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Abstract

A large fraction of the companies that went private between 1990 and 2007 were fairly young public firms, often with the same management team making the crucial restructuring decisions both at the time of the initial public offering (IPO) and the buyout. Why did these public firms decide to revert to private ownership? To answer this question, we investigate the determinants of the decision to go private over a firm's entire public life cycle. Our evidence reveals that firms with declining growth in analyst coverage, falling institutional ownership, and low stock turnover were more likely to go private and opted to do so sooner. We argue that a primary reason behind the decision of IPO firms to abandon their public listing was a failure to attract a critical mass of financial visibility and investor interest. Consistent with the findings of earlier literature, we also find strong support for Jensen's free-cash-flow hypothesis, which argues that these corporate restructurings are a useful tool in capital markets for mitigating agency problems between insiders and outside shareholders.

Key words: financial visibility, LBOs, going private, analyst coverage, institutional investor, insider ownership

In the 1980s, the corporate sector experienced a boom in leveraged buyout (LBO) and going-private activities. After a number of high-profile bankruptcies, however, interest in LBOs cooled off considerably in the early half of the 1990s. Then, in the mid-1990s, buyout activities resurfaced, and they have experienced an unprecedented surge over the past few years. The total volume of U.S. LBO transactions exceeded $390 billion in 2006, the biggest year ever for global leveraged acquisitions.

The LBO boom of the 1980s demonstrated that these transactions are an important restructuring tool for the corporate sector. Corporate raiders and buyout specialists extracted value through reorganization and streamlined sluggish low-growth public firms into more efficient non-public companies. Jensen (1986) argues that agency conflicts between insiders and equity holders are more prevalent in stable, low-growth firms that are able to generate substantial cash flows. The potential for reorganization gains are therefore particularly discernible in large, mature, and more complex firms.

In the 1990s, however, improvements in corporate governance and active monitoring by institutional investors reduced the need for reorganization [Holmstrom and Kaplan (2001), Kaplan (1997)]. In addition, a trend toward managerial compensation increasingly tied to performance through stock options and other equity-based compensation plans facilitated better management compensation schemes [see, for example, Murphy (1999)] and is likely to have reduced the need for going private.

Despite these significant improvements in corporate governance, LBOs and other going-private takeovers are making a strong comeback. Financial innovations in business lending and the emergence of private equity are important catalysts in the recent growth of leveraged

buyouts.[1] Ultimately, the decision to go private lies in the hands of insiders and managers

seeking a more efficient corporate structure and better value for their company. LBOs in the

1980s were the most suitable mechanism for restructuring the deficient conglomerates that were

very prevalent at that time. To be sure, we expect the incentive to mitigate agency conflicts and

information asymmetries between managers and shareholders to continue shaping firms'

reorganization decisions. However, these de-conglomeration incentives for LBOs appear to have

been less germane in the corporate landscape of the 1990s, which was dominated instead by a

boom in initial public offering (IPO) activities.

In this paper, we highlight another important reason behind the decision to go private: the

inability of these new firms to attain a critical mass of *financial visibility*. We document that a

significant fraction of the firms electing to go private in the period 1990-2007 went public on

average about five years before choosing to revert to a private ownership structure.[2] Why are

these new firms abandoning public markets? We find that IPO firms failing to sustain sufficient

financial interest and visibility (proxied by the growth in analyst coverage, change in institutional

ownership, and stock turnover) were more likely to go private and opted to do so sooner. While

many of our empirical findings help reinforce more conventional theories focusing on conflicts

of interest between management, shareholders, and debtholders, they also underscore the

importance of financial visibility over the IPO firm's life cycle in the decision to remain public.

The rest of the paper proceeds as follows. Section 1 formulates the "financial visibility"

hypothesis. In Section 2, we introduce the hazard regression model for analyzing the decision of

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[1]The renewed interest in buyout activities has been enhanced by innovations in asset securitization and the growth of the leveraged loan market [Ranson (2003)]. The size of the private equity sector increased dramatically during the 1990s. Armed with this huge war chest of private equity capital, these funds can target virtually any public company.
[2]We use the Securities Data Corporation's list of new issues to identify IPO firms. To analyze the decision to go private during 1990-2007, we consider all firms that went public after 1988.

IPO firms to exit the public market during their life cycles. Sections 3 and 4 describe our data sources and sample construction before reviewing LBO and non-LBO going-private activities over the last three decades. Sections 5-7 present the different facets of the hazard regression analysis as well as several alternative methodologies that control for unobserved heterogeneity and correct for potential endogeneity problems. Although this study focuses mainly on the buyout decision, in Section 8 we investigate the post-buyout status of IPO firms that chose to go private. We conclude in Section 9.

1. The Financial Visibility Hypothesis

The main objective of our paper is to introduce *financial visibility* as a key element in the public-to-private decision. We argue that young firms are choosing to exit the public market because they have failed to attract an adequate level of investor recognition. Despite being solid performers, frequently outshining their peers, these firms are often overlooked by financial analysts. Having gone public only a few years before, it is very natural for IPO companies to be more cognizant of the costs and benefits of a public listing. Krigman, Shaw, and Womack (2001) highlight the importance of information by documenting that IPO companies tend to switch lead underwriters to improve analyst coverage. Investment analysis is also closely related to institutional ownership, as the more visible firms are likely to attract greater investor interest [O'Brien and Bhushan (1990), Falkenstein (1996)].

The intermediary role played by securities analysts can impact firms in a number of ways. Inadequate analyst coverage contributes to investor uncertainty, resulting in an illiquid stock vulnerable to greater mispricing. Close monitoring by equity analysts also diminishes agency conflicts between owners and managers of the firm [Jensen and Meckling (1976)]. Therefore, failure to attract adequate analyst coverage can effectively lower the product value

and ultimately the franchise value of the firm. Chung and Jo (1996) document a positive relationship between analyst coverage and a firm's value (measured by Tobin's q). Boot, Gopalan, and Thakor (2005) develop a theoretical model contrasting the costs and benefits of public ownership. Their model predictions are consistent with the market visibility hypothesis. Firms with lower investor participation have greater incentives to go private, while greater investor interest encourages firms to remain public or go public if they are privately owned.

There is also evidence that financial visibility is an important determinant of the decision to go private for firms listed on overseas stock markets. Ronneboog and Simons (2005) point out that the fund management industry in the United Kingdom has gradually shifted its focus to larger, more liquid stocks. The implications of this declining investor interest on the public-to-private decision are best reflected by the comments of Bill Ainscough, chief executive officer of Wainhomes Plc: "We feel unloved and unwanted. There has been a lack of investor appetite for small company shares over the last two or three years. This made it difficult to fund expansions and acquisitions through the issue of new shares, which is one of the main reasons for going public in the first place" [Pretzlik (1999)]. This observation highlights the view that one of the principal benefits of a public listing is easier access to debt and equity markets. Without proper analyst coverage, however, access to capital markets becomes more difficult and costly [for example, Bowden, Chen, and Cheng (2004)]. Lower equity prices can also adversely affect a firm's ability to issue public debt at a fair rate.

2. Modeling the Decision to Go Private

The decision to go private and, for that matter, the decision to go public are momentous events in the life of the firm. The need to attract greater investor interest and enhance stock liquidity might encourage firms to go public in the first place. But failure to realize these goals of

greater investor participation and financial visibility might compel these same firms to abandon the public market. Financial visibility and investor recognition therefore figure importantly in the private and public life cycles of firms.

We use a duration model to examine a firm's decision to exit the public market. Hazard analysis is quite optimal in the current framework because it enables us to trace the decision of the firm over its entire public life cycle. To formally describe Cox's proportional hazard model, let the random variable (τ) represent the age of IPO firm (i) in year (t). The key variable in the hazard analysis is the conditional probability that the firm will go private after τ years given that it has not done so until that point in time. The hazard rate at age τ is defined by

$$h(\tau \mid x_{t-1,\, i\bullet} \beta) = h_0(\tau) \exp(x_{t-1,\, i\bullet} \beta). \tag{1}$$

The vector $(x_{t-1,\, i\bullet})$ represents all the explanatory variables included in the regression. All explanatory variables are lagged by one year to reduce regression endogeneity problems. The function $h_0(\tau)$ is commonly referred to as the baseline hazard function. This semi-parametric method of estimation conditions out the baseline hazard and focuses on the proportionality factor $\exp(x_{t-1,\, i\bullet} \beta)$ to estimate the effect of the explanatory variables. Subsequently, our empirical analysis will also consider a full-fledged parametric model that formally addresses heterogeneity concerns.

We investigate the decision to go private by estimating several variations of the hazard model. Initially, we estimate a broad competing risk model where the decision to remain public or go private is evaluated against all alternative termination outcomes (merger, liquidation, or negative delisting). Most of our analysis, however, focuses on estimating a hazard model that excludes all other competing choices. In this case, the regression sample consists of an annual

panel of observations of all IPO firms that either had an LBO or were bought by another private

company and all surviving IPO firms that remained in the public market.

2.1 Explanatory measures for financial visibility

Increased visibility in the public markets raises the profile of firms, enhancing their

legitimacy in the eyes of investors and consumers. The most widely accepted empirical proxy of

visibility is the number of analysts who follow a firm [Ackert and Athanassakos (2001)]. Baker,

Nofsinger, and Weaver (2002) argue that analyst reports are the primary source of information

for most buy-side investors. O'Brien and Bhushan (1990) document that firm size and other size-

related factors determine the extent of analyst coverage. The implication of this close

relationship, of course, is that the number of analysts is inherently closely determined by firm

size. Thus, the actual number of analysts covering a firm may not be the right scale for

differentiating the sheer size of the firm from its ability to garner the attention of analysts. For

many smaller IPO firms, a better indicator of success is their ability to attract a rising flow of

analyst interest as they continue to grow. A more accurate measure of a firm's ability to attract

and maintain analyst coverage is provided by the growth in the number of analysts

(ANALYST_GROWTH).

A number of studies illustrate that institutional investors such as mutual funds, pensions,

and money managers prefer to invest in firms that have a sizable analyst following [O'Brien and

Bhushan (1990), Falkenstein (1996)]. We use the change of institutional ownership

(CHANGE_INST_OWNERSHIP) as an additional proxy for market visibility. Another way to

assess investor interest is by examining stock trading volume. Because investors are more

inclined to trade in firms for which there is greater information, a firm's stock turnover ratio

(TURNOVER), defined by the ratio of the volume of shares traded to market capitalization, is a useful gauge that captures increased financial interest.

The regression model includes a number of indirect measures of firm visibility. We anticipate that less liquid stocks lacking an adequate analyst following will tend to exhibit higher stock price volatility (STOCK_VOLATILITY). The specification controls for firm size, measured by the logarithm of total sales (SIZE). Larger firms receive greater analyst coverage and consequently draw more interest from investors. Bowden, Chen, and Cheng (2004) find that greater analyst coverage is associated with smaller underpricing of secondary offerings. Their finding illustrates the benefits of financial analyst coverage in lowering the cost of capital. Similarly, we can argue that greater visibility makes it possible for these firms to use their public status to grow through acquisition. The dummy variable SECONDARY_OFFER indicates a secondary offering while the variable FIRMS_ACQUIRED represents the number of acquisitions made in the previous year. Both of these regressors capture a firm's capacity to access capital markets and enjoy the benefits of public ownership.

2.2 Agency problems and information asymmetries

While the main focus of this paper is to analyze the relationship between firm visibility and the decision to go private, we also examine the importance of many explanations proposed in the literature. The LBO literature focuses primarily on the implications of agency conflicts and information asymmetries between principals and agents.[3] At the center of most earlier empirical studies of LBOs is Jensen's free-cash-flow hypothesis. To examine this premise, most empirical

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[3]Jensen (1991) and Shleifer and Vishny (1991) argue that LBO activities in the 1980s were a tool for reducing excess capacity in the corporate sector resulting from a protracted wave of conglomeration. Papers by Bharath and Dittmar (2006), Oxman and Yildirim (2007), and Aslan and Kumar (2007) also investigate different facets of LBO activities over the last two decades. Roonenboog, Simons, and Wright (2007) provide a comprehensive review of the LBO literature.

LBO studies employ a variety of cash flow variables [see, for example, Lehn and Poulsen (1989), Halpern, Kieschnick, and Rotenberg (1999)]. We use a similar measure defined by net cash flow (after-tax operating income before depreciation) minus cash and preferred dividends and interest payments (FREE_CASH_FLOW). This net cash flow measure is normalized by the company's total net sales.

The presence of agency problems implies that management might tend to invest undistributed funds in negative net-present-value (NPV) projects. We measure the propensity to waste company resources by the aggregate capital expenditures ratio—that is, cash outflow or the funds used for additions to the company's property, plant, and equipment over net sales (CAPX_RATIO). Growth prospects are also an important factor in the free-cash-flow premise, as low-growth firms are potentially less able to find positive NPV projects for their funds. We use a firm's market-to-book ratio as a simple proxy for Tobin's q that reflects profitable investment opportunities and future growth (MARKET_BOOK). Opler and Titman (1993) argue that the ratio of research and development expenditures to sales (R&D_RATIO) helps distinguish between agency and financial cost theories. Because riskier companies are also more volatile, a negative relationship between STOCK_VOLATILITY and the probability of going private would also be consistent with these financial distress arguments. Financial leverage is a very important component in LBOs, enabling the transfer of wealth from bondholders to equity holders [Asquith and Wizman (1990)]. To investigate the wealth expropriation hypothesis, the specification includes the firm's ratio of book value of long-term debt to equity (DEBT_RATIO).

Kaplan (1989) and Lowenstein (1985) argue that LBOs generate tax benefits from debt financing and take advantage of the existing tax code. To evaluate the merits of the tax benefits

hypothesis, the model controls for the company's tax expenditures, defined by total income taxes (federal, state, and foreign) divided by net sales (TAX_RATIO). Information asymmetries may compel insiders to manipulate information to lower the firm's stock price before the buyout for their own benefit [Lowenstein (1985)]. Public-to-private transactions eliminate asymmetric information between firm insiders and shareholders and remove undervaluation incentives. To control for undervaluation incentives, the specification includes the firm's excess stock return over the Center for Research in Security Prices (CRSP) market return (STOCK_RETURN).

3. Overview of LBO and Non-LBO Going-Private Transactions, 1980-2007

This section briefly examines the experience of U.S. corporate going-private buyouts from 1980 to 2007. Figure 1 traces the volume of LBO and other public-to-private activities over this period. The aggregate yearly volume presented in the figure represents the total value of all transactions that were either completed or announced and pending, but excludes withdrawn and uncompleted deals. The figure illustrates the boom cycle in buyouts in the latter half of the 1980s followed by the subsequent collapse of the LBO market in the early 1990s. Buyout activities have exploded more recently, as the volume of U.S. transactions reached a record $393 billion in 2006 and $340 billion through the first ten months of 2007. In real terms, however, the 2006 LBO volume represents only about 1.93 percent of the CRSP total market capitalization, compared to the 3.19 percent level achieved in 1988.

Figure 1 also reveals that an increasing share of the LBO volume originates from firms that went public after 1970. The rise in the number of IPO firms choosing to go private is not totally unexpected. After all, new issues amounted to roughly 10 percent of the total market capitalization in the 1980s, compared to 20 percent during the 1990s. However, the surge in IPO firms seeking an LBO cannot be explained by this compositional shift alone. The share of LBO

volume in which the target is an IPO company jumped from around 8 percent in the 1980s to close to 50 percent in the 1990s. The proliferation of IPO targets is therefore a symptom of the changing character of the buyout market in the 1990s.

The LBO boom market in the 1980s ended abruptly when lenders pulled the plug on LBO financing. The end was heralded by the failed bid for United Airlines (UAL) in 1989. The UAL deal collapsed because bankers realized that this LBO project was no longer viable and they withdrew from the deal. The subprime mortgage crisis in 2007 and the ensuing turmoil in the asset securitization markets are apparently putting an end to the current LBO boom. Public debt markets are also becoming more cautious in financing LBO takeovers. The slowdown in the recent LBO phase is evident in the rising number of postponed transactions.

4. Data and Sample Selection

The large number of IPO firms choosing to go private offers us a useful framework for investigating the recent wave of LBO and other public-to-private deals. While many long-established firms have also chosen to go private, IPO companies provide a more accurate and comprehensive way of tracking the decision over the public life cycle of the firm. To analyze the reasons behind the decision of IPO firms to go private, we considered the complete sample of these transactions from the Securities Data Corporation (SDC) M&A and New Issues databases. The sample included completed deals in which an IPO firm was a target in an LBO or was acquired and became a private company from January 1, 1990, to the end of October 2007.[4]

Our search identified a total of 1,294 LBO targets and 722 non-LBO going-private transactions announced and completed between 1980 and October 2007 (Table 1). As is common

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[4]Based on CRSP information, we deleted from our sample any buyout firm that had a delisting code of 100 (indicating active issues) or any deal that was dropped from the exchange (negative delisting codes in the range of 500 to 591).

in M&A transactions, not all of these deals can be analyzed because often the targets are

subsidiaries or subdivisions of public companies. This list was further trimmed because the focus

of our sample is those firms that 1) went public after 1988 and subsequently were buyout targets

after January 1, 1990 and 2) were included in Compustat.[5] We obtained the firms' analyst

coverage from IBES and the firms' company and stock information from Compustat and CRSP.

Table 2 provides a breakdown of the final sample consisting of 262 firms on which financial

information was available (169 LBO targets and 93 non-LBO firms that were acquired by

nonpublic companies or investor groups).[6] Of these 262 IPO firms, 218 (150 LBO and 68 non-

LBO targets) were followed by securities analysts.

4.1 Univariate comparisons

Table 3 compares characteristics of our going-private sample with the characteristics of a

sample of firms that remained public. The statistically significant pairwise t-statistics reported in

the last column signify that going-private firms are very different from continuing firms. In

particular, buyout targets exhibited better free cash flows, a higher debt-to-equity ratio, and a

significantly lower market-to-book ratio. In addition, IPO companies that opted to go private are

more profitable than their public peers, having a higher return-on-assets (ROA) ratio.[7]

The bottom panel of Table 3 focuses on measures of financial visibility and firm

ownership. Firms choosing to go private attracted a smaller number of analysts than the control

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[5]The cutoff at 1988 is convenient for two reasons. First, all firms that had an IPO after 1988 went private after 1990. Second, the cutoff excludes firms that went private during the LBO boom of the 1980s. Those firms are examined separately in Section 6.

[6]The sample of IPO firms that went private is broadly distributed across the SIC spectrum. In particular, 28 percent are in manufacturing (SIC 2-3), 38 percent in services (SIC 7-8), 17 percent in wholesale and retail trade (SIC 5), 2 percent in construction and other (SIC 0-1), 9 percent in finance, insurance, and real estate (SIC 6), and 6 percent in transportation (SIC 4).

[7]The majority of surviving firms are profitable, as the median ROA is 2.5 percent. The negative averages for the ROA and free-cash-flow ratio stem from a cluster of firms with substantial losses.

group. This gap is not surprising because the control firms are larger in asset size in terms of both market capitalization and total sales [O'Brien and Bhushan (1990)]. Firms that go private, however, exhibit significantly smaller growth in analyst interest compared to their control peers. Figure 2 shows that the gap in analyst interest after the IPO appears to widen among the two groups and is greatest over the latter years of their public life cycle, when firms that are taken private actually experience a decline in analyst coverage.[8]

The disparity between the two groups is noticeable in other measures of financial visibility as well. The control of surviving firms achieves higher levels of institutional ownership and exhibits greater stock turnover. Figure 3 traces the evolution of institutional ownership for buyout firms and all other surviving firms after the IPO date. Although at the beginning both groups attract very similar interest from institutional investors, firms that remained public are more appealing to professional investors over a longer period than are buyout targets.

5. Hazard Regression Results

5.1 The importance of agency and asymmetric information costs

We first investigate the impact of agency problems and other related asymmetric information explanations on the decision to go private. This initial phase of the regression analysis is helpful in reassessing the importance of agency problems for buyout transactions during the period 1990-2007. In addition, it establishes a useful baseline for comparing these factors with financial visibility incentives. Table 4 presents the regression results for different specifications for all completed deals, including those without analyst coverage. The first column in Panel A evaluates the decision to go private against all competing risks and the second column

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[8]Figures 2 and 3 should be interpreted with caution because of survivorship bias. Our hazard regressions formally correct for many of these survivorship and censoring problems.

limits the control group to only surviving firms. Panels B and C in the table present the results separately for leveraged deals and non-LBO takeovers. The likelihood ratio statistics reported at the bottom of the table indicate that, on the whole, the covariate effects, defined by parameter vector β in equation (1), are statistically different from zero. We should note that the standard errors for the parameter coefficients are corrected for possible firm-level clustering effects using a robust-variance estimation methodology.

Overall, the regression results are fairly similar across the different competing risk models (Panel A). The strong significance of firm size is not surprising because there are inherent impediments to acquiring larger, more complex companies, especially when using debt to finance the deal. As noted previously, firm size is also a good indicator of analyst coverage. Thus, the strong negative relationship between size and the conditional probability of going private is also consistent with the market visibility hypothesis.

The statistically significant positive coefficient of FREE_CASH_FLOW demonstrates that firms with larger undistributed cash flows are more likely to go private, affirming the free-cash-flow hypothesis. Cash flow incentives are also found to be important in non-LBO deals. While the reorganization benefits of stricter debt discipline may be less relevant for non-LBO takeovers, acquirers probably value the ability of the target to generate healthier cash flows.

The regression results reveal a negative relationship between MARKET_BOOK and the likelihood of an LBO. The market-to-book ratio can be viewed as a simple proxy for Tobin's q. A low market-to-book ratio signifies a low-franchise-value firm with fewer profitable prospects of reinvesting its cash flows going forward. This result provides further support for the agency conflicts premise, as management and private equity investors are more likely to target firms having no profitable opportunities and more inclination to invest in NPV projects.

Shareholders of acquisition targets are set to gain the most from LBOs because acquirers usually pay a premium. However, the prospect of higher leverage is more detrimental to a firm's credit ratings, resulting in wider credit spreads after the LBO announcement. Debtholders are therefore more vulnerable and often experience a negative price reaction in the secondary bond markets. The positive coefficient on the debt-to-equity ratio signifies that firms with a higher preexisting debt base are more likely to be buyout targets. This finding is consistent with the wealth expropriation hypothesis, which suggests a transfer from debtholders to shareholders. The higher debt-to-equity ratio may also be an artifact of the capital structure of these IPO firms that went private. Because many of these firms remained closely held after going public, they had less available IPO proceeds to retire debt. Therefore, it would not be prudent to surmise from this result a premeditated action by insiders at the expense of debtholders.

The coefficient on TAX_RATIO is positive but insignificant for LBOs. By comparison, the tax-to-sales-ratio effect is negative and significant for non-LBO deals, indicating that for this subset of going-private transactions there are some incentives to avoid targets with a higher tax burden. Several of the earlier studies in the LBO literature highlighted various tax benefits. The most direct tax benefit is that firms can take advantage of the tax deductibility of interest payments on corporate debt. Kaplan (1989) also presents evidence that many of the earlier deals sought to take advantage of a favorable tax code allowing for certain depreciation deductions related to the fair value of the buyout premium. Most of these tax advantages were eliminated with the enactment of the Tax Reform Act of 1986.[9]

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[9]Nevertheless, tax incentives continue to be an important factor in some buyouts. One such tax advantage was recently highlighted by the announced IPO of Blackstone Group, a large private equity fund. Private equity funds can take advantage of a twenty-year-old tax provision allowing investors in publicly traded partnerships to pay capital-gains taxes of 15 percent on their share of

5.2 Financial visibility

To analyze the impact of financial visibility, Table 5 reports the parameter estimates for the subset of Compustat firms that had analyst coverage. The impact of analyst following (ANALYST_GROWTH) and institutional ownership (CHANGE_INST_OWNERSHIP) on the conditional probability to go private is very significant. The proportional hazard regressions demonstrate that firms unable to maintain a positive inflow of securities analysts were more likely to go private. While the market visibility effects are stronger in LBOs, they are also important in non-LBO takeovers (Panel B), indicating that these acquisition targets were also overlooked by analysts and investors.

To better illustrate the importance of financial analysis, Figure 4 plots the conditional probability of going private for firms with negative and positive analyst coverage. The hazard function for firms experiencing a decline in analyst following is significantly higher, indicating that these firms are more likely to exit the public market after the IPO. The marginal hazard odds-ratio estimates, presented in the last column of Table 5, assess the relative magnitude of the effect of all independent variables. The marginal impact of each continuous explanatory variable is evaluated at its tenth percentile.[10] In the case of analyst growth, the tenth percentile is again negative, representing a firm struggling to attract analyst coverage. The odds-ratio estimates

the firm's income. U.S. corporations are typically expected to pay a tax rate ranging as high as 35 percent.

[10] The numerator in the odds ratio for the explanatory variable X_i is the probability that the firm will go private, where X_i is evaluated at its tenth percentile value (P10) and the rest of the explanatory variables at their mean. The denominator is the probability that the firm will go private, where all explanatory variables are evaluated at their mean. That is,

$$\text{Odds Ratio for } X_i = \frac{P(\text{Going Private} / X_i = X_i^{P10}; X_j = \overline{X}_j \text{ for i} \neq \text{j})}{P(\text{Going Private} / X_j = \overline{X}_j \text{ for all j})}.$$

For the discrete variable, the odds ratio is defined by:

$$\text{Odds Ratio for } (X_i = 1) = \frac{P(\text{Going Private} / X_i = 1; X_j = \overline{X}_j \text{ for i} \neq \text{j})}{P(\text{Going Private} / X_i = 0; X_j = \overline{X}_j \text{ for i} \neq \text{j})}.$$

reveal that a firm attracting this low level of analyst following is about 1.44 times more likely to go private. The tenth-percentile odds ratio for FREE_CASH_FLOW is smaller than 1 because companies with poor cash flows are not very good LBO targets.[11]

Our findings supporting the financial visibility hypothesis are further strengthened by the negative relationship between TURNOVER and the probability of going private. Stock turnover is a reasonable proxy for market visibility, as investors often prefer to trade in information-transparent stocks. Brennan and Subrahmanyam (1995) argue that securities analysis plays a critical role in mitigating information asymmetries in trading, lowering the cost of transacting in stocks and enhancing market depth and stock liquidity. Stock turnover is therefore a very good indicator of information intensity and investor interest.

Another potentially useful indicator is the firm's pre-buyout stock market performance. The regression controls for stock performance, which is measured by the difference between a firm's stock return and the equally weighted CRSP stock return index (including dividends). The effect of STOCK_RETURN is statistically insignificant for all the different model specifications. According to the information asymmetries hypothesis, firm insiders would be well positioned to benefit from an LBO if their company is not properly valued by investors. The regression findings do not support this argument, however, as private equity firms and insiders do not appear to factor in or manipulate firm performance.

The link between STOCK_VOLATILITY and the likelihood of going private is negative and strongly significant. As shown by the odds-ratio estimate, low-volatility firms are twice as likely to be taken private. At first, this result appears somewhat counterintuitive because lower

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[11]It is also noteworthy that the marginal effect of FREE_CASH_FLOW is quite significant. The large impact is attributed in part to the small subset of IPO firms that experienced huge losses in the 1990s. As a result, the distribution of the free-cash-flow ratio is substantially skewed to the left, meaning that the tenth-percentile value is very negative.

investor participation is expected to induce firms with low stock returns and more volatile stock prices to go private [see, for example, Boot, Gopalan, and Thakor (2006)]. The negative coefficient on STOCK_VOLATILITY could be an artifact stemming from the nature of cash-rich LBO firms unable to attract any interest from investors. As seen from Table 3, investor indifference has resulted in lower stock return volatility for going-private firms.

The negative coefficient on stock volatility further supports the financial distress explanation formalized by Opler and Titman (1993), which argues that firms with higher potential costs of failure are less likely to conduct an LBO. Opler and Titman use R&D expenditures to proxy for the likelihood of distress, as high-growth firms with large R&D budgets are also more liable to fail. The R&D ratio is found to have little impact on the decision to go private because these expenditures are fairly small for low-growth LBO targets. However, because riskier companies are also more volatile, a negative relationship between STOCK_VOLATILITY and the probability of going private provides some empirical support for the financial distress premise. The effect of the SECONDARY_OFFER variable indicating a firm's ability to conduct a seasoned offering is negative and significant. One of the benefits of public ownership is increased market liquidity for shareholders and better access to capital at a lower cost than what is available to privately owned companies. Our findings demonstrate that IPO firms with better access to the capital markets are less eager to abandon their public status.

A number of studies [see, for example, Mikkelson, Partch, and Shah (1997), Helwege, Pirinsky, and Stulz (2007)] have examined the insider ownership dynamics of IPO firms. These studies find that IPO firms become widely held over time, with the average level of insider holdings falling to below 20 percent after ten years. Consistent with Helwege, Pirinsky, and Stulz (2007), we find that insider ownership for the control sample approaches 20 percent after

17

ten years. Not surprisingly, firms that exit are more closely held. The average level of insider ownership for firms choosing to go private is 33.2 percent, significantly higher than the 23.1 percent ownership of the control group of surviving IPO companies (Table 3).

Panel A of Table 6 reports the estimates of the proportional hazard regression that controls for insider ownership (INSIDER_OWNERSHIP). Because the available information from Compact Disclosure does not fully match the data in our sample, the number of going-private transactions decreases to 185 firms. Despite the smaller sample, the regression findings are generally unchanged. More important, the relationship between insider ownership and the probability of going private is positive and significant. The result unambiguously shows that it is much easier for management and investors to take private those firms that are more closely held and that it is costlier to them to stay public.

6.3 Analyzing the recent surge in buyout activities

As shown by Figure 1, the volume of buyouts has surged to unprecedented levels over the last few years. This recent sharp rise in going-private activities is further depicted by Figure 5, which presents the estimated baseline hazard function for the sub-periods 1990-2002 and 2003-07. In the current framework, the baseline hazard function $h_0(\tau)$ represents the average rate at which firms are going private over their public life cycle. The solid line in Figure 5 traces the baseline hazard estimate for the 133 IPO firms choosing to go private in the period 1990-2002 (see Table 2). The pace of public-to-private exit in this earlier period rises with a firm's age as management needs time to reevaluate the corporate structure or as enough time elapses for the newly public firm to start catching the attention of private equity investors. The dashed line corresponds to the going-private rate for remaining public-to-private transactions that took place

18

in the period 2003-07. In contrast to the earlier period, firms electing to go private decided to do so at a much later stage of their public life cycle.

Panel B in Table 6 summarizes the hazard regression model estimated again over the same sub-periods used in Figure 5. As evidenced by the strong impact of FREE_CASH_FLOW and ANALYST_GROWTH, public-to-private buyouts in 1990-2002 were driven by a greater desire to ameliorate agency problems and in response to inadequate financial interest. These key measures continue to be significant determinants of the decision to go private during the recent phase of buyout activity, albeit at a lower level of significance. The differing responses in these two sub-periods underscore the profound effect of the latest LBO boom and the fundamental change in the way these deals are financed. The recent LBO surge has been fueled by several financial innovations coming together over the last two decades. The development of a strong secondary market for leveraged loans in conjunction with the explosion of asset securitization— aided somewhat by favorable credit ratings—made it possible for banks to repackage and sell many of these obligations, enabling them to relax lending standards in the primary market. The more appealing financing costs and other favorable terms of lending radically changed the cost-benefit calculus of going private. Firms that were probably beyond their "optimal" age to be taken private suddenly became viable takeover targets for private equity firms and insiders.

6.4 Insider stock ownership

So far, our empirical analysis has focused on company and stock performance measures to identify the key determinants of the decision to go private. The nature of agency conflicts between shareholders and insiders/managers may also depend on the ownership structure of the firm. To examine the role of insider ownership in the decision to go private, we use information

from Compact Disclosure for the period 1990-2006. Compact Disclosure reports the ratio of insider (officer and director) holdings of common shares to total shares outstanding.

A number of studies [see, e.g., Mikkelson, Partch, and Shah (1996), Helwege, Pirinsky, and Stulz (2007)] have examined the insider ownership dynamics for IPO firms. These studies find that IPO firms become widely held over time, with the average level of insider holdings falling to below 20 percent after ten years. Figure 6 traces the evolution of insider ownership for the sample of public-to-private firms and their surviving IPO peers. Consistent with Helwege, Pirinsky, and Stulz (2007), we observe that insider ownership for the control sample approaches 20 percent after ten years. Not surprisingly, firms that exit are more closely held. The average level of insider ownership for firms choosing to go private is 33.2 percent, significantly higher than the 23.1 percent ownership of the control group of surviving IPO companies (Table 3).

The first column in Table 6 reports the estimates of the proportional hazard regression that controls for insider ownership (INSIDER_OWNERSHIP). Because the available information from Compact Disclosure does not fully match with our sample, the number of going-private transactions decreases to 185 firms. Despite the smaller sample, the regression findings are generally unchanged. More important, the relationship between insider ownership and the probability of going private is positive and significant. The result unambiguously shows that it is much easier for management and investors to take private those firms that are more closely held and that it is costlier to them to stay public.[12]

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[12]In addition to shares owned outright, firm insiders are also granted stock options. However, insider option ownership for these IPO firms is tiny compared to stock ownership. In particular, the ratio of the number of stock options to the total number of shares outstanding is on average less than 1 percent. When included as an additional regressor in the hazard, the effect of the options ratio on the probability of going private is not statistically significant.

6.5 Management stability

Although the gradual fall in insider stock ownership after the IPO is well documented, founding managers often continue to have a strong voice in directing the public company forward and, perhaps more importantly for our study, in the decision to take it private again. From SEC Edgar Online, we were able to identify CEO ownership, both post-IPO and pre-buyout, for our sample of public-to-private transactions. In 166 cases (about 63 percent), the firm had the same CEO leadership at the time of both reorganization events. Presumably, this estimate is only a lower bound of managerial stability as a firm's insiders can take different roles and positions in running their company. Overall, firms managed by the same CEO over their private (pre-IPO) and public life cycles were very similar to the remaining cohort except in one important dimension. Not surprisingly, these same-CEO firms were more closely held by insiders. These firms also experienced a greater decline in analyst coverage over the last three years of their public life.[13] While this gap is not significantly significant, this greater loss suggests that IPO firms run by their founding managers appear to be more responsive to financial visibility factors.

Another important aspect in buyouts is insider participation through a management buyout (MBO). Based on information from SDC, we were able to identify close to 40 MBOs in our sample of 262 going-private transactions. This SDC-based estimate of MBO activity is somewhat smaller than expected given that 63 percent of the buyout targets had no change in CEO management. Accordingly, this subset of MBO firms is made up of mature companies with higher free-cash-flow ratios. MBO firms also fare better, experiencing only a 3 percent decline in

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[13]Over the last three-year period before going private, same-CEO IPO firms averaged about 37 percent insider ownership compared to only 29 percent for the remaining firms matched with the Edgar Online database. Over the same period, they experienced a 19 percent decline in analyst following, while coverage for the rest of their peers shrunk by about 14 percent.

analyst coverage compared to a 20 percent drop for the remaining buyout targets. This evidence suggests that LBOs steered by management appear to be seeking a more efficient organizational structure that reduces free-cash-flow problems and realigns the interests of management and shareholders.

6. Was Financial Visibility Important in the 1980s?

Our empirical findings have revealed that firms that went public after 1990 were more likely to become private again if they lacked adequate analyst coverage and investor recognition. These visibility factors increased in importance in the 1990s with the proliferation of IPO companies that were more sensitive to the costs and benefits of their decision to list. Officers and directors of these IPO firms were more amenable to reorganizing or considering a takeover offer if they deemed the public listing not very beneficial to the firm. One interesting implication of these findings is whether these financial visibility incentives also influenced in any way the IPO firms that went private in the 1980s.

The LBO wave of the 1980s followed a protracted period of corporate conglomeration in the United States that undermined many of the internal corporate governance mechanisms. Not surprisingly, most of the studies in the literature analyzing the determinants of LBOs in the 1980s focused primarily on agency problems, informational asymmetries between insiders and investors, and tax incentives. To ensure that we properly measure these incentives over the entire public life cycle, we confine the sample to firms that went public after 1980.[14] Table 1 shows that there were more than 600 LBO and going-private transactions during the 1980-89 period. However, only about 130 of those firms went public after 1980. Once the sample is matched with

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[14]Technically, it is possible to analyze the buyout decision for IPOs going back to the early 1970s. This approach is more problematic, however, because LBOs started to become a viable reorganization option only after 1980.

Compustat and CRSP, it decreases to 78 LBO and non-LBO going-private transactions. We estimate again a proportional hazard regression for the public-to-private decision in the 1980s. The control sample consists of all firms that survived (that is, maintained a CRSP delisting code of 100) up to and beyond the end of 1989. The sample period for the control firms was, of course, truncated after 1989.

The proportional hazard regression estimates for the decision of IPO firms to go private during the 1980s are presented in Table 7. The positive and statistically significant parameter estimate for the FREE_CASH_FLOW strongly supports Jensen's hypothesis. The coefficient on capital expenditure, a proxy for wasteful investment, also has the right sign and is statistically significant. These findings are generally supportive of previous studies by Lehn and Poulsen (1989) and Opler and Titman (1993). Regarding the importance of financial visibility in this period, both explanatory variables ANALYST_GROWTH and TURNOVER are found to be statistically insignificant. The reported hazard regression specifications do not control for changes in institutional ownership because the information on this measure is more sparse, resulting in a much smaller regression sample and lower statistical power. In general, we again find no significant association between changes in institutional ownership and the probability of going private. One possible reason for the lack of significance of analyst coverage is that the scale of financial coverage may have been smaller and therefore less important in the 1980s compared to the 1990s. The evidence suggests otherwise, however, because the average number of analysts following a firm after five years during the 1980s is very similar to that during the 1990s.[15]

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[15]The number of analysts following a firm gradually rises after the IPO (Figure 2). Firms that went public in the period 1990-2007 were able to attract on average around 7.2 analysts five

7. Robustness of Findings

7.1 Endogeneity

The potential for endogeneity arises because financial analysts, investors, and generally market participants are sometimes able to discern prospective acquisition targets. Although merging companies and their advisors are restricted by law from revealing information, investors can scrutinize available market information and signals and employ sophisticated methods to single out merger targets. This information is particularly useful in the merger arbitrage industry, where investors trade stocks in companies that are subject to takeovers. Informed financial analysts and institutional investors could ex ante respond to the merger event, creating a spurious relationship between financial visibility factors and the decision to go private.

The evidence presented so far does not appear to support the presence of endogeneity. We observe, for instance, that buyout targets are lacking analyst coverage from the onset of their IPO (Figure 2). Moreover, there are no unusual shifts in financial coverage before the announcement of the takeover, the period when information on the merger is most likely to be revealed. The observed negative association between institutional ownership and the probability of going private also goes against endogeneity. Investors would actually be keen to buy on any rumor of a takeover to capture the buyout premium, leading to a positive link between institutional interest and the decision to go private.

Despite this preliminary evidence, it is not easy to completely dismiss the possibility of endogeneity effects, especially when the correlation between growth in analyst coverage and the probability of going private is negative. Given their limited resources and time, securities analysts might be more inclined to cease or limit their coverage if they suspected the firm was

years after the IPO. Firms that went public in the 1980s attained a slightly lower but still considerable level of interest, averaging around 6.1 analysts over the same horizon.

considering a merger. They might not completely stop following rumored or potential merger

targets because such information is very useful for their clients, but they might devote fewer

resources, effectively reducing coverage.

The hazard regressions presented earlier attempt to resolve these timing and endogeneity

problems by using lagged explanatory variables.[16] The use of lagged explanatory variables is a

simple but effective approach to removing endogeneity problems. To further address these

potential timing problems, we use a more formal econometric technique to construct a better

instrument for analyst coverage. This instrument is obtained in two stages. The first stage uses a

logistic regression model to estimate the probability of company acquisition [Palepu (1986)]. In

the second stage, we use a conventional model to predict analyst coverage [see, for example,

Bhushan (1989), O'Brien and Bhushan (1990)].[17] The key control in this second-stage analyst

coverage model is the probability-of-acquisition measure derived from the first stage, because it

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[16]To ensure that these ex ante timing effects are eliminated, we make a couple of adjustments to
the financial visibility regressors. First, the monthly or quarterly frequencies of the number of
analysts, stock turnover, and institutional ownership enable us to remove all observations within
six months (or two quarters) of the merger announcement date. Subsequently, the annual
measures are lagged by one year, further pushing the timing of these explanatory measures away
from the merger event.
[17]The first-stage logit model for estimating the probability of acquisition borrows mostly from
Palepu (1986). The dependent variable in the logit model is the probability the firm will be
acquired or merge with another company. The set of explanatory variables includes the return on
equity, the ratio of cash flow to assets, firm size, the q ratio, asset growth, and the ratio of debt to
assets. More important, the model controls for industry-level acquisitions and whether the firm
was a target of prior unsuccessful bids or was at the center of takeover rumors. Both of these
variables are found to significantly affect the probability of acquisition. The logit model is
estimated using a rolling ten-year regression panel to derive an ex ante probability-of-acquisition
measure over the entire sample between 1988 and 2007. In the second stage, the dependent
variable in our model is the logarithm of the number of analysts following a firm. Consistent
with O'Brien and Bhushan (1990), the set of explanatory variables includes firm size, the level
of institutional ownership, market-adjusted returns, and net entry at the industry level. The key
control is the probability-of-acquisition measure derived from the first stage of our analysis. The
impact of the probability-of-acquisition variable is negative and significant, confirming a
tendency by analysts to reduce coverage for firms with a greater likelihood of acquisition.

ensures that the eventual instrument will be free of many of the informational incentives that may prompt analysts to withdraw before the merger. From this second stage, we calculate the analyst excess coverage (EXCESS_COVERAGE) measured by the regression residual (that is, the actual number of analysts minus those predicted). This measure is, by definition, orthogonal to all explanatory variables and therefore removes many of the inherent endogeneity tendencies and other biases.

Using the newly derived excess analyst coverage, we reestimated the hazard regression for the decision to go private (Table 8). The most significant finding of this analysis is that the relationship between the likelihood of going private and the new instrument of excess coverage continues to be negative and statistically significant. Our conclusions on the importance of financial visibility remain unchanged. Firms with the ability to garner a higher-than-anticipated level of analyst following are more likely to stay public.

7.2 Unobserved heterogeneity

A common problem with incomplete specification in duration models is unobserved heterogeneity. The Cox model defined by equation (1) assumes that the proportionality factor $\exp(x_{t-1,i\bullet}\beta)$ is correctly specified to describe all the covariate effects across different firms. As with all statistical models, inference from an incomplete model may be problematic. The simplest way to view the heterogeneity problem is as a survival model with random effects. In our current framework, the random effect describes the influence of the unobserved risk factors on the decision to go private. In the presence of misspecification error, the proportionality factor can be expressed as $\exp(x_{t-1,i\bullet}\beta + \upsilon_{ti})$, where the unobserved heterogeneity υ_{ti} is assumed to be white noise. More formally, this broader version of the proportional hazard framework can be defined by:

$$h(\tau \mid x_{t-1,i\bullet}\beta) = h_0(\tau)\,\omega_{ti}\,\exp(x_{t-1,i\bullet}\beta), \qquad (2)$$

where $\omega_{ti} = \exp(\upsilon_{ti})$. More often, however, unexplained heterogeneity is assumed to vary from

firm to firm (commonly known as *frailty*), which means that the random factor is better

described by a fixed effect ω_i. Another possibility is that unexplained heterogeneity varies

among groups of firms (*shared frailty*). Equation (2) makes clear that the semi-parametric

proportional hazard approach of conditioning out the baseline hazard is difficult to estimate in

the presence of some form of unobserved heterogeneity. A more direct approach is to specify

heterogeneity in a fully parametric model in which the time to going private is assumed to have a

Weibull distribution [see Cox and Oakes (1984, Chapters 2 and 3)]. The fully parametric hazard

function with heterogeneity is given by:

$$h(\tau \mid x_{t-1,i\bullet}\beta;\gamma,\sigma) = \gamma \exp(x_{t-1,i\bullet}\beta + \upsilon_{ti})\,[\tau \exp(x_{t-1,i\bullet}\beta + \upsilon_{ti})]^{\gamma-1}. \qquad (3)$$

The imbedded heterogeneity factor υ_{ti} is assumed to be normally distributed with mean zero and

standard deviation σ.

Because frailty models are numerically more difficult to estimate, we consider a more

parsimonious specification that includes only those explanatory variables that were generally

statistically significant in the proportional hazard regressions. The scope of our current exercise

is simply to investigate the impact of the unobserved heterogeneity. The first column of Table 9

presents the estimates of the parametric hazard model without heterogeneity (that is, $\upsilon_{ti} = 0$).

Note that the magnitude of the coefficient estimates of this baseline model is not directly

comparable with those of the semi-parametric proportional hazard model estimated previously.

The remaining columns in Table 9 report the results under three unobserved

heterogeneity assumptions: 1) yearly and firm-level random effects, 2) firm-level frailty, and 3)

shared frailty effects at the two-digit SIC level. The results from the frailty specifications that account for different forms of unobserved heterogeneity are comparatively very similar to those of the baseline model. In particular, all our proxies for financial visibility represented by the variables EXCESS_COVERAGE, CHANGE_INST_OWNERSHIP, and TURNOVER continue to be significant determinants of the public-to-private decision.

8. Corporate Structure after Going Private

So far, this paper has focused on investigating the decision of IPO firms to exit the public market. Kaplan (1991) and Halpern, Kieschnick, and Rotenberg (1999) demonstrate that it is also instructive to analyze the post-transaction history of these firms. Kaplan points out that buyout targets whose management was seeking to mitigate free-cash-flow problems and eliminate other related agency conflicts should be less inclined to alter their corporate structure after going private. A competing view is that LBOs are simply a mechanism for reorganizing the firm and extracting value. Kaplan likens this process to a "shock therapy" allowing private equity firms and management to restructure the firm. Under this restructuring premise, the new owners should be motivated to cash out their profits rather than continue to operate the firm as a private company.

The post-buyout structure of the firm also has important implications for our financial visibility hypothesis. We demonstrated that IPO firms experiencing weak financial interest from analysts and investors were more likely to go private. These firms had the opportunity to ascertain firsthand the costs and benefits of both private and public ownership, and they decided in favor of the former. It would follow, therefore, that these companies would be much less inclined to turn public again.

The post-buyout status of firms can change in a number of ways. Private companies can opt for a reverse LBO, get acquired by another public firm, or, as seen more recently, the entire private equity firm can go public. Like any other firm, LBO firms can also fall into bankruptcy, cease operations, recapitalize, or get absorbed by another private firm. Our search relied on Bloomberg Financial, LexisNexis, and other online sources to uncover these company reorganization details.

The findings of our extensive search appear in Table 10. Of the 262 Compustat-based firms included in the regression hazard sample, 205 (or roughly 78 percent) were still privately held as of the end of 2007. Of the remaining firms, 37 became public, with less than half of those cases using a reverse LBO, and 20 filed for Chapter 11 bankruptcy or ceased operations. Most firms (about 89 percent) that remained private are still operating on a stand-alone basis and have active company websites, while the rest that vanished were typically acquired and folded into another private company. Similarly, nearly all private firms that returned to public ownership have maintained their corporate identity.

In his study estimating the staying power of LBOs during the 1979-86 period, Kaplan finds that about 62 percent remained private as of August 1990. Halpern, Kieschnick, and Rotenberg put that figure at around 44 percent for buyout firms in the period 1981-86, although the true value of their estimate may actually be higher because many of the firms classified as acquired also remained private. Arguably, these findings may not be directly comparable benchmarks for our analysis because they mirror the behavior of more mature companies. Another factor complicating our inference is that a large share of the buyouts transpired only in the last few years. Presumably, many of the firms might go public again at some point in the future as private equity investors need time to restructure the firm and exit. Nevertheless, the

fact that about 78 percent of the buyouts in the 1990s are still private signifies a strong reluctance among these firms to become public again.

To better understand these competing incentives, we further examine the company characteristics of these three post-buyout groups. Because financial information is unavailable for most of these private companies, Table 10 reports instead the average performance over the three-year period before the public-to-private event. Firms remaining private experienced a substantial decline in analyst coverage and had negative excess coverage while they were public. In contrast, those companies that elected to go public again fared comparatively better on these primary measures of financial visibility. The differences between these two groups, however, are not statistically significant. These pre-transaction mean comparisons offer some, albeit weak, support for the importance of financial visibility.

There is one dimension in which buyout targets that stay private noticeably differ from those that rejoin the public market: managerial ownership. Firms remaining private are much more closely held than those electing to return to a publicly owned corporate structure. The LBO incentives are different in firms with concentrated ownership, especially in IPO companies that are typically more closely held by founders. While firms with either high or low managerial ownership are compelled to go private, we expect a different response after the buyout. In closely held firms whose management was dissatisfied by inadequate financial interest and felt the need to refocus the firm, there should be no strong desire to go public again. In contrast, LBO firms with low insider holdings are usually financed by private equity investors and have a greater need to become public to cash out their gains.

9. Conclusion

This paper investigates the reemergence of going-private transactions. The literature examining the large wave of buyout deals during the 1980s focused primarily on the importance of reorganization benefits. Several of these studies demonstrate that LBO takeovers are a mechanism for reducing agency problems associated with free cash flow. Our analysis of public-to-private deals during the 1990-2007 period continues to support this reorganization thesis. In addition to these traditional restructuring improvements, we propose that a significant force behind the decision to abandon the public markets was the inability of many of these firms to attract a critical mass of analyst coverage and investor interest and the failure to reap the full benefits of public ownership.

Our analysis demonstrates that a significant proportion of the buyout targets were IPO firms. Using various specifications of the hazard regression model, we discover a strong link between the decision to go private and measures of market visibility. The regression results reveal that IPO firms with declining or smaller-than-anticipated analyst coverage, falling institutional ownership, and low stock turnover exhibit a substantially higher probability of going private.

Securities analysts play a critical role in increasing investor recognition of firms and ostensibly in reducing information asymmetries [Merton (1987)]. The information intermediary role of these analysts can enhance stock liquidity, increase firm value, and lower financing costs. The ability of new public companies to compete for coverage has been recently curtailed by the declining number of analysts, as many financial advisory firms elected to cut back or entirely eliminate their research departments after the collapse of Internet stocks. While companies are struggling to draw adequate interest from analysts in order to fully experience the benefits of

public ownership, they are continuing to face all the explicit and implicit costs of maintaining

their listing, including listing fees, disclosure costs, and the greater threat of litigation.

Inadequate analyst coverage and lackluster financial interest of investors can potentially tilt the

cost-benefit trade-offs for these IPO firms in favor of reverting to their original private status.

Financial visibility is particularly coveted by younger, less well-known companies. The

advantages of greater visibility for publicly traded firms might be overshadowed by heightened

scrutiny by shareholders and supervisors. Firms would therefore like to reach an optimal scale in

financial and media exposure to compensate for the adverse costs of public ownership.

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Table 1
LBO and going-private completed deals, 1980-2007

A. LBO deals

Period	Number	Total value of deals ($ billions)	Percent IPOs (volume of deals)	Median age of firm (in years)
1980-1989	442	196	8.2	14.3
1990-1999	225	58	50.7	12.9
2000-2007	627	778	36.7	11.3
All LBOs	1,294	1,032	32.1	12.6

B. Non-LBO going-private deals

Period	Number	Total value of deals ($ billions)	Percent IPOs (volume of deals)	Median age of firm (in years)
1980-1989	166	47	4.7	12.2
1990-1999	184	27	46.9	10.5
2000-2007	372	147	55.4	11.1
All non-LBOs	722	221	43.6	11.2
All deals	2,016	1,253	34.1	12.9

This table summarizes LBO and non-LBO going-private takeovers between January 1980 and October 2007. The total value of the deal is based on the value of the transaction as reported in SDC. For IPO firms, the age is measured by the difference between the deal announcement date and the issue date (in years). The IPO sample is obtained from SDC New Issues, which tracks firms that went public between 1974 and 2007. For the remaining firms that do not have a formal SDC IPO date, the age is measured by the difference between the deal announcement date and the CRSP origination date (date when the firm was first listed). The table includes only companies reported in the CRSP header file.

Table 2
The sample of IPO firms choosing to go private (completed deals)

Year	A. Completed deals		B. Deals with analyst coverage	
	All deals	LBOs	Total	LBOs
1991	2	0	1	0
1992	0	0	0	0
1993	0	0	0	0
1994	9	1	4	1
1995	5	1	3	1
1996	11	4	9	4
1997	8	4	4	2
1998	10	4	8	4
1999	26	23	23	21
2000	31	24	25	19
2001	17	10	12	6
2002	14	6	12	6
2003	13	4	9	3
2004	18	12	15	12
2005	31	24	31	24
2006	38	25	36	23
2007	29	27	26	24
Total	262	169	218	150

This table presents a breakdown of the sample of IPO firms that elected to go private between January 1, 1990, and October 31, 2007. We use the SDC New Issues database to determine the IPO date for firms that went public between 1974 and 2007. The final sample considers only firms that went public after 1988. The year 1988 is not arbitrary but was chosen because all firms that went public after that year did so in the period 1990-2007. Panel A lists all firms that were completed deals and were included in the Compustat database. Panel B summarizes a subset of these completed deals representing firms that also had analyst coverage as reported by IBES.

Table 3
Comparison of going-private IPO firms with surviving firms

	LBOs/non-LBO going-private firms	Control sample	Difference
Financial variables			
FREE_CASH_FLOW	-0.051	-0.198	0.147***
DEBT_RATIO	0.636	0.351	0.285***
MARKET_BOOK	3.208	3.480	-0.273***
TAX_RATIO	0.023	0.022	0.0006
CAPX_RATIO	0.102	0.147	-0.045***
R&D_RATIO	0.056	0.393	-0.337***
ROA	0.011	-0.039	0.050***
SALES	443.4	1,185.8	-742.4***
MARKET_CAP	618.1	1,116.5	-498.4***
Financial visibility and stock market variables			
NUMBER OF ANALYST	5.621	7.401	-1.780***
ANALYST_GROWTH	3.823	5.922	-2.099***
INST_OWNERSHIP	40.54	44.04	-3.505***
CHANGE_INST_OWNERSHIP	2.460	3.397	-0.938***
TURNOVER	5.190	8.915	-3.725***
STOCK_RETURN	-0.049	0.016	-0.065***
STOCK_VOLATILITY	0.079	0.089	-0.001***
INSIDER_OWNERSHIP	33.2	23.1	10.1***
Firm-year observations	1,531	12,959	

The table compares going-private IPO firms with the control sample of surviving peers over the period 1990-2007. The sample includes all firms that went public after 1988 with available Compustat and CRSP information. A surviving IPO firm is one that continues to be listed after going public. The summary statistics measure the performance of the firms over their entire public life cycle. FREE_CASH_FLOW = After-tax net cash flow minus dividends and interest payments divided by net sales. DEBT_RATIO = Book value of long-term debt divided by market capitalization. CAPX_RATIO = Cash outflow used for additions to the company's property, plant, and equipment over net sales. MARKET_BOOK = Market-to-book value of the equity. TAX_RATIO = Income taxes imposed by federal, state, and foreign governments divided by net sales. R&D_RATIO = Research and development expenditures over net sales. ROA= Net income divided by total assets. SALES = Net sales ($ millions). MARKET_CAP = Market capitalization ($ millions) ANALYST_GROWTH = Difference in the log (number of analysts + 1) from year (t) to year (t-1). INST_OWNERSHIP = Institutional ownership (percent). TURNOVER = Stock trading volume divided by market capitalization (percent). STOCK_RETURN = Firm's annualized stock return minus the CRSP equally weighted index return (including dividends). STOCK_VOLATILITY = Yearly standard deviation of a firm's stock return. INSIDER_OWNERSHIP = Shares owned by directors and officers divided by the total number of shares (percent). To eliminate outliers, financial ratios are based on trimmed means (with 1- and 99-percentile bounds). The symbols (*), (**), and (***) indicate statistical significance at the 10, 5, and 1 percent levels, respectively.

Table 4
A hazard model for the decision of IPO firms to go private, 1990-2007: Baseline model

Independent variables	A. LBO and non-LBO firms:		B. LBO firms:	C. Non-LBO firms:
	Against all competing risks	Against surviving firms	Against surviving firms	Against surviving firms
NYSE	-0.27	-0.48***	-0.40**	-0.56
	(2.69)	(8.84)	(4.62)	(2.69)
AMEX	0.119	0.152	-0.26	0.463
	(0.21)	(0.31)	(0.46)	(1.51)
FREE_CASH_FLOW	1.458***	1.287***	1.347***	1.203***
	(33.39)	(19.58)	(12.48)	(10.46)
DEBT_RATIO	0.181***	0.282***	0.282***	0.193**
	(16.94)	(33.36)	(18.44)	(6.09)
MARKET_BOOK	0.006	0.005	-0.13**	0.006
	(0.61)	(0.61)	(5.90)	(0.07)
TAX_RATIO	-0.009	-0.89***	0.416	-1.35**
	(0.01)	(9.89)	(0.65)	(4.38)
CAPX_ RATIO	-0.35	-0.57*	-0.67	-0.41
	(1.45)	(2.85)	(2.44)	(0.76)
R&D_RATIO	-0.14	-0.12	0.030	-0.95
	(0.13)	(0.11)	(0.01)	(0.46)
Log (SALES)	-0.18***	-0.15***	-0.18***	-0.26***
	(40.84)	(41.50)	(33.20)	(23.74)
Firms going private	262	262	169	93
Control firms	4,298	1,857	1,857	1,857
Firm-year observations	24,393	14,490	14,038	13,411
Likelihood ratio test	178.3***	192.1***	191.4***	99.08***

The dependent variable in the hazard regression is the probability that the IPO firm will choose to go private (either through an LBO or agreement to a takeover by another private firm) given that it has not done so until that point in time. The sample includes all firms that went public after 1988 with available Compustat and CRSP information. A surviving IPO firm is one that continues to be listed after going public. The sample with other competing risks includes IPO firms that are no longer public because of a merger, negative delisting, or liquidation. AMEX and NYSE indicate where the firm is listed. FREE_CASH_FLOW = After-tax net cash flow minus dividends and interest payments divided by net sales. DEBT_RATIO = Book value of long-term debt divided by market capitalization. CAPX_RATIO = Cash outflow used for additions to the company's property, plant, and equipment over net sales. MARKET_BOOK = Market-to-book value of the equity. TAX_RATIO = Income taxes imposed by federal, state, and foreign governments divided by net sales. R&D_RATIO = Research and development expenditures over net sales. SALES = Total sales ($ millions). The regression model controls for time variation by including year dummy variables. In this hazard estimation panel framework, the firm-year observations are treated as recurring censored events until the firm goes private, which, of course, is the terminal event. Parameter estimate standard errors are corrected for firm-level clustering effects using a robust-variance estimation methodology. The symbols (*), (**), and (***) indicate statistical significance at the 10, 5, and 1 percent levels, respectively. Numbers in parentheses represent chi-square values.

Table 5

A hazard model for the decision of IPO firms to go private, 1990-2007: The impact of financial visibility

Independent variables	A. LBO and non-LBO firms:		B. LBO firms:	C. Non-LBO firms:	D. Odds ratio:
	Against all competing risks	Against surviving firms	Against surviving firms	Against surviving firms	Against surviving firms
Financial variables					
NYSE	-0.926***	-0.955***	-1.021***	-1.049**	0.512
	(26.19)	(26.10)	(16.29)	(6.53)	
AMEX	-0.354	-0.011	-0.455	0.301	0.989
	(1.31)	(0.00)	(1.26)	(0.50)	
FREE_CASH_FLOW	1.216***	1.199 ***	1.197***	1.191***	0.459
	(16.28)	(14.44)	(7.51)	(9.85)	
DEBT_RATIO	0.171 ***	0.208 ***	0.293***	0.146	0.921
	(8.72)	(10.45)	(16.05)	(2.30)	
MARKET_BOOK	-0.072*	-0.081*	-0.073	-0.112	1.241
	(3.61)	(3.84)	(1.85)	(2.15)	
TAX_RATIO	-0.026	-1.324***	-0.984	-1.779***	1.031
	(0.18)	(17.57)	(1.33)	(11.74)	
CAPX_ RATIO	-0.505	-0.750*	-0.468	-1.269	1.109
	(1.84)	(3.54)	(1.13)	(1.54)	
R&D_RATIO	0.045	0.042	0.071	-0.190	0.986
	(0.05)	(0.05)	(0.14)	(0.16)	
Log SALES	-0.166***	-0.111***	-0.183***	-0.129	1.634
	(27.32)	(13.64)	(26.31)	(2.67)	
Financial visibility					
ANALYST_GROWTH	-0.020***	-0.021***	-0.026***	-0.011**	1.442
	(42.49)	(27.44)	(6.82)	(4.12)	
CHANGE_INST_OWNERSHIP	-0.021***	-0.026***	-0.026***	-0.023**	1.295
	(11.53)	(15.31)	(10.28)	(4.42)	
TURNOVER	-0.037*	-0.042*	-0.003	-0.140**	1.351
	(2.78)	(3.57)	(0.01)	(6.59)	

Table 5 continued next page

Table 5 continued

Independent Variables	A. LBO and non-LBO firms:		B. LBO firms:	C. Non-LBO firms:	D. Odds ratio:
	Against all competing risks	Against surviving firms	Against surviving firms	Against surviving firms	Against surviving firms
Stock market performance					
STOCK_RETURN	-0.106	-0.181	-0.210	-0.187	1.121
	(0.29)	(0.66)	(0.46)	(0.27)	
STOCK_VOLATILITY	-0.189***	-0.150***	-0.260***	-0.053	2.140
	(57.80)	(30.96)	(44.39)	(1.95)	
Capital market access					
SECONDARY_OFFER	-1.474**	-1.516**	-1.805*	-0.958	0.246
	(4.45)	(4.65)	(3.53)	(0.91)	
FIRMS_ACQUIRED	-0.479*	-0.509*	-0.517	-0.387	0.644
	(3.46)	(3.66)	(2.54)	(0.85)	
Firms going private	218	218	150	68	
Control firms	3,053	1,415	1,415	1,415	
Firm-year observations	18,383	11,701	11,374	10,816	
Likelihood ratio test	355.3***	342.5***	338.8***	113.6***	

The dependent variable in the hazard regression is the probability that the IPO firm will choose to go private (either through an LBO or agreement to a takeover by another private firm) given that it has not done so until that point in time. AMEX and NYSE are binary indicators for the two major stock exchanges. The sample includes all firms that went public after 1988 with available Compustat and CRSP information. A surviving IPO firm is one that continues to be listed after going public. The sample with other competing risks includes IPO firms that are no longer public because of a merger, negative delisting, or liquidation. ANALYST_GROWTH = Difference in the log (number of analysts + 1) measured as a percent. CHANGE_INST_OWNERSHIP = Change in institutional ownership (percent). TURNOVER = Stock trading volume divided by market capitalization (percent). STOCK_RETURN = Firm's yearly stock return minus the CRSP equally weighted index return (including dividends). STOCK_VOLATILITY = Yearly standard deviation of a firm's stock return. SECONDARY_OFFER = Binary indicator of seasoned equity offering in the previous year. FIRMS_ACQUIRED = Number of firms acquired in the previous year. The regression model controls for time variation by including year dummy variables. The hazard estimation framework treats firm-year observations as recurring censored events until the firm goes private (the terminal event). Parameter estimate standard errors are corrected for firm-level clustering effects using a robust-variance estimation methodology. For continuous explanatory variables, the hazard odds ratio measures the marginal effect when it is evaluated at the tenth-percentile value. For discrete explanatory variables, the odds ratio represents the marginal effect when the event occurs. The symbols (*), (**), and (***) indicate statistical significance at the 10, 5, and 1 percent levels, respectively. The numbers in parentheses represent chi-square statistics.

Table 6
A hazard model for the decision of IPO firms to go private: Alternative specifications

Independent variables	A. Insider ownership	B. Going private during:	
	1990-2007	1990-2002	2003-2007
Financial variables			
NYSE	-0.951***	-1.116***	-0.739***
	(15.91)	(12.67)	(9.10)
AMEX	0.147	0.220	-0.374
	(0.20)	(0.20)	(0.74)
FREE_CASH_FLOW	1.266 ***	1.813***	0.615**
	(9.16)	(13.69)	(3.65)
DEBT_RATIO	0.226 ***	0.225**	0.216***
	(8.10)	(5.08)	(7.39)
MARKET_BOOK	-0.084*	-0.064	-0.086
	(2.83)	(1.64)	(1.81)
TAX_RATIO	-1.400***	-1.867***	-0.830
	(18.65)	(16.07)	(1.93)
CAPX_ RATIO	-0.811*	-1.576*	-0.039
	(3.47)	(3.65)	(0.01)
R&D_RATIO	0.088	0.122	-0.634*
	(0.33)	(0.41)	(2.77)
Log SALES	-0.080**	-0.229***	-0.150***
	(4.59)	(7.55)	(11.17)
Financial visibility			
ANALYST_GROWTH	-0.021***	-0.023***	-0.016***
	(20.68)	(24.90)	(10.48)
CHANGE_INST_OWNERSHIP	-0.032***	-0.035**	-0.017
	(10.84)	(5.97)	(2.48)
TURNOVER	-0.029	-0.110**	-0.010
	(1.45)	(4.13)	(0.25)
Stock market performance			
STOCK_RETURN	-0.233	-0.129	-0.359
	(1.06)	(0.15)	(1.51)
STOCK_VOLATILITY	-0.146***	-0.134***	-0.133***
	(19.52)	(16.30)	(7.75)

Table 6 continued below

Table 6 continued

Independent variables	A. Insider ownership	B. Going private during:	
	1990-2007	1990-2002	2003-2007
Capital market access			
SECONDARY_OFFER	-1.104	-1.006	-0.885
	(2.38)	(1.03)	(1.79)
FIRMS_ACQUIRED	-0.491*	-0.101	-1.938**
	(3.44)	(0.15)	(4.01)
Ownership			
INSIDER_OWNERSHIP	0.015***		
	(14.14)		
Firms going private	185	101	117
Control firms	1,127	1,329	1,415
Firm-year observations	9,244	10,568	11,351
Likelihood ratio test	300.9***	363.84***	164.19***

The dependent variable in the hazard regression is the probability that the IPO firm will choose to go private (either through an LBO or agreement to a takeover by another private firm) given that it has not done so until that point in time. The sample includes all firms that went public after 1988 with available Compustat and CRSP information. The regression analyzes LBO and non-LBO going-private IPO firms as well as surviving IPO firms. A surviving IPO firm is one that continues to be listed after going public. INSIDER_OWNERSHIP = Shares owned by directors and officers divided by the total number of shares (percent). The remaining variables are defined in the notes of Tables 4 and 5. The regression model controls for time variation by including year dummy variables. The regression sample for the sub-period 1990-2002 excludes all control firms that went public after 2002. The hazard estimation framework treats firm-year observations as recurring censored events until the firm goes private (the terminal event). Parameter estimate standard errors are corrected for firm-level clustering effects using a robust-variance estimation methodology. The symbols (*), (**), and (***) indicate statistical significance at the 10, 5, and 1 percent levels, respectively. The numbers in parentheses represent chi-square statistics.

Table 7
A hazard model for the decision of IPO firms to go private: 1980-1989

Independent variables	LBO and non-LBO firms:	
	Against surviving firms	Against surviving firms
Financial variables		
FREE_CASH_FLOW	1.551**	1.971**
	(6.36)	(6.24)
DEBT_RATIO	0.177**	0.141
	(3.84)	(1.83)
MARKET_BOOK	0.018	0.069
	(0.07)	(1.23)
TAX_RATIO	-4.72*	-4.18
	(3.64)	(1.97)
CAPX_ RATIO	0.592**	0.702**
	(4.07)	(4.21)
R&D_RATIO	-4.11***	-4.87***
	(10.04)	(8.77)
Log (SALES)	0.355***	0.348***
	(28.38)	(12.98)
Financial visibility		
ANALYST_GROWTH		0.001
		(0.02)
TURNOVER		0.107
		(0.44)
Stock market performance		
STOCK_RETURN		-3.25
		(1.23)
STOCK_VOLATILITY		0.720
		(0.09)
Firms going private	78	72
Firms remaining public	1,912	1,668
Firm-year observations	14,015	11,052
Likelihood ratio test	159.1***	139.5***

The dependent variable in the hazard regression is the probability that the IPO firm will choose to go private (either through an LBO or agreement to a takeover by another private firm) given that it has not done so until that point in time. The sample includes all firms that went public during the period 1980-1988 with available CRSP and Compustat information. A surviving IPO firm is one that continues to be listed after going public. The explanatory variables are defined in the notes of Tables 4 and 5. The regression model controls for time variation by including year dummy variables. In this hazard estimation panel framework, the firm-year observations are treated as recurring censored events until the firm goes private (the terminal event). Parameter estimate standard errors are corrected for firm-level clustering effects using a robust-variance estimation methodology. The symbols (*), (**), and (***) indicate statistical significance at the 10, 5, and 1 percent levels, respectively. The numbers in parentheses represent chi-square statistics.

Table 8
Addressing endogeneity concerns, 1990-2007

Independent variables	Against all competing risks	Against surviving firms
NYSE	-1.030***	-1.084***
	(30.64)	(32.26)
AMEX	-0.375	-0.026
	(1.41)	(0.01)
FREE_CASH_FLOW	1.157 ***	1.195 ***
	(15.27)	(14.24)
DEBT_RATIO	0.170 ***	0.225 ***
	(7.80)	(11.07)
MARKET_BOOK	-0.075*	-0.087**
	(3.79)	(4.19)
TAX_RATIO	-0.015	-1.239***
	(0.06)	(19.39)
CAPX_ RATIO	-0.446	-0.700*
	(1.51)	(3.28)
R&D_RATIO	0.068	0.082
	(0.11)	(0.18)
Log (SALES)	-0.150***	-0.095***
	(23.17)	(10.18)
Financial visibility		
EXCESS_COVERAGE	-0.104***	-0.100***
	(21.48)	(19.94)
CHANGE_INST_OWNERSHIP	-0.016**	-0.020**
	(5.11)	(5.10)
TURNOVER	-0.038*	-0.043*
	(2.83)	(3.64)
Stock market performance		
STOCK_RETURN	-0.071	-0.155
	(0.12)	(0.48)
STOCK_VOLATILITY	-0.180***	-0.142***
	(49.59)	(25.77)
Capital market access		
SECONDARY_OFFER	-1.623**	-1.691**
	(5.30)	(5.64)
FIRMS_ACQUIRED	-0.524**	-0.552**
	(4.10)	(4.54)
Firms going private	218	218
Control firms	3,053	1,415
Firm-year observations	18,383	11,676
Likelihood ratio test	327.47***	310.86***

The dependent variable in the hazard regression is the probability that the IPO firm will choose to go private (either through an LBO or agreement to a takeover by another private firm) given that it has not done so until that point in time. The sample includes all firms that went public after 1988 with available CRSP and Compustat information. A surviving IPO firm is one that continues to be listed after going public. The sample with other competing risks includes IPO firms that are no longer public because of a merger, negative delisting, or liquidation. EXCESS_COVERAGE = Two-stage constructed instrument of financial visibility measured by the actual minus predicted analyst following. The remaining explanatory variables are defined in the notes to Tables 4 and 5. The regression also controls for time variation by including year dummy controls. In this hazard estimation panel framework, the firm-year observations are treated as recurring censored events until the firm goes private (the terminal event). Parameter estimate standard errors are corrected for firm-level clustering effects using a robust-variance methodology. The symbols (*), (**), and (***) indicated statistical significance at the 10, 5, and 1 percent levels, respectively. The numbers in parentheses represent chi-square statistics.

Table 9
Examining the impact of heterogeneity, 1990-2007

Independent variables	Baseline model $(\upsilon_{ti} = 0)$	Firm-level frailty $(\upsilon_{ti} = \upsilon_i)$	Random coefficients (υ_{ti})	SIC-level share frailty $(\upsilon_{ti} = \upsilon_j)$ j=2-digit SIC
CONSTANT	3.349***	3.497***	3.442***	3.469***
	(30.55)	(30.35)	(26.12)	(28.05)
NYSE	-0.558***	-0.541***	-0.564***	-0.494***
	(-6.36)	(-6.13)	(-6.49)	(-5.54)
FREE_CASH_FLOW	0.392***	0.331***	0.389***	0.296**
	(2.98)	(3.13)	(3.1)	(2.03)
DEBT_RATIO	0.118***	0.081***	0.121***	0.108***
	(4.49)	(3.13)	(4.45)	(3.92)
CAPX_ RATIO	-0.226	-0.287*	-0.245	-0.224
	(-1.26)	-1.66	(-1.35)	(-1.23)
Log (SALES)	0.037***	0.056***	0.037***	0.047***
	(4.19)	(6.38)	(4.22)	(5.09)
Financial visibility				
EXCESS_COVERAGE	-0.025***	-0.024***	-0.025***	-0.021**
	(-2.79)	(-2.97)	(-2.78)	(-2.45)
CHANGE_INST_OWNERSHIP	-0.013***	-0.011***	-0.014***	-0.013***
	(-4.45)	(-4.11)	(-4.4)	(-4.45)
TURNOVER	-0.048***	-0.034***	-0.048***	-0.048***
	(-5.84)	(-5.43)	(-5.93)	(-5.88)
Stock market performance				
STOCK_VOLATILITY	-0.042***	-0.028***	-0.041***	-0.035***
	(-4.07)	(-3.58)	(-4.14)	(-3.58)
Distribution shape parameters				
γ	2.238***	3.652***	2.262***	2.370***
	(18.98)	(15.84)	(18.95)	(18.97)
σ		0.81***	0.34***	0.31***
		(3.51)	(2.83)	(6.02)
Firms going private	218	218	218	218
Firms remaining public	1,415	1,415	1,415	1,415
Firm-year observations	11,676	11,676	11,676	11,676
Likelihood ratio test	285***	287***	393***	340***

To ascertain the importance of heterogeneity, this table reports the estimates of a fully parametric model for the likelihood of going private. The parametric Weibull hazard function is defined by:

$$h(\tau \mid x_{t-1,i\bullet}\beta;\gamma,\sigma) = \gamma \exp(x_{t-1,i\bullet}\beta + \upsilon_{ti}) [\tau \exp(x_{t-1,i\bullet}\beta + \upsilon_{ti})]^{\gamma-1}.$$

The random variable τ represents the firm age and $x_{t-1,i\bullet}$ is the vector of independent variables. The heterogeneity factor υ_{ti} is assumed to be normally distributed with mean zero and standard deviation σ. The sample includes all firms that went public after 1988 with available CRSP and Compustat information. The regression analyzes LBO and non-LBO going-private IPO firms as well as surviving IPO firms. A surviving IPO firm is one that continues to be listed after going public. The explanatory variables are formally defined in the notes to Tables 4 and 5. The regression model controls for time variation by including year dummy variables. The symbols (*), (**), and (***) indicated statistical significance at the 10, 5, and 1 percent levels, respectively. Values in parentheses represent t-statistics.

Table 10
Post-transaction status of firms that went private in 1990-2007

	Firms still private	Firms filing chapter 11 or ceasing operations	Firms becoming public
Number of firms (% total)	205 (78.2)	20 (7.6)	37 (14.2)
LBO firms	129	15	25
Firms with active websites	182	8	37
PREMIUM	35.8	30.5	35.5
Pre-transaction performance			
Firm financial characteristics			
FREE_CASH_FLOW	0.002	0.001	0.041
DEBT_RATIO	0.642	1.031	0.667
MARKET_BOOK	2.127	2.642	2.428
TAX_RATIO	0.017	0.021	0.033
ROA	-0.019	0.035	0.014
MARKET_CAP	852.1	171.2	508.1
Financial visibility			
NUMBER_ANALYST	4.87	4.74	6.79
ANALYST_GROWTH	-19.32	-15.17	-12.85
EXCESS_COVERAGE	-0.023	-0.002	0.201
INST_OWNERSHIP	40.9	37.1	44.95
CHANGE_INST_OWNERSHIP	3.23	0.61	1.31
TURNOVER	4.57	3.47	4.57
STOCK_RETURN	-0.026	-0.121	-0.007
Firm ownership			
INSIDER_OWNERSHIP	37.1	28.3	24.1

The table reports the post-buyout status of IPO firms that decided to go private. The status of the firm is determined as of the end of 2007. The analysis focuses on the 262 firms with available Compustat information. The post-buyout status of the firm was primarily determined from information available in Bloomberg Financial and LexisNexis. The reported financial, stock market, and market visibility measures represent the average performance over a three-year period before going private. PREMIUM = Initial deal premium measured as a percent (calculated based on the twenty-day trading average price prior to the announcement day). The variable PREMIUM is only available for 225 of the 262 deals. The variable definitions are formally provided in the notes to Tables 3-6.
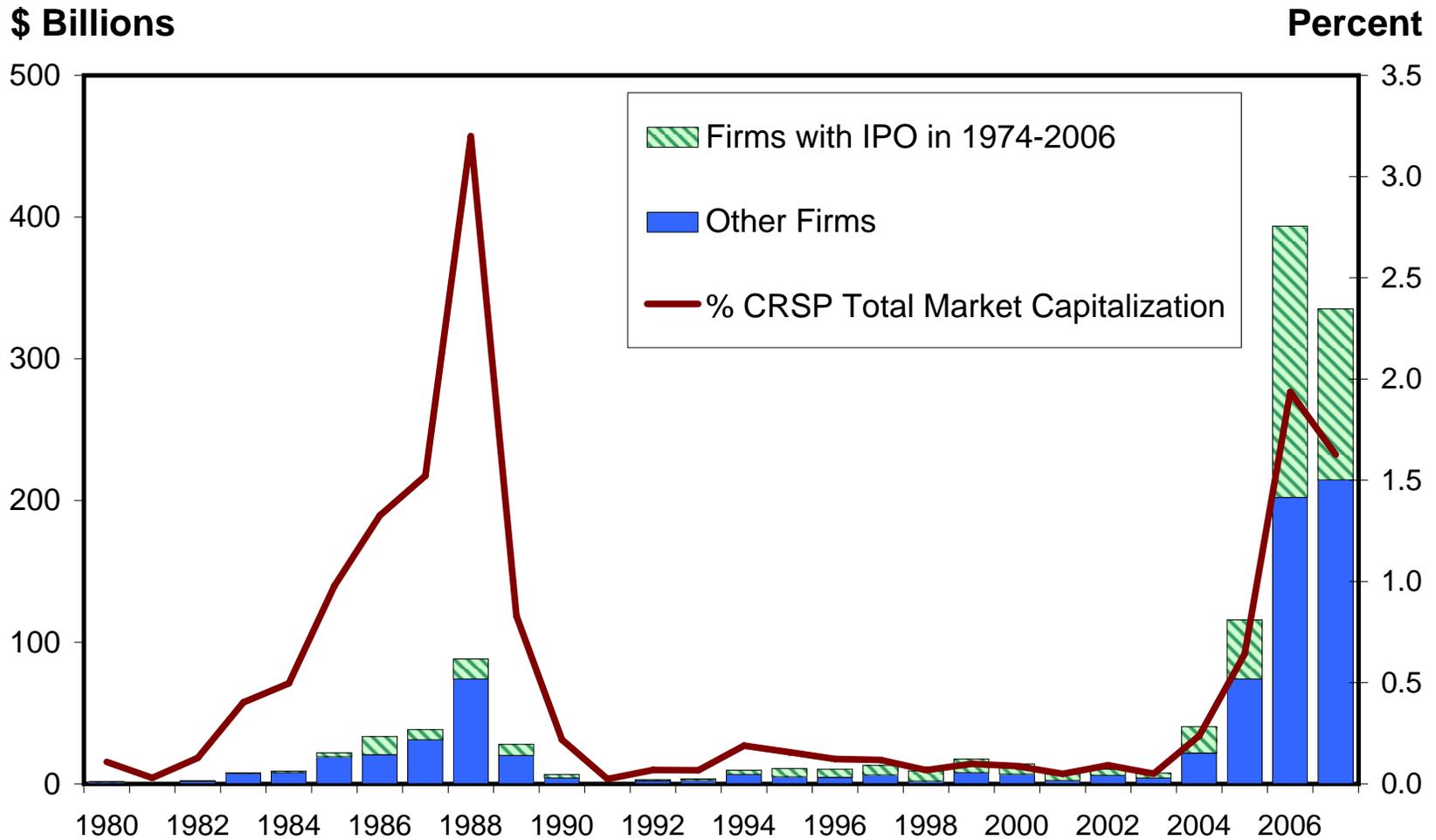
Figure 1
Volume of completed or pending LBO and going-private transactions
This graph plots the volume of buyouts from January 1980 to October 2007. The bars in the figure represent the annual transaction volume (in $ billions, left scale); the solid line traces relative volume measured by the ratio of annual volume divided by the CRSP total end-of-year market capitalization (right scale). The group of IPO firms represents any firm that went public in the period 1974-2006. Data sources: Securities Data Corporation M&A and New Issues databases.
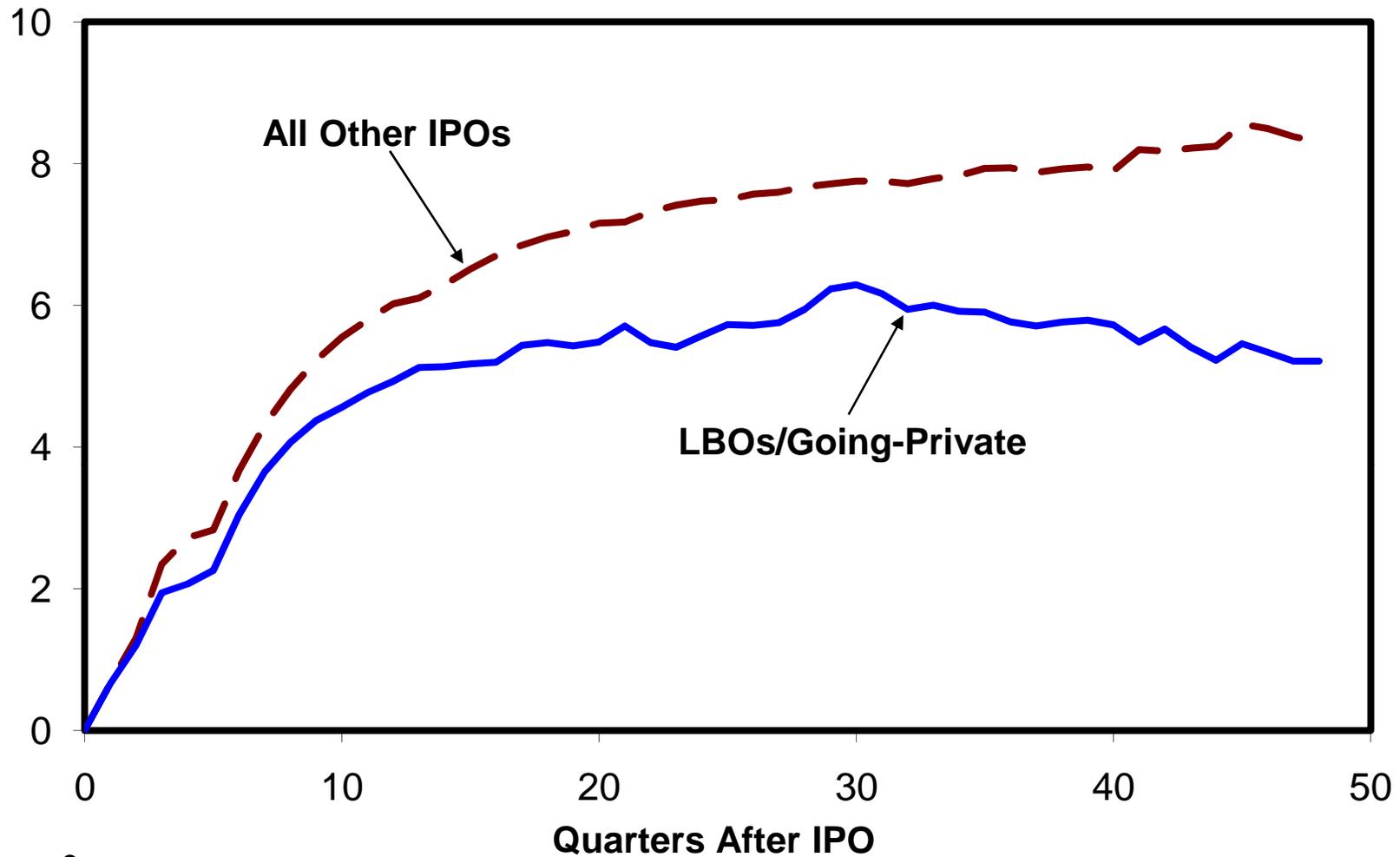
Figure 2
Number of Analysts After the IPO
The graph reports analyst coverage for firms that went public during 1988-2006. The sample includes 218 firms that went private and 3,053 control firms. The solid line traces the number of analyst for LBO and non-LBO going-private firms. Data sources: analyst coverage from I\B\E\S and IPO information from Securities Data Corporation, New Issues database.
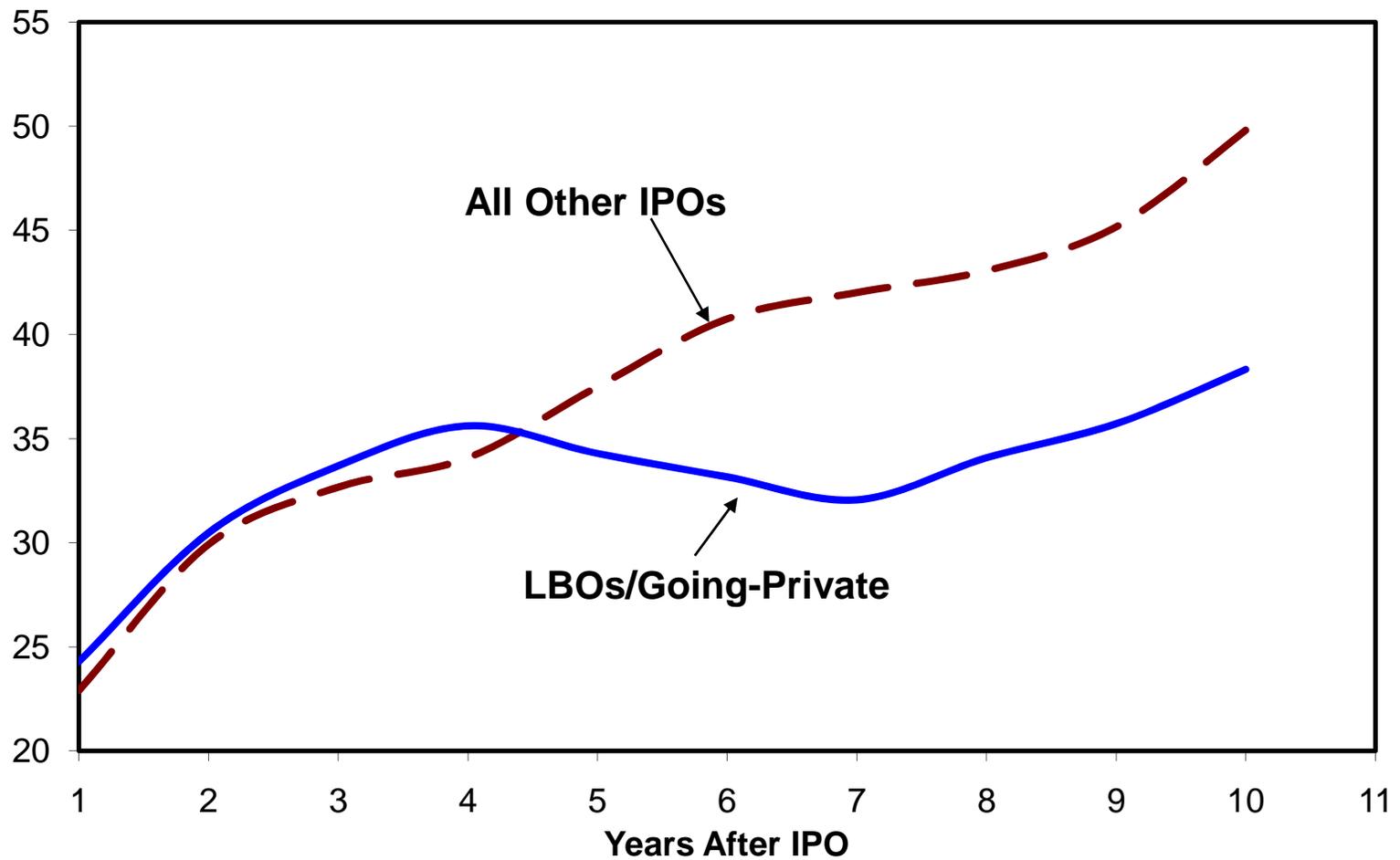
Figure 3
Institutional Ownership After the IPO
The graph reports institutional ownership for firms that went public during 1988-2006. The sample includes 235 firms that went private with available information on institutional ownership and 3,815 control firms. The solid line plots institutional onwership (in percent) for LBO and non-LBO going-private firms. Data sources: Institutional ownership from 13F/Thomson Financial and IPO information from Securities Data Corporation, New Issues database.
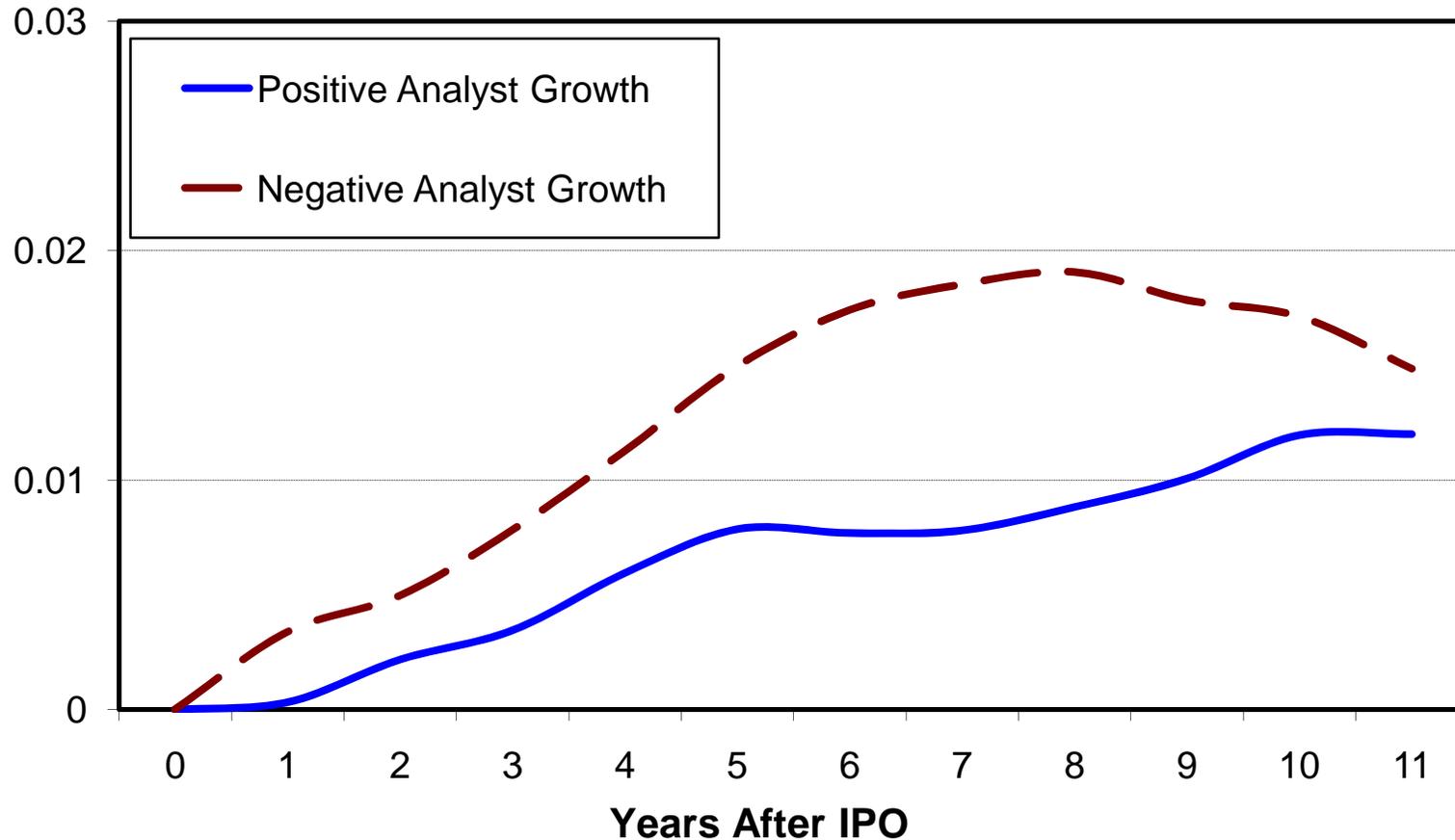
Figure 4
The Rate of Going Private For IPO Firms with Negative and Positive Analyst Growth, 1990-2007
The graph shows the conditional rate of going-private (hazard rate) for firms with negative and positive analyst growth. Equation (1) formally defines the proportional hazard model. Of the 218 firms that went private, 70 firms experienced on average negative analyst growth over their public life cycle. Data sources: Securities Data Corporation New Issues and M&A databases, CRSP, and Compustat.
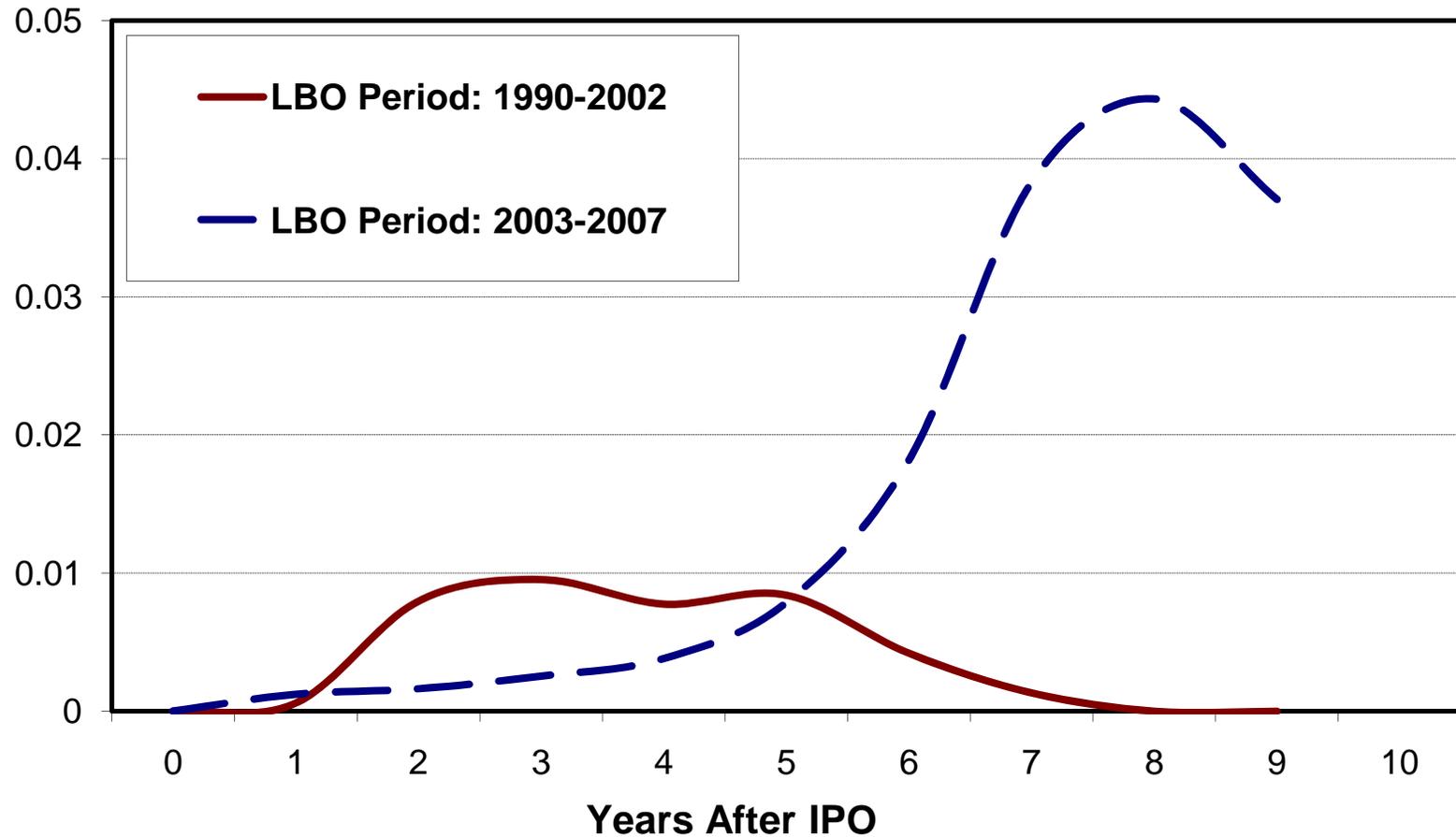
Figure 5
Impact of the Recent LBO Boom on the Incentive to Go Private
The graph plots the baseline hazard rate for firms that went private during 1990-2002 and 2003-2006. Equation (1) formally defines the proportional hazard model. Of the 262 firms that went private, 133 choose to so during 1990-2002 (see Table 2), Data sources: Securities Data Corporation New Issues and M&A databases, CRSP, and Compustat.
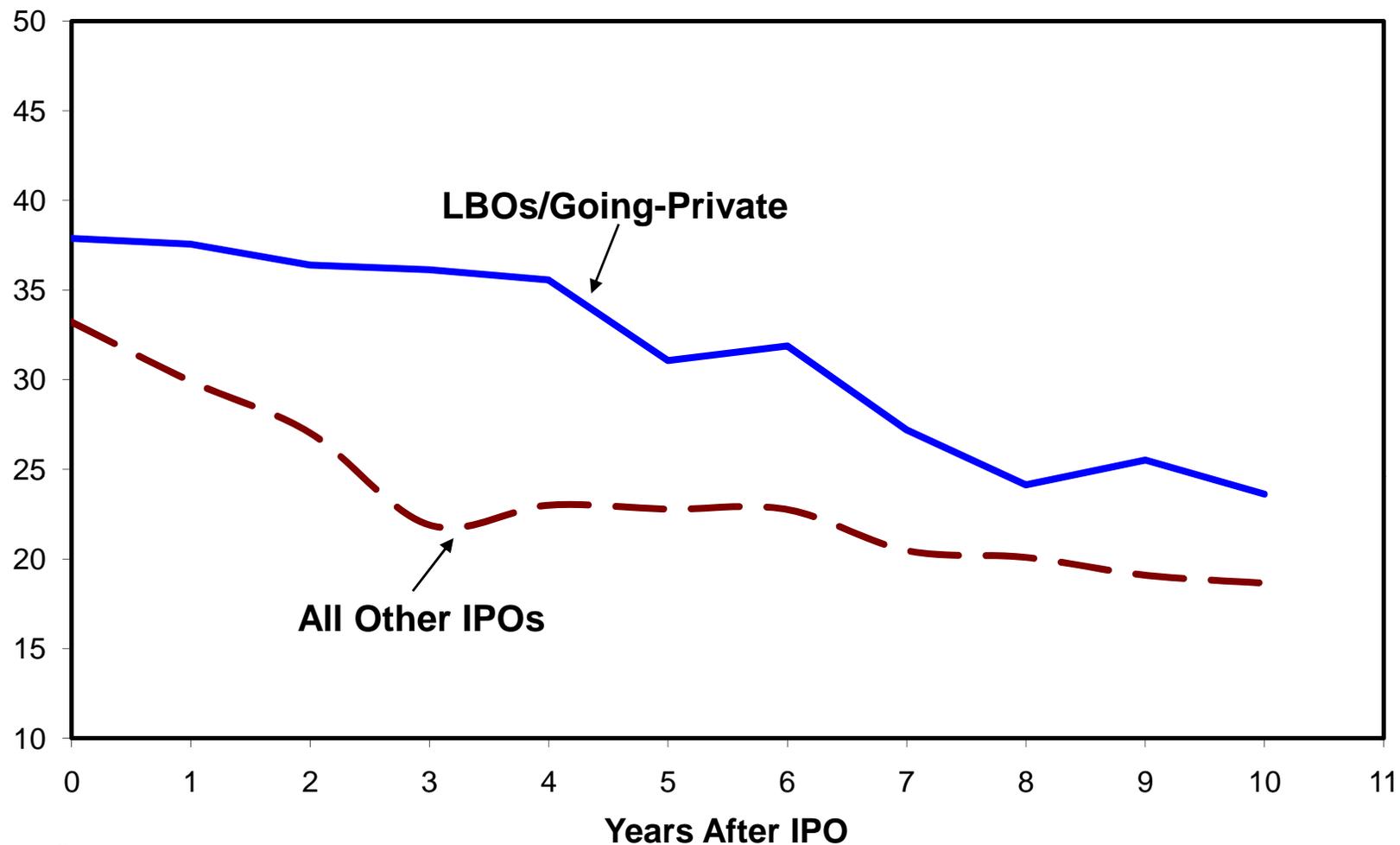
Figure 6
Insider Ownership After the IPO (percent)
The graph plots insider stock ownership for firms that went public during 1988-2006. The solid line traces the percent owned by insiders for LBOs and non-LBO going-private firms. The sample consists of 3,573 firms with insider stock ownership information of which 208 chose to go private. Data sources: Insider stock ownership from Compact Disclosure and IPO information from Securities Data Corporation, New Issues database.