current accruals can still be manipulated (through for instance capitalization of R&D, conservative deprecation schemes, etc.) and such earnings management is not detected using our approach. Consequently, if there are systematic differences in how different owner groups manage earnings, these would go undetected in this study.

The second empirical limitation of this paper relates to its wide scope across time and geography. Studying a 20-year period comes with certain risks, such as heterogeneity over time, non-stationarity and the possibility of structural breaks. We control for these aspects by breaking the 20-year period into smaller compartments but still recognize that there could be

additional time-fixed effects. Furthermore, our study is Europe-wide. Europe is a continent comprised of numerous markets and currencies, especially when going back as far as 1995. Furthermore, previous literature on earnings management in European countries has detected differences in levels of earnings management between different countries, both before and after the implementation of IFRS in 2004 and 2005 (Gray et al., 2015; Maijoor and Vanstraelen, 2006). Although IFRS accounting rules are very similar to those of U.S. GAAP, the various local GAAP practices of all European countries likely come with certain local differences, ultimately reducing comparability. This is a limitation that we do not address in this paper but that we encourage the reader to keep in mind.

The third limitation is data-related. We split the issuers into the three ownership groups based on categorization by SDC Platinum. We rely on their classification of PE and VC ownernship and acknowledge the fact that their database may not be exhaustive.

Finally, there is an array of methods to estimate long-term performance, all of which have their benefits and limitations. We use the RATS methodology, which has the advantage of allowing for varying levels of risks over the event window but the drawback that residuals are not minimum variance due to the heteroskedasticity in the error term caused by differing risk parameters for the different securities (Råsbrandt, 2013). There is also significant time-overlap among our issuers, which introduces cross-correlation issues. These issues could be alleviated by using a calendar-time portfolio approach, as advocated by Fama (1998) and Mitchell and Stafford (2000). However, our interest in the long-term returns is quite binary: we seek to evaluate whether the DCA variable is indeed proxying for earnings management, in which case we would expect it to be associated with lower returns. We are therefore not particularly concerned with the exact magnitude of returns but rather their direction. For these reasons, we find the model quite suitable.

Section 5: Empirical Results and Discussion

In this section, we show and discuss the results as they relate to our three hypotheses. We first report the prevalence of earnings management in European IPOs in the 1995 to 2015 period (*H1*). We then show how the propensity to manage earnings differs based on previous ownership and across time (*H2*). We discuss these differences at length and in light of what previous research has found. We then test the robustness of the DCA variable. Finally, we

report the differences in long-term performance between quartiles sorted based on their level of DCA as a percentage of lagged total assets (*H3*).

5.1 Earnings management in European IPOs from 1995 to 2015 (Hypothesis 1)

Our first hypothesis (*H1*) posits that there is, on average, earnings management in IPOs. We find statistically significant evidence at the 1 percent level in support of this hypothesis across all time periods. We report the summary statistics of our findings in Table 2.

Table 2 – Summary Statistics of DCA Results by time period

	N	DCA (%)			T-stat	Wilcoxon signed-rank p-value	% with DCA>0
		Mean	Median	Std. dev.			
All-time	2,126	11.8	3.5	35.0	15.58	0.000	64.3
1995-1998	220	13.4	4.7	36.5	5.45	0.000	69.1
1999-2001	566	22.9	10.7	45.5	11.97	0.000	73.0
2002-2006	439	7.2	2.8	29.8	5.09	0.000	60.1
2007-2008	313	9.2	3.3	30.9	5.27	0.000	63.3
2009-2015	588	5.4	0.9	24.4	5.38	0.000	57.7

DCA = discretionary current accruals reported as a percentage of lagged total assets, estimated as explained in Section 4.1. The t-stat is two-tailed and refers to the mean with null-hypothesis of mean equalling zero. The two-tailed Wilcoxon signed-rank p-value is a statistical hypothesis test used to test the statistical significance of the median when the distribution of the sample cannot be assumed to be normally distributed. % with DCA>0 reports the percentage of issuers that exhibit positive discretionary current accruals.

If there were no earnings management in IPOs, we would expect about 50 percent of issuers to have positive discretionary current accruals and the remaining 50 percent to exhibit negative discretionary current accruals, with a mean and median of around zero. Over the entire time-period, we observe a mean DCA of 11.8 percent, significant on the 1 percent level, and that 64.3 percent of issuers exhibit positive discretionary current accruals. These results strongly support the existence of earnings management in IPOs. The different time periods observed unanimously support this conclusion, albeit with varying magnitudes.

We observe two trends in the magnitude and frequency of earnings management over the time periods. Firstly, there appears to be a downward trend, with lower average and median DCA in more recent years. In 1995 to 1998, the average DCA among European IPOs was 13.4 percent, with 69.1 percent of these exhibiting positive DCA, whereas for IPOs in 2009 to 2015, those figures were 5.4 and 57.7 percent, respectively. Secondly, earnings management appears to more prevalent in the time periods leading up to or during a financial crisis. In 1999 to 2001, the period leading up to and during the dot-com bubble, we observe an average DCA of 22.9

percent, with 73.0 percent of issuers exhibiting positive DCA, whereas for IPOs before and during the financial crisis of 2007 to 2008, those figures amount to 9.2 and 63.3 percent, respectively. The same downward trend is observed when comparing the two crises periods, though the 2007 to 2008 figures are still greater than those in both 2002 to 2006 and 2009 to 2015.

These results were expected and are largely in line with previous literature (e.g. Teoh et al., 1998; DuCharme et al., 2001). We suggest two main explanations for these findings: managerial wealth-maximizing incentives and informational asymmetries. In the context of an IPO, managers are incentivized to inflate earnings upwards to increase the proceeds of the IPO, in turn maximizing their own wealth (DuCharme et al., 2001). The limited publicly available information on the firm makes it difficult for investors to detect such earnings manipulation (DuCharme et al., 2001), which is manifested in the little resistance managers face in inflating earnings.

As mentioned above, we observe the highest DCA level in the 1999 to 2001 period. In addition, this window contains 566 IPOs, markedly more IPOs per year than in any other period in our sample. Given that this time period coincides with the dot-com bubble, an era characterized by a rapid rise in the stock valuations of U.S technology companies, we argue that IPO firm managers took advantage of this hot issue market by managing upwards more aggressively than in other periods to ride the wave of investor optimism. This is supported by the hot issue market theory (see Section 2.1.4). In other words, managers may be more incentivized to inflate earnings in hot issue periods, when high market valuations may be believed to be less attributable to earnings manipulation but rather strong investor confidence and the booming economy.

5.2 Earnings management by previous ownership (Hypothesis 2)

Our second hypothesis (*H2*) is that non-sponsored IPOs generally exhibit greater levels of earnings management (as proxied for by DCA) than PE- and VC-backed IPOs. Our results show that non-sponsored IPOs tend to have relatively high DCA levels, as marked by a mean of 14.2 percent. In contrast, private equity- and venture capital-backed IPOs engage noticeably less in earnings management with a mean of 3.0 percent and 4.3 percent, respectively. In Panel

A of Table 3, we report the summary statistics of the DCA estimation for the different ownership groups. In Panel B, we report mean DCA by owner group and time period.

Table 3 – Summary Statistics of DCA Results by Previous Ownership

Panel A – Summary Statistics of DCA Results by Ownership Group							
	N	DCA (%)			T-stat	Wilcoxon signed-rank p-value	% with DCA>0
		Mean	Median	Std. dev.			
Non-Sponsored	1,652	14.2	5.2	37.0	15.57	0.000	67.5
Private Equity	233	3.0	0.7	14.0	3.32	0.006	55.8
Venture Capital	241	4.3	0.2	32.9	2.03	0.529	50.2
All issuing firms	2,126	11.8	3.5	35.0	15.58	0.000	64.3

Panel B – Mean DCA (%) by Ownership Group Over Time				
Period	All	NS	PE	VC
All time	11.8	14.2	3.0	4.3
(t-stat)	*(15.58)*	*(15.57)*	*(3.32)*	*(2.03)*
1995-1998	13.4	13.6	4.9	16.6
(t-stat)	*(5.45)*	*(5.22)*	*(1.02)*	*(1.64)*
1999-2001	22.9	23.6	15.0	14.8
(t-stat)	*(11.97)*	*(11.85)*	*(1.64)*	*(1.51)*
2002-2006	7.2	9.5	1.9	4.3
(t-stat)	*(5.09)*	*(5.04)*	*(1.16)*	*(1.28)*
2007-2008	9.2	11.3	3.9	1.4
(t-stat)	*(5.27)*	*(5.10)*	*(2.34)*	*(0.40)*
2009-2015	5.4	7.3	1.4	0.9
(t-stat)	*(5.38)*	*(5.69)*	*(2.06)*	*(0.25)*

DCA = discretionary current accruals reported as a percentage of lagged total assets, estimated as explained in Section 4.1. The t-stat is two-tailed and refers to the mean with null-hypothesis of mean equalling zero. The two-tailed Wilcoxon signed-rank p-value is a statistical hypothesis test used to test the statistical significance of the median when the distribution of the sample cannot be assumed to be normally distributed. % with DCA>0 reports the percentage of issuers that exhibit positive discretionary current accruals.

We find that non-sponsored, PE-backed and VC-backed IPOs have average discretionary current accruals of 14.2, 3.0, and 4.3 percent of lagged total assets, statistically significant on the 1 percent, 1 percent, and 5 percent levels, respectively. When comparing the means of the three ownership groups, we find that the mean DCA in PE- and VC-backed IPOs is lower than that in non-sponsored IPOs, statistically significant at the 1 percent level (t-statistics of 8.6 and 4.3 for NS ≠ PE and NS ≠ VC, respectively). When comparing the mean of PE-backed IPOs to that of VC-backed IPOs, however, we find no statistically significant difference (t-statistic of -0.5 for PE ≠ VC).

These results strongly support *H2*; there are, on average, higher levels of earnings management (as proxied for by DCA) in non-sponsored IPOs than in PE- and VC-backed IPOs

in our sample. These differences are prevalent not only in the magnitude but also in the frequency of the earnings management; we observe that 67.5 percent of non-sponsored IPOs exhibit positive discretionary current accruals, whereas among PE- and VC-backed IPOs 55.8 and 50.2 percent of issuers exhibit positive discretionary current accruals, respectively. In other words, only half of the VC-backed issuers have positive DCA, implying a median close to zero, which is confirmed by a statistically insignificant Wilcoxon sign-rank p-value. This questions the existence of earnings management in VC-backed issuers, given how a median of zero is the distribution we would expect for a sample without earnings management (or, more specifically, with the same level of earnings management as industry peers). Nonetheless, the mean DCA of VC-sponsored IPOs is still positive and statistically significant, which deviates from the zero-mean expectation we have for an earnings management neutral portfolio. Regardless, the evidence points toward little to no earnings management in VC-backed issuers, a markedly different conclusion than that of non-sponsored firms.

An important concern in our thesis is to control for differences and heterogeneity across time, given how we examine a 20-year period. As evident in Panel B of Table 3, the evidence points to the same conclusion in all time periods; PE-backed IPOs exhibit lower levels of DCA than non-sponsored IPOs in all time periods. VC-backed IPOs also exhibit lowers levels of DCA than non-sponsored IPOs in all time periods except in 1995 to 1998, when the difference is quite small and the DCA of VC-issuers is not significantly different from zero. However, given how the total number of PE- and VC-backed issuers is 233 and 241, respectively, some periods have few observations for these two groups and should be interpreted with caution. Further, the take-away from this exercise should not be the differences between owner groups in certain time periods but rather that no individual time period is driving the results and that all time periods paint a similar picture: non-sponsored IPOs exhibit greater magnitude and frequency of earnings management than their private equity- and venture capital-backed counterparts.

5.2.1 Understanding differences in earnings management across previous owners

Several explanations have been put forth in an attempt to explain similar findings in a U.S. setting. We explore three main explanations: (i) reputation theory and professional owner effects, (ii) differences in firm characteristics, and (iii) that PE and VC firms could be more

adept at managing earnings in a manner that goes undetected by our current accruals-based methodology.

(i) The first and main explanations are the notions of reputation theory and professional owner effects. As outlined in Section 2.3.2 and 2.3.3, venture capitalists and private equity firms require access to the capital markets since they will likely conduct IPOs of their portfolio companies in the future. Accordingly, any attempt to fool the investors through upwards earnings management in public offerings may tarnish their reputation and estrange investors. Given that VCs and PEs generally collaborate with higher quality investment banks and auditors, reputational concerns tend to be carried over to the other parties and advisors involved in the public offering, which creates further resistance against earnings management (Megginson and Weiss, 1991). Moreover, VC and PE ownership are associated with other professional owner effects, such as increased institutional shareholding and board engagement (Cotter and Peck, 2001; Gompers 1995; Lerner 1995).

Large institutional shareholding in PE-backed IPOs may entail more stringent standards with regards to transparent governance and financial reporting in their portfolio companies. Any departure from such standards threatens the PE firm's business ties. The active monitoring and board membership associated with sponsor ownership further inhibit any attempts by the PE- and VC-backed issuers to inflate their earnings (Baker and Gompers, 2003). Additionally, assuming earnings management has occurred, the inevitable reversal of abnormal discretionary accruals may weigh on a VC's portfolio company's share price (if the VC has not fully exited the firm upon lockup expiry). A track record of underperforming investments further jeopardizes the VCs reputation and chances of participating in future sponsorship syndicates (Tian et al., 2016).

(ii) The second potential explanation explores the possibility that differences beyond firm ownership type may affect our findings. For instance, PE-backed issuers are generally mature firms that return to the public market, while non-sponsored issuers are typically younger growth-oriented firms with no financial reporting history (Katz, 2009). In further support of differences in firm characteristics, Brav and Gompers (1997) show that non-sponsored firms are typically smaller than their PE- and VC-backed

counterparts and argue that they likely have less sophisticated financial reporting and governance systems in place. These two examples point to the possibility that the differences we observe between owner groups are due to firm characteristics such as size, growth, and industry rather than ownership. We explore this thoroughly in Section 5.2.2 and find that the differences in DCA across owner groups persist despite controlling for size, book-to-market, and industry.

(iii) The third potential explanation addresses the possibility that the differences observed are not solely due to differences in earnings management between the ownership groups but rather due to differences in methods employed to manage earnings. PEs and VCs typically buy firms with the intention of selling them in the upcoming three to seven years (Kaplan and Stromberg, 2009). Given how they routinely buy and sell companies, PE and VC owners are likely particularly well-qualified to window-dress a firm's earnings preceding a sale in sophisticated, less detectable ways. Furthermore, since professional owners such as PE and VC firms have the exit in mind from a very early stage, they have a considerable window of time to plan and implement income-increasing changes to non-current assets through, for instance, conservative depreciation schemes, capitalization of R&D expenses, etc.

Our methodology focuses on firms' current accruals and does not capture earnings management arising from the discretionary adjustments of non-current accruals, such as the ones described above. It is therefore possible that the differences in earnings management between the observed ownership groups are more reflective of the *approach* employed to manage earnings than the *magnitude* thereof. However, non-current accruals are also more difficult to manage since managers generally have greater discretion on short-term accruals than on long-term accruals (Guenther, 1994). Nonetheless, we view this as a limitation of our paper that would be important to address in future research. We simultaneously argue that the rationale outlined in explanation (i) still applies and that we would not expect the results to be drastically different if non-current accruals were accounted for.

5.2.2 Robustness of the DCA variable

In this section, we address the concern that differences in DCA across owner base could be driven by firm characteristics rather than by previous ownership. We conduct this test by regressing DCA on a set of control variables, proxying for size, growth and industry characteristics, along with two binary variables equal to one if the issuer is PE- or VC-backed. If previous ownership influences DCA, irrespective of firm characteristics, we would expect the PE and VC ownership variables in our control regression to remain significantly different from zero in this regression. Summary statistics from the control regression are shown in Table 4.

Table 4 – Summary Statistics from Control Variable Regression A6

Variable	Estimate	Standard error	T-stat	P-value
Intercept	0.219	0.036	6.00	0.000
LMVE	-0.020	0.005	-3.96	0.000
BTM	0.000	0.021	0.016	0.987
PE	-0.087	0.025	-3.46	0.001
VC	-0.082	0.025	-3.23	0.001

LMVE is the natural logarithm of market capitalization and *BTM* is the book-to-market. PE and VC are binary variables equal to one if the issuer is backed by a PE or VC firm, respectively. T-stats and p-values are two-tailed. The table summarizes the results of the following regression (A6):

$$DCA_i = \alpha_i + \beta_1 LMVE_i + \beta_2 BTM_i + \beta_3 PE_i + \beta_4 VC_i + \theta_1 Industry_i + \varepsilon_i$$

As shown above, the coefficient of *LMVE* (i.e., size) is negative, suggesting a negative relationship between size and earnings management. In addition, 4 of the 22 industries are significantly different from zero, suggesting that firms in certain industries are more prone to manage earnings. For the sake of brevity, we show all the coefficients of the industry factors in Appendix 6. Book-to-market, on the other hand, shows no bearing on the DCA variable. With the effects of size, book-to-market, and industry accounted for, both PE and VC ownership appear to be associated with significantly lower levels of earnings management, evidence in favor *H2*.

5.3 Impact of DCA on long-term share performance (Hypothesis 3)

In this section, we test our third hypothesis (*H3*) – that issuers with more aggressive earnings management experience greater underperformance than issuers that manage earnings more conservatively. We find support for this hypothesis when looking at raw and market-adjusted returns, with the aggressive portfolio (Q4) performing worst in all time periods. However,

when we employ the Fama-French (1993) model, the results become slightly more ambiguous. Before we further analyze these results, we show the post-IPO firm characteristics of the quartiles below.

Table 5 – Summary Statistics of DCA Results by DCA Quartile

		DCA (%)			M$ MV*	BTM*
	N	Mean	Median	Std. dev.	Median	Median
Q1 (DCA < -2.4%)	532	-16.0	-8.6	19.2	175	0.303
Q2 (-2.4% < DCA < 2.2%)	531	0.5	0.4	1.6	292	0.283
Q3 (2.2% < DCA < 12.7%)	531	9.4	8.9	4.0	145	0.319
Q4 (DCA > 12.7%)	532	54.1	38.5	41.5	119	0.262
All issuing firms	2,126	12.0	3.6	34.7	166	0.296

* M$ MV is million USD market value of equity and BTM is book-to-market.

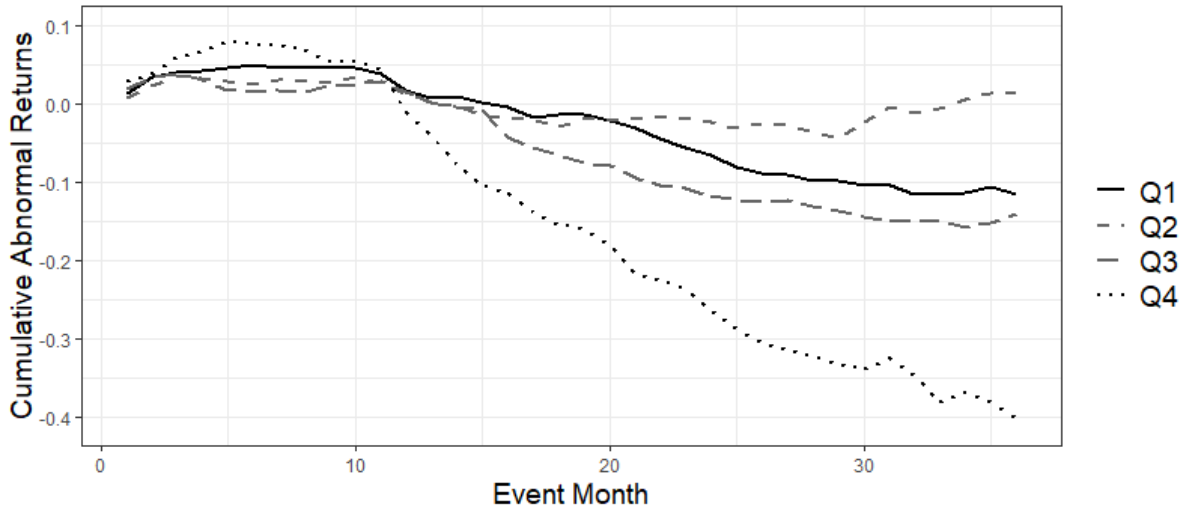
As evident in the above table, there are slight differences in size and book-to-market, with the most aggressive earnings managers being smaller and with lower book-to-market ratios. This has implications for the Fama-French (1993) 3-factor-adjusted returns, which we will return to shortly. In Table 6, we report the 36-month returns for all time periods, for all three methods, and for the quartiles. Panel A shows the cumulated raw return, Panel B the market-adjusted cumulated abnormal returns (CARs), and Panel C the Fama-French (1993) 3-factor model-adjusted CARs.

Table 6 – 36-month abnormal returns by DCA quartiles

Panel A: Raw returns						
Period	N	Returns (%)				
		All	Q1	Q2	Q3	Q4
All-time	2,126	-10.0	-2.7	13.6	-8.0	-44.4
	(t-stat)	(-3.95)	(-0.54)	(2.36)	(-1.75)	(-7.44)
1995-1998	220	47.8	83.2	40.4	31.6	4.2
	(t-stat)	(5.67)	(5.64)	(3.04)	(2.45)	(0.40)
1999-2001	566	-57.4	-46.6	-35.3	-57.2	-89.9
	(t-stat)	(-9.02)	(-4.02)	(-3.21)	(-4.45)	(-6.01)
2002-2006	439	11.0	3.0	47.9	9.6	-15.1
	(t-stat)	(1.76)	(0.39)	(2.26)	(1.32)	(-1.63)
2007-2008	313	-22.4	-26.6	-18.7	-15.8	-29.2
	(t-stat)	(-4.21)	(-2.29)	(-1.93)	(-1.65)	(-2.53)
2009-2015	588	7.1	9.9	19.3	7.7	-8.8
	(t-stat)	(2.04)	(1.38)	(3.48)	(1.07)	(-1.17)
Panel B: Market-adjusted returns (MSCI equal-weighted)						
Period	N	Returns (%)				
		All	Q1	Q2	Q3	Q4
All-time	2,126	-16.6	-11.5	1.4	-14.1	-40.1
	(t-stat)	(-6.52)	(-2.51)	(0.26)	(-3.22)	(-7.07)
1995-1998	220	0.7	37.8	4.6	-13.7	-27.4
	(t-stat)	(0.10)	(2.46)	(0.34)	(-1.02)	(-1.69)
1999-2001	566	-32.2	-26.4	-17.7	-35.7	-50.0
	(t-stat)	(-5.29)	(-2.38)	(-1.67)	(-2.87)	(-3.49)
2002-2006	439	4.0	0.4	33.0	4.1	-17.3
	(t-stat)	(0.60)	(0.04)	(1.55)	(0.54)	(-1.90)
2007-2008	313	-0.5	2.6	-1.8	10.9	-12.1
	(t-stat)	(-0.08)	(0.20)	(-0.17)	(0.92)	(-0.99)
2009-2015	588	-8.0	-5.2	5.5	-6.6	-26.4
	(t-stat)	(-2.27)	(-0.71)	(1.00)	(-0.90)	(-3.42)
Panel C: Fama-French 3-factor-adjusted returns						
Period	N	Returns (%)				
		All	Q1	Q2	Q3	Q4
All-time	2,126	-2.7	-2.9	2.7	-3.5	-5.8
	(t-stat)	(-1.06)	(-0.63)	(0.47)	(-0.78)	(-1.00)
1995-1998	220	32.5	64.4	36.0	9.4	16.0
	(t-stat)	(4.18)	(4.05)	(2.48)	(0.64)	(0.83)
1999-2001	566	46.2	40.6	30.3	44.3	68.1
	(t-stat)	(6.96)	(3.28)	(2.60)	(3.26)	(4.34)
2002-2006	439	-6.4	-14.7	18.4	-0.4	-30.4
	(t-stat)	(-0.91)	(-1.18)	(0.82)	(-0.04)	(-3.06)
2007-2008	313	-14.3	-10.1	-15.8	-11.5	-18.7
	(t-stat)	(-2.16)	(-0.70)	(-1.33)	(-0.85)	(-1.34)
2009-2015	588	-14.3	-10.3	-2.3	-12.0	-33.0
	(t-stat)	(-3.96)	(-1.35)	(-0.40)	(-1.56)	(-4.17)

First, the raw returns unanimously show that the aggressive portfolio performs worse than the others across all time periods by a substantial margin. Over the entire period, the conservative portfolio returns negative 2.7 percent while the aggressive portfolio returns negative 44.4 percent. However, raw returns do not adjust for the risk level of the underlying portfolio and should therefore not be given too much weight. Second, when we compute market-adjusted returns[3], the pattern remains the same as for the raw returns: the aggressive portfolio underperforms the other quartiles both over the entire period and during every individual time period. In Figure 4, we illustrate the development of returns over the 36 months.

Figure 4 – Market-adjusted cumulative abnormal returns by quartile



The returns for each issuing firm quartile above are depicted across the 36-month post IPO window. Q1 represents the most conservative earnings managers while Q4 represents the most aggressive ones.

All four quartiles outperform the equal-weighted MSCI Europe in their first 10 months, with the aggressive portfolio performing particularly well the first 4 to 8 months. After the first 10 months, however, all portfolios start underperforming the benchmark. In the remaining months, the aggressive portfolio underperforms by a substantial margin, while the conservative Q1 and the neutral Q2 portfolios perform best among the four quartiles.

These results are largely in line with what we would expect, given the length of the lockup period; owners that are subject to a lockup period but intend to sell their shares upon lockup expiration have strong monetary incentives to inflate earnings the first 3 to 9 months. The figure of the returns is in strong support of this notion. Not only does the aggressive portfolio exhibit the highest risk-adjusted returns in the first 3 to 9 months, it also shows the

[3] The equal-weighted MSCI Europe index as the benchmark

greatest underperformance in the remainder of the event-window. The difference between the 36-month CARs of the Q1 and Q4 portfolios are statistically significant on the 1 percent level (t-statistic of 5.6)

However, as shown in Table 5, there are differences in size and book-to-market between the quartiles. These firm characteristics are risk-factors that are not accounted for using solely the market-adjusted returns that could be driving the differences in returns. When we employ Fama-French's 3-factor model to capture the exposure to these risk-factors, the effect disappears in the full-length period (with no statistically significant difference) but remains in four of the five grouped periods. The time period when the aggressive portfolio does not perform worse than the other portfolios is the period affected by the dot-com bubble, 1999 to 2001. Upon further examination of the deviating time period, we observe that the raw returns are negative 46.7 and negative 89.9 percent for Q1 and Q4, respectively, while the corresponding Fama-French risk-adjusted abnormal returns are positive 40.6 and 68.1 percent for the two quartiles. In other words, given their factor-loadings on the three risk factors in the Fama-French model, the expected returns for Q1 and Q4 in a downturn as severe as the dot-com bubble were negative 87.2 and negative 158.0 percent. A return expectation that is lower than negative 100 percent is, of course, unrealistic but is a consequence of the cumulation of abnormal returns. Logically, cumulating returns instead of compounding them comes with the consequence of understating positive returns and exaggerating negative returns, which is a fair approximation until changes of great magnitude such as these are observed.

Given how the figures during the dot-com years (1999 to 2001) deviate so clearly from other time periods and thereby drive the results for the full-length period, we also run the regression on all issuers that went public between 2002 and 2015. In this period, the aggressive portfolio yields an abnormal return of negative 30.1 percent in the 36 months following the IPO while the conservative portfolio's equivalent return is negative 13.6 percent. The difference in CARs between the Q1 and Q4 portfolio is statistically significant on the 1 percent level (t-statistic of 3.1).

When analyzing the full-length period, these results are somewhat ambiguous and although DCA is clearly associated with greater underperformance in raw and market-adjusted returns, we cannot exclude the possibility that higher DCA is to some extent proxying for exposure to size and book-to-market risk factors. However, when we look at 2002 to 2015, the period after the dot-com years, the conservative portfolio outperforms the aggressive portfolio

by 18.5 percent in raw returns, 15.5 percent in equal-weighted MSCI market-adjusted returns, and 16.5 percent in Fama-French 3-factor-adjusted returns.

These findings partially support *H3*: the aggressive quartile of earnings managers perform significantly worse than the conservative quartile in all time periods and with all benchmarks, with the exception of the dot-com years (1999 to 2001) when the 3-factor model is employed.

Section 6: Conclusion and Future Research

This paper studies earnings management in European IPOs between 1995 and 2015 and examines how it differs by three groups of issuers, split by previous ownership: non-sponsored, private equity-backed, and venture capital-backed. We find compelling evidence of earnings management in IPOs across all time-periods studied. The full sample of issuers exhibit average and median discretionary current accruals (DCA)–which we use as a proxy for earnings management–in the year of the IPO of 11.8 and 3.5 percent of lagged total assets, respectively. The means and medians are positive and statistically significant at the 1 percent level in all time periods studied. These results lend strong support to the existence of earnings management in European IPOs, which imply that owners act on wealth-maximizing incentives and take advantage of informational asymmetries between the firm and investors.

When examining differences in earnings management across groups of previous ownership, we find that PE- and VC-backed issuers exhibit an average of 3.0 and 4.3 percent of discretionary current accruals, significantly lower than the 14.2 percent observed in non-sponsored IPOs. Furthermore, roughly two thirds of the non-sponsored issuers display DCA greater than zero, while their PE- and VC-backed counterparts exhibit DCA above zero in 55.8 and 50.2 percent of cases, respectively. These results strongly suggest that earnings management is, on average, greater and more frequent in non-sponsored IPOs than in those backed by financial sponsors, statistically significant on the 1 percent level. These results are robust to controlling for the effects of size, book-to-market, and industry-fixed effects. These differences suggest that issuing firms backed by financial sponsors (i.e., PE and VC firms) generally have better earnings quality (i.e., that they accurately reflect the economic reality of

the firm), potentially attributable to the professional owners' enforcement of better corporate governance and greater exposure towards reputation effects.

To validate discretionary current accruals as a proxy for earnings management, we also study the 36-month post-issue performance of the issuing firms, with the expectation that the quartile of issuers with the highest levels of discretionary current accruals (labeled as the aggressive quartile) performs worse than the quartile with the lowest levels of discretionary current accruals (labeled the conservative quartile). We find that the aggressive quartile underperforms the conservative quartile by 41.7 percent in raw returns, 28.6 percent in MSCI Europe equal-weighted market-adjusted returns, and 2.9 percent in Fama-French (1993) 3-factor-adjusted returns in the 36 months following the respective IPOs. The lower differences in the Fama-French (1993) 3-factor-adjusted returns are driven by the aggressive portfolio's overperformance during the dot-com crisis of the early 2000's. When instead examining issuers that went public between 2002 and 2015, the aggressive portfolio underperforms the conservative portfolio by 16.5 percent in Fama-French 3-factor-adjusted returns. Overall, these results credit DCA as a proxy for earnings management.

This paper fills an important gap in existing European earnings management literature by showcasing the differences in earnings management in IPOs across previous owners. As we see it, there are two main areas where these findings could be developed further. First, applying a geographic lens on a similar research question as studied in this paper would serve to highlight differences in earnings management practices across geographies.

Second, we mention in our paper that our methodology focuses on current accruals because these are most easily managed. However, long-term accruals can also be managed, and an argument can be made that as owners with the exit in mind from an early stage, PE and VC firms are well-positioned to take advantage of such earnings management strategies. Therefore, it would be interesting to conduct a similar study that also accounts for discretionary *noncurrent* accruals.

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Appendices

Appendix 1 – Data cleaning process

Step		Variable units (N)
1	Extraction of European IPO firms from SDC Platinum	5,065
2	Removal of firms with neither ISIN nor SEDOL codes	-250
3	Removal of firms with missing accruals and share price data	-1,708
4	Removal of firms with less than $20m market capitalization	-584
5	Removal of firms backed by both PE and VC firms	-5
6	Removal of IPOs after 2015-12-31	-345
7	Removal of IPOs with DCA below 1st and 99th percentile	-44
	Remaining IPOs	**2,126**

The table above illustrates the steps used to eliminate issuing firms from our initial sample.

Appendix 2 – Time distribution of IPOs

Year	Frequency	%	Cumulative freq.	%
1995	30	1.4%	30	1.4%
1996	19	0.9%	49	2.3%
1997	59	2.8%	108	5.1%
1998	119	5.6%	227	10.7%
1999	248	11.7%	475	22.3%
2000	230	10.8%	705	33.2%
2001	87	4.1%	792	37.3%
2002	29	1.4%	821	38.6%
2003	15	0.7%	836	39.3%
2004	74	3.5%	910	42.8%
2005	118	5.6%	1,028	48.4%
2006	225	10.6%	1,253	58.9%
2007	247	11.6%	1,500	70.6%
2008	41	1.9%	1,541	72.5%
2009	19	0.9%	1,560	73.4%
2010	88	4.1%	1,648	77.5%
2011	82	3.9%	1,730	81.4%
2012	51	2.4%	1,781	83.8%
2013	71	3.3%	1,852	87.1%
2014	144	6.8%	1,996	93.9%
2015	130	6.1%	2,126	100.0%
Total	2,126	100.0%		

The frequency and cumulative frequency of the IPOs of our issuing firm sample are showcased above.

Appendix 3 – SIC Distribution of Issuing Firms

Industry	Two-digit SIC Codes	Frequency	%
Chemical products	28	161	7.6%
Communications	48	99	4.7%
Computer hardware and software	35, 73-74	519	24.4%
Construction	15-19	42	2.0%
Durable goods	50	42	2.0%
Eating and drinking establishments	58	10	0.5%
Electric and gas services	49	78	3.7%
Electronic equipment	36	127	6.0%
Entertainment services	70-71, 78-79	65	3.1%
Financial services	60-64	74	3.5%
Food products	20	66	3.1%
Health	80	26	1.2%
Investment firms	67	55	2.6%
Manufacturing	30-34	86	4.0%
Mining	10-13	18	0.8%
Oil and gas	29	44	2.1%
Paper and paper products	24-27	50	2.4%
Real estate	65-66	79	3.7%
Retail	53-54, 56-57, 59	89	4.2%
Scientific instruments	38	61	2.9%
Transportation	37, 39-42, 44-45, 47	142	6.7%
All others	1-9, 14, 21-23, 43, 46, 51-52, 55, 68-69, 72, 75-77, 81-99	193	9.1%
Total		2,126	100.0%

Appendix 3 shows the frequency of IPOs observed in each industry studied

Appendix 4 – SIC Distribution of Industry Peers

Industry	Two-digit SIC Codes	Frequency	%
Chemical products	28	665	3.63%
Communications	48	999	5.46%
Computer hardware and software	35, 73-74	2,343	12.80%
Construction	15-19	571	3.12%
Durable goods	50	367	2.01%
Eating and drinking establishments	58	116	0.63%
Electric and gas services	49	1,412	7.72%
Electronic equipment	36	561	3.07%
Entertainment services	70-71, 78-79	557	3.04%
Financial services	60-64	1,629	8.90%
Food products	20	623	3.40%
Health	80	94	0.51%
Investment firms	67	830	4.54%
Manufacturing	30-34	889	4.86%
Mining	10-13	323	1.77%
Oil and gas	29	430	2.35%
Paper and paper products	24-27	586	3.20%
Real estate	65-66	948	5.18%
Retail	53-54, 56-57, 59	559	3.05%
Scientific instruments	38	414	2.26%
Transportation	37, 39-42, 44-45, 47	1,718	9.39%
All others	1-9, 14, 21-23, 43, 46, 51-52, 55, 68-69, 72, 75-77, 81-99	1,665	9.10%
Total		18,299	100.0%

The table above shows the industry distribution of industry peers used in equation A2.

Appendix 5 – Observations of Industry Peers Per Year and Industry

Year	Observations (N)			
	Minimum	Mean	Max	Total
1995	14	180	540	3,966
1996	14	184	549	4,054
1997	18	240	655	5,269
1998	21	263	720	5,776
1999	24	266	793	5,846
2000	28	269	845	5,918
2001	31	278	881	6,115
2002	34	274	860	6,034
2003	35	277	880	6,097
2004	35	287	904	6,323
2005	39	296	956	6,519
2006	39	362	1062	7,969
2007	38	372	1052	8,181
2008	35	369	1008	8,108
2009	35	363	972	7,982
2010	35	355	935	7,815
2011	34	344	907	7,578
2012	35	338	906	7,435
2013	33	337	891	7,404
2014	31	333	883	7,317
2015	32	322	848	7,085

Appendix 5 shows the minimum, mean, maximum, and total number of industry peers used in regression A2 in every year of the period studied, i.e. in 1995, the mininum number of peers used was 14, for the Health industry.

Appendix 6 – Control regression

Variable	Estimate	Standard Error	T-stat	P-value
Intercept	0.219	0.036	6.00***	0.000
LMVE	-0.020	0.005	-3.96***	0.000
BTM	0.000	0.021	0.02	0.987
VC	-0.087	0.025	-3.46***	0.001
PE	-0.082	0.025	-3.23***	0.001
Mining	-0.081	0.087	-0.93	0.353
Oil and Gas	-0.011	0.059	-0.19	0.850
Construction	-0.047	0.059	-0.80	0.422
Food Products	0.007	0.050	0.13	0.895
Paper and Paper Products	-0.046	0.055	-0.84	0.404
Chemical Products	-0.090	0.038	-2.37**	0.018
Manufacturing	-0.020	0.045	-0.44	0.657
Computer Hardware & Software	0.086	0.030	2.92***	0.004
Electronic Equipment	0.052	0.040	1.31	0.189
Transportation	-0.011	0.039	-0.28	0.780
Scientific Instruments	0.079	0.051	1.55	0.121
Communications	0.010	0.044	0.22	0.824
Electric and Gas Services	0.035	0.049	0.71	0.475
Durable Goods	0.047	0.059	0.79	0.429
Retail	0.015	0.045	0.34	0.736
Eating and Drinking Establishments	-0.118	0.111	-1.07	0.286
Financial Services	0.141	0.048	2.91***	0.004
Real Estate	0.112	0.047	2.38**	0.017
Investment firms	0.076	0.053	1.44	0.150
Entertainment Services	0.003	0.050	0.06	0.955
Health	-0.016	0.074	-0.22	0.828

This table shows results of the DCA variable robustness check of regression A6.