Is there life after loss of analyst coverage?

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Abstract

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1. Introduction

Firms value analyst coverage. CEOs spend time and resources attempting to obtain and maintain coverage from sell-side analysts. Rajan and Servaes (1997) and Cliff and Denis (2004) find that firms pay for the extent and quality of analyst coverage by underpricing their initial public offerings (IPOs). Krigman, Shaw, and Womack (2001) show that the prospect of gaining access to better analyst coverage motivates firms to switch underwriters between their IPOs and their subsequent seasoned equity offerings (SEOs). The popular press suggests also that when firms lose analyst coverage, they try to buy it elsewhere or hire public relation firms to pitch their business to analysts.[1]

Analyst coverage improves firm valuation (Bradley, Jordan, and Ritter, 2003), stock liquidity (Irvine, 2003), and reduces the cost of equity capital (Baker, Nofsinger, and Weaver, 2002). However the evidence on the channels through which analyst coverage benefits firms and, ultimately, on the role of sell-side analysts, is mixed. It is an open question, in fact, whether analysts provide superior information in their reports or merely repackage public information. Some studies claim that analysts play an important information role because they help reduce the informational asymmetries between investors and the insiders of a firm (Brennan and Subrahmanyam, 1995) or because they have superior forecasting and stock-picking abilities (Elton, Gruber, and Grossman, 1986; Womack, 1996; Barber, Lehavy, McNichols, and Trueman, 2001). Other studies argue that analysts release common industry-level information (Pietroski and Roulstone, 2004) or piggyback on corporate news (Altınkılıç and Hansen, 2007). In doing so, analysts play a marketing role: They add no information but attract investor attention by showcasing one stock among many (Easley, O'Hara, and Paperman, 1998).

[1] To quote the Wall Street Journal: "*Friedman's Inc. became a Wall Street orphan last year when ABN Amro Bank NV, the only major financial firm to publish research on the jeweler's stock, closed its U.S. stock-analysis operations. But Friedman's didn't go begging for other research coverage - it went out and bought some. The small Savannah, Ga., firm turned to J.M. Dutton & Associates, which for a flat annual fee of $25,000 will publish research on almost any publicly traded company. Founder John Dutton says he doesn't guarantee positive ratings, though 86% of his firm's clients that are rated receive either "buy" or "strong buy" ratings or some similar variation. And clients like Friedman's say they don't mind that it looks like they are paying for bullish coverage. Says Friedman's Chief Executive Officer Bradley Stinn: "We just want people talking about us."* (Craig, S., 2003. Stock analysis: left out of shrinking research pool, companies resort to buying coverage. *Wall Street Journal*, March 26, 2003, C1.)

This paper contributes to the academic debate by analyzing the long-term consequences to firms when they permanently lose analyst coverage. If analysts are valuable because they enhance information efficiency or build investor recognition for a stock, losing coverage is likely to be detrimental to a firm. Analysis of the adverse effects offers is likely to offer insights in the role of analysts. Our first hypothesis, the *superior information* hypothesis argues that analysts have better information about a firm's prospects than that available in public information (Brav and Lehavy, 2003; Asquith, Mikhail, and Au, 2005; Das, Guo, and Zhang, 2006) and convey it to investors through their coverage choices. If analysts decide to terminate coverage on that firm because they have superior information about a major deterioration of a firm's growth prospects, the loss of coverage will be followed by a decrease in the operating fundamentals of the firm. Our second hypothesis, the *investor recognition* hypothesis, argues that even if analysts deliver no superior information, they help bring stocks to the limited attention of investors.[2] If the loss of coverage reduces investor recognition for a stock, the adverse effects will manifest in lower liquidity and higher expected returns for that stock (Merton, 1987; Amihud and Mendelson, 1986).

The two hypotheses are not mutually exclusive. While an analyst may drop coverage on a firm to signal a future deterioration of that firm's prospects, the same analyst may also drop coverage on another firm to redirect investors' attention.

In our paper, we analyze firms experiencing a total and permanent loss of analyst coverage. Our sample selection is motivated by two reasons. First, contemporaneous studies focus their analysis on a permanent −but not total− loss of analyst following. These studies report conflicting results about the extent of the adverse effects. Kelly and Ljungqvist (2007) find that firms that lose analyst coverage between 2000 and 2005 significantly decline in price. The observed price reaction is not mean-reverting but is attenuated as other analysts continue to cover the stock. In contrast, Kecskés and Womack (2007) find that investors overreact to a decrease in the number of analysts covering a stock. In their sample from

[2] Prior studies have shown that limited attention significantly affect investors' behavior. Barber and Odean (2008) show that investor portfolio choices are concentrated among attention grabbing stocks. Klibanoff, Lamont, and Wizman (1998) show that investors in closed-end mutual funds typically under-react to country-specific news, except when the news appears on the front page of *The New York Times*. Huberman and Regev (2001) document that the publication of a Sunday *New York Times* news article on a new cancer curing drug caused the stock price of the drug producer to soar, even though the news had been previously reported in *Nature* five months earlier. Dellavigna and Pollet (2008) find that investors under-react to earnings announcements on Friday. Corwin and Coughenour (2008) show that, during periods of increased activity, specialists allocate attention only to their most active stocks. Neglected stocks experience higher transaction costs and lower liquidity.

1984 through 2004, drops of analyst coverage in one year produce negative returns that are followed by higher positive returns the next year. Second, a total −but not permanent− loss of coverage produces short-lived negative effects that disappear once the coverage is regained. Demiroglu and Ryngaert (2008) document that the depressed prices of stocks that have been temporarily neglected by analysts rise significantly as the analysts resume coverage on these firms.

From I/B/E/S database, we thus identify the firms that lost all analyst coverage and never regained it. On average, 10% of all covered firms lost coverage between 1983 and 2004. To make sure we are not identifying firms that are facing imminent delisting, we remove those firms that stopped trading within one year of the loss of coverage. A third of firms that lost coverage continued to be listed for at least one year after the loss in coverage and consequently, enter into our final sample of 2,753 firms. Sample firms are mostly small, seasoned firms that operate in the manufacturing industry. Value stocks and growth stocks are equally represented in the sample.

Our research design consists of three steps. We first model the analyst's decision to drop coverage on a stock. Building on prior theoretical and empirical literature, we model the coverage drop decision as a function of the firm's propensity to go bankrupt and its potential to generate investment banking and trading revenue. Second, we use a propensity score technique to find, among the firms regularly covered by analysts, control firms that are accurately similar to sample firms on the propensity to go bankrupt and generate brokerage revenue. Finally, we measure the adverse effects for the sample firms over the years following the loss of coverage relative to their control firms. This endogenous research design allows us to test the superior information and the investor recognition hypotheses simultaneously. In contrast, Hong and Kacperczyk (2007) and Kelly and Ljungqvist (2007) analyze partial drops in coverage through exogenous events like brokerage division closures. While an exogenous methodology allows a test of the investor recognition hypothesis, it offers no insights into the superior information hypothesis. Since the two hypotheses are not mutually exclusive, results that support one hypothesis do not necessarily rule out the other.

We find a number of significant results. First, after matching on both the propensity for bankruptcy and revenue generation, we find that the operating performance of sample firms significantly deteriorates relative to their controls in the two years after the loss of coverage. Sales, operating ROA,

ROA, current ratios, cash ratios, and Altman Z-scores are all significantly lower than those of control firms, both for levels and changes. The stock price performance in our sample reflects the deterioration in the operating performance: Both market-adjusted returns and Fama-French three-factor alphas significantly worsen. In addition, market capitalizations, the value of assets, liquidity, institutional holdings, and the amount of equity issues of sample firms all decrease relative to their matched firms. Consistent with the superior information hypothesis, it appears that analysts predict a deterioration of a firm's growth prospects, and they signal it by terminating coverage on that firm.

Second, we focus on stock delisting as the ultimate adverse effect of losing analyst coverage and we find that sample firms delist at a significantly higher rate than control firms. Specifically, 29% of sample firms delist between one and two years after the loss of coverage, while 34% delist between two and five years. In contrast, the corresponding numbers for control firms are 8% and 18%. A Cox proportional hazard model shows that, after controlling for the propensity for bankruptcy and generating brokerage revenue, the loss of analyst coverage for sample firms continues to be a significant predictor of the probability of delisting. Our results imply that a firm that loses coverage is 26% more likely to delist than its control firm. In addition, our results are robust: The loss of analyst coverage significantly predicts the delisting rates for firms whose price per share is above $5, firms in the largest quintile of market capitalization, firms with high institutional presence, firms that lost coverage after the adoption of the regulation Fair Disclosure (FD) in 2000, and firms that continued to be publicly traded for at least four years after the loss of coverage.

Third, we examine a subsample of firms whose low potential to generate brokerage revenue –rather than their poor operating performance– is more likely to drive an analyst's decision to drop their coverage. Specifically, we confine the analysis to a subsample of top performers (i.e., firms in the top-two quintiles of ROA, Altman Z-scores, excess returns, and Fama-French three-factor alphas), and we find that, after the loss of coverage, the operating performance of these top performers does not worsen relative to their matched counterparts but their market valuation, liquidity, and institutional presence significantly drop relative to their controls. For these top performers, our results support the investor recognition hypothesis.

Overall, our results are consistent with both hypotheses. We conclude therefore that analysts are

valuable because they provide better information about firm's growth prospects than publicly available information. Analysts are also valuable because their coverage increases stock visibility and directs investors' attention to these firms. That is, analyst coverage enhances both the perfection and completion of the information available in the equity markets.

Relative to prior literature, this paper contributes by analyzing the long-term consequences of losing analyst coverage from a firm's perspective. To the best of our knowledge, this is the first paper to explicitly model why analysts drop coverage of firms. While analysts are likely to drop coverage on firms performing poorly, we find that modest performance is not the only driver of an analyst's decision to terminate coverage. Analysts are likely to drop coverage also on firms with low potential to generate brokerage revenue. Since 2002, analyst regulation has separated sell-side analysts from investment banking ties. As a result, an analyst's economic incentive to provide coverage has generally reduced and depends mainly on the potential to generate trading revenue. Our analysis of the determinants of coverage loss provides thus insights into analyst incentives to cover firms that support the business of a brokerage firm.

In addition, while contemporaneous papers focus on temporary or partial losses in coverage and document reversible effects on firms, this is the first paper to analyze the long-term effects of a complete loss in coverage. In our matching procedure, we use all the variables identified by prior literature on bankruptcy prediction. The predictive power of the loss of coverage, even after matching on these publicly available proxies for bankruptcy, suggests that analysts have superior information that allows them to drop the future underperformers among firms with a similar propensity for bankruptcy. The loss of analyst coverage therefore adds to the existing proxies for predicting bankruptcy.

The remainder of the paper is organized as follows. In Section 2, we discuss data and sample descriptive statistics. Section 3 provides details of our model for the determinants of the loss of analyst coverage. Section 4 reports the long-term consequences of the loss in coverage for sample firms. We conclude in Section 5.

2. Data and sample descriptive statistics

2.1 Data

Analysts do not typically announce when they intend to drop coverage on a stock. When they do

drop coverage, they tend to time their announcements in conjunction with corporate bad news, making an analysis of the effects quite noisy. We therefore use ex-post information to identify the stocks that lost coverage. Specifically, we obtain, from the I/B/E/S Detail file, the date of the last analyst estimate for all firms publicly traded on NYSE, AMEX, and Nasdaq between 1983 and 2004. We retain only firms whose last coverage date was in 2004 or before and have not regained coverage up to the date of this study. Market participants cannot apply this look-ahead procedure directly to find whether, on the day of the last estimate, a firm has actually lost all analyst coverage. However, we expect them to become aware of the loss in coverage sometime afterwards. Since the purpose of this study is to examine the long-term consequences of losing coverage, rather than determinants or short-term consequences, this hindsight bias has no impact on our analysis. From 1983 through 2004, 9,634 firms experienced a total and permanent loss in analyst coverage.

To construct our sample, we apply three criteria to this population of firms. First, we retain only U.S. firms because foreign firms may be covered by other analysts that we cannot track. Consequently, we remove American Depository Receipts (ADRs). Second, sample firms must have ordinary common shares publicly traded on the main domestic exchanges at the time of the last analyst estimate. This eliminates certificates, shares of beneficial interest, units (i.e., depository units, units of beneficial interest, units of limited partnership interests, and depository receipts), Real Estate Investment Trusts (REITs), and closed-end funds. Third, we compare the CRSP delisting date to the date of the last analyst coverage on I/B/E/S, and retain only those firms that have not been delisted from their primary exchange within one calendar year since the loss of analyst coverage. This eliminates firms that lost coverage only because they would have been imminently liquidated, acquired, or delisted for other reasons. Our final sample consists of 2,753 U.S. firms that continue to be publicly traded for at least one year after experiencing a complete loss in analyst coverage.[3]

The data used in this paper comes from multiple sources. Stock returns and trading volume data are obtained from CRSP, accounting data from Compustat, institutional holdings from CDA/Spectrum

[3] The advent of the Sarbanes-Oxley Act has affected the relative tradeoff between costs and benefits of a firm's decision to remain a publicly traded entity. Engel, Hayes, and Wang (2007) document that the net benefits of remaining public are very small, and consequently, a number of firms are choosing to go private. Hence, we remove those firms whose delisting decisions are voluntary and not necessarily driven by the loss in analyst coverage. Our overall results are however robust to the inclusion of these firms in the sample.

Institutional 13f Holdings, analyst recommendations and earnings forecasts from I/B/E/S, and bid-ask spreads from the CRSP and TAQ databases.

2.2 Descriptive statistics for the sample

Figure 1 shows the evolution in the number of firms that lost coverage as a percentage of the total number of covered firms on I/B/E/S. In general, our sample firms represent about one third of the population of firms that lost coverage from 1983 through 2004. Over the 22-year period, the number of firms that lost coverage appears to rise and fall with the business cycle, with more firms being dropped by analysts during economic expansions and fewer firms being dropped during economic contractions. Since the pool of available analysts and the number of stocks each analyst can meaningfully cover is likely to be limited in the short term, one expects that analysts would drop coverage at a higher rate during economic booms.[4] Khanna, Noe, and Sonti (2008) argue that the supply of an investment bank's human resources is inelastic for IPOs. In hot markets, the inelasticity has the effect of lowering the extent and quality of due diligence undertaken to validate a firm's true value. Inconsistent with this hypothesis, however, Figure 1 shows that the number of analysts has actually increased at a higher pace than the number of covered firms. The average number of firms per analyst, computed as all firms covered on I/B/E/S divided by all individual analysts, drops below one in the second half of the 1990s.

Panel A of Table 1 provides information on the yearly time-trend of the firms losing coverage. Over the 1990-1991 period, a period that marked both a U.S. business cycle contraction and a drop in the number of new issues on the market, a total of 546 firms lost analyst coverage. Of these, 203 firms continued to be listed for at least a year after the loss of coverage. The corresponding figures for the 1999-2000 period, during the peak of the business cycle, are 1,932 and 546, respectively. The average annual frequency of firms losing coverage, as a percentage of all firms covered on I/B/E/S, is about 7% and 19%, respectively, over these two periods. Most sample firms are listed on Nasdaq (70%) and are not recent IPOs: Fewer than 5% of these firms have been listed for less than a year and over half of them have been listed between two and ten years. The median trading age is about six years. There are 577 firms with trading ages in the 10 to 20 year range, while 317 firms have traded for more than 20 years. This suggests

[4] Tedeschi, B., 2003. Can the dot-coms still standing reclaim the attention of analysts still employed? Stay tuned. *New York Times*, April 21, 2003, C10, column 1.

that sample firms are not merely companies which have fallen out of analysts' favor after their recent IPOs.

In Panels B and C of Table 1, we report summary statistics on the market capitalization and B/M ratio distributions for the sample firms. The median firm has a market capitalization of equity of $34 million. While half of the sample firms are in the $10 million to $50 million range, 23 firms are over $1 billion in size (Panel B). Not surprisingly, most sample firms fall in the smallest Fama-French size quintile (Panel C). We also examine whether analysts tend to drop value firms. Jegadeesh, Kim, Krische, and Lee (2004) argue that analysts prefer firms with low book-to-market (B/M) ratios – glamour firms. No similar pattern is observed for firms that lost analyst coverage. While the median sample firm has a B/M ratio of 0.68, the sample appears to be equally distributed over the entire value-to-growth spectrum. In particular, both the first quintile of growth firms and the fifth quintile of value firms contain roughly the same number of sample firms, confirming that our sample firms are not value firms that have fallen out of favor.

Finally, Panel D of Table 1 reports the stock price distribution for sample firms at the end of the year prior to, the month prior to, the month of, and the month after the loss of analyst coverage. Continued listing requirements at organized exchanges usually stipulate an average price of at least $1.[5] About 6% of sample firms fall into this category in the month of the loss of coverage; 46% trade at a price of $1 to $5; and 48% trade at a price of over $5. These proportions slightly change in the month after the loss of coverage.

2.3 Do firms lose analyst coverage abruptly?

Panel A of Table 1 suggests that analyst terminations do not cluster by time. Do they cluster by industry? Previous studies examine the value of analyst coverage by focusing on coverage initiations following an IPO (Michaely and Womack, 1999; Bradley, Jordan, and Ritter, 2003). However, this focus does not provide a clean test because IPOs generally cluster by time and industry. Ritter (1991) argues that this clustering is due to investors becoming irrationally optimistic about certain industries. Managers and investment bankers take advantage of this favorable inclination by offering new stocks to overly

[5] See http://www.nyse.com/regulation/listed/1147474807436.html for detailed information on NYSE's continued listing standards and http://www.nasdaq.com/about/nasdaq_listing_req_fees.pdf for listing requirements on the NASDAQ exchange.

optimistic investors. If analysts' decision of initiating coverage is tilted towards an industry, it is difficult to disentangle the effects of gaining coverage from the market environment surrounding that industry. Similarly, if analysts' decision of terminating coverage clusters by industry, it is hard to distinguish the effects of losing coverage from the effects of exogenous shocks like those studied by Hong and Kacperczyk (2007) and Kelly and Ljungqvist (2007). We use the first two digits of the NAICS industry code to classify firms by industry. Most sample firms are manufacturing (39%) or financial firms (16%). High-tech and internet firms, as defined in Loughran and Ritter (2004), account for 21% of the sample and account for a significant proportion of the sample only between 1997 and 2001.

Table 2 provides another way of examining the same issue. In Table 2, we report analyst earnings per share (EPS) estimates and recommendations on sample firms over the year [-4, 0] event window. Year 0 marks the year when the coverage is lost. The mean EPS estimate declines steadily from $4.25 four years before the loss of coverage to -$0.97 in the year when coverage is dropped. The mean EPS estimate is $3.49 *above* the industry in year -4 and drops to $1.95 *below* the industry estimate in year 0. The fact that the mean industry-adjusted estimate becomes negative and generally increases in magnitude over time indicates that analysts believe that sample firms are performing, on average, worse than the industry, not that the industry itself is out of favor. The changes in mean EPS estimate and in mean industry-adjusted EPS estimate are significant for each of the four periods examined. Recommendations (with Strong Buy = 1 and Sell = 5) slowly worsen for the average sample firm. The mean recommendation is 1.95 in year -4, drifting down to 2.38 in year 0. Recommendations for the average sample firm are in line with the industry in year -4 but become off in year -1 and even more off in year 0 when the mean industry-adjusted recommendation is 0.32.

The number of annual estimates for the average sample firm gradually decreases from 9 to 4 in the five years examined. Also, the number of analysts covering the firm slowly declines. If firms realize that analyst coverage has been declining, they might try to substitute for it by increasing advertising or releasing information about their business and products. Grullon, Kanatas, and Weston (2004) show that firms with greater advertising expenditure, *ceteris paribus*, attract a larger number of individual and institutional investors while their common stock is more liquid. Therefore, in Table 2, we report the mean industry-adjusted advertising expenses-to-sales ratio. Firms do not seem to adjust for the loss of coverage

by increasing advertising. The sample firms marginally increase their advertising expenses in the year they lose coverage, although their ratio remains far below the average ratio at the industry level.

Finally, Bradley, Jordan, and Ritter (2008) find that analysts affiliated with the investment bank that served as an underwriter for an IPO, initiate coverage on that IPO immediately after the quiet period and almost always with a favorable recommendation. If affiliated analysts are the first to initiate coverage, they may be the last to terminate it. We thus examine the affiliation of the analysts that last covered our sample firms and we find a different effect. The last analyst to provide coverage is an analyst affiliated with the lead or co-lead manager of the most recent equity issue, merger deal, or debt issue in only 8% of the sample firms.[6] Overall, Table 2 indicates that losing coverage is not a precipitous process that is triggered by an external shock. Sample firms appear to gradually lose analyst interest.

3. Determinants of loss in coverage

McNichols and O'Brien (1997) document that analysts prefer to report good news rather than bad news because good news is easier to sell to a broader audience. This implies that analysts drop coverage of firms that are performing poorly or that they believe are unlikely to perform well in the future. In addition, for a brokerage firm, the economic incentives for providing analyst research include increased trading (Irvine, 2000; 2004) and investment banking revenue (Clarke, Khorana, Patel, and Rau, 2007), implying that analysts are also likely to drop coverage of firms that are unlikely to generate revenue. In this section, we use proxies for these two factors to construct a model of the determinants of losing coverage.

3.1 Univariate analysis of the determinants of loss in coverage

Table 3 reports univariate statistics for sample firms in the year prior to the loss of coverage, year -1. We divide these statistics into two categories: 1) operating and stock performance indicators and 2) potential revenue generation characteristics (i.e., the potential for generating trading and investment banking revenue through merger or underwriting advisory services).

From an operating performance standpoint, in the year before the loss of coverage, the median sample firm is less profitable, more liquid in terms of current and cash ratios, and less financially stable

[6] If a sample firm has not been involved in such deals, the affiliation of the last analyst is determined by looking at the IPO syndicate that took the firm public.

than the median firm covered on I/B/E/S. Operating ROA is 5.20% for sample firms versus 10.88% for covered firms; sales are $45 million versus $160 million; and Altman Z-score is 1.26 versus 2.14.[7] The last five columns in Table 3 report the distribution of the performance indicators for the sample firms relative to covered firms, based on quintile breakpoints computed using the universe of covered firms. Across operating performance metrics, except for leverage, current ratio, and cash ratio, sample firms are disproportionately represented in the two lowest quintiles of performance relative to the universe of covered firms on I/B/E/S. The pattern is less clear from a price performance standpoint. While market-adjusted excess returns are significantly worse than the universe of covered firms, the FF three-factor alpha is significantly higher. In addition, the distribution of alphas relative to the universe of covered firms is quite uniform.

From a revenue generation standpoint, our sample firms are typically small-cap firms. As mentioned earlier, the median sample firm has a market capitalization of $34 million.[8] Data on the book value of assets are similar. Sample firms have higher mean and median book-to-market ratios than covered firms. However, the distribution of sample firms across different quintiles is quite even, confirming the univariate rankings shown in Panel C of Table 1. Our sample firms have significantly lower share turnover and trading volume and higher bid-ask spreads than the average or median firm in the universe of covered firms on I/B/E/S. Given that 80% of the sample falls in the two smallest quintiles of the universe of covered firms based on market capitalization, the lower trading volume and higher bid-ask spreads are not surprising. Following Bhushan (1989), we use institutional holdings and the number of institutions holding a stock as measures of the buy-side interest in that stock. Both are significantly lower than the universe. If an analyst's decision of terminating coverage affects the investor recognition of a stock, it is likely that the impact will be greater for firms with low institutional presence – firms where individual investors are the main shareholders. While the median firm in our sample engages in no M&A activity in the three years prior to losing coverage, this is also true for the typical firm on I/B/E/S over the same three-year period. The mean M&A and issue activity (both number of deals and dollar

[7] The values for the universe of covered firms are computed after removing the firms in our sample that were still covered at the end of year -1.

[8] As in Collins, Kothari, and Rayburn (1987), we use the size of our sample firms as a proxy for their potential to generate revenue for a brokerage firm. Larger firms are expected to raise larger amounts of capital, have more traded shares, and engage in larger acquisitions. Each of these factors increases a brokerage firm's incentive to provide coverage to the firm.

amounts) of our sample firms is considerably lower than the mean activity of firms covered on I/B/E/S. Again, across most measures of potential revenue generation characteristics, sample firms fall into the lowest quintiles relative to the universe of covered firms on I/B/E/S.

Table 4 reports the time-series of performance and revenue generation characteristics for sample firms before they lose coverage, specifically, over the year [-3, 0] event period. Data presented in Table 4 are descriptive statistics for the median firm in our sample adjusted by the corresponding value for a control firm matched on size and two-digit NAICS industry in year -1. Note that, while all sample firms still have coverage at the end of year -1, coverage is lost before the end of year 0, which means that the statistics in year 0 reflect some of the effect of losing coverage.

From an operating performance standpoint, Panel A of Table 4 reports that the industry and size-adjusted operating ROA for sample firms is not significantly different from zero in years -3 and -2, but significantly negative in years -1 and 0 (-0.64% and -2.39%, respectively). A similar pattern holds for ROA. While operating performance declines, leverage increases significantly in years -1 and 0. Much of the increase occurs in the year of coverage loss. The decline in market value of equity is responsible for the increase in leverage ratio. Current and cash ratios are constant on a control-firm adjusted basis. The decline in operating performance is consistent with the decrease in the Altman Z-score, indicating an increase in the risk of bankruptcy in year 0. Note that the control firm-adjusted Altman Z-score is insignificant in the years leading up to the coverage loss and becomes significantly negative only in year 0. In this year, the volatility of sample firms also increases relative to control firms matched on size and industry. However, it is unclear that a poor operating performance is the reason why analysts drop coverage on the median sample firm. Sales for sample firms are significantly higher than those for control firms in the years prior to the loss of coverage and become insignificant in year 0. From a price performance standpoint, cumulative excess returns and FF three-factor alphas both decline steadily in the years preceding the coverage loss.

From a revenue generation standpoint, Panel B reports the evolution of the potential revenue generation characteristics for sample firms relative to their size and industry-matched firms. Market capitalizations of the sample firms steadily decline: The difference in market capitalization is significantly positive in year -3 and becomes significantly negative in year 0. Share turnover and trading volume are

significantly higher for sample firms than for control firms over each of the three years preceding the coverage loss. The excess trading volume and share turnover both drop significantly in year 0. The bid-ask spread, which is another proxy for liquidity, indicates that sample firms are more liquid than their matched firms in the years preceding the loss in coverage but become significantly less liquid in year 0 (0.23%). It appears that analysts do not cease to cover the sample firms as institutional investors lose their interest in them. In fact, institutional holdings and the number of institutions are significantly higher for sample firms than for control firms over the pre-coverage loss period and drop significantly only in year 0. Neither M&A activity nor underwriting activity appears to be significantly different for sample firms when compared to control firms over the three years prior to loss in coverage.

3.2 Multivariate analysis of the determinants of loss in coverage

In this section, we construct a logistic regression model of the determinants of losing coverage for our sample firms against four sets of control firms: 1) the universe of covered firms, 2) a set of size and industry-matched firms, 3) a set of firms matched on the propensity for bankruptcy, and 4) a set of firms matched on both the propensity for bankruptcy and the potential for revenue generation. The dependent variable in each of the logistic regressions is a binary variable that takes on a value of one in the year when coverage is lost, and zero otherwise. Table 5 reports regressions using levels of variables in year -1. Regressions using changes in values of the explanatory variables over the years [-3, -1] and years [-2, -1] are qualitatively similar and are not reported for brevity. Year, industry, and exchange fixed effects are included in each regression.

Model 1 uses the universe of firms covered on I/B/E/S as a control set to examine the determinants of coverage loss for sample firms. The unconditional likelihood of losing coverage is related to the stock price performance but not to the operating performance. Excess return and FF three-factor alphas earned by a firm in year -1 are significantly negatively related to an analyst's decision of terminating coverage on that firm. Coefficients for ROA, sales, leverage, and Altman Z-score are insignificant. This is also true for models where these variables are included separately to predict the loss of coverage. Market capitalization, the number of institutions holding the stock, the number of M&A deals, the issue amount, and the number of issues are all negatively related to the probability of losing coverage. Value firms are more likely to lose coverage as are firms that are less liquid in terms of trading

volume and bid-ask spread.

In model 1, one of the most significant determinants of coverage loss is market capitalization. Hence, in model 2, we evaluate our sample firms against a set of control firms matched on size and industry in year -1. The insignificance of all operating performance variables in explaining an analyst's decision to drop coverage suggests that size and industry are good proxies for operating performance. Market-adjusted excess returns continue to be significant while FF three-factor alphas cease to be. Among the potential revenue generation characteristics, only B/M ratio, institutional presence, and trading volume retain their significance. The likelihood of losing coverage increases as the sample firm becomes less of a growth stock than the control firm. Unlike the univariate results, firms with a larger number of institutional shareholders are less likely to lose coverage. Interestingly, the liquidity coefficient reverses sign. Liquid sample firms (with higher trading volume and lower bid-ask spread) are more likely to lose coverage than control firms. Underwriting activity, which is proxied by the number of deals in the three years before losing coverage, is no longer important. This is not surprising because sample and control firms are matched on size and operate in the same industry and they are unlikely to generate significantly different levels of investment banking activity.[9]

In model 3, we use proxies developed by prior theoretical and empirical literature to create a set of control firms matched on the risk of bankruptcy. These proxies include working capital/assets, retained earnings/assets, earnings before interest and taxation/assets, market value of equity/liabilities, and sales/assets (Altman, 1968). In addition, Zmijewski (1984) uses net income/assets, liabilities/assets, and current assets/current liabilities as proxies of default risk. Finally, Shumway (2001) finds that market-driven variables, such as relative size (i.e., logarithm of market capitalization for a stock divided by total market capitalization for all stocks traded on an exchange), cumulative excess returns using monthly returns and the market model, and the idiosyncratic standard deviation of stock returns, explain the risk of bankruptcy better than accounting ratios do. We measure all eleven proxies in year -1. To identify the control firms, we use the innovative methodology of propensity score matching (Villalonga, 2004; Cooper, Gulen, and Rau, 2005). This matching method has the advantage of identifying a control group of

[9] In unreported regressions, we use institutional holdings as a control variable. We do not include institutional holdings and the number of institutions simultaneously because of their high correlation ($\rho = 0.75$). However, our results are qualitatively similar with either variable.

firms screened along multiple dimensions, not just a few, and allowing for a closer match on the propensity for bankruptcy as well as the potential for revenue generation.[10] Using the eleven proxies for the propensity for bankruptcy, we find 1,940 matches.[11]

As shown in model 3, the propensity score method identifies a close matching for operating and price performance indicators: With the exception of market-adjusted excess returns, none of them are significant in predicting the loss of analyst coverage. However, many of the potential revenue generation variables continue to be significant. Hence, in models 4 and 5, we add six proxies for the firm's potential for generating brokerage revenue to the eleven proxies of bankruptcy risk. Specifically, we use market capitalization, B/M ratio, trading volume, share turnover, number of institutions, and total institutional holdings as proxies for the revenue generation potential of a firm.[12] We also include industry and exchange fixed effects. We identify matches for 1,891 sample firms after matching on both the propensity for bankruptcy and revenue generation. Most of the variables in models 4 and 5 are insignificant once we use both sets of proxies, suggesting that our matching procedure is accurate in selecting control firms that match the sample firms over the factors that cause analysts to drop coverage. We thus use these 17 proxies to match our sample firms to appropriate controls.

4. Consequences of loss in coverage

[10] We use several propensity score methodologies to obtain matches. The nearest-neighbor matching method randomly orders treated (sample) observations and untreated (control) observations. Starting from the first treated observation, it assigns the untreated observation with the closest propensity score and continues till all the treated observations are matched. The nearest neighbor within caliper method (also known as the "greedy" method) randomly selects one untreated observation that matches the propensity score of the treated observation within a support region. The Mahalanobis metric randomly orders observations and calculates the distance between the first observation and all untreated observations. The untreated observation with the minimum distance is chosen as a control. Finally, we use a combination of the three methods, the Mahalanobis metric matching within propensity score calipers. This method first identifies a subset of potential controls that are close to each treated observation on the propensity score and then selects the untreated observation from this subset by using the nearest available distance. Rosenbaum and Rubin (1985) find that this method is superior to the others because it reduces the covariance imbalance. As commonly recommended in literature, we set the caliper at 25% of the standard deviation of propensity scores. Our results are broadly similar regardless of the method used, so for brevity, we report only the results using the Mahalanobis metric matching within propensity score calipers.

[11] More specifically, the inability to find a control firm occurs for two primary reasons: (1) missing data or (2) the lack of overlap between the propensity score ranges for the sample firms and control firms. First, any missing data on the variables used to measure the propensity for bankruptcy and the propensity for revenue generation, will result in a missing propensity score and hence the firm will be removed from the analysis. Second, if the maximum propensity score for a sample firm exceeds the maximum score for control firms, that sample firm will be removed from the analysis.

[12] We do not use the number of M&A deals and the number of issues because the typical number of deals for our sample firm and their control firms is zero.

Having constructed a model for the loss of coverage, we now turn to the consequences of the loss in coverage for a firm. We begin by examining whether the performance for sample firms declines relative to control firms matched on both propensity for bankruptcy and revenue generation over the two years following the loss in coverage, i.e., over the year [0, +2] event period. If analysts have superior information other than that publicly available in the proxies for bankruptcy, a firm's performance should indeed worsen relative to its control firm. If analysts have no superior information when they decide to drop coverage, then the performance of sample firms should be indistinguishable from that of control firms. Finally, if the termination of analyst coverage affects the visibility of a stock among investors, liquidity should relatively worsen.

4.1 Univariate analysis of the consequences of loss in coverage

Table 6 reports changes in performance indicators and revenue generation indicators from year 0 up to two years after the loss in coverage. Panel A of Table 6 reports changes in performance indicators. Operating performance declines significantly following a loss in coverage, even after matching on the propensity for bankruptcy and revenue generation. For example, operating ROA for sample firms is significantly below the performance of the matched control firms in the year of and the two years subsequent to the loss of coverage. Control-adjusted operating ROA is -4.98%, -4.57%, and -4.61% in years 0, +1, and +2, respectively. A similar pattern is observed for ROA, sales, and the leverage ratio. The asset liquidity as measured by current ratio and cash ratio decreases in the years following the loss of coverage, while the risk of bankruptcy represented by the Altman Z-Score increases sharply relative to the control firms. These results are different from those in Table 4. In the years leading up to the loss of coverage, sample firms did not experience a dramatic decline in most performance indicators. After the loss in coverage, operating performance declines strikingly. The pattern of price performance is relatively unclear. Although significantly negative, cumulative excess returns increase over time, while there is no clear pattern in the FF three-factor alphas. Overall, the deterioration of operating performance indicators, such as sales and operating income, after the loss in coverage is consistent with the superior information hypothesis.

Panel B of Table 6 reports changes in potential revenue generation characteristics. These changes also differ from those in Table 4, where most revenue generation indicators did not decline significantly

before the loss of coverage. In contrast, in Panel B of Table 6, even after matching on the propensity for bankruptcy and revenue generation, almost all revenue generation characteristics significantly worsen after sample firms lost coverage. Both market capitalization of equity and the book value of total assets decrease significantly for sample firms relative to their control firms. Trading volume and share turnover fall while bid-ask spreads increase significantly in the years following the loss in coverage. Institutional holdings and the number of institutions holding the stock also decline sharply relative to control firms. Fewer investors trade the sample stocks. This is consistent with O'Brien and Bhushan (1990) who find that changes in institutional ownership are positively associated with lagged analyst following. Finally, sample firms engage in fewer M&A transactions than control firms.

Finally, in Table 7, we investigate the long-term consequences for these firms when they lose analyst coverage. Panel A of Table 7 compares the delisting rates of sample firms with the delisting rates of control firms: 2,274 of the 2,753 sample firms delisted while 479 firms still trade at the end of our analysis period. Of the 2,274 delisting events, 807 occurred between the first and the second year following the loss of coverage, while 926 firms delisted between two and five years. In other words, 63% of our sample firms delisted within five years of the loss in coverage. Very few firms survived more than five years. 429 firms delisted between five and ten years, and only 112 firms delisted after more than ten years following loss in coverage. For control firms, the results are considerably less striking. Only 26% of the control firms that are matched on the propensity for bankruptcy and revenue generation delisted within five years after the sample firms experienced the termination of analyst coverage. Panel B of Table 7 indicates that the stock delisting of our sample firms was mainly due to liquidation or a merger.[13] These findings hold across matching methods, suggesting that they are not driven by the reduced number of matches attributable to a more rigorous propensity score matching approach.

4.2 Multivariate analysis of the consequences of loss in coverage

We next examine whether the loss of analyst coverage predicts the stock delisting in a multivariate framework, after we control for other factors. Specifically, we use a Cox proportional hazard model to compute the hazard probability that a firm will be delisted after losing analyst coverage. The

[13] Sixty-five firms stopped trading on a registered exchange and went to the OTC market while 90 firms voluntarily deregistered and went private.

year when the coverage is lost marks time 0, and data is thus left-censored by construction. Note that data is also right-censored, since the survival analysis covers seven years after the loss of coverage. Observation units are sample firms and control firms, matched on the propensity for bankruptcy and revenue generation in year -1. The covariates include the time-constant 'Loss of Coverage' dummy and time-varying indicators of performance and potential revenue generation.

Panel A of Table 8 reports the coefficients for six Cox regression models. We also report Lin and Wei's (1989) heteroskedasticity-robust *z*-statistics in parentheses. Regression models 1 and 2 show that, from an operating performance standpoint, the hazard probability that a firm will delist is negatively associated with its ROA and positively related to its volatility. From a revenue generation perspective, the hazard probability of delisting is negatively related to market capitalization and positively related to the B/M ratio. Higher levels of trading volume and share turnover decrease the likelihood of delisting, while an increased bid-ask spread significantly increases the likelihood of delisting. The number of institutional investors with an equity stake in the firm has a negative and statistically significant coefficient, suggesting that a high institutional presence tends to lower the likelihood of a firm's delisting. However, even after matching on the propensity for bankruptcy and revenue generation in year -1 and controlling for other factors from year 0 to year +7, the coefficient of the 'Loss of Coverage' dummy is highly significant in predicting the probability of delisting. Hazard ratios (computed as $e^{coefficient}$-1 but not reported in Table 8) suggest that analyst coverage is also economically important: Losing analyst coverage implies that a sample firm is 26% more likely to delist than its control firm.

Model 3 includes six more covariates. Three variables derive from the Dupont identity, which separates ROE into net profit margin (net income divided by sales), asset turnover (sales divided by total assets), and equity multiplier (total assets divided by common equity). The fourth variable is the Standard and Poor's long-term debt rating that range from 2 (AAA) to 27 (D) and 28 (Not Meaningful) on Compustat. The fifth variable is the firm's equity beta, estimated over a five-year period by using daily stock returns and the CRSP value-weighted market returns with dividends as a proxy for the market portfolio. The debt rating and stock beta are proxies for the cost of debt and cost of equity, respectively. Finally, the trading age of the firm is included as a control variable. In model 3, the 'Loss of Coverage' dummy continues to significantly predict the likelihood of delisting. Both net profit margin and asset

turnover are significant determinants of the hazard rate of delisting in year *t*. Equity beta of the firm is significantly positively related to the probability of delisting. The revenue generation variables retain their significance in this enhanced model specification.

Model 4 examines whether losing coverage during a recession cycle predicts a higher delisting probability than losing it in an expansion cycle. Using the official NBER business cycle expansion and contraction dates, we categorize the 'Loss of Coverage' dummy into two dummies: 'Loss of Coverage in Recession' and 'Loss of Coverage in Expansion.' In model 4, both coefficients are significant. However, losing coverage in a recession period, rather than an expansion period, implies a higher probability of delisting: 46% versus 26%. Finally, models 5 and 6 focus on two of the main reasons for delisting, liquidation or merger. In both models, the dummy variable for the loss of analyst coverage is significant, suggesting that coverage loss predicts both liquidation and merger outcomes.

Overall, our results are consistent with the superior information story. Our propensity matching approach uses all the variables identified in the current literature on bankruptcy prediction. The significance of the 'Loss of Coverage' dummy, even after matching on publicly available proxies for bankruptcy, suggests that analysts have superior information that allows them to drop the future underperformers among firms with a similar propensity for bankruptcy.

Analysts may be employed by investment banks or independent research firms. Does the type of firm employing an analyst affect that analyst's ability to predict the deterioration in a firm's prospects and, ultimately, its delisting? The expected relation is uncertain. An analyst from an independent research firm is subject to fewer potential conflicts of interest than an analyst employed by an investment bank and, consequently, may show a better predictive ability. Yet, an analyst from an investment bank may have access to better information on that investment bank's clients. In untabulated results, consistent with Gu and Xue (2008), we find that analysts from investment banks significantly predict the probability of delisting, while analysts from independent research firms have little predictive power.

4.3 Robustness checks

We next examine the impact of losing coverage on five types of firms categorized by: 1) level of share price, 2) size, 3) institutional presence, 4) regulation FD effective at the time of the loss of coverage, and 5) number of trading years following the loss of coverage.

First, we separate penny stocks − defined as stocks with a share price of less than $5 at the end of year -1 − from the rest of the sample. Penny stocks may be more likely to delist because they fail to meet exchange listing requirements. Second, we examine whether the impact of losing coverage is similar for smaller versus larger firms in the sample based on market capitalization quintiles at the end of year -1. For the smaller firms, delisting may be a result of the violation of the continued listing requirements. For the larger firms in the sample, this is much less likely to be the case. Third, we classify firms as having a high ex-ante institutional presence when the total 13f holdings are above the median value for all sample firms, as reported in the fourth quarter of year -1. Firms with a large institutional following may not be affected by the loss in analyst coverage. Fourth, regulation FD, which prohibits selective communication of material information unless the same information is timely disclosed to the general public, was implemented by the Securities and Exchange Commission on October 23, 2000. We use this date to categorize our sample firms as pre- and post-FD firms. Gintschel and Markov (2004) and Francis, Nanda, and Wang (2006) both document that regulation FD has been effective in curtailing private information flows to analysts. Hence, it is likely that the ability of analysts to predict delisting will be lower in the post-FD period. Finally, we analyze whether the relation between coverage loss and the demise of the firm is robust across various event windows. An analyst may be more likely to act upon both private and public information in making the decision to drop coverage of a firm over shorter horizons than over longer time horizons. We thus perform separate analyses on subsamples of firms which trade for more than two, three, and four calendar years after the loss of coverage in year 0.

In Panel B of Table 8, we run the Cox regression model 3 of Panel A over these subsamples. For brevity, we do not report any covariates except the "Loss of Coverage' dummy. Results are robust across subsamples: 'Loss of Coverage' is statistically significant in predicting delisting in all categorizations. In particular, non-penny stocks that lost analyst coverage are 31% more likely to be delisted than their control stocks (model 2), while the corresponding marginal effect on the likelihood of delisting is 27% for penny stocks (model 1). Losing coverage makes a greater difference for larger firms than for smaller firms: The coefficient of 'Loss of Coverage' predicts that firms in the largest size quintile have a 28% higher likelihood of delisting (model 4); while firms in the smallest size quintile have a 19% higher

likelihood (model 3).[14] Part of this difference may be related to the number of institutions holding the sample stocks in year -1. Losing analyst coverage predicts that firms with high institutional ownership are 31% more likely to delist (model 6), while firms with low institutional ownership are 25% more likely (model 5). Firms that lost coverage over the pre-FD period have a 35% higher likelihood of delisting (model 7), compared to a 19% higher likelihood for firms that lost coverage over post-FD period (model 8). Consistent with prior literature, this result confirms that regulation FD has reduced the analysts' predictive ability depending on private information, though the analyst coverage dummy remains significant. Finally, we find a positive and significant relation between coverage loss and the likelihood of a firm's delisting across various trading windows (models 9 to 11): When we constrain the firm to remain publicly traded at least for four years after year 0, the hazard probability of delisting increases by 16% following a complete loss of analyst coverage.

Our results so far are robust and support the superior information hypothesis. However, our results on the worsening of the bid-ask spread, the drop in trading volume and total institutional holdings also imply some support for the investor recognition hypothesis. However, the simultaneous worsening of the operating performance leaves us unable to draw a clear conclusion.

Our analysis of the determinants of losing coverage shows that the analyst's decision to drop coverage on a firm is determined by both performance and the firm's potential to generate brokerage revenue. This implies that there are some healthy firms in our sample that do have survival prospects but lack revenue generation prospects. An analysis of the consequences of losing coverage for these healthy firms should lead to stronger inferences on the investor recognition hypothesis. We therefore categorize sample firms by ROA, Altman Z-score, excess return, or FF three-factor alpha quintiles. In Panel C of Table 8, the median quintile values indicate that firms in the top two quintiles are indeed healthy firms. We run the Cox regression model 3 of Panel A over the performance quintiles. Again, for brevity, we report only the coefficients of the 'Loss of Coverage' dummy. Losing analyst coverage increases the probability of delisting across all quintiles, included the top performance quintiles.

4.5 Results from a subsample of top performers

[14] The listing requirements for NYSE require a market capitalization of at least $75 million. In addition, continued listing requirements for NYSE and Nasdaq require an average market capitalization of $50 million over a 30 day trading period. The smallest firm in the largest size quintile has a market capitalization of $88 million in year 0, suggesting that it is unlikely that firms in this quintile delist because they fail to meet exchange requirements.

We call the 163 firms that rank in the top two quintiles across *all* four measures of performance, ROA, Altman Z-scores, excess returns, and FF three-factor alphas, in Panel C of Table 8, *top performers.* Panels A and B of Table 9 report performance indicators and revenue generation characteristics of these firms relative to their matched controls. In the two years after the loss of coverage, there is almost no significant difference in the levels of operating and price performance. In contrast, some of the revenue generation characteristics deteriorate after the loss of coverage: Market capitalization, assets, share turnover, trading volume, total institutional holdings, and the number of institutions all decrease significantly. It is likely therefore that these firms provide a cleaner sample to test the investor recognition hypothesis.

We report delisting rates in Panel C of Table 9. Again delisting rates are significantly higher for the 163 top performers than for their benchmarks. Nearly 44% of top performers are delisted within five years of the loss in coverage, compared to 24% for the matched group. Panel D of Table 9 reports the results of the Cox regression model for this subsample. The coefficient of the 'Loss of Coverage' dummy is still significant in model 1, and also in models 2 and 3, where we break up the subsample into firms that were eventually liquidated and firms that were eventually merged out of existence. It continues to be significant after we control for business and industry cycles.

The results for the top performers seem more consistent with the investor recognition hypothesis than the superior information hypothesis. We argue that the loss in analyst coverage affects the stock visibility among institutional investors as well as individual investors. Institutional investors, who are resource-constrained in terms of research capabilities, tend to rely on analysts' assessment as a first screen in making their portfolio decisions. The loss in analyst coverage for a firm triggers a drop in the institutional presence in that firm. This sell-off by institutions is not matched by buyer demand from individual investors in absence of analyst coverage. Consequently, stock valuation, trading activity, and liquidity of these firms decrease. As predicted by Merton (1987) and Amihud and Mendelson (1986), the reduction in investor recognition leads to a rise in the cost of capital to compensate for the increased information risk. For a firm that loses analyst coverage, financing and investing activity becomes so expensive to force that firm to pass up value-generating opportunities. Ultimately, this reduces the firm's growth and survival prospects, relative to its control firm. The fact that 'Loss of Coverage' for the top

performers significantly predicts the probability of being liquidated as well as of being acquired suggests that the relation is not driven only by a microstructure effect.

This effect is illustrated in Figure 2 which depicts the relation between delisting rates and institutional presence −measured as total percent institutional ownership and number of institutions with a stake in a firm− over the ten years after the loss of analyst coverage. As shown in Panel A, institutions promptly react to the lack of coverage on all sample firms. In the years following the release of the last research report, the average sample firm experiences a significant decline in institutional presence and especially high rates of delisting. For control firms, institutional presence also continues to decrease over time, albeit at a much slower pace. Panel B focuses on the subsample of 163 top performers. The pattern is similar for these firms.

5. Conclusions

This paper examines the value of analyst coverage by examining a sample of 2,753 firms that lost all analyst coverage from 1983 through 2004. We find that the likelihood of losing coverage is inversely related to a firm's market capitalization, book-to-market ratio, institutional ownership, trading volume, and the number and amount of capital raising and M&A transactions, factors that may proxy for the revenue generation potential of the firm. Using these variables along with proxies for the propensity to bankruptcy, we construct a model to match each sample firm to a control firm. After the loss in coverage, the sample firms perform considerably worse and exhibit a significantly higher delisting frequency than their matched counterparts: 63% of sample firms delist within five years of loss in coverage, compared to only 26% for the control firms.

Analysts are valuable because they provide better information about a firm's growth prospects than that publicly available in conventional proxies. This result is robust for subsamples of large firms, firms that trade at high prices, firms with high institutional presence, firms that lost coverage after regulation FD, and firms that continued to trade up to four years after the loss of coverage. However, our tests on a subsample of firms that outperform their peers show that the loss of analyst coverage does not predict a decline in the operating performance but does precede a significant deterioration in liquidity. For these firms, our results are consistent with the hypothesis that analysts serve to direct investors' attention. To reverse the philosopher Bishop Berkeley's dictum, for these firms, *percipi est esse*.

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Table 1
Sample descriptive statistics

In Panel A, 'All Analysts' and 'All Covered Firms' are, respectively, analysts and firms that are reported on the I/B/E/S database in each year from 1983 to 2004. 'Firms Losing Coverage' are U.S. firms whose common stocks are listed on the main domestic exchanges and for whom analyst coverage has been terminated during a given year. Among the 'Firms Losing Coverage,' 'Sample Firms' are those firms that have been trading publicly for at least one calendar year after the loss of analyst coverage. Panel B and C are based on numbers at the end of the year prior to the loss of coverage. Market capitalization is common shares outstanding multiplied by calendar year closing price. 116 sample firms have missing values for market capitalization. B/M ratio is defined as the algebraic sum of common equity, deferred taxes, investment tax credit, and preferred stock, divided by market capitalization. The Fama-French quintile breakpoints in Panel C are obtained from Ken French's website. In Panel D, the price level at the end of year -1 is the price at the end of the year prior to the loss of coverage (Compustat Data24). The three other prices are prices at the end of the month relative to the month when coverage is lost, obtained from CRSP. Data come from I/B/E/S, Compustat, CRSP, and CRSP/Compustat Merged databases.

Panel A: Firms losing coverage by year

Year	All Analysts (1)	All Covered Firms (2)	Firms Losing Coverage (3)	As % of All Covered Firms (4)=(3)/(2)	Sample Firms (5)	As % of All Covered Firms (6)=(5)/(2)
1983	2,324	2,673	108	4.04%	46	1.72%
1984	2,320	3,217	246	7.65%	68	2.11%
1985	2,535	3,513	259	7.37%	64	1.82%
1986	2,525	3,786	332	8.77%	77	2.03%
1987	3,146	4,126	387	9.38%	122	2.96%
1988	3,284	4,146	398	9.60%	89	2.15%
1989	3,756	4,066	361	8.88%	104	2.56%
1990	4,221	3,930	311	7.91%	110	2.80%
1991	4,145	3,807	235	6.17%	93	2.44%
1992	4,751	3,929	188	4.78%	67	1.71%
1993	6,387	4,288	283	6.60%	106	2.47%
1994	7,249	4,660	370	7.94%	141	3.03%
1995	9,039	5,050	399	7.90%	106	2.10%
1996	9,929	5,534	478	8.64%	143	2.58%
1997	11,403	5,845	774	13.24%	217	3.71%
1998	12,241	5,811	828	14.25%	218	3.75%
1999	12,771	5,378	977	18.17%	257	4.78%
2000	13,147	4,817	955	19.83%	289	6.00%
2001	13,301	3,953	628	15.89%	150	3.79%
2002	12,884	3,671	421	11.47%	130	3.54%
2003	12,661	3,677	326	8.87%	71	1.93%
2004	11,499	3,803	370	9.73%	85	2.24%
Total	165,518	93,680	9,634	10.28%	2,753	2.94%

Panel B: Market capitalization and B/M Ratio distributions for sample firms

Market Capitalization	Firms	Percentage
< 10 $ millions	296	11.23%
10 to 50	1,374	52.10%
50 to 100	543	20.59%
100 to 500	373	14.15%
500 to 1,000	28	1.06%
> 1,000 $ millions	23	0.87%

B/M	Firms	Percentage
< 0	113	4.34%
0 to 0.25	410	15.76%
0.25 to 0.5	446	17.15%
0.5 to 0.75	434	16.69%
0.75 to 1	366	14.07%
> 1	832	31.99%

Panel C: Fama-French market capitalization and B/M Ratio quintiles for sample firms

FF Market Capitalization Quintiles		
Quintile	Firms	Percentage
Small 1	2,428	92.07%
2	194	7.36%
3	8	0.30%
4	5	0.19%
Large 5	2	0.08%

FF B/M Quintiles		
Quintile	Firms	Percentage
Growth 1	716	27.53%
2	350	13.45%
3	336	12.92%
4	413	15.88%
Value 5	786	30.22%

Panel D: Price level

	Year -1		Month -1		Month 0		Month +1	
Price Levels	Firms	Percentage	Firms	Percentage	Firms	Percentage	Firms	Percentage
< $1	115	4.30%	178	6.52%	170	6.22%	197	7.21%
1 to 5	1,049	39.24%	1,237	45.34%	1,268	46.43%	1,304	47.73%
5 to 10	799	29.89%	692	25.37%	690	25.27%	635	23.24%
10 to 20	504	18.86%	431	15.80%	407	14.90%	398	14.57%
20 to 50	190	7.11%	172	6.31%	178	6.52%	181	6.63%
> 50	16	0.60%	18	0.66%	18	0.66%	17	0.62%

Table 2

Analyst earnings estimates and recommendations for sample firms in the years prior to the loss of coverage

This table reports mean analyst earnings-per-share (EPS) estimates and mean recommendations for sample firms in the four years prior to year 0, which marks the year when the firm loses coverage. The EPS estimate is the mean EPS estimate for sample firms from the I/B/E/S Detail tapes. Industry-adjusted EPS estimate is the mean difference between sample EPS estimate and the mean industry EPS estimate. Recommendation is the mean analyst recommendation on sample firms from the I/B/E/S Recommendation tapes. Industry-adjusted recommendation is the mean difference between the sample recommendation and the mean industry recommendation. Recommendations range from 1 (Strong Buy) to 5 (Sell). While I/B/E/S reports EPS estimates since 1981, analyst recommendations are available since 1994. Number of estimates is the mean number of EPS estimates in year *t*. Number of analysts is the mean number of analysts (covering sample firms) issuing at least one report during the year. Industry-adjusted advertising expenses/sales ratio is the mean difference between the sample advertising/sales ratio and the mean industry advertising/sales ratio (Data45/Data12).

	Levels					Changes			
Year	-4	-3	-2	-1	0	-4 to 0	-3 to 0	-2 to 0	-1 to 0
EPS Estimate	4.25	0.83	-0.56	-1.51	-0.97	-5.71	-1.36	-0.39	-1.79
Industry-Adjusted EPS Estimate	3.49	-0.74	-2.24	-2.68	-1.95	-5.82	-1.41	-0.44	-1.79
Recommendation	1.95	1.97	2.03	2.19	2.38	0.62	0.65	0.64	0.48
Industry-Adjusted Recommendation	-0.02	0.00	0.05	0.18	0.32	0.43	0.51	0.52	0.42
Number of Estimates	9	8	8	6	4	-6	-5	-4	-3
Number of Analysts	3	3	3	2	2	-2	-2	-1	-1
Industry-Adjusted Advertising Expenses/Sales Ratio	-6.17%	1.44%	-8.14%	-9.32%	-7.90%	-1.43%	-6.60%	0.57%	1.10%

Table 3

Performance indicators and potential revenue generation characteristics for sample firms

All performance indicators and potential revenue characteristics are determined at the end of the year -1, that is, the year prior to the loss of analyst coverage, except for M&A and Issues characteristics. Data items come from the Compustat database. Data on M&A deals and new equity issues come from the SDC New Issues database. Operating ROA is defined as operating income before depreciation divided by total assets (Data13/Data6). ROA is net income divided by total assets (Data258/Data6). Sales are equal to Data12. Total Liabilities/Total Assets is (Data181/Data6). Market D/E Ratio is defined as total liabilities divided by market capitalization, (Data181/Data25×Data24). Current Ratio is current assets divided by current liabilities, (Data4/Data5). Cash Ratio is cash divided by current liabilities, (Data162/Data5). Altman's Z-score is defined as 3.3×((pretax income + interest expense)/total assets) + 0.999×(sales/total assets) + 0.6×(market capitalization/total liabilities) + 1.2×(working capital/total assets) + 1.4×(retained earnings/total assets), or 3.3×((Data170+Data15)/Data6) + 0.999×(Data12/Data6) + 0.6×(Market Cap/Data181) + 1.2×(Data179/Data6) + 1.4×(Data36/Data6). Volatility is the idiosyncratic standard deviation of stock monthly returns in year -1. The market-adjusted excess return is computed as the buy-and-hold return over the year prior to the loss of coverage, adjusted for the CRSP NYSE/Amex/Nasdaq value-weighted return. The Fama-French three-factor alpha is computed using monthly stock returns and monthly factors over five years prior to the loss of coverage. Market Capitalization ($ millions) is common shares outstanding multiplied by calendar year closing price (Data25×Data24). Assets ($ millions) is equal to Data6. B/M ratio is (common equity + deferred taxes + investment tax credit-preferred stock)/market capitalization, or (Data60+Data74+Data208-Data130)/Market capitalization. Share Turnover is the total annual trading volume divided by CRSP publicly held shares. Trading volume for Nasdaq stocks is divided by two to correct for double counting. Bid-ask spread is the annual average of daily differences between the closing bid and ask prices scaled by the mid-range closing price. M&A deal amount and Number of M&A deals are the cumulated transaction value and number of M&A deals, respectively, over the prior three years, i.e., years -3, -2, and -1. Issues amount and number of issues are the cumulated value and number of new equity issues over the prior three years. Variables are winsorized at the 1% and 99% levels. The table reports *p*-values from a nonparametric test for difference in medians, except in the cases of M&A deals and issues amounts and numbers where it reports *p*-values from a *t*-test for difference in means. The last five columns report the distributions of performance indicators and potential revenue generation characteristics for sample firms relative to 'All covered firms' quintile breakpoints. 'All covered firms' reported on I/B/E/S are the non-sample firms which do not experience a complete loss of analyst coverage.

	All covered firms			Sample firms				Quintiles				
	Median	Mean	N	Median	Mean	N	*P*-value	Low 1	2	3	4	High 5
Performance Indicators												
Operating ROA	10.88%	8.21%	81,856	5.20%	-0.16%	2,494	0.0000	39%	21%	19%	11%	10%
ROA	2.94%	-1.23%	83,550	0.35%	-10.41%	2,515	0.0000	39%	23%	15%	12%	10%
Sales ($ millions)	159.60	1,245.17	83,468	45.48	127.56	2,510	0.0000	42%	29%	18%	9%	2%
Total Liabilities/Total Assets	0.56	0.56	83,683	0.53	0.54	2,512	0.0031	24%	20%	18%	18%	21%
Market D/E Ratio	0.69	2.30	82,754	0.80	2.41	2,491	0.0017	22%	18%	19%	19%	22%
Current Ratio	2.01	2.79	69,559	2.15	3.11	2,146	0.0000	22%	18%	17%	19%	24%
Cash Ratio	0.18	0.66	63,364	0.21	0.86	2,007	0.0006	20%	18%	18%	19%	25%
Altman Z-Score	2.14	3.92	67,974	1.26	2.44	2,122	0.0000	16%	15%	23%	29%	17%
Volatility	0.10	0.12	72,980	0.13	0.15	2,405	0.0000	11%	11%	19%	25%	34%
Market-Adjusted Excess Return	-3.46%	3.82%	90,927	-30.04%	-17.72%	2,630	0.0000	40%	21%	15%	12%	12%
Fama-French Three-Factor Alpha	2.88%	4.92%	90,927	3.24%	6.74%	2,621	0.4956	23%	17%	14%	19%	27%
Potential Revenue Generation Characteristics												
Market Capitalization ($ millions)	136.42	1,264.22	85,140	34.31	76.03	2,637	0.0000	44%	36%	15%	4%	1%
Assets ($ millions)	207.68	2,263.69	83,946	55.12	221.59	2,525	0.0000	42%	30%	17%	8%	3%
B/M Ratio	0.55	0.65	71,547	0.68	0.80	2,264	0.0000	21%	14%	14%	21%	31%
Trading Volume (millions of shares)	4.34	26.63	90,927	2.38	7.97	2,630	0.0000	30%	29%	22%	14%	5%
Share Turnover	0.47	0.74	90,927	0.41	0.63	2,630	0.0000	26%	22%	21%	16%	15%
Bid-Ask Spread	1.99%	3.18%	82,600	3.75%	4.82%	2,413	0.0000	2%	7%	20%	33%	38%
Total Institutional Holdings	18.09%	25.13%	90,927	9.15%	14.57%	2,639	0.0000	25%	30%	27%	14%	4%
Number of Institutions	15	48.34	90,927	7	10.92	2,639	0.0000	28%	36%	27%	8%	1%
M&A Deal Amount ($ millions)	0	2367.34	90,927	0	173.59	2,753	0.0000	92%	5%	2%	1%	0%
Number of M&A deals	0	19.15	90,927	0	9.77	2,753	0.0000	100%	0%	0%	0%	0%
Issues Amount ($ millions)	0	138.42	90,927	0	25.59	2,753	0.0000	99%	1%	0%	0%	0%
Number of Issues	0	1.71	90,927	0	0.90	2,753	0.0000	100%	0%	0%	0%	0%

Table 4

Time series of performance indicators and potential revenue generation characteristics before the loss of coverage

This table reports the time series of performance indicators and potential revenue generation characteristics for sample firms, relative to control firms matched on size and industry, in the three years before the loss of coverage. For each sample firm, the control firm is a firm from the same industry which is closest in size to the sample firm in the year prior to the loss of analyst coverage, i.e., year -1. Year 0 marks the year when the analyst coverage is terminated. Industry is the two-digit NAICS code. Control firm-adjusted values are determined as median end-of-year differences between sample firms and control firms. Variables are as defined in Table 3. *P*-values for a nonparametric sign-test of difference from zero are reported in parentheses.

Panel A: Performance indicators

	Levels				Changes	
Year *t*	-3	-2	-1	0	-3 to -1	-2 to -1
Operating ROA	0.00%	0.00%	-0.64%	-2.39%	-0.26%	-0.52%
	(0.63)	(0.43)	(0.00)	(0.00)	(0.03)	(0.00)
ROA	0.00%	0.00%	-0.81%	-3.27%	-0.36%	-0.65%
	(0.37)	(0.43)	(0.00)	(0.00)	(0.02)	(0.00)
Ln(Sales)	0.10	0.09	0.11	0.05	-0.02	-0.02
	(0.04)	(0.03)	(0.01)	(0.21)	(0.36)	(0.05)
Total Liabilities/Total Assets	0.01	0.00	0.01	0.04	0.00	0.01
	(0.08)	(0.62)	(0.05)	(0.00)	(0.15)	(0.01)
Market D/E Ratio	0.01	0.00	0.07	0.25	0.04	0.04
	(0.13)	(0.22)	(0.00)	(0.00)	(0.00)	(0.00)
Current Ratio	0.00	0.00	0.00	0.00	0.00	0.00
	(0.56)	(0.98)	(0.15)	(1.00)	(0.46)	(0.22)
Cash Ratio	0.00	0.00	0.00	0.00	0.00	0.00
	(0.16)	(0.19)	(0.08)	(1.00)	(0.30)	(0.84)
Altman Z-Score	0.00	0.00	0.00	-0.33	0.00	0.00
	(0.64)	(0.82)	(1.00)	(0.00)	(0.81)	(1.00)
Volatility	0.00	0.00	0.00	0.01	0.00	0.00
	(0.74)	(0.51)	(0.12)	(0.00)	(0.69)	(0.53)
Market-Adjusted Excess Return	2.36%	-1.68%	-9.35%	-21.33%	-13.10%	-10.28%
	(0.13)	(0.22)	(0.00)	(0.00)	(0.00)	(0.00)
Fama-French Three-Factor Alpha	1.12%	1.54%	0.81%	-0.73%	-0.99%	-0.85%
	(0.03)	(0.01)	(0.09)	(0.03)	(0.10)	(0.04)

Panel B: Potential revenue generation characteristics

	Levels				Changes	
Year *t*	-3	-2	-1	0	-3 to -1	-2 to -1
Market capitalization	2.21	2.77	-0.01	-5.25	-1.86	-2.89
	(0.00)	(0.00)	(0.21)	(0.00)	(0.00)	(0.00)
Assets	3.25	3.56	4.96	1.55	0.00	0.00
	(0.01)	(0.00)	(0.00)	(0.03)	(0.78)	(0.46)
B/M Ratio	0.00	0.00	0.01	0.07	0.00	0.02
	(0.64)	(0.78)	(0.00)	(0.00)	(0.02)	(0.00)
Trading Volume	0.13	0.28	0.26	0.13	0.03	-0.12
	(0.03)	(0.00)	(0.00)	(0.06)	(0.62)	(0.00)
Share Turnover	0.03	0.01	0.05	0.02	0.00	0.00
	(0.04)	(0.03)	(0.00)	(0.06)	(1.00)	(0.81)
Bid-Ask Spread	-0.12%	-0.17%	-0.19%	0.23%	-0.07%	-0.01%
	(0.58)	(0.89)	(0.08)	(0.03)	(0.28)	(0.48)
Total Institutional Holdings	1.61%	1.39%	0.71%	0.00%	0.00%	-0.27%
	(0.02)	(0.01)	(0.04)	(0.84)	(0.71)	(0.16)
Number of Institutions	1	1	1	0	0	0
	(0.00)	(0.00)	(0.00)	(0.20)	(0.06)	(0.07)
M&A Deal Amount (3 years)	0.45	0.79	1.18	0.00	0.00	0.00
	(0.41)	(0.04)	(0.03)	(1.00)	(1.00)	(1.00)
Number of M&A Deals (3 years)	0	0	0	0	0	0
	(0.73)	(0.78)	(0.55)	(0.18)	(0.38)	(0.53)
Issues Amount (3 years)	10.60	5.05	-0.65	-3.75	-16.73	0.00
	(0.18)	(0.33)	(0.61)	(0.30)	(0.50)	(0.50)
Number of Issues (3 years)	0	0	0	0	0	0
	(1.00)	(1.00)	(1.00)	(0.25)	(1.00)	(1.00)

Table 5

Logistic regressions for probability of losing coverage

This table reports logistic regression models for the probability that a firm will lose analyst coverage. The dependent variable is a 'Loss of Coverage' dummy that takes a value of one for sample firms, and zero for other firms. The regression models use three sets of control firms selected among the universe of all other covered firms in the year prior to loss of coverage, year -1, by using three matching methods: 1) size and industry, 2) propensity for bankruptcy, and 3) propensity for bankruptcy and revenue generation. For each sample firm, the first method identifies the control firm operating in the same industry (based on two-digit NAICS code) which is the closest in size to the sample firm in year -1. The second and third matching methods are specifically propensity score matching methods using one-to-one Mahalanobis metric matching within propensity score calipers (caliper = 0.25×standard deviation). Proxies of the propensity for bankruptcy are working capital/assets, retained earnings/assets, earnings before interest and taxation/assets, market value of equity/liabilities, sales/assets, net income/assets, liabilities/assets, current assets/current liabilities, relative size, cumulative abnormal returns, and volatility. Proxies of the propensity for revenue generation are market capitalization, B/M ratio, trading volume, share turnover, total institutional holdings and number of institutions. A 10% institutional holding is measured as 0.10; a 1% bid-ask spread is measured as 0.01. Number of institutions is the total number of institutional investors reporting their holdings of a given stock in the fourth quarter of year *t*. The number of institutions is divided by 10. Observations are firm-years, and variables are calculated at the end of year, and winsorized at the 1% and 99% levels. Industry, stock exchange, and year fixed effects are included in all regressions. White's heteroskedasticity-adjusted *z*-statistics are in parentheses.

	All Covered Stocks	Industry and Size	Propensity for Bankruptcy	Propensity for Bankruptcy and Revenue Generation	
	(1)	(2)	(3)	(4)	(5)
Intercept	-1.55	-0.81	-1.07	-0.76	-0.82
	(-3.98)	(-1.29)	(-1.67)	(-1.33)	(-1.42)
Performance indicators					
ROA	-0.00	-0.09	-0.11	-0.11	-0.11
	(-0.03)	(-0.56)	(-0.62)	(-0.64)	(-0.65)
Ln(Sales)	-0.04	-0.01	-0.04	-0.01	-0.01
	(-1.57)	(-0.36)	(-1.01)	(-0.24)	(-0.22)
Total Liabilities/Total Assets	0.07	0.37	0.23	0.18	0.18
	(0.52)	(1.83)	(1.11)	(0.91)	(0.91)
Cash Ratio	0.00	0.03	0.02	0.01	0.01
	(0.64)	(1.64)	(1.02)	(0.35)	(0.35)
Altman Z Score	-0.00	-0.00	-0.00	-0.01	-0.00
	(-0.92)	(-0.69)	(-0.16)	(-0.61)	(-0.61)
Volatility	0.77	0.62	0.27	0.05	0.05
	(2.03)	(1.17)	(0.51)	(0.09)	(0.10)
Market-Adjusted Excess Returns	-0.33	-0.24	-0.12	-0.03	-0.03
	(-6.19)	(-4.11)	(-2.04)	(-0.54)	(-0.56)
Fama-French Three-Factor Alpha	-0.23	-0.16	-0.17	-0.08	-0.08
	(-2.59)	(-1.32)	(-1.22)	(-0.82)	(-0.84)
Potential revenue generation characteristics					
Ln(Market Capitalization)	-0.18	-0.05	-0.12	-0.04	-0.03
	(-4.34)	(-0.77)	(-1.94)	(-0.69)	(-0.63)
B/M	0.15	0.23	0.07	0.05	0.05
	(3.71)	(3.64)	(1.15)	(0.91)	(0.89)
Ln(Trading Volume)	-0.10	0.10	0.16	0.09	0.09
	(-2.90)	(2.07)	(3.32)	(1.92)	(1.93)
Share Turnover	-0.04	-0.01	-0.07	-0.09	-0.09
	(-0.87)	(-0.09)	(-1.00)	(-1.55)	(-1.55)
Bid-Ask Spread	5.01	-1.76	-3.00	-2.79	-2.27
	(4.85)	(-1.27)	(-2.16)	(-2.15)	(-2.10)
Number of Institutions	-0.28	-0.10	-0.24	-0.02	
	(-14.94)	(-3.40)	(-7.22)	(-0.62)	
Total Institutional Holdings					-0.15
					(-0.64)
Number of M&A Deals	-0.00	-0.00	-0.00	-0.00	-0.00
	(-2.12)	(-0.39)	(-2.93)	(-1.92)	(-1.90)
Number of Issues	-0.02	-0.00	-0.02	-0.03	-0.03
	(-2.43)	(-0.26)	(-2.38)	(-2.96)	(-2.96)
Pseudo-R^2	0.1394	0.0224	0.0408	0.0104	0.0104
Number of Observations	47,370	3,692	3,461	3,306	3,306

Table 6

Time series of performance indicators and potential revenue generation characteristics after loss of coverage

This table reports the time series of performance indicators and revenue generation potential characteristics for sample firms, relative to control firms matched on propensity for bankruptcy and revenue generation in year -1. Proxies of the propensity for bankruptcy are working capital/assets, retained earnings/assets, earnings before interest and taxation/assets, market value of equity/liabilities, sales/assets, net income/assets, liabilities/assets, current assets/current liabilities, relative size, cumulative excess returns, and volatility. Proxies of the propensity for revenue generation are market capitalization, B/M ratio, trading volume, share turnover, total institutional holdings and number of institutions. The propensity score matching method is the one-to-one Mahalanobis metric matching within propensity score calipers (caliper = 0.25×standard deviation). Year 0 marks the year when analyst coverage is terminated. Control group adjusted values are calculated as median end-of-year differences between sample firms and control firms. *P*-values for a nonparametric sign-test of difference from zero are reported in parentheses.

Panel A: Performance indicators

	Levels			Changes	
Year	0	+1	+2	-1 to +1	-1 to + 2
Operating ROA	-4.98% (0.00)	-4.57% (0.00)	-4.61% (0.00)	-3.66% (0.00)	-4.26% (0.00)
ROA	-4.55% (0.00)	-4.89% (0.00)	-3.63% (0.00)	-4.37% (0.00)	-4.37% (0.00)
Ln(Sales)	-0.04 (0.11)	-0.21 (0.00)	-0.31 (0.00)	-0.22 (0.00)	-0.36 (0.00)
Total Liabilities/Total Assets	0.06 (0.00)	0.06 (0.00)	0.05 (0.00)	0.04 (0.00)	0.04 (0.00)
Market D/E Ratio	0.21 (0.00)	0.23 (0.00)	0.26 (0.00)	0.26 (0.00)	0.28 (0.00)
Current Ratio	-0.23 (0.00)	-0.41 (0.00)	-0.48 (0.00)	-0.28 (0.00)	-0.28 (0.00)
Cash Ratio	-0.01 (0.01)	-0.02 (0.00)	-0.04 (0.00)	-0.02 (0.03)	-0.04 (0.02)
Altman Z-Score	-0.85 (0.00)	-1.31 (0.00)	-1.42 (0.00)	-0.81 (0.00)	-1.17 (0.00)
Volatility	0.01 (0.00)	0.01 (0.00)	0.00 (0.31)	0.01 (0.02)	0.00 (0.85)
Market-Adjusted Excess Returns	-16.33% (0.00)	-10.17% (0.00)	-1.26% (0.43)	-6.61% (0.00)	-1.54% (0.20)
Fama-French Three-Factor Alpha	-0.62% (0.10)	-0.84% (0.01)	-0.55% (0.23)	-1.07% (0.12)	-1.18% (0.07)

Panel B: Potential revenue generation characteristics

	Levels			Changes	
Year	0	+1	+2	-1 to +1	-1 to + 2
Market Capitalization	-6.50	-11.78	-16.20	-15.80	-19.11
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Assets	0.08	-8.09	-10.38	-10.57	-16.25
	(0.17)	(0.00)	(0.00)	(0.00)	(0.00)
B/M Ratio	0.10	0.07	0.05	0.11	0.11
	(0.00)	(0.18)	(0.14)	(0.00)	(0.04)
Trading Volume	0.07	-0.50	-1.39	-1.01	-2.29
	(0.55)	(0.00)	(0.00)	(0.00)	(0.00)
Share Turnover	0.02	-0.07	-0.14	-0.13	-0.18
	(0.40)	(0.00)	(0.00)	(0.00)	(0.00)
Bid-Ask Spread	0.23%	1.08%	1.59%	0.97%	1.35%
	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)
Total Institutional Holdings	-0.58%	-2.16%	-4.86%	-3.44%	-6.33%
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Number of Institutions	0	-2	-3	-3	-5
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
M&A Deal Amount	0.76	-0.55	-2.00	0.00	-4.73
	(0.25)	(0.16)	(0.00)	(0.00)	(0.00)
Number of M&A Deals	1	-1	-1	0	0
	(0.14)	(0.83)	(0.00)	(1.00)	(1.00)
Issues Amount	-6.45	-12.50	-24.30	0.00	-16.20
	(0.00)	(0.00)	(0.00)	(1.00)	(0.00)
Number of Issues	-1	-1	-1	0	0
	(0.00)	(0.00)	(0.00)	(1.00)	(1.00)

Table 7

Eventual status of sample firms

This table reports the percentage of delisted sample firms in the years after losing coverage. Sample firms are firms that continue to trade publicly for at least one year after losing coverage. For each sample firm, the control firm is, alternatively, a firm from the same industry that is closest in size to the sample firm, a firm that is matched on the propensity for bankruptcy, or a firm that is matched on the propensity for bankruptcy and revenue generation, in the year prior to loss of coverage. Industry is the two-digit NAICS code. Delisting reasons come from CRSP delisting codes. Liquidation is identified by 400-490, 535-561, 572, 574, and 580-591 codes; merger by 200-290 and 300-390 codes; stopped trading by 500-520 codes; and deregistration by 570, 573 and 575 codes.

Panel A: Delisting rate

			Control Firms					
	Sample Firms		Industry and Size		Propensity for Bankruptcy		Propensity for Bankruptcy and Revenue Generation	
Delisted After	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Less than 1 year	--	--	259	9.89%	267	13.76%	273	14.44%
1 to 2 years	807	29.31%	197	7.52%	148	7.63%	155	8.20%
2 to 5 years	926	33.64%	443	16.92%	358	18.45%	336	17.77%
5 to 10 years	429	15.58%	383	14.63%	291	15.00%	273	14.44%
More than 10 years	112	4.07%	321	12.26%	163	8.40%	160	8.46%
Still Trading	479	17.40%	1,015	38.77%	713	36.75%	694	36.70%
Total	2,753	100.00%	2,618	100.00%	1,940	100.00%	1,891	100.00%

Panel B: Delisting reasons

			Control Firms					
	Sample Firms		Industry and Size		Propensity for Bankruptcy		Propensity for Bankruptcy and Revenue Generation	
Reason	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
Liquidation	1,161	51.06%	713	44.48%	435	35.45%	501	41.85%
Merger	958	42.13%	792	49.41%	734	59.82%	629	52.55%
Stopped trading	65	2.86%	43	2.68%	32	2.61%	33	2.76%
Deregistration	90	3.96%	55	3.43%	26	2.12%	34	2.84%
Total Delistings	2,274	100.00%	1,603	100.00%	1,227	100.00%	1,197	100.00%

Table 8

Cox regression: Probability that firm will be delisted after losing analyst coverage

Panel A presents Cox regression results for the hazard rate of delisting (using the Breslow method for ties). The following model is estimated:

$\lambda\{t, Z(\text{LOSS OF COVERAGE dummy}, \text{ROA}_t, \text{LN(SALES)}_t, \text{TOTAL LIABILITIES/TOTAL ASSETS}_t, \text{CASH RATIO}_t, \text{ALTMAN Z-SCORE}_t, \text{LN(MARKET CAPITALIZATION)}_t, \text{B/M RATIO}_t, \text{VOLATILITY}_t, \text{LN(TRADING VOLUME)}_t, \text{SHARE TURNOVER}, \text{BID-ASK SPREAD}, \text{NUMBER OF M\&A DEALS}_t, \text{NUMBER OF ISSUES}_t)\}$

The failure event is the stock's delisting in year *t*. The analysis covers seven years from year 0, the year when sample firms lose analyst coverage. 'Loss of Coverage' is a dummy equal to one for sample firms or zero for control firms matched on propensity for bankruptcy and revenue generation. All other covariates are time-varying variables. Using the Dupont analysis, ROE is partitioned into ROA and equity multiplier, which is the ratio between total assets and common equity (Data6/Data60). ROA is further broken into net profit margin, and asset turnover. Net profit margin is the net income divided by sales (Data172/Data12). Value points for the net profit margin are divided by 100. Asset turnover is determined as yearly sales divided by total assets (Data12/Data6). S&P Long-Term Debt Rating is the Standard and Poor's rating on corporate bonds with long-term maturity. Ratings come from Compustat (Data280), and they range from 2 (AAA) to 27 (D) and 28 (Not Meaningful). A value of 1 denotes unassigned ratings. The equity beta is estimated using the standard CAPM approach. Daily stock returns are regressed on CRSP's value-weighted market returns with dividends, over a five-year period. Trading age is the number of years from the first trading day to the end of time 0. Institutional holdings are determined as total shares held by institutional investors reporting in the fourth quarter of year *t*. Number of institutions is the total number of institutional investors reporting their holdings of a given stock in the fourth quarter of year *t*. A 10% institutional holding is measured as 0.10; a 1% bid-ask spread is measured as 0.01. The number of institutions and trading age are divided by 10. All variables are winsorized at the 1% and 99% levels. Data on institutional holdings come from 13f database. Other variables are described in Table 3. In Panel B, sample firms are categorized by price level, market capitalization, number of trading years after the loss of coverage, and institutional presence. Penny stocks are stocks whose stock price is lower than $5 at the end of year 0. Stocks have a high institutional presence when the total 13f holdings by institutional investors are above the median value as reported in the fourth quarter of the year -1. Panel C reports the coefficients for the loss of coverage dummy for subsamples sorted on Altman Z-score, ROA, excess returns, and Fama-French three-factor alphas. Lin and Wei's (1989) heteroskedasticity-adjusted *z*-statistics are in parentheses.

Panel A: Delisting hazard rate over seven years since loss of coverage

	All Delisting Reasons				Liquidation	Merger
	1	2	3	4	5	6
'Loss of Coverage' Dummy	0.23	0.23	0.24		0.20	0.23
	(12.21)	(12.31)	(12.96)		(10.94)	(12.82)
'Loss of Coverage in Recession' Dummy				0.38		
				(6.98)		
'Loss of Coverage in Expansion' Dummy				0.23		
				(12.20)		
Performance Indicators						
ROA	-0.15	-0.16				
	(-4.54)	(-4.82)				
Net Profit Margin			-0.04	-0.04	-0.04	-0.03
			(-5.29)	(-5.31)	(-5.48)	(-4.14)
Asset Turnover			-0.09	-0.09	-0.08	-0.06
			(-6.25)	(-6.29)	(-5.77)	(-4.75)
Equity Multiplier			0.00	0.00	0.00	0.00
			(1.35)	(1.37)	(1.45)	(1.64)
Ln(Sales)	0.01	0.02	0.06	0.07	0.07	0.05
	(1.23)	(2.09)	(5.66)	(5.70)	(5.93)	(4.37)
Total Liabilities/Total Assets	0.07	0.06	0.03	0.04	0.03	0.06
	(1.76)	(1.37)	(0.75)	(0.80)	(0.66)	(1.42)
Cash Ratio	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(-0.86)	(-0.71)	(-1.03)	(-0.99)	(-1.09)	(-0.02)
Altman Z-Score	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(-0.93)	(-0.80)	(-0.82)	(-0.77)	(-1.15)	(-0.01)
Volatility	0.43	0.39	0.43	0.43	0.34	0.45
	(4.86)	(4.42)	(4.85)	(4.91)	(3.78)	(5.27)
S&P Long-Term Debt Rating			-0.00	-0.00	0.00	0.00
			(-0.08)	(-0.09)	(0.11)	(0.28)
Equity Beta			0.14	0.13	0.17	0.17
			(5.36)	(5.22)	(6.88)	(6.75)
Trading Age			-0.02	-0.02	-0.01	-0.01
			(-1.79)	(-1.74)	(-0.96)	(-1.59)
Potential Revenue Generation Characteristics						
Ln(Market Capitalization)	-0.04	-0.02	-0.06	-0.07	-0.05	-0.07
	(-4.51)	(-2.57)	(-6.10)	(-6.17)	(-4.93)	(-6.60)
B/M Ratio	0.02	0.02	0.01	0.01	0.01	0.01
	(2.99)	(2.91)	(0.72)	(0.74)	(0.79)	(1.23)
Ln(Trading Volume)	-0.08	-0.09	-0.07	-0.07	-0.04	-0.07
	(-8.94)	(-9.23)	(-7.43)	(-7.43)	(-4.11)	(-7.16)
Share Turnover	-0.07	-0.05	-0.05	-0.05	-0.03	-0.05
	(-4.39)	(-3.10)	(-3.24)	(-3.18)	(-2.11)	(-3.36)
Bid-Ask Spread	0.12	0.12	0.13	0.13	0.10	0.10
	(3.58)	(3.71)	(3.88)	(3.92)	(3.24)	(3.28)
Institutional Holdings	0.03					
	(0.58)					
Number of Institutions		-0.02	-0.03	-0.03	-0.03	-0.03
		(-6.66)	(-7.52)	(-7.49)	(-8.25)	(-7.75)
Number of M&A Deals	0.00	0.01	0.01	0.01	0.01	0.01
	(0.88)	(2.39)	(1.82)	(1.83)	(1.40)	(1.91)
Number of Issues	-0.08	-0.06	-0.07	-0.07	-0.04	-0.06
	(-2.74)	(-1.91)	(-2.37)	(-2.37)	(-1.27)	(-1.87)
Wald $\chi 2$	526.58	573.24	661.64	667.64	518.23	686.85
Prob. > $\chi 2$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Number of Observations	11,214	11,214	11,214	11,214	11,214	11,214

Panel B: Robustness checks

	Price Level		Size		Institutional Presence		Regulation FD		Years of Trading After Loss of Coverage		
	Penny Stocks	Non-Penny Stocks	Small Firms Quintile 1	Large Firms Quintile 5	Low Presence	High Presence	Pre-FD	Post-FD	More than 2 Years	More than 3 Years	More than 4 Years
	1	2	3	4	5	6	7	8	9	10	11
'Loss of Coverage' Dummy	0.24	0.27	0.17	0.25	0.22	0.27	0.30	0.17	0.26	0.22	0.15
	(9.88)	(8.19)	(3.39)	(6.46)	(8.14)	(10.13)	(11.30)	(6.36)	(12.44)	(9.66)	(5.90)
Other variables not reported											
Wald $\chi 2$	508.6	190.69	266.53	235.25	362.18	364.76	481.90	302.96	523.63	379.3	254.41
Prob. > $\chi 2$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Number of Observations	7,163	4,051	2,141	2,257	5,500	5,714	6,360	4,854	9,104	7,606	6,459

Panel C: Subsamples based on quintile sorts

	ROA Quintiles				
	1	2	3	4	5
'Loss of Coverage' Dummy	0.31	0.23	0.28	0.20	0.20
	(6.36)	(4.99)	(6.51)	(4.84)	(5.05)
Other variables not reported					
Quintile Median	-48.88%	-10.80%	-0.35%	3.44%	8.54%
Wald $\chi 2$	256.18	223.42	244.79	161.61	103.36
Prob. > $\chi 2$	0.0000	0.0000	0.0000	0.0000	0.0000
Number of Observations	1,731	2,019	2,340	2,476	2,648
	Altman Z-Score Quintiles				
	1	2	3	4	5
'Loss of Coverage' Dummy	0.26	0.21	0.30	0.28	0.12
	(5.13)	(4.57)	(6.60)	(6.73)	(3.00)
Other variables not reported					
Quintile Median	-2.79	0.25	1.22	2.55	6.70
Wald $\chi 2$	274.22	192.81	224.74	174.24	118.85
Prob. > $\chi 2$	0.0000	0.0000	0.0000	0.0000	0.0000
Number of Observations	1,681	2,254	2,277	2,518	2,484
	Excess Return Quintiles				
	1	2	3	4	5
'Loss of Coverage' Dummy	0.32	0.26	0.18	0.32	0.23
	(7.02)	(5.92)	(4.54)	(7.53)	(5.42)
Other variables not reported					
Quintile Median	-82.23%	-56.23%	-33.53%	-4.11%	55.35%
Wald $\chi 2$	288.99	230.10	117.56	152.54	127.05
Prob. > $\chi 2$	0.0000	0.0000	0.0000	0.0000	0.0000
Number of Observations	1,912	2,153	2,480	2,487	2,182
	Fama-French Three-Factor Alpha Quintiles				
	1	2	3	4	5
'Loss of Coverage' Dummy	0.20	0.37	0.17	0.27	0.21
	(4.52)	(9.11)	(3.96)	(6.42)	(5.12)
Other variables not reported					
Quintile Median	0.59%	1.71%	2.41%	5.08%	8.43%
Wald $\chi 2$	176.42	223.32	106.69	220.07	183.98
Prob. > $\chi 2$	0.0000	0.0000	0.0000	0.0000	0.0000
Number of Observations	2,334	2,435	2,220	2,132	2,093

Table 9

Robustness checks for subsample of top performers

This table reports robustness checks for a subsample of top performers, classified as firms in the top 2 quintiles on all of Altman Z-scores, ROA, excess returns and Fama-French three-factor alphas. Panels A and B report the time series of performance indicators and revenue generation potential characteristics relative to control firms matched on propensity for bankruptcy and revenue generation in year -1, as in Table 6. Panel C reports the percentage of delisted sample firms in the years after losing coverage for this subsample as in Table 7. Panel D Panel C reports the coefficients for the loss of coverage dummy for Cox regressions as in Table 8 Panel A.

Panel A: Time series of performance indicators after loss of coverage

	Levels				Changes	
Year	-1	0	+1	+2	-1 to +1	-1 to + 2
Operating ROA	5.45%	-2.25%	-1.88%	-1.34%	-7.11%	-6.88%
	(0.00)	(0.37)	(0.26)	(0.54)	(0.00)	(0.00)
ROA	7.24	1.33%	-0.62%	-0.84%	-7.83%	-10.16%
	(0.00)	(0.37)	(0.66)	(0.84)	(0.00)	(0.00)
Ln(Sales)	-0.09	-0.06	-0.18	-0.44	-0.15	-0.30
	(0.81)	(1.00)	(0.21)	(0.00)	(0.00)	(0.00)
Total Liabilities/Total Assets	-0.03	-0.02	0.01	-0.09	0.03	0.02
	(0.21)	(0.81)	(0.79)	(0.22)	(0.19)	(0.68)
Market D/E Ratio	-0.10	0.06	0.10	0.10	0.22	0.39
	(0.06)	(0.37)	(0.03)	(0.22)	(0.00)	(0.00)
Current Ratio	0.40	0.36	-0.05	-0.12	-0.40	-0.47
	(0.02)	(0.09)	(0.79)	(0.61)	(0.00)	(0.30)
Cash Ratio	0.02	-0.02	-0.00	-0.03	-0.05	-0.12
	(0.58)	(0.46)	(0.66)	(0.12)	(0.08)	(0.00)
Altman Z-Score	1.58	0.00	-0.18	0.41	-0.95	-0.74
	(0.00)	(1.00)	(0.54)	(0.35)	(0.01)	(0.10)
Volatility	-0.01	-0.01	0.00	0.01	-0.01	-0.00
	(0.43)	(0.37)	(0.86)	(0.61)	(0.19)	(1.00)
Excess Return	44.72%	-39.37%	-5.27%	-4.69%	-52.92%	-54.89%
	(0.00)	(0.00)	(0.37)	(0.66)	(0.00)	(0.00)
Fama-French Three-Factor Alpha	2.60%	-0.70%	-0.67%	0.59%	-1.53%	-0.89%
	(0.27)	(0.53)	(0.75)	(0.35)	(0.35)	(0.64)

Panel B: Potential revenue generation characteristics after loss of coverage

	Levels				Changes	
Year	-1	0	+1	+2	-1 to +1	-1 to + 2
Market capitalization	-5.46 (0.35)	-12.92 (0.00)	-11.27 (0.00)	-21.34 (0.00)	-25.94 (0.00)	-19.15 (0.00)
Assets	-9.28 (0.06)	-8.34 (0.12)	-10.96 (0.02)	-19.92 (0.01)	-6.08 (0.00)	-12.79 (0.01)
B/M Ratio	-0.05 (0.21)	0.17 (0.00)	0.18 (0.02)	0.17 (0.10)	0.22 (0.00)	0.22 (0.00)
Trading Volume	-1.03 (0.03)	-1.19 (0.01)	-2.89 (0.00)	-2.68 (0.00)	-2.16 (0.00)	-2.73 (0.00)
Share Turnover	-0.07 (0.04)	0.01 (0.74)	-0.12 (0.00)	-0.19 (0.00)	-0.17 (0.34)	-0.11 (0.15)
Bid-Ask Spread	-3.34% (0.19)	1.22% (0.32)	0.90% (0.93)	-1.65% (0.52)	3.32% (0.36)	1.25% (0.84)
Total Institutional Holdings	-0.79% (0.56)	-1.48% (0.62)	-2.87% (0.13)	-9.40% (0.02)	-2.16% (0.25)	-3.10% (1.00)
Number of Institutions	-1 (0.18)	-2 (0.01)	-4 (0.00)	-6 (0.00)	-2 (0.05)	-5 (0.02)
M&A Deal Amount	-1.53 (0.19)	-0.21 (1.00)	0.25 (1.00)	-1.00 (0.53)	0.00 (1.00)	-0.25 (0.79)
Number of M&A Deals	-1 (0.68)	1 (0.62)	1 (0.43)	-1 (0.72)	0 (1.00)	-1 (0.06)
Issues Amount	-11.95 (0.08)	-15.40 (0.02)	-12.00 (0.03)	-18.35 (0.00)	0.00 (1.00)	-2.90 (0.13)
Number of Issues	-1 (0.11)	-1 (0.03)	-1 (0.05)	-1 (0.00)	0 (1.00)	0 (1.00)

Panel C: Delisting rate and reason for delisting

	Subsample Firms		Control firms	
Delisted After	Number	Percentage	Number	Percentage
Less than 1 year	--	--	18	11.04%
1 to 2 years	19	11.66%	10	6.13%
2 to 5 years	52	31.90%	30	18.40%
5 to 10 years	43	26.38%	32	19.63%
More than 10 years	4	2.45%	13	7.98%
Still Trading	45	27.61%	60	36.81%
Total	163	100.00%	163	100.00%
Reason	Number	Percentage	Number	Percentage
Liquidation	51	43.22%	29	28.16%
Merger	60	50.85%	70	67.96%
Stopped trading	3	2.54%	2	1.94%
Deregistration	4	3.39%	2	1.94%
Total Delistings	118	100.00%	103	100.00%

Panel D: Delisting hazard rate over seven years since loss of coverage

	All Delisting Reasons	Liquidation	Merger
	(1)	(2)	(3)
'Loss of Coverage' Dummy	0.23	0.19	0.22
	(3.95)	(3.25)	(3.77)
Other variables not reported			
Wald $\chi 2$	51.07	48.06	51.18
Prob. > $\chi 2$	0.0002	0.0000	0.0000
Number of Observations	1,189	1,189	1,189

Figure 1

Firms losing coverage, 1983 - 2004

Figure 1 reports the evolution of the firms losing coverage from 1983 to 2004, compared to sample firms, as a fraction of all firms covered on I/B/E/S. The sample includes U.S. firms that continue to be publicly traded on the main domestic exchanges for at least one calendar year after the loss of their coverage. Certificates, ADRs, shares of beneficial interest, units, REITs and closed-end funds are excluded from the sample. The figure also reports the average number of firms per analyst, determined as the ratio between all firms covered on I/B/E/S and all individual analysts.

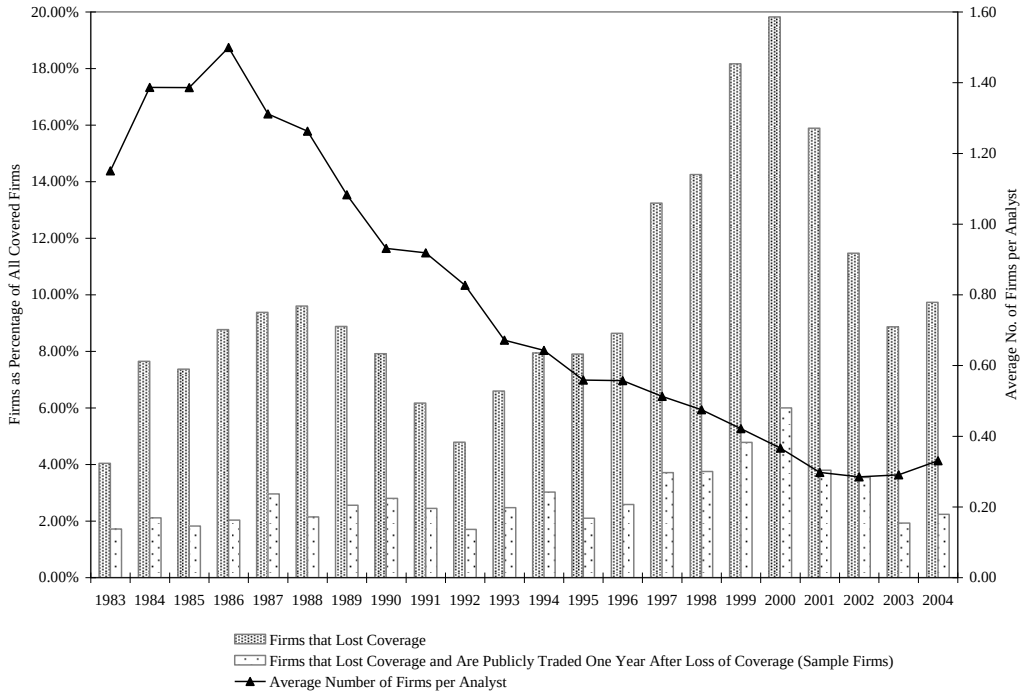
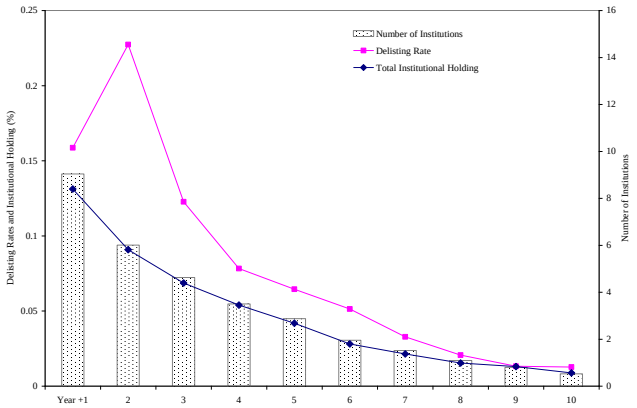


Figure 2

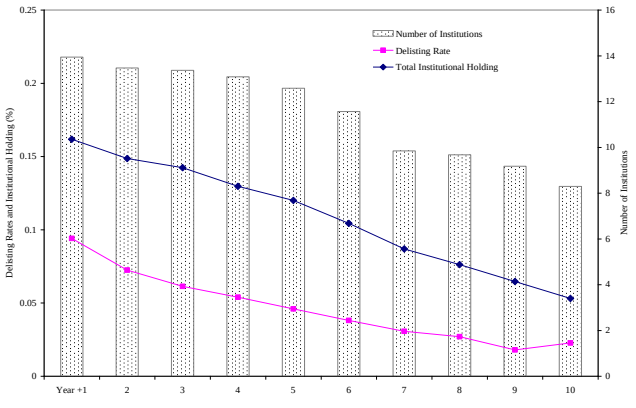
Delisting rate and institutional presence in the years after the loss of analyst coverage

Panel A reports the delisting rate and the average institutional presence for sample firms and their control firms over ten years after the loss of analyst coverage. Total institutional holdings are determined as total shares held by all institutions (out of shares outstanding) that are reported by the 13f database in the fourth quarter of year *t*. Number of institutions is the total number of institutional investors reporting their holdings of a given stock in the fourth quarter of year *t*. Panel B reports the evolution of delisting rate and institutional presence for a subsample of 163 top performers and their control firms over ten years after the loss of coverage. Control firms are matched –in the year prior to the loss of coverage– on the propensity for bankruptcy and revenue generation.

Panel A: All sample firms vs. their control firms

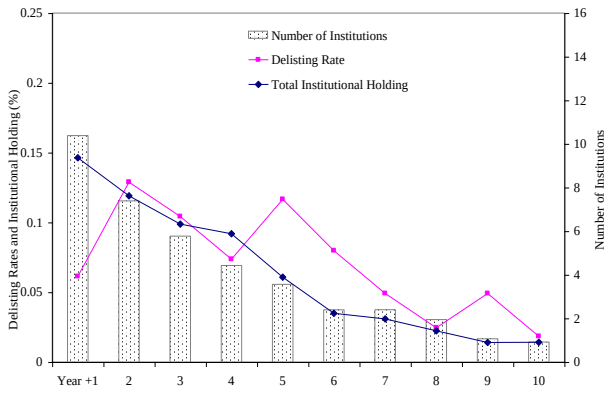


Sample firms

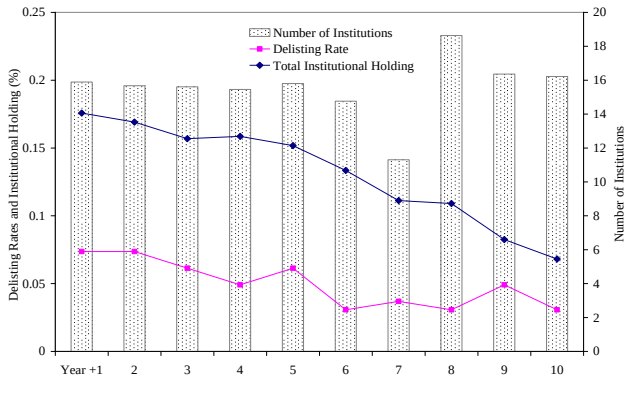


Control firms

Panel B: Subsample of top performers vs. their control firms



Top performing sample firms



Control firms