Earnings Quality and Ownership Structure: The Role of Private Equity Sponsors*

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Abstract

This study explores how the ownership structure of a firm, in particular, whether it is private-equity-backed (PE-backed) or non-PE-backed, affects earnings quality. I investigate for a unique sample of private firms with public debt a time series of financial statement data significantly longer than the three years provided in the typical IPO prospectus. My findings suggest that PE-backed private firms generally have higher earnings quality—engage in less upward earnings management and report more conservatively—than non-PE-backed private firms, both before and after the IPO. The results further indicate that majority ownership by a PE sponsor is associated, in the post-IPO period, with better long-term stock price performance, and minority ownership by a PE sponsor with worse long-term financial and stock price performance, than ownership by management. In addition, larger PE sponsor size is positively associated with both better long-term financial and stock price performance when the firm goes public. The study adds to our understanding of how ownership structure and corporate governance affect quality of earnings.

Keywords: conservatism; earnings management; private and public firms; private equity sponsors.

Data Availability: Data are available from sources identified in the paper.

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I. INTRODUCTION

This study explores how the ownership structure of a firm affects accounting practices and performance in the period surrounding an IPO. In particular, I examine how degree of earnings management and conservatism differ between private equity-backed (PE-backed) and non-PE-backed firms both before and after an IPO.[1] In addition, I examine the association between the PE sponsor's ownership-stake and size and the firm's post-IPO performance.

PE sponsors have become prominent in the U.S. capital markets, participating in more than one-third of IPOs (also known as Reverse LBOs)[2] and in more than one-quarter of U.S. mergers during the past few years (*Investment Dealers' Digest*, February 23, 2006; *Forbes*, December 10, 2007). The value of private equity buyouts in the United States surged to $220 billion in 2006 (*Economist.com*, February 8, 2007), and $438 billion in private-equity deals were announced in 2007 (*USA Today*, January 29, 2008). Hence, the importance of examining the effect of PE sponsors on corporate governance and performance and better understanding their reporting practices.

Using a unique sample of firms with privately held equity and publicly held debt that provided access to a time series of financial information longer than the three years provided in the typical prospectus, I first compare the tendency of PE-backed and non-PE-backed firms to

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[1] PE-backed firms are owned by PE sponsors, investment firms such as the Blackstone Group, Texas Pacific Group, and Kohlberg Kravis Roberts & Co., which generally buy mature businesses via leveraged buyout (LBO) or management buyout (MBO) transactions and take them private. Non-PE-backed firms are defined in this study as firms that are majority owned by management and do not have any PE sponsors.

[2] Reverse LBOs, in particular, have recently been subjected to public scrutiny. Newspaper headlines such as *"private equity walks on water. But more of its new issues sink like a stone than you would think"* refer to revered LBOs that went sour such as Refco, Inc., and Sealy Corporation, the stock price of which dropped 59% in the 19 months since its IPO (*Forbes*, December 10, 2007).

engage in *upward earnings management* in the period surrounding an IPO.[3] Tighter monitoring associated with the presence of PE sponsors on the board, together with these repeated players' reputation considerations pre- and post-IPO, are expected to restrain earnings management. Alternatively, more opportunistic behavior and IPO timing documented on the part of PE sponsors (Degeorge and Zeckhauser 1993), and their overall larger ownership concentration (Leuz 2006), are expected to increase earnings management. Consistent with the monitoring role of PE sponsors, I find, for a sample of 147 IPOs (1,070 firm-year observations) that occurred between 1980 and 2005, that PE-backed firms engaged in significantly less upward earnings management than non-PE-backed firms, both pre- and post-IPO.

I also examine whether PE-backed and non-PE-backed firms differ with respect to another earnings quality property, *timely loss recognition* (conditional conservatism). Although all firm-year observations in my sample are subject to identical financial reporting regulations, the professionalized environment created by PE sponsors, together with their significantly higher leverage levels, are expected to increase demand for timely information by both PE sponsor-owners and debt holders. PE sponsors that can better anticipate and prepare their portfolio firms for future IPOs (Gompers 1995, Kaplan and Strömberg 2003), moreover, are expected to begin to report more conservatively due to market enforcement mechanisms and public investors' anticipated demands. On the other hand, PE sponsor-owners in private firms, because the stakes they hold are usually larger than the stakes held by management in non PE-backed firms, can resolve any information asymmetry through "insider access" and, hence, have less need to rely

[3] Only scant data is available on privately held firms in the United States., with the exception of financial institutions and insurance firms (Mikhail 1999, Beatty et al. 2002, Beatty and Harris 1998). Indeed, Hand (2005), who uses prospectus information to gain insight on private firms, emphasizes that he is "unaware of any other systematic, large-sample source of financial statement data for pre-IPO companies." Private firms with public debt are nevertheless subject to the same financial reporting regulations as public firms under sections 13 and 15(d) of the Securities Exchange Act of 1934. This sample includes such large and familiar firms as J. Crew, Sealy Corp., and UPS.

on public disclosure and demand timely loss recognition. The results of using two models of conditional conservatism—a time-series measure of timely loss recognition model and an accruals-based model—suggest that PE-backed firms recognize losses in a timelier manner than non-PE-backed firms, especially in the pre-IPO period, consistent with the harsher financial reporting discipline associated with having PE sponsors.

Finally, I test whether post-IPO, *long-term financial and stock-price performance* are associated with characteristics of ownership status and PE sponsor size. PE sponsors monitor firms' progress as well as provide support in the form of financial and strategic advice (Gompers 1995, Lerner 1995). Hence, PE-backed firms tend to exhibit better earnings quality and post-IPO financial and stock price performance than non-PE-backed firms (Ivanov et al. 2008). Having PE sponsors with higher ownership stakes, especially larger PE sponsors with greater capital under management (as a reputation proxy), can contribute to even tighter monitoring and, hence, better long-term performance. Alternatively, when PE-backed firms return to public listing, agency theory predicts a reintroduction of inefficiencies and loss of previously experienced performance gains (Bruton et al. 2002). Consistent with the monitoring role of PE sponsors, this study documents that in the post-IPO period, majority ownership by a PE sponsor is associated with better long-term stock price performance, and minority ownership by a PE sponsor with worse long-term financial and stock price performance, than ownership by management, and that larger PE sponsor size is positively associated with better long-term financial and stock price performance when the firm goes public.

Using the Heckman (1979) two-stage approach to control for endogeneity with respect to receiving PE financing, the results are qualitatively unchanged despite the smaller sample sizes.

My results are also robust to various winsorization cutoffs and earnings definitions, and to controlling for restructuring activity, transition periods, industry membership, and auditor size.

This paper contributes to the existing literature in several ways. First, the study furthers our understanding of how ownership structure affects earnings management and financial reporting practices and expands on the growing literature on ownership concentration and structure (i.e., Haw et al. 2004, Leuz et al. 2003, and Leuz 2006, among others). The present study focuses, in particular, on PE-backed and non-PE-backed ownership structures.

Second, the study expands on the growing literature on the accounting practices and post-IPO performance of U.S. PE-backed firms. The effect of PE sponsors' ownership on earnings quality and post-IPO performance have attracted little attention in the recent academic literature relative to the considerable attention devoted to the role of venture capitalists (VCs). Most of the prior PE literature focuses on the market performance of reverse LBOs as compared to "ordinary" IPOs (DeGeorge and Zeckhauser 1993, Holthausen and Larcker 1996, and, more recently, Cao and Lerner 2006) and documents better long-term performance by reverse LBO firms. But other differences, beyond differences in ownership structure, can affect these findings. For example, reverse LBOs are mature firms that *return* to the public market, whereas ordinary IPOs are more commonly much younger growth firms without a financial reporting history. That both the PE-backed and non-PE-backed firms in my sample are mature firms enables me to better focus on the effect of ownership structure.[4]

The only U.S. study of which I am aware that addresses the influence of ownership structure (PE-backed versus non-PE-backed) on accounting practices is Chou et al. (2006), who

[4] Chou et al. (2006), address the influence of ownership structure on abnormal market returns in the post-IPO period and conclude that, except for effects through earnings management, acquirer status (PE sponsor versus management-owner) has little additional influence on post-issue price performance. Whether ownership status influences post-IPO performance thus remains an empirical question.

identify upward earnings management in the year of an IPO *only* in PE-backed firms. But the authors cannot conclude that PE sponsors' involvement in earnings management is greater than that of management-owners due to the small sample size. These findings, although statistically insignificant, are surprising in light of the results reported in the VC literature, several recent studies documenting *less* upward earnings management by VCs than is observed in "ordinary" IPOs (Morsfield and Tan 2006, Hochberg 2005).[5] There are some institutional differences, however, between VC-backed and PE-backed IPOs that make it difficult to rely on the findings of the VC literature in the PE context.[6] For example, PE sponsors hold their portfolio firms through LBO funds that have limited life spans of 10-12 years and usually share around 20% of the upside gain via carried interest (in addition to management fees of about 2% of the assets under management). Hence, PE sponsors have a stronger incentive than VCs to file for IPO before the funds mature, and cash out (Cao 2007). On the other hand, unlike VCs, which invest in early-stage companies, PE sponsors generally buy mature businesses that had been subject to full financial disclosure before the IPO. The expected, much reduced information asymmetries between issuer and investors (Cai 2002) further limits opportunities for PE sponsors to manage earnings before the IPO.[7,8] The complete and standardized financial information available for my

[5] Other studies, however, document lower earnings quality of VC-backed firms relative to non-VC backed firms (e.g., Cohen and Langberg 2005, Darrough and Rangan 2005).
[6] Indeed, the VC literature actually excludes PE-backed firms from its analysis (e.g., Hochberg 2005).
[7] Although information asymmetry might be lower for my sample, the price effect of earnings management might be higher than in the case of "ordinary" IPOs and VC-backed firms, which, having little to no earnings history, have little or no earnings to manage (Chou et al. 2006).
[8] Additional differences between PE sponsors and VCs are documented in the literature. PE-backed firms tend to have large enterprise value and use bank debt; PE sponsors generally acquire mature, established companies and seek a majority stake; profit levels are crucial and technology considerations largely irrelevant; and PE managers typically come from an accounting, investment banking, or management consulting background. VC-backed firms, on the other hand, tend to have small enterprise value and rarely use bank debt; generally acquire young companies and start-ups and take only a minority stake; the portfolio firms, though mostly not profitable, will always be developing or applying new technology; VC managers have often been successful start-up entrepreneurs or possess specialized technology expertise (Fraser-Sampson 2007, Klein and Zur 2007, Morsfield and Tan 2006, Hand 2005, Chou et al. 2006).

sample of PE-backed firms lends deeper insight into their reporting practices and enables me to re-address the accounting reporting differences between PE-backed and non-PE-backed firms.

This paper also contributes to the literature on earnings management in the context of IPOs (Teoh, Wong and Rao 1998, Chou et al. 2006, Morsfield and Tan 2006, Hochberg 2005). These studies relied heavily on prospectus filings, which have been shown to be contaminated by optimistic bias, window dressing, and earnings manipulation (Ang and Brau 2002).[9] Recent literature has raised the further concern that receipts of IPO proceeds during the year of IPO might inflate the earnings management measures reported in these studies (Ball and Shivakumar 2006b). I avoid retrospectively prepared prospectus financials in favor of audited 10Ks filed in real time, and am further able to rely on pre-IPO financials.[10]

Finally, private firms are important players in the U.S. market, yet their accounting practices remain largely unknown due mainly to the lack of publicly available financials.[11] My unique sample of private firms with public debt makes it possible to extend our understanding of the reporting practices of U.S. private firms in a variety of industries and under different ownership structures. My findings on the effect of ownership structure are important to stakeholders such as banks, customers, employees, and suppliers that depend on the financial health of private firms.

This study has several limitations. Because I focus on private firms with public debt that later file for public listing, I end up with a relatively small sample size (147 firms and 1,070

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[9] According to paragraph 29 of Accounting Principles Board Opinion No. 20, companies filing publicly for the first time are permitted a restatement.

[10] I focus my analysis on earnings management in the years preceding the IPO. In addition, I was able to replicate the results of Chou et al. (2006) for PE-backed firms in the year of IPO using the Jones (1991) cross sectional current accruals model (see the discussion in section V).

[11] According to the American Institute of Certified Public Accountants (AICPA), more than 99% of U.S. businesses are privately held. The 500 largest private firms together employed 4.4 million people and had revenues of $1.4 trillion (*Forbes*, November 27, 2006). Beyond their ubiquity, the financial reporting of private firms is of particular interest. In June 2006, the AICPA and FASB agreed to create a joint committee to improve the financial reporting process for private firms.

firm-year observations). To be able to raise pubic debt, these firms are more likely to be larger and have better earnings quality than other private firms (Bharath et al. 2008). For these reasons, it is unclear whether this sample is representative of the universe of revered buyouts overall. Potential sample selection bias concerns, however, are mitigated because these limitations apply to both PE-backed and non-PE-backed firms in my sample.

The remainder of this paper is organized as follows. Section II discusses the motivation for and theory that underlies the hypotheses. Section III describes the data collection procedures and research design, section IV the sample descriptive statistics. Results are presented in section V. Section VI reports the results of a variety of robustness checks. Section VII concludes with a discussion and implications for future research.

II. MOTIVATION, THEORY, AND HYPOTHESES

Earnings Management

The evidence to date regarding the effect of ownership structure (PE-backed versus non-PE-backed) on earnings management is limited and mixed.

There is theory and empirical evidence to support the prediction that the active monitoring associated with the presence of PE sponsors on the board results in *lower* upward earnings management in the period surrounding an IPO. Active monitoring can substitute for tighter debt terms in motivating managers because PE sponsors, likely being repeat players in the LBO debt market, are intent on protecting their reputations (Cotter and Peck 2001). PE sponsors are also likely to play a role in restructuring management compensation, and can monitor and motivate management by virtue of their board membership (Gompers 1995, Lerner 1995, Cotter and Peck 2001, Renneboog and Simons 2005). Tighter monitoring, more sophisticated ownership, and board membership are, in turn, expected to be associated with less earnings management (e.g. Xie et al. 2003, Cornett et al. 2005, Wongsunwai 2007). Being repeat players in the IPO market, PE sponsors risk reputation loss if their IPOs fail (Cao and Lerner 2006), which also can lead to less upward earnings management by PE-backed firms, both pre and post-IPO.

Alternative theory and evidence support *greater* upward earnings management by PE-backed than by non-PE-backed firms, especially in the period surrounding an IPO. Degeorge and Zeckhauser (1993) suggest that PE-backed firms' decision to return to public listing is driven by opportunistic behavior and IPO timing. If PE-backed firms do go public because they have exhausted the benefits of the LBO ownership form or their profits are insufficient to cover their debt load, I would expect them to manage earnings upward. The incentive to manage earnings in a reverse LBO might be greater for PE sponsors than for managers because, by the time the earnings "reverse," the PE sponsors might no longer have a stake in the firm (Chou et al. 2006). Furthermore, managers who feel more compelled to meet the earnings goals of the sophisticated PE sponsors for whom they work might, at least in principle, engage in more upward earnings manipulation (Cornett et al. 2005). Prior literature also documents that differences in firms' ownership concentration can affect reporting incentives and earnings management. Because in the more concentrated ownership structure of a PE-backed firm (see Table 4), large owners typically sit on the board and are often directly involved in firm management, communicating firm performance via financial statements becomes less important than earnings management intended to hide expropriation activities from outside investors (Leuz 2006).[12]

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[12] Indeed, both Leuz et al. (2003) and Haw et al. (2004) document a positive correlation between earnings management and ownership concentration, at least in firms with high levels of management ownership (Yeo et al. 2002).

Although it remains an empirical question whether PE-backed firms engage in more upward earnings management than non-PE-backed firms, my first hypothesis (stated in alternative form), consistent with the monitoring role of PE sponsors, is:

H1: *Non-PE-backed firms engage in upward earnings management to a greater extent than do PE-backed firms.*

Conditional Conservatism

I expect PE-backed firms to have *higher* financial reporting quality, as measured by timely loss recognition, than non-PE-backed firms due to the professionalized environment created by PE sponsors and their greater demand for timely information. Indeed, Kaplan and Strömberg (2003) show that PE sponsors make control rights contingent on financial as well as non-financial measures, which can trigger harsher financial reporting discipline and greater demand for higher-quality accounting information. That PE-backed private firms tend also to have significantly higher leverage than non-PE-backed private firms (see Table 2, Panel A) can lead debt holders to demand more timely loss recognition (Ball et al. 2005). Ball and Shivakumar (2006b) further document that firms report more conservatively on the prospectus in the pre-IPO period due to anticipated demands of public investors and the market enforcement mechanism. Because PE sponsors can anticipate and prepare their portfolio firms for future IPOs (Gompers 1995, Kaplan and Strömberg 2003), I expect PE-backed firms to report more conservatively than non-PE-backed firms that cannot as easily anticipate the exit.

Alternative theory and empirical evidence support the *lower* financial reporting quality of PE-backed firms. Because, due to their high ownership concentration, PE sponsor-owners can resolve any information asymmetry through "insider access" and thus have less need to rely on public disclosure, they have less incentive to incorporate economic losses into accounting income in a timely manner (for a discussion of "insider access," see Ball et al. 2000 and Francis et al. 2005). Support can also be found in the VC literature, Cohen and Langberg (2005) finding that, on average, reported earnings are less informative for VC-backed firms, and that the value of, and information within, reported earnings decreases as a function of VCs' ownership.

Prior literature finds that publicly listed firms report more conservatively than private firms to accommodate shareholder demand for higher quality earnings reporting and reduce shareholder litigation costs (Givoly at al. 2007, Skinner 1997). Because these incentives exist as soon as firms are publicly listed, regardless of the initial controlling party, they are expected to increase timely loss recognition among non-PE-backed firms as well, and thereby reduce the differences between them and PE-backed firms in the post-IPO period.

In this study, I focus on a conditional conservatism measure, timely loss recognition, used by Ball and Shivakumar (2005) and Givoly et al. (2007).[13] Consistent with the harsher financial reporting discipline created by PE sponsors, my next hypothesis (stated in alternative form) is:

H2: *PE-backed firms are more likely than non-PE-backed firms to recognize losses in a timely fashion.*

[13] Basu (1997) defines conditional conservatism as follows: "Accountants' tendency to require a higher degree of verification for recognizing good news than bad news in financial statements … earnings reflect bad news more quickly than good news." Pre-IPO firms in my sample do not have stock prices. Therefore, following Ball and Shivakumar (2005), who compared private and public firms in the United Kingdom, I use a conditional conservatism model that does not require stock prices (see the discussion in section III).

Post-IPO Abnormal Returns and Financial Performance

Having tested the effect of ownership structure (PE-backed versus non-PE-backed) on earnings quality, I next test whether ownership structure also affects long-term reported financial performance and market abnormal returns in the post-IPO period.

To the extent that non-PE-backed firms, as hypothesized above, manage earnings upward and have unusually high positive accruals before the IPO, earnings in the post-IPO years as well as overall financial performance are expected to decline (Teoh, Wong and Rao 1998). This lower earnings quality is also predicted to reduce market abnormal returns (Chou et al. 2006). Furthermore, in addition to giving financial and strategic advice, PE sponsors play a monitoring role in their portfolio firms (Gompers 1995, Lerner 1995), and tighter monitoring is documented to lead to better earnings quality and long-term financial returns (Wongsunwai 2007, Ivanov et al. 2008, Cao and Lerner 2006). Hence, I expect PE-backed firms to have better long-term financial and abnormal market returns than non-PE-backed firms.

I noted above the counter argument that PE-backed firms' decision to return to public listing is driven by opportunistic behavior and IPO timing. If PE-backed firms go public because they have exhausted the benefits of the LBO ownership form or their profits are insufficient to cover their debt load, their operating performance following the IPO would be expected to deteriorate (Degeorge and Zeckhauser 1993). Improvements in the financial performance of PE-backed firms that go private can also be explained by agency theory, in particular, greater goal congruence between owners and management and stronger incentives to create shareholder wealth as management's ownership stake increases as well as the high leverage of LBOs (Holthausen and Larcker 1996, Kaplan 1991, Burton et al. 2002). When a company returns to public listing, manager and owner interests and incentives once again diverge, monitoring costs increase, leverage decreases, and agency theory, as noted above, predicts a reintroduction of inefficiencies and loss of previously experienced performance gains (Burton et al. 2002). Finally, other factors such as managerial risk aversion or managerial entrenchment might occasion performance *increases* following a reverse buyout of *management*-owned as opposed to PE-backed firms (Holthausen and Larcker 1996).

Consistent with the higher earnings quality and better monitoring and control associated with PE sponsor owners, my next hypothesis (stated in alternative form) is:

> **H3:** *PE-backed firms are likely to have better long-term financial and stock price performance in the post-IPO period than non-PE-backed firms.*

PE Sponsor Ownership Stake and Size

<u>PE sponsor ownership stake (majority versus minority)</u>

Higher ownership stakes by PE sponsor can contribute to tighter monitoring (Cao 2007), which is expected to be associated with better earnings quality, financial performance, and abnormal returns. Furthermore, post-IPO performance has strong wealth implications, *especially* for PE sponsors that hold large ownership stakes before and after an IPO (Cao and Lerner 2006). I therefore expect firms that are majority owned by PE sponsors to outperform firms that are minority owned by PE sponsors.

Alternatively, because higher financial reporting quality is costly, if the tighter monitoring associated with large-stake PE ownership substitutes for earnings quality, earnings quality would be expected to decline with higher ownership stakes (Beuselinck and Manigart 2005). Furthermore, if going public is a value maximizing decision (Zingales 1995), PE sponsors would be hypothesized to take firms public when the value added by ownership concentration no longer outweighs the monitoring cost, in which case pre-IPO PE sponsor-ownership and post-IPO performance would be *negatively* associated (Cao 2007).

Although I have no directional prediction for how PE ownership stake affects earnings quality, consistent with the stronger wealth implications of PE sponsors' larger ownership stakes, my next hypothesis (stated in alternative form) is:

> **H4a:** *Firms that are majority owned by PE sponsors are likely to have better long term financial and stock price performance in the post-IPO period than firms that are minority owned by PE sponsors.*

<u>PE sponsor size (capital under management)</u>

Because more firms that are majority owned by PE sponsors are owned by large PE sponsors (those with greater capital under management; see the discussion in section IV), I need to disentangle the influence of ownership stake (majority versus minority) and PE sponsor size, which was identified as the most appropriate proxy for PE sponsor reputation (Cao and Lerner 2006). Overall, I expect firms with more reputable owners to establish better governance and have tighter monitoring, which are expected to be associated with better earnings quality and financial performance in the post-IPO period (Wongsunwai, 2007, Ivanov et al. 2008). Cao and Lerner (2006) attribute superior post-IPO returns earned by firms with larger PE sponsors to these repeated players' concern for their reputations.

Smaller PE sponsors, on the other hand, might have greater need of external financing and so be more strongly motivated to increase the quality of their reported earnings in order to be able to secure cheaper public debt (Bharath et al. 2008). Hence, I have no directional prediction regarding the effect of PE sponsor size on earnings quality. My last hypothesis regarding post-IPO performance (stated in alternative form) is:

H4b: *Both financial and stock price performance improve with increased PE sponsor size.*

III. SAMPLE SELECTION AND RESEARCH DESIGN

Sample Selection

My sample of private firms with public debt covers all firm-year observations on COMPUSTAT for any of the 28 years from 1978 through 2005 that satisfy the following criteria:[14] (1) the firm's stock price at fiscal year end is unavailable; (2) the firm has total debt as well as total revenues exceeding $1 million; (3) the firm is a separate domestic company, not a subsidiary of another public firm; and (4) the firm has the financial data needed to test the hypotheses for at least two years. I further exclude financial institutions and firms in regulated industries (SIC codes 6000-6999 and 4800-4900).

Because some public firms met the above criteria as a result of missing price data (e.g., public firms that file for bankruptcy protection or that are traded over the counter but appear on COMPUSTAT without a stock price), and in order to ensure that my sample included only private firms with public debt, I examined each firm and removed public firm observations (details are provided in **Table 1**).[15]

[14] Prior to 1980, leveraged takeover activity was limited and few private firms held public debt. Indeed, one of the first instances (if not the first) of a private firm with public debt was Movado in 1979.

[15] To determine whether firms qualified as private firms with public debt, I hand-collected SEC filings information from EDGAR and 10K Wizard, bankruptcy information from BankruptcyData.com, and other historical information

I further categorized each firm as being in one of the following pre-IPO, mutually exclusive categories: (1) PE majority-owned, defined as those that are majority-owned (more than 50%) by private equity investment firms or financiers (e.g., Carl Icahn);[16] (2) PE minority-owned, defined as PE sponsors that hold less than 50% ownership; (3) management-owned, defined as those that have no PE sponsors and are at least 50% owned by the founders, executives, and directors, or family members; (4) employee-owned, defined as those that have no PE sponsors and are at least 50% owned by their employees; and (5) unknown, no available information on firm ownership. Finally, I identified changes in organization type due to equity IPOs, mergers and acquisitions, bankruptcies, and deregistration (form type 15-15D). The resulting sample, which includes 2,810 firm-year observations and 557 private firms (for the years 1980-2005), is used for the descriptive statistics reported in **Table 2**.

To restrict the focus to the period surrounding the IPO (five years before and five years after), I further removed all non-IPO firms. The final sample, which includes 123 PE-backed (both majority- and minority-owned) IPOs and 24 management-owned IPOs (hereafter referred to as non-PE-backed, or management-owned, firms), is used for the analyses that follow.[17]

I identify the IPOs' date and first-day-of-trading returns using the Securities Data Company's (SDC) Corporate New Issues database. For the returns analysis, I required that each IPO be listed in CRSP. For firms in the pre-IPO phase, corporate governance information (e.g., board characteristics, compensation structure) was collected from 10Ks and proxies in the year prior to the IPO. I used prospectus information to identify changes in corporate governance post-

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from Hoover's DataBase as well as from several news resources including Factiva, ProQuest, and LexisNexis. I omitted 355 firm-year observations of cooperatives, limited partnerships, and government-owned firms that might have different earnings management incentives resulting from their organizational and ownership structures.

[16] The list of PE sponsors was taken from the Thomson Financials VentureXpert database.

[17] I use the Heckman (1979) two-stage procedure described at the end of section III to account for the possible endogeneity of the choice of going public or receiving PE financing. I do not conduct separate analyses for the other ownership and organizational forms due to the small number of observations. The main results are unchanged when management-owned and employees-owned firms are combined as non-PE-backed firms.

IPO. I used the Thomson Financials VentureXpert database to rank PE sponsors according to total investment (in $US).

Research Design: Earnings Management

Unexpected Discretionary Accruals

In order to be able to compare my findings to prior research, I use as my comprehensive measure of earnings management the cross-sectional modified Jones (1991) model. Following Xie (2001), I use the modified Jones model to estimate normal accruals and discretionary accruals, as explained below.

The Jones model regresses total accruals (TACC) on the change in sales, after subtracting the change in trade receivables and level of property, plant, and equipment, for a test sample of all public firms in the same two-digit SIC code and year.[18] The test sample of all public firms is taken from the entire population of public firms on COMPUSTAT with a price higher than $1.[19] I further excluded from the test sample IPO years as well as the 582 firms in my sample of public and private firms, and required that at least ten observations be available before performing each regression (Teoh, Wong, and Rao 1998).

I calculated the expected portion of total accruals (ETACC) using the estimated coefficients from regression (1) as they appear in equation (2), denoting the residuals as the unexpected discretionary accruals (UTACC) as they appear in equation (3). I winsorized all the continuous variables needed for the regression at the 1st and 99th percentile.

$$TACC_{j,t} / TA_{j,t-1} = a_1*[1 / TA_{j,t-1}] + a_2*[(\Delta REV_{j,t} - \Delta TR_{j,t})/TA_{j,t-1}] + a_3*[PPE_{j,t} / TA_{j,t-1}] + e_{j,t} \quad (1)$$

$$ETACC_{j,t} = \hat{a}_1*[1 / TA_{j,t-1}] + \hat{a}_2*[(\Delta REV_{j,t} - \Delta TR_{j,t}) / TA_{j,t-1}] + \hat{a}_3*[PPE_{j,t} / TA_{j,t-1}] \quad (2)$$

[18] I subtract the change in trade receivables from the change in sales to allow for the possibility of sales manipulations (Teoh, Welch, and Wong 1998a).

[19] The restriction on the stock price is to avoid public firms that are in distress or file for bankruptcy protection.

$$UTACC_{j,t} = TACC_{j,t} / TA_{j,t-1} - ETACC_{j,t} \quad (3)$$

where: $TACC_{j,t}$ are total accruals for firm j in year t. Following Hribar and Collins (2002), I define total accruals as the difference between income before extraordinary items (#123) and net cash flow from operating activities, adjusted to extraordinary items and discontinued operations (#308 – #124). For the years prior to 1988, when COMPUSTAT item #308 is unavailable, I define total accruals as follows: Δ(current assets #4) – Δ(current liabilities #5) – Δ(cash #1) + Δ(short-term debt #34) – (depreciation and amortization #125).[20] $TA_{j,t-1}$ is the beginning-of-the-year total assets (lagged #6). $\Delta REV_{j,t}$ is the change in sales in year t (#12). $PPE_{j,t}$ is gross property, plant, and equipment in year t (#7). $\Delta TR_{j,t}$ is the change in trade receivables in year t (#151).

Though widely used in the earnings management literature, accruals models such as the modified Jones model are far from perfect in detecting earnings management. Because the models assume the relationship between cash flows and accruals to be linear, thus ignoring the asymmetry in the gain and loss recognition of accruals, I incorporate in the estimation of the modified Jones model the improvement in accruals models proposed by Ball and Shivakumar (2006a). Specifically, I add to the model a proxy for potentially reportable gains and losses in the form of the sign of the cash flows from operations. Consistent with the results reported by Ball and Shivakumar (2006a), the introduction of this proxy increases the explanatory power of the model considerably.[21]

[20] In addition, to correct for measurement errors in the balance-sheet approach prior to 1988, I eliminated firm-year observations with "non-articulation" events: merger or acquisition, discontinued operations, and gain or loss on foreign currency translations (Hribar and Collins 2002).

[21] In particular, I augmented the modified Jones model with the following independent variables: cash flow from operations in year t (CF_t), a dummy variable set to 1 if CF_t <1 and 0 otherwise (DCF_t), and an interactive variable, CF_t x DCF_t (Ball and Shivakumar 2006a).

Because performance might be a key driver of both a firm's decision to go public and of PE sponsors to provide financial backing (Morsfield and Tan 2006), I employ in an untabulated analysis the Kothari et al. (2005) performance-matching approach, which is indicated to have relevance in an IPO setting.[22] The results are qualitatively similar. For the year of IPO, I report the results of the current unexpected discretionary accruals model derived from the cross-sectional modified Jones model used by Teoh et al. (1998b, 1998b), Morsfield and Tan (2006), and Chou et al. (2006).[23]

Additional Earnings Management Measure

Following Penman and Zhang (2004), the operating activities for clean surplus relation leads to Operating $\text{Income}_{j,t}$ = Free Cash $\text{Flow}_{j,t}$ + $\Delta\text{NOA}_{j,t}$. The free cash flow is the "hard" aspect, $\Delta\text{NOA}_{j,t}$ the "soft" aspect, of the operating income calculation, which involves discretionary measurements and estimations.[24] $\Delta\text{NOA}_{j,t}$ can therefore be used as an additional signal of earnings management, where:

growth in net operating assets: $\text{GNOA}_{j,t} = (\text{NOA}_{j,t} - \text{NOA}_{j,t-1})/|\text{NOA}_{j,t-1}|$ (4)

Because changes in measures can be attributed to external factors and period effects, following prior literature (Teoh, Welch, and Wong 1998b), I report the differences between the

[22] Specifically, I use ROA, which is defined as net income (COMPUSTAT data item #172) plus net of tax interest expense (#15) divided by total assets at end of year t–1 (lagged #6), as the performance measure, and match each observation by industry, year, and the deciles of ROA in the same industry and year.

[23] Current accruals are defined as the difference between the change in noncash current assets and the change in current operating liabilities. The unexpected discretionary accruals are estimated from a cross-sectional regression, in the same year and industry, of current accruals on the change in sales, both scaled by prior year total assets.

[24] I define NOA as follows. Common equity: [common equity (#60) + preferred treasury stock (#227) – preferred dividends in arrears (#242)] + financial obligations: [debt in current liabilities (#34) + total long-term debt (#9) + preferred stock (#130) – preferred treasury stock (#227) + preferred dividends in arrears (#242)] – financial assets: [cash and short-term investments (#1) + investments and advances minus other (#32)] + minority interest (#38).
OpI: earnings: [net income (#172) – preferred dividends (#19) + change in marketable securities adjustment (change in #238) + change in cumulative translation adjustment (change in #230)] + net interest expense: [after-tax interest expense (#15 × (1 – marginal tax rate)) + preferred dividends (#19) – after-tax interest income (#62 × (1 – marginal tax rate)) + minority interest in income (#49) minus the change in marketable securities adjustment (change in #238)], where the marginal tax rate is the top statutory federal tax rate plus 2% average state tax rate. The top federal statutory corporate tax rate was 48% in 1971-1978, 46% in 1979-1986, 40% in 1987, 34% in 1988-1992, and 35% in 1993-2005 (Nissim and Penman 2003).

GNOA measure for each firm and the median measure for the same year and industry (4-digit SIC codes if there are at least five non-IPO firms, otherwise 3-digit SIC codes or 2-digit SIC codes with at least five observations).

To minimize survivorship bias, I report the average of five years' annual UTACC and GNOA variables, using the maximum number of years for which COMPUSTAT data is available, for firms that do not survive for five full years after their IPO (for further discussion, see Ivanov et al. 2008).

Multivariate Earnings Management Analysis

I also estimate the following regression, which allows for differences in earnings management between PE-backed and non-PE-backed firms in order to test **H1**:

$$EM_t = a_0 + a_1{*}PE + a_3{*}Size_t + a_4{*}BV_t + a_5{*}Growth_t + a_6{*}Leverage_t + a_7{*}Profitability_t + a_8{*}QRatio_t + a_9{*}Oper\_Cycle_t + a_{10}{*}Age_t + a_{11}{*}Cash_t + a_{12}{*}CAPEX_t + a_{13}{*}D\_Loss_t + a_{14}{*}D\_Audit\_Quality_t + e_t \quad (5)$$

where: EM_t is a measure of earnings management, alternatively defined as $UTACC_t$ and $GNOA_t$. *PE* is a dummy variable with the value 1 for PE-backed private firms (both majority- and minority-owned) and 0 for firms owned by management. *Size* is alternatively defined as the natural logarithms of total assets (#6) or sales (#12). *BV* is equity book value (#60+ #130 + 35#) divided by total assets. *Growth* is defined as growth in sales. *Leverage* is defined as total debt (#9 + #34) divided by total assets. *Profitability* is defined as operating income divided by net operating assets (RNOA). *QRatio* is the quick ratio, defined as cash and short-term investment (#1) plus total receivables (#2) divided by current liabilities (#5). *Oper_Cycle* is operating cycle days (receivable collection period plus inventory turnover in days). *Age* is defined as number of years since incorporation (first appearance on COMPUSTAT). *Cash* is cash and short-term investment divided by total assets. CAPEX is capital expenditures (#128) divided by total assets.

D_Loss is a dummy for loss firms (#172) and *D_Audit_Quality* a dummy for the big national accounting firms (#149).[25]

Research Design: Conditional Conservatism

Conditional Conservatism: Timely Loss Recognition

Earnings are more conservative when losses are recognized in a timely manner, as emphasized by Basu (1997), in whose model stock returns are used as a proxy for economic gains and losses. Ball and Shivakumar (2005), who do not have stock returns for their sample of pure private firms, use changes in accounting income as the independent variables associated with transitory gains and losses. In a similar way, I estimate the following variation of Basu's regression to allow for differences in timely loss recognition between PE-backed and non-PE-backed firms in order to test **H2**:[26]

$$\Delta OpI_t = a_0 + a_1{*}D\Delta OpI_{t-1} + a_2{*}\Delta OpI_{t-1} + a_3{*}D\Delta OpI_{t-1}{*}\Delta OpI_{t-1} + a_4{*}PE + a_5{*}PE{*}D\Delta OpI_{t-1} + + a_6{*}PE{*}\Delta OpI_{t-1} + a_7{*}PE{*}D\Delta OpI_{t-1}{*}\Delta OpI_{t-1} + e_t \quad (6)$$

where: ΔOpI_t is changes in earnings from year t–1 to year t, standardized by total assets at the end of year t–1. Earnings are measured before interest expense and interest income (OpI).[27] $D\Delta OpI_{t-1}$ is a dummy variable that gets the value 1 if $\Delta OpI_{t-1}<0$ and 0 otherwise. *PE* is a dummy variable with the value 1 for PE-backed firms and 0 for non-PE-backed firms.

I predict that the involvement of PE sponsors leads to a higher level of earnings quality, as measured by more timely loss recognition. As a result, I anticipate that persistent gain

[25] The above control variables were used in the prior literature in the context of IPOs and the choice of private equity financing, in particular, size, growth, leverage, and profitability (Morsfield and Tan 2006, Chou et al. 2006), and age, investments, and liquidity (Beuselinck et al. 2005). The audit firm's size was added because it can influence firms' earnings management and timely loss recognition (Basu et al. 2001, Aharony et al. 1993, Morsfield and Tan 2006).

[26] This variation on Ball and Shivakumar's (2005) regression was used in Beuselinck et al. (2005). I further estimate regressions (5) and (6) separately for the pre- and post-IPO periods.

[27] The results remain qualitatively similar when I measure, in an untabulated analysis, earnings before and after extraordinary items.

recognition will be greater for PE-backed than for non-PE-backed private firms, and therefore expect $a_6>0$. I also expect timely loss recognition to be greater for PE-backed than non-PE-backed private firms, and therefore expect $a_7<0$.

Conditional Conservatism: Accrual Model for Timely Loss Recognition

That the timely loss recognition identified above is a result neither of random errors in accruals nor of earnings management is supported by the results of an alternate model developed by Ball and Shivakumar (2005) that recognizes unrealized gains and losses via accruals. Dechow et al. (1998) show that accruals can mitigate the noise in operating cash flow and lead to a negative correlation between accruals and cash flow. Ball and Shivakumar (2005) also identify a second role of accruals: timely recognition of economic gains and losses leads to positive but asymmetric correlation between accruals and contemporaneous cash flow. Ball and Shivakumar (2005) maintain that the asymmetry in the accruals model exists because in non-cash items there is more timely recognition of economic losses than of economic gains. Therefore, the second role of accruals is greater in the case of losses. Following Beuselinck et al. (2005), I run the following variation of Ball and Shivakumar's (2005) regression:

$$\begin{aligned} ACC_t = \; & b_0 + b_1{*}DCFO_t + b2{*}CFO_t + b3{*}DCFO_t{*}CFO_t + b_4{*}PE + b_5{*}\,PE\,{*}DCFO_t + \\ & + b_6{*}\,PE\,{*}CFO_t + b_7{*}\,PE\,{*}DCFO_t{*}CFO_t + e_t \end{aligned} \tag{7}$$

where: ACC_t is total accruals in year t, standardized by beginning-of-the-year total assets. For the definition of accruals, see the discussion of abnormal accruals above. Following Hribar and Collins (2002), CFO_t is defined, for years after 1988, as cash from operations in year t, adjusted to extraordinary items and discontinued operations (#308 – #124), and standardized by total assets at end of year t–1.[28] $DCFO_t$ is a dummy variable that takes the value 1 if $CFO_t < 0$ and 0 otherwise. *PE* is as defined above.

Following Ball and Shivakumar (2005), I predict that the above model will demonstrate the strong role of accruals in mitigating noise in operating cash flow. I therefore expect $b_2<0$. I also predict that PE sponsor involvement leads to higher earnings quality, which, in turn, leads to a positive but asymmetric correlation between accruals and contemporaneous cash flow. I therefore predict that the coefficient $b_7>0$.

I account for the possible endogeneity of receiving PE financing by using the Heckman (1979) two-stage procedure. In the first stage, I estimate a PROBIT model with, as predictors, size (alternatively defined as the natural logarithms of total assets or sales), ratio of book value of equity to total assets, growth (in sales), leverage, profitability (RNOA), quick ratio, length of the operating cycle, age, cash and capital expenditures (both divided by total assets), a dummy for loss firms, and audit quality (a dummy for the big national accounting firms). Estimates of the PROBIT model are used to compute the inverse Mills' ratio for each sample firm. In the second stage, I include the inverse Mills' ratio as a control variable in regressions (5), (6), and (7) and allow the coefficient to vary between the two groups of firms. (For a similar implementation, see Ball and Shivakumar 2005, Givoly et al. 2007, Beuselinck et al. 2005, and Hochberg 2005).

Research Design: Adjusted Abnormal Returns and Financial Performance

For each IPO, the adjusted size and book-to-market matched abnormal returns are calculated as the buy-and-hold daily returns on the periods of one year, three years, and five years after the IPO, less the buy-and-hold returns on a benchmark of a value-weighted size and

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[28] Following Xie (2001), for years prior to 1988, I define cash flow from operations as funds from operations (COMPUSTAT data item #110) – Δ(current assets #4)$_t$ + Δ(cash and cash equivalent #1)$_t$ + Δ(current liabilities #5)$_t$ – Δ(short-term debt #34)$_t$. All variables are divided by total assets at end of year t–1 (lagged #6).

book-to-market matched control sample over the same period (the daily matched portfolio returns as well as the relevant breakpoints are from Kenneth French's Web site).[29] If the sample firm delists during the relevant period, I add the delist return to the firm's buy-and-hold return and set the size and book-to-market matched return equal to zero after the delisting date. When the delisting return is missing, following Shumway and Warther (1999) and CRSP "white paper" delisting returns (2001), I allocate it in accordance with the delisting code and exchange code.

To avoid the problem of overlapping periods in the estimation of buy-and-hold returns, following Chou et al. (2006) and Fan (2007), I also estimate the value-weighted monthly abnormal returns based on calendar time estimated Fama and French (1993) three factor-model. Specifically, I regress the monthly returns (in excess of the risk free-rate) on the three factors as in the following regression:

$$R_{pt} - R_{ft} = a_p + b_p\,(R_{mt} - R_{ft}) + s_p SMB_t + h_p HML_t + \varepsilon_t \qquad (8)$$

where: R_{pt} is the equally weighted portfolio returns in calendar month t; R_{ft} is the 30-day T-bill yield in month t; R_{mt} is the return on the value weighted CRSP index; SMB_t is the return on small firms minus the return on large firms; and HML_t is the return on high book-to-market stocks minus the return on low book-to-market stocks in month t. The regressions are carried out separately for each ownership stake and for different sizes of PE sponsors. The estimate of the intercept coefficient (a_p) is a measure of average monthly abnormal returns.

I use three measures of long-run financial performance for the periods of one year, three years, and five years after the IPO: industry adjusted operating performance; market-to-book ratio; and a stock exchange delisting measure (for similar implementations, see Ivanov et al. 2008, Moeller et al. 2004, Gompers et al. 2003, and Field and Karpoff 2002).

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[29] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

The first measure is industry-adjusted operating performance (ROA), which I use to calculate the average matched-adjusted return on assets for the periods after the IPO. ROA is defined as net income (#172) plus net of tax interest expense (#15) divided by total assets at end of year t–1 (lagged #6), minus the industry median ROA for the same period (based on 4-digit SIC codes if there are at least five non-IPO firms, otherwise the 3-digit SIC codes or 2-digit SIC codes with at least five observations). For firms that do not survive for one year, three years, or five years after the IPO, the maximum number of years for which COMPUSTAT data is available is used. The second measure is the market-to-book ratio as measured at the end of one year, three years, or five years since the IPO. For firms that do not survive for the full period after the IPO, the maximum number of years for which COMPUSTAT data is available is used. Market value of equity is defined as common shares outstanding (#25) multiplied by the fiscal year closing price (#199). Book value of equity is defined as total common equity (#60) + carrying value of preferred stock (#130) + deferred taxes and investment tax credit (#35). The third measure, stock exchange delisting, is defined as the percentage of firms delisted from the NYSE, AMEX, or NASDAQ due to bankruptcy, default, or liquidation (CRSP delisting codes 400 and above).

Lastly, prior literature having suggested that lead underwriter reputation can affect long-run IPO returns (e.g., Carter et al. 1998), I report and control for the reputation ranking of IPO underwriting.[30]

All returns analyses are performed separately for different ownership stakes and different sizes of PE sponsors.

[30] These rankings, available on Jay Ritter's Web site: http://bear.cba.ufl.edu/ritter/rank.xls, vary from one to nine, nine being the best reputation, and are updated.

IV. DESCRIPTIVE STATISTICS

Descriptive Statistics: Private Firms with Public Debt

Column 1 of **Table 2, Panel A** includes descriptive statistics for the entire sample of private firms with public debt (2,810 firm-year observations of 557 firms). The remaining data in Table 2, Panel A show the distribution of firms and firm-year observations among various ownership forms.

Private firms majority-owned by PE sponsors make up 57% of the firms in the sample; 14% are minority-owned by PE sponsors, 22% owned by management.[31] Firms that are majority- or minority-owned by PE sponsors have the highest leverage (means of 76.5% and 77.9%, respectively, versus total sample mean of 68.0%), and firms that are majority-owned by PE sponsors have the lowest assets, sales growth, and ROA. However, as **Panel B** shows, the different ownership forms have a similar industry representation and there is no particular industry clustering. These results remain significant under a LOGIT model (untabulated), suggesting the need to control for these financial measure variables in earnings management and conservatism analyses.

As can be seen in **Panel C**, PE-backed firms have the highest concentration of below-BBB-ranked debt (68.1% and 62.3% for majority-owned and minority-owned PE-backed firms, respectively, versus total sample mean of 55.5%). As can be seen in **Panel D**, they are also more likely to file for bankruptcy protection (17.2% and 19.5%, respectively, versus total sample mean of 16.2%). These observations are not surprising inasmuch as PE sponsors tend to be involved in LBO and MBO activities, which increase debt levels and, hence, the overall risk of default. Moreover, PE-backed private firms (both majority- and minority-owned) are more likely to exit

[31] Because several firms changed their ownership structure during the period, the total number of firms adds up to 568.

via equity IPO (30.1% and 35.1%, respectively, versus total sample mean of 28.4%). This result is consistent with the goal of PE sponsors to monetize their investments through an IPO or M&A transaction.

Table 2, Panel E shows that 15.3% of the PE-backed firms in the sample are owned by the 14 largest PE sponsors in the market.

Descriptive Statistics: Pre-IPO and Post-IPO Periods

Table 3 presents descriptive statistics for 123 PE-backed firms (96 majority-owned and 27 minority-owned) and 24 non-PE-backed firms (management-owned) that had IPOs. This table compares the firms under the different ownerships structures and during two periods: five years pre-IPO and five years post-IPO. Consistent with the results in Table 2, Panel A, the PE-backed firms have significantly higher leverage than the non-PE-backed firms in the pre- and post-IPO periods. PE-backed firms also have significantly lower quick ratios and cash as a percentage of assets. Moreover, for both PE-backed and non-PE-backed firms, leverage is significantly higher in the pre-IPO than in the post-IPO period. This result is not surprising given that many of the pre-IPO firms went through an LBO or MBO, which was why they had issued public debt.

Untabulated analysis further reveals that the involvement of PE-backed and non-PE-backed firms in restructuring activity (as indicated by discontinued operations, M&A activity, and increases or decreases in asset growth greater than 50%) is not significantly different in the period surrounding an IPO. As indicated in Table 3, however, the proportion of special items is significantly higher for majority PE-backed than for non-PE-backed firms in the pre-IPO period. To control for these differences, I conduct the conservatism analyses on operating income definitions that exclude such special items.

Descriptive Statistics: Corporate Governance

Table 4 presents descriptive statistics for corporate governance among both PE-backed firms (both majority- and minority-owned) and management-owned firms in the pre-IPO period. As Cao and Lerner (2006) report, PE sponsors have a large ownership stake (79.9% and 36.4%, respectively, for firms that are majority- and minority-owned by PE sponsors) and actively monitor managers. Indeed, 55.2% and 34%, respectively, of the boards of directors are from or affiliated with PE sponsor groups, and PE-backed firms' boards are significantly larger than those of management-owned firms. Moreover, in PE-backed firms, a greater proportion of CEO pay is in the form of equity and variable compensation (mainly options and bonuses), which is consistent with giving the CEO an incentive to take the company public (Cadman and Sunder 2007).[32] As further indicated by the post-IPO panel, PE sponsors retain a significant ownership stake (47.3% and 23.4%, respectively) in the post-IPO period, and continue to monitor managers (50.3% and 29.4%, respectively, of the boards of directors are from or affiliated with PE sponsor groups).

V. EMPIRICAL RESULTS

Results: Earnings Management

The results of estimating earnings management by abnormal accruals (UTACC) and industry adjusted growth in net operating assets (GNOA) are provided in **Table 5, Panel A**. Consistent with my prediction that earnings are managed upward to a lesser extent by PE-backed firms than by non-PE-backed firms, the first line of results in Table 5 indicates that the UTACC

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[32] In some instances, PE-backed firms tie the CEO's bonus to cash-flow performance and EBITDA. For example, this appeared in the 1997 10K of Family Restaurants (majority-owned by Apollo Partners): "The Company's President and Chief Executive Officer … entered into an Employment Agreement with the Company … providing for annual compensation of not less than $400,000, to increase to $500,000 upon the attainment of $40,000,000 in Company EBITDA …"

means of firms that are majority- and minority-owned by PE sponsors are -3.7% and -4.2%, respectively, whereas the mean for management-owned firms is -0.3%. The differences of -3.4% and -3.9% are significant at the 0.01 level. Similar results are obtained for the differences in GNOA, when making the comparison on medians, and for the post-IPO period (also after including average information in order to minimize any survival bias). Excepting the significantly less negative GNOA for the majority-PE-owned firms in the pre-IPO period, the analysis reveals no significant differences between firms that are majority-owned and minority-owned by PE sponsors.[33]

These results also hold when I repeat the analysis for the year-by-year, before and after IPO. For most of the years, the differences in both means and medians are more negative for PE-backed than for non-PE-backed firms.[34]

I do not interpret the results during the IPO year because receipt of IPO proceeds, being associated with explosive growth, can affect accruals and working capital (Ball and Shivakumar 2006b). Following prior literature, I also report in the last line of Table 5, Panel A the results of an abnormal *current* accruals model for the year of IPO. These results are similar in magnitude to those obtained for PE-backed firms by Chou et al. (2006), who find only weak evidence that PE-backed firms have higher discretionary accruals than non-PE-backed firms, but, due to the small sample size, could not conclude that PE sponsors' involvement was associated with greater earrings management. In my sample, there is a weak contrary indication.

Table 5, Panel B reports the results of regression (5) for the sample of pre- and post-IPO firms under two specifications: (1) including control for possible endogeneity, and (2) including

[33] Untabulated analyses indicate that the main abnormal accruals results remain qualitatively unaltered when I use other specifications of the Jones model such as current accruals (with or without control for timely loss recognition and the balance sheet approach) and the Kothari et al. (2005) performance-matching approach.

[34] The reported results for the five years pre-IPO and five years post-IPO (but not for the year-by-year analyses) exclude firm-year observations during restructuring periods. When performed on the entire sample, the results are qualitatively similar.

control variables (as defined in section III). In both periods, for both earnings management measures, and under both specifications, the coefficients, a_1, the dummy variables for PE-backed firms, are negative, by and large significantly so, indicating that earnings are managed upward to a lesser extent by PE-backed firms than by non-PE-backed firms. Moreover, the coefficients of the inverse Mills' variables (lambda) are significant when performing the regression on GNOA, suggesting the presence of endogeneity and the appropriateness of controlling for it.[35]

Untabulated analyses further reveal the foregoing results to hold for the comparison of both majority- and minority-PE-owned firms versus management-owned firms. However, there are no significant differences between majority-owned and minority-owned PE-backed firms, and I find only weak evidence of less upward earnings management by firms backed by large PE sponsors than by firms backed by small PE sponsors in the pre-IPO period. These results reverse in the post-IPO period.

Overall, and consistent with **H1**, these results indicate that non-PE-backed firms manage earnings upward to a greater extent than PE-backed firms (both majority- and minority-owned), as indicated by the significantly higher abnormal accruals and GNOA. This is consistent with the prediction that PE sponsors restrain earnings management.

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[35] If firms select PE financing based on either expected abnormal accruals or expected growth in net operating assets, the dummy variable PE is endogenous. It is more likely in the GNOA regression because GNOA is correlated with growth and profitability, which were identified by prior literature as being associated with the choice of PE financing (Morsfield and Tan 2006, Chou et al. 2006). This association was further confirmed by the first stage probit model.

Results: Conditional Conservatism

Conditional Conservatism: Timely Loss Recognition

Table 6 reports the results of regression (6) for the sample of pre- and post-IPO firms under three specifications: (1) excluding control variables, (2) including control for possible endogeneity, and (3) including control variables.

For non-PE-backed private firms in the pre-IPO period, the coefficients, a_2, on prior positive earnings changes are significantly negative, indicating timely recognition of economic gains (on average, approximately 45% to 105% reversal of income increases). The incremental coefficients, a_3, on prior negative earnings changes are positive (but significant only under specifications (2) and (3)) indicating that losses are recognized in a less timely manner than gains. The sum of the coefficients $a_2 + a_3$ is negative under all specifications, but relatively small (coefficients' sum range from -0.05 to -0.30), indicating timely loss recognition, which leads to a reversal of income decreases (on average, approximately 5% to 30%). Taken together, non-PE-backed private firms appear to have low earnings quality as measured by deferred loss recognition.

The incremental coefficients on earnings increases for PE-backed private firms, a_6, are significantly positive under the three specifications (with coefficients of 0.55, 0.74, and 1.19, and t-values of 1.68, 2.30, and 5.12, respectively), indicating that PE-backed private firms are more likely than non-PE-backed private firms to defer recognition of economic gains. As I further predicted, the incremental coefficients on earnings decreases for PE-backed firms, a_7, and the sum of the coefficients, $a_3 + a_7$, is significantly negative under all specifications, indicating that PE-backed private firms are more likely than non-PE-backed private firms to incorporate transitory losses in income.

Table 6 also presents the results of regression (6) for the sample of post-IPO firms. The sum of the coefficients, $a_3 + a_7$, is significantly negative under the three regression specifications, and the main coefficient of interest, a_7, is negative (but significant only under specifications (1) and (2)).

Taken together, and consistent with **H2**, PE-backed private firms have higher-quality earnings reporting than non-PE-backed private firms in both the pre-IPO and post-IPO periods.

Conditional Conservatism: Accrual Model for Timely Loss Recognition

Table 7 reports the results of regression (7), under the above three specifications, for the sample of pre- and post-IPO firms.

In the case of non-PE-backed pre-IPO private firms, the coefficient on prior positive cash flow, $b_{2,}$ is significantly negative (with coefficients of -0.28, -0.38, and -0.62, and t-values of –2.38, -2.51, and -3.94, for the three specifications, respectively) indicating that, on average, between 28% and 62% of cash flow is mitigated by accruals in years with positive cash flow. This finding is consistent with the role of accruals in mitigating noise in operating cash flow. The coefficient on prior negative cash flow, $b_{3,}$ is negative as well (but insignificant under specification (2)), indicating that non-PE-backed private firms mitigate noise in cash flow to an even greater degree in years with negative operating cash flow.

The incremental coefficient, $b_{6,}$ for PE-backed private firms in positive-cash-flow years is negative (but significant only in specification (1)), indicating that PE-backed private firms are more likely than non-PE-backed private firms to offset cash flow in years with positive cash flow. Also as predicted, the incremental coefficient in negative-cash-flow years, b_7, for PE-backed private firms is significantly positive under specifications (1) and (2) (with coefficients of 2.51, 1.59, and 1.50, and t-values of 2.58, 1.68, and 1.59, respectively), indicating that in negative-cash-flow years, the accruals of PE-backed private firms offset cash flow to a lesser extent than is the case for non-PE-backed private firms (higher positive correlation). Therefore, consistent with **H2**, earnings reporting in the pre-IPO period are of higher quality for PE-backed private firms than for non-PE-backed private firms. These results are consistent with the prediction that the involvement of PE sponsors induces higher quality earnings reporting. As indicated in Table 7, however, these results no longer hold in the post-IPO period.[36]

That the coefficients of the inverse Mills' variables (lambda) are significant in neither the pre- nor post-IPO period under both regression models, (6) and (7), suggests the absence of significant endogeneity problems.[37]

Untabulated analyses further reveal that the results of both conservatism regression models, (6) and (7), hold for the comparison of both majority- and minority-PE-owned firms versus management-owned firms. Moreover, there is weak evidence that firms majority-owned by PE sponsors report more conservatively than firms that are minority-owned by PE sponsors, and that in the post-IPO period, firms owned by large PE sponsors report more conservatively than those owned by small PE sponsors.[38]

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[36] As was discussed in section II above, prior literature finds that publicly listed firms report more conservatively than private firms to accommodate shareholder demand for higher quality earnings reporting and reduce shareholder litigation costs (Givoly at al. 2007, Skinner 1997). Because these incentives exist as soon as firms are publicly listed, regardless of the initial controlling party, they can increase timely loss recognition among non-PE-backed firms as well, and thereby reduce the differences between them and PE-backed firms in the post-IPO period.

[37] If firms select PE financing based on either expected changes in operating income or expected accruals, the dummy variable PE is endogenous. It is unlikely that a change in the operating income will change regression (6) because the PE financing decision is unlikely to involve the change in operating income in a single year. It is more likely in the accruals regression, because it is specified on levels (for further discussion, see Ball and Shivakumar 2005).

[38] I re-estimated the conservatism regression models (6) and (7) with six dummy variables, one for each industry, as defined in Table 2. The results were qualitatively the same (untabulated).

Results: Adjusted Abnormal Returns and Financial Performance

Table 8, Panel A, which reports the results of both size-and-book-to-market-adjusted buy-and-hold abnormal returns and financial performance analyses, shows the adjusted abnormal returns (between one year and five years) to be significantly higher for firms majority-owned by PE sponsors than for firms minority-owned by PE sponsors.[39] For example, the mean of one-year abnormal returns for firms majority-owned by PE sponsors is 19.1% (median of 8.8%), but the mean for firms minority-owned by PE sponsors is -9.3% (-18.3%). This difference of 28.5% (27.1%) is significant at the 0.01 level for the medians. In the one-year and three-year periods after the IPO, the median returns for firms majority-owned by PE sponsors are also significantly higher than for management-owned firms. Firms minority-owned by PE sponsors have the lowest abnormal returns in the one-, three-, and five-year periods (for the five-year period, their abnormal return is significantly lower than that of management-owned firms).

Table 8, Panel A documents that firms minority-owned by PE sponsors also have the lowest post-IPO financial performance. In particular, they have the lowest (but not statistically significant) industry adjusted ROA and market-to-book ratios (statistically significant for one and three years) as well as the highest percentage of post-IPO delistings. Management-owned firms, on the other hand, have the highest (but not statistically significant) industry adjusted ROA and market-to-book ratios (statistically significant for the one and three year periods), and, consistent with the findings in Table 5, have the highest level of abnormal accruals in the five years pre-IPO.

Taken together, and consistent with **H3**, firms majority-owned by PE sponsors have higher abnormal returns than firms owned by management despite their lower financial

[39] The use of other benchmarks such as the value-weighted market return index or S&P composite index yields qualitatively similar results. The results are also qualitatively the same when I use cumulative abnormal returns.

performance. These results can be attributed to the PE sponsor's higher earnings quality (less engagement in upward earnings management and timelier loss recognition) and capacity for tighter monitoring and control, both pre- and post-IPO. The poor abnormal returns of firms minority-owned by PE sponsors, which is consistent with **H4a**, can be attributed to their poor financial performance and the lesser degree of monitoring and control exercised by minority stakes owners (as indicated in Table 4 and the discussion in section IV above).

Table 8, Panel B reports the results of the abnormal returns as well as financial performance analyses for firms owned by large PE sponsors relative to firms owned by small PE sponsors. Overall, abnormal returns and industry adjusted ROA are significantly higher for firms owned by large PE sponsors. Firms owned by large PE sponsors also have a lower percentage of delisting. The results of the market-to-book ratios are mixed. Moreover, firms owned by large PE sponsors have significantly lower pre-IPO median abnormal accruals (and in the post-IPO period report more conservatively).

Taken together, and consistent with **H4b**, these results indicate that lower engagement in pre-IPO earnings management, together with the ability of large PE sponsors to provide a higher level of monitoring and support, lead to better long-run financial and market-adjusted performance for firms owned by larger PE sponsors.

Table 8 indicates that PE-backed firms have significantly higher underwriter reputation and significantly lower pre-IPO abnormal accruals than management-owned firms. The same holds true for firms owned by large PE sponsors relative to firms owned by small PE sponsors. Moreover, a significantly higher percentage of firms that are majority owned by PE sponsors are also owned by large PE sponsors, and vice versa. To untangle the influence of these factors and verify that the abnormal return results are not driven by them, I further control for underwriter reputation, pre-IPO abnormal accruals, and PE sponsor size and ownership stake (when applicable). The main abnormal return results are qualitatively similar.[40]

Table 9 reports, separately for the different ownership groups, the results of the Fama-French three factor calendar time portfolio regressions (8). Consistent with the finding above, Table 9 indicates that firms minority-owned by PE sponsors have the lowest average monthly abnormal returns in the one-, three-, and five-year periods (as captured by the estimate of the intercept), firms owned by larger PE sponsors, the highest average monthly abnormal returns.

Additional Results: Listing Status

To gain insight into the influence of private and public listing status, I compare for a given ownership structure financial practices before and after the IPO.

Stock-price penalties and the use of equity-based compensation are strong incentives for managers of U.S. public firms to manage earnings upward (Givoly et al. 2007). This pattern is consistent with the view that the opportunity to manipulate stock price is a motive for earnings management (Jensen 2005).

Moreover, all firm-year observations in my sample, both pre and post-IPO, are subject to identical financial reporting regulations. But because pre-IPO firms are more closely held, many shareholders have “inside information” and therefore less need to rely on financial statements and the quality of financial reporting is therefore predicted to be lower in the pre-IPO period (Ball and Shivakumar 2005). Timelier loss recognition is also associated with lower shareholder litigation costs (Skinner 1997), which creates an additional incentive for post-IPO public firms to recognize losses in a more timely manner.

[40] Specifically, for each period I run the following regressions: $Abnormal\_Returns_t = a_0 + a_1*Dummy\_Ownership + a_2*Underwriter\_Reputation + a_3*Avg\_Pre\text{-}IPO\_UTACC + a_4*Dummy\_Large\_PE\_Sponsor + a_4*Dummy\_Majority\_PE\_Ownership + e_t$.

Consistent with these predictions, and with the findings of Givoly at al. (2007) and Ball and Shivakumar (2005), untabulated analyses reveal that post-IPO firms have greater upward earnings management and report more conservatively than pre-IPO firms, regardless of the initial controlling party.

VI. ROBUSTNESS CHECKS

Transition Periods

In untabulated analyses, I identify specific earnings-management incentives that arise for firms engaged in “going private” (public to private) transactions such as LBOs and MBOs as well as in other contexts such as M&A and bankruptcy.

Overall, my findings are consistent with the results of prior literature. First, I document lower unexpected discretionary accruals in the two years prior to an MBO transaction. This is consistent with managers’ incentive to act in their own financial interest and influence firm price in their favor (DeAngelo 1986, Perry and Williams 1994, Wu 1997, Marquardt and Wiedman 2004). Second, I find higher unexpected discretionary accruals and growth in net operating assets in the two years prior to an LBO. These results are consistent with entrepreneurs’ incentive to manage earnings upward prior to PE financing (Beuselinck et al. 2005). Third, I find evidence consistent with upward earnings management by PE-backed public firms in the years prior to M&A transaction, consistent with the assumption that these firms can anticipate an acquisition or initiate and plan for a sale and are therefore able to manage earnings accordingly (Erickson and Wang 1999). Finally, I find evidence of downward earnings management by PE-backed public firms in the two years prior to a bankruptcy filing relative to prior years. This result is consistent with the incentive of managers, especially in public firms, to avoid the threat of lawsuits by stakeholders (Rosner 2003). When I remove observations during these transition periods, the results are qualitatively similar.

Restructuring Activities

Renneboog and Simons (2005) argue that PE sponsors can create the "stronger incentive alignment with a focus on performance and value, the reduction in wasting corporate resources, and the improved monitoring capabilities embedded in the governance structure of an LBO." PE-backed firms, therefore, especially in the pre-IPO period, might be involved in more restructuring activities than non-PE-backed firms, which might affect the results of this study.

I identify and compare for PE-backed and non-PE-backed firms several proxies for restructuring activities including magnitude of discontinued operations, involvement in M&A activities, and yearly increase or decrease in assets greater than 50%. This analysis reveals that the involvement of both groups of firms in restructuring activities is not significantly different in the period surrounding an IPO. When I remove observations during restructuring periods, the results are qualitatively similar.

VII. SUMMARY AND CONCLUSIONS

In this paper, I explore for a unique sample of U.S. private firms with public debt whether ownership structure, that is, being PE-backed or non-PE-backed, affects earnings management and earnings conservatism before and immediately following an IPO. I also test for the association between the PE sponsor's ownership stake and size and post-IPO financial and stock-price performance.

Consistent with my predictions, I find that the presence of and monitoring by sophisticated PE sponsors restrains upward earnings management and induces a higher frequency of timely loss recognition, both pre- and post-IPO. I further find that majority ownership by a PE sponsor is associated with better stock price performance relative to management-owned firms, and that larger PE sponsor size is positively associated with both better long-term financial and stock price performance when a firm goes public. These results can be attributed to less upward earnings management, more timely loss recognition, and tighter monitoring and control by PE sponsors, both pre- and post-IPO. Firms minority-owned by PE sponsors, on the other hand, have worse long-term financial and stock price performance in the years following an IPO than management-owned firms because of the lesser ability of these PE sponsors to control and monitor.

It is worth exploring the incentives for PE-backed and non-PE-backed firms to manage earnings in order to minimize taxes or manipulate bond prices, and the association of both actions with auditor compensation. Comparing PE-backed and non-PE-backed firms in international settings could enhance the results obtained in this study of domestic firms, and shed further light on the effect of institutions on PE-backed and non-PE-backed firms (Leuz 2006).

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Table 1
Sample Selection

Private Firms with Public Debt (1980-2005)

	No. of Firm-Year Observations	No. of Firms
"Potential" private firms with public debt (COMPUSTAT)[a]	**13,062**	**3,355**
Historical prospectus data[b]	(3,233)	(1,242)
Public firms	(2,324)	(371)
Subsidiaries of public firms	(561)	(102)
Public spin-offs	(111)	(34)
Firms in bankruptcy process	(295)	(100)
Firms with no available information	(1,683)	(344)
Foreign firms	(772)	(184)
IPO year	(116)	(116)
Other[c]	(737)	(280)
Subtotal	3,230	582
1978-1979 Firm-year Observations	(65)	0
Cooperatives, LPs, and Government-owned Firms	(355)	(25)
Private firms with public debt	**2,810**	**557**
IPO Firms (11 years surrounding the IPO)[d]	**1,070**	**147**

[a] The sample of "potential" private firms with public debt covers all firm-year observations on COMPUSTAT for any of the 28 years from 1978 to 2005 that satisfy the following criteria: (1) the firm's stock price at fiscal year end is unavailable; (2) the firm has total debt as well as total revenues exceeding $1 million; (3) the firm is a separate domestic company, not a subsidiary of another public firm; and (4) the firm has the financial data needed to test the hypotheses for at least two years. I further exclude financial institutions and firms in other regulated industries (SIC codes 6000-6999 and 4800-4900).

[b] COMPUSTAT reports three years of historical information for public firms that file for initial public offering. This financial information is taken from the prospectus.

[c] "Other" includes observations of the same firm with different names, firms with no consecutive years of information, firms that have joint ventures and partnerships with public firms, holding companies of public firms, and observations with information available only for the years 1978-1979.

[d] Firms that are owned by PE sponsors or management and that filed for an initial public offering (IPO). The firm-year observations include the period of five years before and five years after the IPO.

Sources: EDGAR, 10K Wizard, BankruptcyData.com, Hoover's DataBase, Factiva, ProQuest, and LexisNexis.

Table 2
Descriptive Statistics on Private Firms with Public Debt

		Total (1)	PE Majority (2)	PE Minority (3)	Mgmt (4)	Employ. (5)	Unknown (6)
			Ownership Breakdown[a]				
No. of Firms		557	319	77	121	19	32
No. of Firm-year Observations		2,810	1,408	355	649	223	175
Panel A: Financial Measures of Sample							
Total Assets	Mean	653	592	607	662	1,175	772
(in $ millions)	Median	355	388	303	295	372	215
	Std. Dev.	850	632	958	931	2,038	969
	t-stat[b]		-2.6*	-0.9	0.2	3.8***	1.6
Total Sales	Mean	809	665	867	908	2,163	383
(in $ millions)	Median	413	423	450	385	691	294
	Std. Dev.	1,184	735	1,335	1,531	3,458	336
	t-stat		-4.8**	0.8	1.5	5.7**	-12.5**
Sales Growth	Mean	6.1%	5.1%	7.0%	6.1%	7.9%	8.3%
	Median	4.9%	3.7%	4.7%	4.8%	8.3%	6.5%
	Std. Dev.	14.2%	14.8%	15.1%	13.7%	8.6%	16.5%
	t-stat		-1.8*	1.0	0.1	2.7***	1.6
Leverage	Mean	68.0%	76.5%	77.9%	63.1%	25.8%	53.8%
	Median	67.0%	72.2%	73.8%	64.7%	21.6%	46.4%
	Std. Dev.	31.5%	30.0%	27.0%	27.8%	20.3%	25.9%
	t-stat		8.4***	6.2**	-3.9**	-27.8***	-6.9***
ROA	Mean	4.7%	3.3%	3.8%	6.7%	8.1%	3.6%
	Median	5.3%	4.6%	5.0%	6.1%	7.9%	5.3%
	Std. Dev.	7.3%	8.0%	8.5%	6.4%	5.2%	10.3%
	t-stat		-4.9***	-1.7*	6.3***	8.7***	-1.3

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.
The distribution of each variable is truncated at the extreme ±1% values.

[a] Ownership of private equity firms was determined based on the majority or minority ownership. Management ownership was based on the holdings of the founders, top executives, directors, and family members. Employee ownership was based on the holdings of employees including their pension and stock option plans. The "unknown" category generally consists of firms with no available information regarding ownership.
[b]t-stat for two-tailed tests of the differences between the specific ownership's financials and the total financials.

Legend:

Total Assets	Total end-of-the-year assets in millions of dollars (COMPUSTAT data item #6).
Total Sales	Sales (net) in millions of dollars (#12).
Leverage	Total debt (#9+#34) divided by total assets at end of the year (#6).
Sales Growth	Growth in sales (#12) from year t–1 to year t.
ROA	Net income (#172) plus net of tax interest expense (#15) divided by total assets at end of year t–1 (lagged #6).

Table 2 (continued)
Descriptive Statistics on Private Firms with Public Debt

	Total (1)	PE Majority (2)	PE Minority (3)	Mgmt (4)	Employ. (5)	Unknown (6)
No. of Firms	557	319	77	121	19	32
No. of Firm-year Observations	2,810	1,408	355	649	223	175
Panel B: Industry Affiliation (two-digit SIC codes)						
Mining & Construction (10-17)	3.2%	2.2%	1.3%	7.4%	5.3%	--
Manufacturing I (20-29)	23.9%	22.6%	27.3%	27.3%	15.8%	21.9%
Manufacturing II (30-39)	30.3%	36.7%	23.4%	21.5%	10.5%	28.1%
Transportation & Public Utilities (40-49)	3.8%	3.4%	2.6%	2.5%	10.5%	9.4%
Retail & Wholesale Trade (50-59)	21.9%	21.0%	33.8%	19.8%	10.5%	25.0%
Services	16.3%	14.1%	10.4%	20.7%	42.1%	15.6%
Other	0.5%	--	1.3%	0.8%	5.3%	--
Panel C: S&P Senior Debt Ranking (#280)						
BBB or Better	2.9%	0.2%	2.0%	0.3%	13.9%	22.3%
BB	9.3%	9.4%	3.7%	13.4%	6.3%	8.6%
B	41.6%	53.1%	52.1%	30.8%	6.3%	13.1%
C - CCC	4.6%	5.6%	6.5%	4.0%	--	--
D and Selective Default	0.3	0.2%	--	0.8%	--	0.6%
Not Rated	41.2%	31.4%	35.8%	50.7%	73.5%	55.4%
Panel D: Change in Status during the Sample Period						
IPO	28.4%	30.1%	35.1%	19.8%	31.6%	21.9%
Bankruptcy	16.2%	17.2%	19.5%	13.2%	5.3%	15.6%
M&A	16.5%	16.9%	14.3%	12.4%	21.1%	28.1%
Deregistration	15.6%	14.1%	6.5%	28.1%	5.3%	6.3%
Total percent of firms that changed value	76.7%	78.4%	75.3%	73.6%	63.2%	71.9%
Panel E: Size of PE Sponsor Firms[a]						
Tier 1	3.1%	6.0%	0.8%			
Tier 2	7.4%	13.1%	6.5%			
Tier 3	4.8%	9.2%	1.1%			
Other	84.7%	71.6%	91.5%			

[a] PE sponsors are ranked according to total investment (in $US) during the years 1980-2005.
Tier 1 includes: Warburg Pincus, Carlyle Group, and KKR.
Tier 2 includes: Apax, Blackstone, Goldman Sachs, J.P. Morgan, Welsh Carson Anderson & Stone, and Hicks Muse Tate & Furst.
Tier 3 includes: 3i Group, Bain Capital, Thomas H. Lee, Morgan Stanley, and Cinven.

Source: Thomson Financials, VentureXpert.

Table 3
Descriptive Statistics Pre-IPO and Post-IPO

		5 Years Pre-IPO						5 Years Post-IPO					
		PE Majority (1)	PE Minority (2)	Mgmt (3)	Diff.[a] (1) - (2)	Diff. (1) - (3)	Diff. (2) - (3)	PE Majority (4)	PE Minority (5)	Mgmt (6)	Diff. (4) - (5)	Diff. (4) - (6)	Diff. (5) - (6)
No. of Firms		96	27	24				70	23	21			
No. of Firm-year Observations		329	85	86				254	93	76			
Total Assets	Mean	849	814	1146	35	-296*	-331	1412	1228	1483	184	-71	-255
(in $ millions)	Median	516	390	382	126***	134***	8	913	654	594	260***	319***	60
Total Sales	Mean	974	979	963	-6	10	16	1886	1354	891	532**	996***	463**
(in $ millions)	Median	540	533	504	7	36***	29	1127	782	661	345***	466***	121*
Sales Growth	Mean	6.9%	8.5%	7.6%	-1.6%	-0.7%	0.9%***	9.3%	8.2%	14.7%	1.0%	-5.4%	-6.5%
	Median	5.5%	4.6%	5.2%	0.9%***	0.3%***	-0.6%	7.5%	4.4%	9.1%	3.1%***	-1.6%***	-4.7%
Leverage	Mean	72.8%	76.5%	58.3%	-3.7%	14.5%***	18.2%***	47.7%	50.5%	42.2%	-2.8%	5.5%*	8.3%**
	Median	68.7%	71.0%	54.5%	-2.3%***	14.2%***	16.5%	45.0%	44.7%	44.8%	0.3%***	0.2%***	-0.1%
ROA	Mean	5.2%	3.4%	3.6%	1.9%	1.7%	-0.2%	5.2%	4.4%	5.1%	0.8%	0.2%	-0.7%
	Median	5.5%	5.4%	5.1%	0.1%***	0.4%***	0.3%	6.3%	5.5%	5.0%	0.8%***	1.3%***	0.6%
Q-Ratio	Mean	83.2%	70.3%	109.6%	13.0%**	-26.4%***	-39.3%***	81.3%	85.2%	105.1%	-3.9%	-23.8***	-19.9%*
	Median	75.1%	62.4%	102.9%	12.7%***	-27.8%***	-40.6%	73.9%	69.2%	91.4%	4.7%***	-17.5%***	-22.1%
Cash	Mean	3.9%	4.2%	5.8%	-0.4%	-2.0%**	-1.6%	4.5%	4.0%	7.9%	0.5%	-3.4%***	-3.9%***
	Median	2.1%	1.3%	2.4%	0.8%***	-0.3%***	-1.1%	1.7%	1.2%	3.2%	0.5%***	-1.5%***	-2.0%
TACC	Mean	-7.9%	-7.8%	-5.1%	-0.1%	-2.9%**	-2.7%*	-5.1%	-6.7%	-6.1%	1.6%**	0.9%	-0.6%
	Median	-6.9%	-7.1%	-5.2%	0.2%***	-1.7%***	-1.8%*	-4.7%	-6.2%	-5.9%	1.45***	1.2%***	-0.3%**
CFO	Mean	7.6%	5.1%	4.2%	2.5%	3.4%	0.9%	7.7%	9.6%	7.3%	-1.9%*	0.5%	2.3%*
	Median	6.8%	5.3%	5.7%	1.4%*	1.1%*	-0.4%	8.3%	8.2%	7.3%	0.1%***	1.0%***	0.8%**
Special Items	Mean	-2.1%	-3.1%	-1.9%	1.0%	-0.3%	-1.3%	-2.7%	-2.4%	-2.5%	-0.3%	-0.2%	0.1%
	Median	-0.9%	-1.0%	-1.1%	0.1%***	0.3%***	0.1%	-1.5%	-1.0%	-0.6%	-0.5%***	-0.9%***	-0.4%
	Proportion[b]	42.2%	34.1%	24.4%	8.1%	17.8%***	9.7%	57.5%	58.1%	59.2%	-0.6%	-1.7%	-1.1%
% of Loss Firms	Mean	48.6%	57.6%	36.0%	-9.0%	12.6%	21.6%	22.8%	34.4%	27.6%	-11.6%**	-4.8%	6.8%
% Audited by a "Big" Auditor	Mean	96.0%	82.4%	93.0%	13.7%	3.0%	-10.7%	99.6%	93.5%	97.4%	6.1%**	2.2%	-3.8%

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.
The distribution of each variable is winsorized at the extreme ±1% values.
[a] Differences in means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test.

Table 3 (Continued)
Descriptive Statistics Pre-IPO and Post-IPO

[b] Proportion is calculated as the number of observations that reported special items divided by the total number of observations. Statistical significance is assessed using the t-test for differences in proportions.

Legend:

Total Assets	Total end-of-the-year assets in millions of dollars (COMPUSTAT data item #6).
Total Sales	Sales (net) in millions of dollars (#12).
Leverage	Total debt (#9+#34) divided by total assets at end of the year (#6).
Sales Growth	Growth in sales (#12) from year t–1 to year t.
ROA	Net income (#172) plus net of tax interest expense (#15) divided by total assets at end of year t–1 (lagged #6).
Q-Ratio	Cash and short-term investment (#1) plus total receivables (#2) divided by current liabilities (#5).
Cash	Cash and short-term investment (#1) divided by total asset at end of year t (#6).
TACC	Total accruals divided by total assets at end of year t–1 (lagged #6). For year>=1988: total accruals [income before extraordinary items (SCF) (#123) – net cash flow from operating activities (#308) + extraordinary items and discounted operations (SCF) (#124)] divided by total assets at end of year t–1 (lagged #6). For year<1988: [change in current assets during period t (#4) – change in current liabilities during period t (#5) – change in cash and cash equivalents during period t (#1) + change in current maturities of long-term debt and other short-term debt included in current liabilities during period t (#34) – depreciation and amortization expense during period t (#125)]. In addition, I eliminated firm-year observations with the following "non-articulation" events: firm-year observations in which a company is involved in a merger or acquisition (#AFTNT35 code #1); firm-year observations in which a company reports "discontinued operations" greater than $10,000 (#66); and firm-year observations in which a company reports a gain or loss on foreign currency translations greater than $10,000 (#150) (Hribar and Collins 2002).
CFO	Cash flow from operations divided by total assets at the end of year t–1. For year>=1988: net cash flow from operating activities (#308) divided by total assets at end of year t–1 (lagged #6). For year <1988: [funds from operations (#110) – change in current assets during period t (#4) + change in cash and cash equivalent during period t (#1) + change in current liabilities during period t (#5) – change in current maturities of long-term debt and other short-term debt included in current liabilities during period t (#34)]. All variables are divided by total assets at end of year t–1 (lagged #6) (Xie 2001).
Special Items	Special items (#17) divided by total assets at end of year t–1 (lagged #6).
Loss Firms	Firms with negative net income (#172) during year t.
Audited by “Big” Auditor	Percentage of firms audited by one of the big national auditing firms (#149).

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Table 4
Corporate Governance

		Pre-IPO						Post-IPO					
		PE Majority (1)	PE Minority (2)	Mgmt (3)	Diff.[a] (1) - (2)	Diff. (1) - (3)	Diff. (2) - (3)	PE Majority (4)	PE Minority (5)	Mgmt (6)	Diff. (4) - (5)	Diff. (4) - (6)	Diff. (5) - (6)
No. of Firms		62	12	18				62	12	18			
Board													
Chair CEO	Mean	56.5%	83.3%	61.1%	-26.9%**	-4.7%	22.2%	54.8%	91.7%	61.1%	-36.8%***	-6.3%	30.6%**
Insiders	Mean	33.9%	29.9%	56.7%	4.0%	-22.7%***	-26.7%***	25.3%	27.6%	37.4%	-2.4%	-12.1%***	-9.8%**
	Median	29.3%	28.6%	50.0%	0.7%***	-20.7%***	-21.4%***	22.2%	28.6%	40.0%	-6.3%***	-17.8%***	-11.4%*
PE on Board	Mean	55.2%	34.0%		21.1%***			50.3%	29.4%		20.9%***		
	Median	57.1%	37.5%		19.6%***			50.0%	31.0%		19.0%***		
Board Size	Mean	7.1	6.3	5.4	0.8**	1.7**	0.9	8.2	6.3	6.6	1.8***	1.5***	-0.3
	Median	7.0	6.0	5.0	1.0***	2.0***	1.0	8.0	7.0	6.5	1.0***	1.5***	0.5
CEO Compensation													
Options *(% of total compensation)*	Mean	68.4%	68.7%	13.2%	-0.2%	55.3%**	55.5%**	69.9%	65.7%	46.9%	4.2%	23.0%*	18.8%
	Median	71.0%	68.7%	13.2%	2.3%***	57.8%***	55.5%	74.3%	66.1%	43.7%	8.2%***	30.6%***	22.4%
Total Options *(in $ millions)*	Mean	$3.93	$1.17	$0.09	$2.76***	$3.84	$1.10	$8.41	$3.36	$0.65	$5.04	$7.76***	$2.72
	Median	$1.78	$1.17	$0.09	$0.61***	$1.69***	$1.10	$2.74	$1.55	$0.39	$1.18***	$2.34***	$1.16
Variable *(% of total compensation)*	Mean	61.9%	55.2%	51.8%	6.7%	10.2%	3.5%	73.8%	69.0%	45.4%	4.8%	28.4%***	23.6%**
	Median	59.7%	58.0%	54.6%	1.7%***	5.1%***	3.4%	82.5%	69.8%	50.2%	12.7%***	32.3%***	19.6%
Total Comp *(in $ millions)*	Mean	$1.06	$0.77	$1.36	$0.29*	-$0.30	-$0.59*	$1.62	$1.09	$0.77	$0.53	$0.84**	$0.32
	Median	$0.78	$0.68	$0.82	$0.10***	-$0.04***	-$0.14	$0.95	$0.72	$0.60	$0.23***	$0.35***	$0.12
Ownership													
CEO	Mean	5.6%	14.9%	38.3%	-9.3%*	-32.7%***	-23.4%**	3.8%	10.6%	11.7%	-6.8%	-7.9%*	-1.1%
	Median	3.0%	11.2%	26.4%	-8.3%***	-23.5%**	-15.2%	2.2%	5.0%	6.4%	-2.8%***	-4.2%**	-1.5%
Mgmt	Mean	12.9%	15.3%	57.0%	-2.5%	-44.2%***	-41.7%***	9.7%	11.6%	39.3%	-1.9%	-29.5%***	-27.6%***
	Median	9.4%	13.1%	68.5%	-3.7%***	-59.1%*	-55.4%	5.8%	11.4%	41.8%	-5.6%***	-36.0%	-30.4%**
PE Sponsor	Mean	79.9%	36.4%		43.5%***			47.3%	23.4%		23.9%***		
	Median	82.8%	39.9%		42.9%***			49.8%	20.8%		29.0%***		

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.
[a] Differences in means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test.

Table 4 (continued)
Corporate Governance

Legend:

Chair CEO	Percentage of firms in which the CEO is the chairman of the board of directors.
Insiders	Number of directors who serve as executives in the firm divided by total board size.
PE on Board	Number of directors who represent PE sponsors divided by total board size.
Board Size	Total number of directors on the board of directors.
Options	Total options divided by the sum of the total comp and total options.
Total Options	Cumulative value of options distributed to the CEO during her/his tenure as well as the cumulative value of options realized. When the cumulative value was absent, the average value of options distributed during the year was used.
Variable	Sum of the total option, bonus, other annual compensation, and other compensation (excluding salary) divided by the total comp and total options. (Note: Variable includes instances in which options were NOT distributed.)
Total Comp	Sum of the salary, bonus, other annual compensation, and other compensation.
CEO	Percentage owned by the CEO.
Mgmt	Percentage owned by the management.
PE	Percentage owned by the PE sponsors.

Table 5
Magnitude of Abnormal Accruals and Growth in Net Operating Assets

Panel A: Univariate Analysis

		PE Majority			PE Minority			Mgmt			Diff.[a] PE Majority v. PE Minority		Diff. PE Majority v. Mgmt		Diff. PE Minority v. Mgmt	
Years		N	UTACC (1)	GNOA (2)	N	UTACC (3)	GNOA (4)	N	UTACC (5)	GNOA (6)	UTACC (1) - (3)	GNOA (2) - (4)	UTACC (1) - (5)	GNOA (2) - (6)	UTACC (3) - (5)	GNOA (4) - (6)
5 Years Pre-IPO	Mean	277	-3.7%	-4.9%	69	-4.2%	-9.6%	79	-0.3%	-0.9%	0.5%	4.7%**	-3.4%***	-4.0%	-3.9%***	-8.7%*
	Median		-3.5%	-3.2%		-2.1%	-7.9%		-1.1%	-2.9%	-1.4%*	4.7%**	-2.3%***	-0.3%***	-1.0%**	-4.9%**
5 Years Post-IPO	Mean	206	-1.4%	-2.1%	81	-1.4%	-0.9%	62	5.4%	13.9%	0.0%	-1.2%	-6.8%*	-16.0%**	-6.8%*	-14.8%**
	Median		-0.8%	-0.6%		-1.2%	-2.9%		1.5%	0.4%	0.4%	2.3%	-2.3%**	-1.0%***	-2.7%**	-3.3%***
Avg. 5 Years Post-IPO[b]	Mean		-0.3%	-1.5%		-1.4%	2.3%		3.3%	13.4%	1.1%	-3.7%	-3.6%	-14.9%**	-4.7%	-11.2%*
	Median		-0.6%	-0.8%		-0.2%	1.2%		1.7%	4.9%	-0.4%	1.2%	-2.3%*	-5.6%*	-1.9%	-3.6%
-5	Mean	32	-4.9%	6.0%	5	-8.7%	-22.7%	12	8.8%	15.8%	3.9%	28.7%	-13.7%***	-9.8%	-17.6%**	-38.5%*
	Median		-4.0%	-1.5%		-1.3%	-15.4%		7.1%	-0.6%	-2.7%***	14.0%	-11.1%***	-0.8%	-8.4%***	-14.8%*
-4	Mean	48	-3.5%	-5.5%	11	-25.5%	86.6%	13	-3.8%	7.0%	21.9%	-92.1%	0.3%	-12.5%	-21.6%	79.6%
	Median		-2.8%	-2.6%		-2.3%	-10.0%		-4.0%	-2.2%	-0.6%**	7.4%*	1.2%	-0.4%**	1.8%	-7.9%
-3	Mean	65	-4.3%	-1.1%	18	-4.3%	-8.0%	17	-2.0%	-5.5%	0.0%	6.9%	-2.3%	4.4%	-2.3%	-2.6%
	Median		-3.1%	-6.4%		-0.7%	-7.1%		-1.4%	-6.4%	-2.4%***	0.7%**	-1.7%***	0.0%**	0.8%	-0.7%
-2	Mean	87	-4.3%	1.4%	23	-5.9%	9.3%	20	-0.2%	-3.8%	1.6%	-7.9%	-4.1%*	5.2%	-5.7%**	13.1%
	Median		-3.7%	-6.5%		-4.5%	-5.9%		-1.6%	-4.3%	0.8%**	-0.7%	-2.0%**	-2.2%**	-2.9%*	-1.6%
-1	Mean	96	-4.3%	6.4%	27	-3.5%	5.7%	24	-0.1%	-3.8%	-0.7%	0.7%	-4.1%**	10.2%	-3.4%	9.5%
	Median		-3.9%	-3.3%		-5.4%	-7.9%		1.1%	-5.3%	1.5%***	4.6%	-5.0%***	2.0%	-6.5%**	-2.6%
IPO Year	Mean	84	-1.9%	5.7%	24	0.5%	25.1%	24	7.3%	365.4%	-2.4%	-19.4%	-9.2%	-359.7%	-6.8%	-340.3%
	Median		-1.3%	0.0%		0.5%	-2.0%		1.1%	12.7%	-1.7%***	2.0%	-2.4%**	-12.7%*	-0.6%	-14.7%
+1	Mean	70	0.6%	11.9%	23	0.5%	-0.5%	21	1.1%	46.9%	0.1%	12.4%*	-0.5%	-34.9%	-0.6%	-47.3%*
	Median		0.3%	0.0%		0.2%	-2.4%		-1.1%	6.6%	0.1%	2.4%	1.3%	-6.6%	1.2%	-9.0%*
+2	Mean	60	-1.8%	3.8%	22	-3.3%	3.0%	17	16.1%	8.9%	1.5%	0.8%	-17.9%	-5.1%	-19.4%	-6.0%
	Median		-1.2%	0.0%		-2.1%	-0.3%		-0.4%	0.3%	0.9%	0.3%	-0.8%	-0.3%	-1.7%	-0.6%
+3	Mean	49	4.3%	-1.9%	20	-0.2%	8.7%	14	0.4%	2.8%	4.5%	-10.6%	3.9%	-4.7%	-0.5%	5.9%
	Median		-0.8%	-4.3%		-0.3%	0.1%		2.9%	-0.9%	-0.5%	-4.4%*	-3.7%**	-3.4%**	-3.2%	1.0%
+4	Mean	41	-1.5%	-6.9%	15	-4.0%	10.7%	12	-5.7%	-6.8%	2.6%	-17.7%	4.2%	-0.1%	1.6%	17.5%
	Median		0.1%	-2.4%		-2.6%	-5.4%		-1.3%	1.6%	2.7%	3.0%	1.4%	-4.0%*	-1.3%	-7.0%
+5	Mean	34	-1.5%	6.2%	14	-1.3%	-3.1%	12	-0.8%	17.6%	-0.2%	9.3%	-0.7%	-11.4%	-0.5%	-20.7%
	Median		-1.0%	0.5%		-1.8%	-8.6%		0.1%	-1.7%	0.8%	9.1%	-1.1%	2.2%	-2.0%	-6.9%*
IPO Year Current UACC[c]	Mean	84	2.2%		24	3.7%		24	12.3%		-1.5%		-10.2%		-8.6%	
	Median		1.4%			2.6%			3.1%		-1.2%		-1.7%**		-0.5%	

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.

Table 5 (continued)
Magnitude of Abnormal Accruals and Growth in Net Operating Assets

Panel B: Multivariate Analysis

		5 Years Pre-IPO								5 Years Post-IPO							
		UTACC				GNOA				UTACC				GNOA			
Independent Variable	Predicted Sign	Coef. (1)	t-stat (1)	Coef. (2)	t-stat (2)	Coef. (3)	t-stat (3)	Coef. (4)	t-stat (4)	Coef. (5)	t-stat (5)	Coef. (6)	t-stat (6)	Coef. (7)	t-stat (7)	Coef. (8)	t-stat (8)
Intercept (a_0)	?	0.031	1.37	-0.124	-2.74***	0.197	2.59***	-0.247	-1.66*	0.134	1.33	0.167	1.09	0.964	6.91***	-0.492	-2.28**
PE (a_1)	-	-0.081	-3.41***	-0.022	-2.35**	-0.305	-3.81***	-0.022	-0.74	-0.156	-1.51	-0.071	-2.47**	-1.029	-6.16***	-0.122	-2.99***
LAMBDA		0.030	1.74*			0.154	2.72****			0.052	0.73			0.587	5.81***		
PE*LAMBDA		0.020	0.76			0.024	0.29			-0.018	-0.19			-0.395	-2.82***		
Pseudo-R-square[d]		18.30%				18.30%				12.16%				12.16%			
ln(Total Assets)				-0.014	-1.99**			0.032	1.33			0.005	0.19			0.010	0.30
ln(Sales)				0.020	2.56**			-0.008	-0.30			-0.017	-0.64			0.014	0.38
Book Value / Total Assets				0.070	2**			0.083	0.72			-0.034	-0.31			0.374	2.42**
Sales Growth				-0.062	-2.97***			0.183	2.72***			-0.040	-0.54			0.074	0.70
Leverage				0.023	0.66			0.001	0.01			0.000	0.00			0.193	1.26
RNOA				0.036	4.7***			-0.009	-0.38			0.137	1.60			0.784	6.4***
Q-Ratio				0.016	1.96*			0.065	2.45**			0.024	0.85			0.042	1.04
Oper_Cycle				0.000	1.59			0.000	0.67			0.000	0.52			0.000	2.11**
Age				0.000	0.37			-0.001	-0.94			0.000	-0.05			-0.001	-0.92
Cash / Total Assets				-0.104	-1.43			-0.238	-1.00			-0.198	-1.05			0.501	1.85*
CAPEX / Total Assets				-0.079	-0.79			0.813	-2.48**			0.015	0.06			0.459	1.20
D_loss				-0.032	-4.44***			-0.031	-1.33			-0.055	-1.79*			0.087	1.97**
D_Audit_Quality				0.057	2.69***			-0.011	-0.15			-0.031	-0.40			0.047	0.42
Adj-R-square		5.69%		26.25%		6.20%		13.37%		1.70%		3.92%		14.79%		27.87%	
No. of Observations		297		297		304		304		319		319		324		324	

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.
The distribution of each variable is truncated at the extreme ±1% values.
[a] Differences in means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test.
[b] The average of five years' annual UTACC and GNOA variables. For firms that do not survive for five full years after the IPO, the maximum number of years for which COMPUSTAT data is available is used.
[c] Current unexpected discretionary accruals are derived from the cross-sectional modified Jones model used by Teoh et al. (1998b, 1998b). (See section III.)
[d] McFadden's LRI Pseudo-R-square for the first stage PROBIT model in the Heckman (1979) procedure.
Note: Panel A's summary of five years' pre-IPO and five years' post-IPO excludes firm-year observations during restructuring periods.

Table 5 (continued)
Magnitude of Abnormal Accruals and Growth in Net Operating Assets

Legend:

UTACC	Unexpected discretionary total accruals are derived from the cross-sectional modified Jones model (see section III). To control for the asymmetric recognition of gains and losses, I augmented the modified Jones model with the following independent variables: cash flow from operations in year t (CF_t), a dummy variable set to 1 if CF_t <1 and 0 otherwise (DCF_t), and an interactive variable, CF_t x DCF_t (Ball and Shivakumar (2006a).
GNOA	Industry adjusted growth in net operating assets after subtracting the industry median (same 4-digit SICs codes) GNOA for the same year: $GNOA_{j,t} = (NOA_{j,t} – NOA_{j,t–1}) / \|NOA_{j,t–1}\|$, where: NOA: common equity: [common equity (#60) + preferred treasury stock (#227) – preferred dividends in arrears (#242)] + financial obligations: [debt in current liabilities (#34) + total long-term debt (#9) + preferred stock (#130) – preferred treasury stock (#227) + preferred dividends in arrears (#242)] – financial assets: [cash and short-term Investments (#1) + investments and advances minus other (#32)] + minority interest (#38) (Nissim and Penman 2003).
PE	Dummy variable set to 1 for PE-backed firms (both majority- and minority-owned) and 0 for firms owned by management.
LAMBDA:	Following the Heckman (1979) procedure, in the first stage I estimate a PROBIT model with, as predictors, size (alternatively defined as the natural logarithms of total assets or sales), ratio of book value of equity to total assets, growth (in sales), leverage, profitability (operating income divided by net operating assets), quick ratio, length of the operating cycle, age, cash and capital expenditures (both divided by total assets), a dummy for loss firms, and audit quality (a dummy for the big national accounting firms). Estimates of the PROBIT model are used to compute an inverse Mills' ratio for each firm. In the second stage, the inverse Mills' ratio is added to equation (5) as a control variable. To allow its coefficient to vary between the two groups of firms, an interactive variable (PE*LAMBDA) is also included.
ln(Total Assets)	The natural logarithm of total assets (#6).
ln(Total Sales)	The natural logarithm of total sales (#12).
Book Value	Book value of equity: total common equity (#60) + carrying value of preferred stock (#130) + deferred taxes and investment tax credit (#35).
Sales Growth	Growth in sales (#12) from year t–1 to year t.
Leverage	Total debt (#9+#34) divided by total assets at end of the year (#6).
RNOA	Operating Income (OpI) dividend by net operating assets at end of year t-1 (NOA_{t-1}), where: OpI: earnings: [net income (#172) – preferred dividends (#19) + change in marketable securities adjustment (change in #238) + change in cumulative translation adjustment (change in #230)] + net interest expense: [after-tax interest expense (#15 × (1 – marginal tax rate)) + preferred dividends (#19) – after-tax interest income (#62 × (1 – marginal tax rate)) + minority interest in income (#49) minus the change in marketable securities adjustment (change in #238)], where the marginal tax rate is the top statutory federal tax rate plus 2% average state tax rate. The top federal statutory corporate tax rate was 48% in 1971-1978, 46% in 1979-1986, 40% in 1987, 34% in 1988-1992, and 35% in 1993-2003 (Nissim and Penman 2003).
Q-Ratio	Cash and short-term investment (#1) plus total receivables (#2) divided by current liabilities (#5).
Oper_Cycle	Operating cycle days (receivable collection period plus inventory turnover in days), calculated as: (yearly average accounts receivable #2)/(total revenues/360 #12) + (yearly average inventory #3)/(cost of goods sold/360 #41).
Age	Number of years since incorporation (first appearance on COMPUSTAT).
Cash	Cash and short-term investment (#1) divided by total assets at end of year t (#6).
CAPEX	Capital expenditures (#128) divided by total assets at end of year t (#6).
D_Loss	Dummy variable set to 1 for firms with negative net income (#172) during year t and 0 otherwise.
D_Audit_Quality	Dummy variable set to 1 for firms audited by one of the big national auditing firms (#149).

Table 6
Conditional Conservatism (Timely Loss Recognition) by Firm Type

$$\Delta OpI_t = a_0 + a1*D\Delta OpI_{t-1} + a_2*\Delta OpI_{t-1} + a_3*D\Delta OpI_{t-1}*\Delta OpI_{t-1} + a_4*PE + a_5*PE*D\Delta OpI_{t-1} + a_6*PE*\Delta OpI_{t-1} + a_7*PE*D\Delta OpI_{t-1}*\Delta OpI_{t-1} + e_t$$

			5 Years Pre-IPO						5 Years Post-IPO					
Independent Variable		Predicted Sign	Coef. (1)	t-stat (1)	Coef. (2)	t-stat (2)	Coef. (3)	t-stat (3)	Coef. (4)	t-stat (4)	Coef. (5)	t-stat (5)	Coef. (6)	t-stat (6)
Intercept	(a_0)	?	0.015	0.69	0.061	1.39	-0.182	-2.57**	0.018	0.66	0.046	0.52	-0.035	-0.38
$D\Delta OpI_{t-1}$	(a_1)	?	0.010	0.28	-0.006	-0.19	0.004	0.15	0.009	0.19	0.017	0.37	0.028	0.76
ΔOpI_{t-1}	(a_2)	?	-0.445	-1.7*	-0.844	-3.06***	-1.052	-5.3***	-0.093	-0.50	-0.151	-0.77	-0.084	-0.55
$D\Delta OpI_{t-1}*\Delta OpI_{t-1}$	(a_3)	?	0.396	1.06	0.764	2.2**	0.752	2.93**	0.342	1.04	0.560	1.29	-0.533	-1.38
PE	(a_4)	?	-0.028	-1.05	-0.043	-0.93	-0.041	-2.21**	-0.026	-0.84	-0.013	-0.14	0.002	0.07
$PE*D\Delta OpI_{t-1}$	(a_5)	?	-0.013	-0.33	-0.023	-0.61	0.022	0.84	-0.029	-0.58	-0.035	-0.68	-0.014	-0.35
$PE*\Delta OpI_{t-1}$	(a_6)	+	0.548	1.68*	0.741	2.3**	1.185	5.12***	0.064	0.30	0.088	0.39	-0.069	-0.40
$PE*D\Delta OpI_{t-1}*\Delta OpI_{t-1}$	(a_7)	-	-1.023	-2.37**	-1.182	-3.01***	-1.343	-4.74***	-1.017	-2.71***	-1.128	-2.41**	-0.024	-0.06
LAMBDA		?			0.026	0.81					0.033	0.54		
PE*LAMBDA		?			-0.043	-0.99					-0.177	-1.29		
Pseudo-R-square[a]					15.23%						7.85%			
ln(Total Assets)							-0.012	-1.10					-0.009	-0.64
ln(Sales)							0.023	1.99**					0.005	0.35
Book Value / Total Assets							0.113	2.13**					0.035	0.49
Sales Growth							0.058	1.65					0.037	0.96
Leverage							0.102	1.93*					0.077	1.17
RNOA							0.660	12.66***					0.693	9.11***
Q-Ratio							-0.010	-0.84					-0.009	-0.55
Oper_Cycle							0.000	1.72*					0.000	-1.09
Age							-0.001	-2.46**					0.000	0.72
Cash / Total Assets							0.020	0.18					0.003	0.02
CAPEX / Total Assets							-0.248	-1.52					-0.642	-3.76***
D_loss							0.005	0.47					-0.035	-1.88*
D_Audit_Quality							0.006	0.21					-0.006	-0.15
Adj-R-square			11.06%		19.11%		63.08%		7.21%		9.88%		49.00%	
No. of Observations			258		210		210		306		246		246	

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.
Each variable in the table is truncated at the extreme ±1% values of its distribution.
[a] McFadden's LRI Pseudo-R-square for the first stage PROBIT model in the Heckman (1979) procedure.

Table 6 (continued)
Conditional Conservatism (Timely Loss Recognition) by Firm Type

Legend:

ΔOpI_t:	Change in the earnings measure from year t–1 to year t, standardized by net operating assets at the end of year t–1. Earnings are measured as operating income (OpI), as defined below.
$D\Delta OpI$:	Dummy variable set to 1 if $\Delta OpI_{t-1} < 0$ and 0 otherwise.
PE:	Dummy variable set to 1 for PE-backed firms (both majority- and minority-owned) and 0 for firms owned by management.
LAMBDA:	Following the Heckman (1979) procedure, in the first stage I estimate a PROBIT model with, as predictors, size (alternatively defined as the natural logarithms of total assets or sales), ratio of book value of equity to total assets, growth (in sales), leverage, profitability (operating income divided by net operating assets), quick ratio, length of the operating cycle, age, cash and capital expenditures (both divided by total assets), a dummy for loss firms, and audit quality (a dummy for the big national accounting firms). Estimates of the PROBIT model are used to compute an inverse Mills' ratio for each firm. In the second stage, the inverse Mills' ratio is added to equation (6) as a control variable. To allow its coefficient to vary between the two groups of firms, an interactive variable (PE*LAMBDA) is also included.
OpI	Operating income divided by net operating assets (NOA) at end of year t–1, where: NOA: common equity: [common equity (#60) + preferred treasury stock (#227) – preferred dividends in arrears (#242)] + financial obligations: [debt in current liabilities (#34) + total long-term debt (#9) + preferred stock (#130) – preferred treasury stock (#227) + preferred dividends in arrears (#242)] – financial assets: [cash and short-term Investments (#1) + investments and advances minus other (#32)] + minority interest (#38). Operating income: earnings: [net income (#172) – preferred dividends (#19) + change in marketable securities adjustment (change in #238) + change in cumulative translation adjustment (change in #230)] + net interest expense: [after-tax interest expense (#15 × (1 – marginal tax rate)) + preferred dividends (#19) – after-tax interest income (#62 × (1 – marginal tax rate)) + minority interest in income (#49) minus the change in marketable securities adjustment (change in #238)], where the marginal tax rate is the top statutory federal tax rate plus 2% average state tax rate. The top federal statutory corporate tax rate was 48% in 1971-1978, 46% in 1979-1986, 40% in 1987, 34% in 1988-1992, and 35% in 1993-2005 (Nissim and Penman 2003).

All control variables are as defined in Table 5.

Table 7
Conditional Conservatism (Accruals) by Firm Type

$$ACC_t = b_0 + b_1{*}DCFO_t + b_2{*}CFO_t + b_3{*}DCFO_t{*}CFOt + b_4{*}PE + b_5{*}PE{*}DCFO_t + b_6{*}PE{*}CFO_t + b_7{*}PE{*}DCFO_t{*}CFO_t + e_t$$

			5 Years Pre-IPO						5 Years Post-IPO					
Independent Variable		Predicted Sign	Coef. (1)	t-stat (1)	Coef. (2)	t-stat (2)	Coef. (3)	t-stat (3)	Coef. (4)	t-stat (4)	Coef. (5)	t-stat (5)	Coef. (6)	t-stat (6)
$Intercep_t$	(b_0)	?	-0.038	-3.05***	-0.010	-0.40	-0.012	-0.28	-0.020	-1.54	-0.055	-1.73*	-0.088	-2.35**
$DCFO_t$	(b_1)	?	0.021	0.49	0.053	1.18	0.013	0.29	0.056	1.36	0.042	1.15	0.041	1.27
CFO_t	(b_2)	-	-0.284	-2.38**	-0.375	-2.51**	-0.615	-3.94***	-0.406	-3.65***	-0.397	-3.29**	-0.466	-4.39***
$DCFO_t{*}CFO_t$	(b_3)	?	-2.037	-2.15**	-1.427	-1.60	-1.471	-1.65*	0.498	0.49	0.376	0.44	0.101	0.13
PE	(b_4)	?	0.010	0.72	-0.036	-1.47	-0.010	-0.68	0.012	0.84	0.054	1.65*	0.012	0.89
$PE{*}DCFO_t$	(b_5)	?	-0.014	-0.30	-0.035	-0.74	-0.006	-0.13	-0.084	-1.9*	-0.043	-1.04	-0.039	-1.06
$PE{*}CFO_t$	(b_6)	?	-0.365	-2.77***	-0.170	-1.05	0.070	0.42	-0.118	-0.95	-0.077	-0.58	-0.050	-0.42
$PE{*}DCFO_t{*}CFO_t$	(b_7)	+	2.506	2.58**	1.593	1.68*	1.502	1.59	-0.210	-0.20	-0.543	-0.59	-0.101	-0.12
LAMBDA		?			0.020	1.32					-0.022	-1.14		
PE*LAMBDA		?			0.022	1.08					-0.011	-0.40		
Pseudo-R-square[a]					14.72%						9.79%			
ln(Total Assets)							-0.020	-3.12***					-0.010	-1.79*
ln(Sales)							0.018	2.64**					0.013	1.97**
Book Value / Total Assets							0.013	0.43					0.080	2.87***
Sales' Growth							0.001	0.05					0.030	1.99**
Leverage							-0.041	-1.38					-0.006	-0.23
Q-Ratio							0.019	2.88***					0.007	1.81*
Oper_Cycle							0.000	0.87					0.000	3.57***
Age							0.000	0.90					0.000	0.02
Cash / Total Assets							-0.104	-1.63					-0.141	-2.43**
CAPEX / Total Assets							0.166	1.84*					0.047	0.61
D_Audit_Quality							0.001	0.08					0.009	0.56
Adj-R-square			36.33%		35.67%		42.07%		24.41%		31.62%		45.30%	
No. of Observations			371		293		293		400		295		295	

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.
Each variable in the table is truncated at the extreme ±1% values of its distribution.

[a] McFadden's LRI Pseudo-R-square for the first stage PROBIT model in the Heckman (1979) procedure.

Table 7 (continued)
Conditional Conservatism (Accruals) by Firm Type

Legend:

ACC_t:	Total accruals divided by total assets at end of year t–1. For year>=1988: total accruals [income before extraordinary items (SCF) (#123) – net cash flow from operating activities (#308) + extraordinary items and discounted operations (SCF) (#124)] divided by total assets at end of year t–1 (lagged #6). For year<1988: [change in current assets during period t (#4) – change in current liabilities during period t (#5) – change in cash and cash equivalents during period t (#1) + change in current maturities of long-term debt and other short-term debt included in current liabilities during period t (#34) – depreciation and amortization expense during period t (#125)]. In addition, I eliminated firm-year observations with the following "non-articulation" events: firm-year observations in which a company is involved in a merger or acquisition (#AFTNT35 code #1); firm-year observations in which a company reports "discontinued operations" greater than $10,000 (#66); and firm-year observations in which a company reports a gain or loss on foreign currency translations greater than $10,000 (#150) (Hribar and Collins 2002).
CFO_t:	Cash flow from operations divided by total assets at the end of year t–1. For year>=1988: net cash flow from operating activities (#308) divided by total assets at end of year t–1 (lagged #6). For year <1988: [funds from operations (#110) – change in current assets during period t (#4) + change in cash and cash equivalent during period t (#1) + change in current liabilities during period t (#5) – change in current maturities of long-term debt and other short-term debt included in current liabilities during period t (#34)]. All variables are divided by total assets at end of year t–1 (lagged #6) (Xie 2001).
$DCFO_t$:	Dummy variable that is 1 if $CFO_t < 0$ and 0 otherwise.
PE:	Dummy variable set to 1 for PE-backed firms (both majority- and minority-owned) and 0 for firms owned by management.
LAMBDA:	Following the Heckman (1979) procedure, in the first stage I estimate a PROBIT model with, as predictors, size (alternatively defined as the natural logarithms of total assets or sales), ratio of book value of equity to total assets, growth (in sales), leverage, profitability (operating income divided by net operating assets), quick ratio, length of the operating cycle, age, cash and capital expenditures (both divided by total assets), a dummy for loss firms, and audit quality (a dummy for the big national accounting firms). Estimates of the PROBIT model are used to compute an inverse Mills' ratio for each firm. In the second stage, the inverse Mills' ratio is added to equation (7) as a control variable. To allow its coefficient to vary between the two groups of firms, an interactive variable (PE*LAMBDA) is also included.

All control variables are as defined in Table 5.

Table 8
Market-Adjusted Performance

Panel A: Firm Type

		PE Majority	PE Minority	Mgmt	Diff.[a]	Diff.	Diff.
		(1)	(2)	(3)	(1) - (2)	(1) - (3)	(2) - (3)
No. of Firms		92	26	21			
Size and Book-to-Market (5x5) Adj. Returns[b]							
1 Year	Mean	19.1%	-9.3%	3.9%	28.5%	15.3%	-13.2%
	t-stat				(2.66)	(1.81)	(-0.97)
	Median	8.8%	-18.3%	-12.6%	27.1%***	21.4%**	-5.7%
3 Year	Mean	19.0%	-27.5%	-4.9%	46.5%	23.9%	-22.6%
	t-stat				(2.59)	(1.15)	(-0.86)
	Median	9.7%	-36.7%	-16.8%	46.3%**	26.5%*	-19.9%
5 Year	Mean	17.3%	-56.8%	-3.5%	74.1%	20.8%	-53.4
	t-stat				(2.67)	(0.58)	(-1.66)
	Median	-0.4%	-66.3%	-12.9%	65.9%*	12.5%	-53.4*
Industry Adj. ROA							
1 Year	Mean	0.7%	0.5%	1.7%	0.2%	-1.0%	-1.2%
	Median	0.5%	0.7%	1.9%	-0.3%	-1.4%	-1.2%
3 Year	Mean	-0.2%	-1.1%	-0.1%	1.0%	-0.1%	-1.1%
	Median	-0.2%	-0.1%	-0.7%	-0.1%	0.4%	0.5%
5 Year	Mean	-0.2%	-1.1%	0.4%	1.0%	-0.6%	-1.5%
	Median	-0.2%	-0.6%	0.0%	0.5%	-0.1%	-0.6%
Market-to-Book							
1 Year	Mean	3.28	2.26	3.19	1.01	0.09	-0.92
	Median	2.14	2.05	2.20	0.09***	-0.06***	-0.15
3 Year	Mean	2.31	1.75	3.03	0.57	-0.72	-1.29*
	Median	2.08	1.49	2.93	0.59***	-0.85***	-1.44
5 Year	Mean	2.77	2.01	2.84	0.76	-0.07	-0.83
	Median	2.36	1.86	1.62	0.50***	0.74***	0.24
Delisting							
1 Year	Mean	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3 Year	Mean	0.0%	7.7%	0.0%	-7.7%	0.0%	7.7%
5 Year	Mean	5.4%	11.5%	4.8%	-6.1%	0.7%	6.8%
Pre-IPO UTACC	Mean	-4.0%	-4.7%	0.4%	0.7%	-4.4%***	-5.1%***
	Median	-3.5%	-3.7%	0.7%	0.2%***	-4.2%***	-4.3%***
Underwriter Reputation	Mean	8.82	8.78	8.32	0.04	0.50	0.46
	Median	9.10	9.10	8.83	0.00	0.27***	0.27
Large PE Sponsors	Mean	32.6%	3.8%		28.8%***		

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.
The distribution of each variable is winsorized at the extreme ±1% values.
[a] Differences in means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test.
[b] Due to the cross–correlation problem, the t-statistics for abnormal returns should not be translated into *p*-values; these t-statistics appear in parentheses.

Table 8 (continued)
Market-Adjusted Performance

Panel B: PE Sponsor's Size

		Large PE	Small PE	Diff.[a]
		(1)	(2)	(1) - (2)
No. of Firms		31	87	
Size and Book-to-Market (5x5) Adj. Returns[b]				
1 Year	Mean	22.5%	8.8%	13.7%
	t-stat			(1.66)
	Median	9.1%	1.7%	7.3%
3 Year	Mean	42.3%	-2.7%	44.9%
	t-stat			(1.85)
	Median	17.6%	-13.3%	30.8%
5 Year	Mean	65.1%	-27.8%	93.0%
	t-stat			(2.96)
	Median	48.7%	-31.3%	80.0%***
Industry Adj. ROA				
1 Year	Mean	3.3%	-0.3%	3.6%**
	Median	0.4%	0.5%	-0.03%
3 Year	Mean	1.5%	-1.0%	2.5%*
	Median	1.3%	-0.4%	1.7%**
5 Year	Mean	1.2%	-1.0%	2.2%*
	Median	0.8%	-0.7%	1.5%**
Market-to-Book				
1 Year	Mean	1.86	3.53	-1.66
	Median	2.21	2.14	0.07***
3 Year	Mean	1.62	2.38	-0.76
	Median	1.56	2.03	-0.48***
5 Year	Mean	2.83	2.37	0.46
	Median	2.23	2.23	0.01***
Delisting				
1 Year	Mean	0.0%	0.0%	0.0%
3 Year	Mean	0.0%	2.3%	-2.3%
5 Year	Mean	3.2%	8.0%	-4.8%
Pre-IPO UTACC	Mean	-4.6%	-3.9%	-0.7%
	Median	-4.1%	-3.5%	-0.6%***
Underwriter Reputation	Mean	8.95	8.76	0.19*
	Median	9.10	9.10	0.00

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.
The distribution of each variable is winsorized at the extreme ±1% values.
[a] Differences in means are tested for significance using a two-tailed t-test; differences in medians are tested for significance using a two-tailed Wilcoxon signed rank test.
[b] Due to the cross–correlation problem, the t-statistics for abnormal returns should not be translated into *p*-values; these t-statistics appear in parentheses.

Table 8 (continued)
Market-Adjusted Performance

Legend:

Size and Book-to-Market (5x5) Adj. Returns: For each IPO, the adjusted market returns are calculated as the buy-and-hold daily returns on the periods of 1 year, 3 years, and 5 years after the IPO, less the buy-and-hold returns on a Fama and French size and book-to-market (5x5) matched portfolio of daily value-weighted market returns index over the same period. The size and book-to-market portfolio returns are obtained from Kenneth French's Web site; http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html. If the sample firm delists during the relevant period, I add the delist return to the firm's buy-and-hold return and set the market-adjusted return equal to zero after the delisting date. When the delisting return is missing, I allocate it, following Shumway and Warther (1999) and CRSP "white paper" delisting returns (2001), according to the delisting code and exchange code.

Industry Adj. ROA: The average of 1 year, 3 years, or 5 years after the IPO matched-adjusted return on assets, which is defined as net income (#172) plus net of tax interest expense (#15) divided by total assets at end of year t–1 (lagged #6), minus the industry median ROA for the same period (based on 4-digit SIC codes). For firms that do not survive for the full 1 year, 3 years, or 5 years after the IPO, the maximum number of years for which COMPUSTAT data is available is used.

Market-to-Book: The market-to-book ratio is measured at the end of 1 year, 3 years, or 5 years since the IPO. For firms that do not survive the full 1 year, 3 years, or 5 years after the IPO, the maximum number of years for which COMPUSTAT data is available is used. Market value of equity is defined as common shares outstanding (#25) multiplied by fiscal year closing price (#199). Book value of equity is defined as total common equity (#60) + carrying value of preferred stock (#130) + deferred taxes and investment tax credit (#35).

Delisting: The percentage of firms delisted from the NYSE, Amex, or Nasdaq due to bankruptcy, default, or liquidation (CRSP delisting codes 400 and above).

Pre-IPO UTACC: The average of 5 years' pre-IPO annual UTACC. Unexpected discretionary total accruals are derived from the cross-sectional modified Jones model (see section III). To control for the asymmetric recognition of gains and losses, I augmented the modified Jones model with the following independent variables: cash flow from operations in year t (CFt), a dummy variable set to 1 if CFt <1 and o otherwise (DCFt), and an interactive variable, CFt x DCFt (Ball and Shivakumar 2006a).

Underwriter Reputation: The lead underwriter reputation rankings as measured by Carter et al. (1998) and updated on Jay's Ritter Web site: http://bear.cba.ufl.edu/ritter/rank.xls.

PE Sponsor Size: PE sponsors are ranked according to total investment (in $US) during the years 1980-2005. Large PE sponsors include: Warburg Pincus, Carlyle Group, KKR, Apax, Blackstone, Goldman Sachs, J.P. Morgan, Welsh Carson Anderson & Stone, Hicks Muse Tate & Furst, 3i Group, Bain Capital, Thomas H. Lee, Morgan Stanley, and Cinven (Tiers 1-3 from Table 2). Small PE sponsors include all other PE sponsors. (Source: Thomson Financials, VentureXpert.)

Table 9
Fama-French Three Factors Calendar Time Portfolio Regressions

Independent Variable	1 Year Ret Coef. (1)	1 Year Ret t-stat (1)	3 Years Ret Coef. (2)	3 Years Ret t-stat (2)	5 Years Ret Coef. (3)	5 Years Ret t-stat (3)
PE Majority						
Intercept	0.005	1.32	0.002	0.92	-0.001	-0.41
RMF	1.062	9.29***	0.946	13.48***	0.919	15.66***
SMB	1.039	7.53***	0.787	9.35***	0.808	11.88***
HML	0.540	3.53***	0.383	3.97***	0.447	5.52***
Adj-R-square	13.86%		10.33%		10.43%	
No. of Observations	904		2,464		3,444	
PE Minority						
Intercept	-0.010	-1.26	-0.010	-2.07**	-0.008	-2.2**
RMF	1.606	6.17***	1.098	7.51***	1.133	9.57***
SMB	0.772	2.33**	0.913	4.91***	0.846	5.87***
HML	0.281	0.85	0.151	0.76	0.385	2.38**
Adj-R-square	17.32%		11.76%		10.86%	
No. of Observations	251		760		1,157	
Mgmt						
Intercept	-0.002	-0.28	0.002	0.34	-0.002	-0.51
RMF	0.977	3.56***	1.004	6***	1.010	8.14***
SMB	0.659	2.5***	0.796	4.48***	0.616	4.52***
HML	0.439	1.13	0.241	1.09	0.345	2**
Adj-R-square	6.21%		9.57%		9.29%	
No. of Observations	211		617		901	
Large PE						
Intercept	0.012	2.18**	0.008	2.14**	0.006	1.84*
RMF	1.250	7.1***	0.853	7.48***	0.822	8.31***
SMB	0.822	3.96***	0.718	5.38***	0.762	6.74***
HML	0.123	0.5	0.073	0.46	0.192	1.39
Adj-R-square	20.45%		10.36%		9.60%	
No. of Observations	317		887		1,226	
Small PE						
Intercept	-0.004	-0.86	-0.005	-1.93*	-0.007	-3.34***
RMF	1.131	8.91***	1.027	13.75***	1.034	16.75***
SMB	1.126	7.11***	0.854	9.23***	0.858	11.69***
HML	0.701	4.21***	0.475	4.63***	0.581	6.87***
Adj-R-square	14.15%		11.41%		11.56%	
No. of Observations	846		2,346		3,395	

*** significance at the 0.01level, ** significance at the 0.05 level, * significance at the 0.10 level.
The distribution of each variable is winsorized at the extreme ±1% values.

Regression coefficients estimated in calendar time from the Fama-French (1993) three factor regression model:

$R_{pt} - R_{ft} = a_p + b_p (R_{mt} - R_{ft}) + s_p SMB_t + h_p HML_t + \varepsilon_t$

where R_{pt} is the equally weighted portfolio returns in calendar month t; R_{ft} is the 30-day T-bill yield in month t; R_{mt} is the return on the value weighted CRSP index; SMB_t is the return on small firms minus the return on large firms; and HML_t is the return on high book-to-market stocks minus the return on low book-to-market stocks in month t.