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Do Analysts Influence Corporate Financing and Investment?

John A. Doukas, Chansog (Francis) Kim, and Christos Pantzalis*

We examine whether abnormal analyst coverage influences the external financing and investment decisions of the firm. Controlling for self-selection bias in analysts' excessive coverage, we find that firms with high (low) analyst coverage consistently engage in higher (lower) external financing than do their industry peers of similar size. Our evidence also demonstrates that firms with excessive analyst coverage overinvest and realize lower future returns than do firms with low analyst coverage. Our findings are consistent with the hypothesis that analysts favor the coverage of firms that have the potential to engage in profitable investment-banking business.

> We do not want to maximize the price at which Berkshire shares trade. We wish instead for them to trade in a narrow range centered at intrinsic value. . . [We] are bothered as much by significant overvaluation as significant undervaluation. *Warren Buffet, Berkshire Hathaway Annual Report, 1998.*

One of the distinct characteristics of the US capital market is its transparency. Unlike capital markets in other countries, companies traded on the US stock markets are supposed to accurately report a wide range of information to investors, who then use that information to assess the risks and rewards of their investments. Security analysts generally receive credit for contributing to the stock market's transparency. In response to the growing demand by investors and corporate managers for the dissemination of firm-specific information and stock valuation, security analysis has increased considerably in recent years. In the 1990s, stock recommendations and earnings forecasts issued by analysts associated with major brokerage houses gained dramatic prominence among investors and corporate managers, and came to represent a primary source of information for investors.

In this paper, we study whether security analysts play an important role in corporate finance. We ask whether heightened analyst coverage is associated with excessive external financing and overinvestment. The pressures and economic incentives to generate trading commissions and investment-banking business can influence corporate financing, and as a result, investment, when analysts focus on serving these interests at the expense of the integrity of their research. An empirical investigation of the role of analysts from this perspective is important for the understanding of financial markets' capital allocation process.

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Despite the potentially useful role of security analysts, the recent revelations of accounting fraud at major companies such as Enron and WorldCom, among others, have severely shaken investor confidence in the US stock markets. As a result, concerns about the role of analysts have increased. Subsequent to the Nasdaq crash of 2000, security analysts have come under considerable criticism. Declining standards and quality of research have been mentioned, but the most frequently cited criticism is that economic incentives motivate analysts to direct their attention and stock recommendations toward stocks that generate investment-banking business and trading commissions.[1]

Investment-banking considerations and trading profits could also explain analysts' influence on corporate managers' behavior in recent years. Jensen (2004, 2005) argues that in trying to conform to analysts' pressures for growth rates that are essentially impossible to achieve, corporate managers often revise plans and budgets to meet analysts' expectations. In some cases, managers—fearing the consequences of missing analysts' expectations—will shape the capital budgeting process around analysts' consensus earnings forecasts. Enron, Cisco, and Nortel, among others, are recent examples of firms whose managers' corporate actions were (or are, as the case may be) designed to sustain overvalued stock shares by pursuing corporate strategies that reflect analysts' pressure for higher growth targets. These cases, among others, clearly suggest that when companies try too hard to meet analysts' unrealistic forecasts they often fail to undertake shareholder value maximizing corporate actions.

Recent studies show that analysts' optimistic bias (Lim, 2001) and excessive coverage (Doukas, Kim, and Pantzalis, 2005) are associated with equity overvaluation. In inefficient markets, this assumes that managers tend to maximize short-run share prices affected by uninformed demand. Fundamental or long-run value, of course, is determined by investment policy. Although there is ample anecdotal evidence that analyst coverage is likely to be concentrated in stocks with strong potential for trading commissions and lucrative investment-banking deals, the question of whether excessive analyst coverage influences firms' external financing decisions remains unanswered. While our work relates to previous studies (Hayes, 1998; Lin and McNichols, 1998; Alford and Berger, 1999; Michaely and Womack, 1999; among others) arguing that incentives motivate analyst coverage and issuance of optimistic recommendations, the aim of this study is to examine whether excessive analyst coverage, motivated by incentives, affects firms' external financing.

Our approach differs from studies that examine the relation between firms' financing choices (equity vs. debt issuance) and analyst coverage from the perspective of information asymmetry (Chang, Dasgupta, and Hilary, 2006) and those that test whether analysts' optimistic recommendations per se increase investment banks' probability of winning underwriting deals (Ljungqvist, Marston, and Wilhelm, 2006). Chang, Dasgupta, and Hilary (2006), using the number of analysts as a proxy for information asymmetry between managers and outside investors, examine whether firms with low coverage are less likely to issue equity than debt. Specifically, they show that firms followed by few analysts (i.e., high-information asymmetry firms) are less likely to issue equity than debt, concluding that these firms are likely to issue more equity when exuberant economic conditions prevail (timing the market). That is, firms with low analyst coverage generally prefer issuing debt rather than equity. Equity issuance for firms with low analyst coverage becomes

[1] See http://www.nasd.com/RegulatoryEnforcement/NASDEnforcementMarketRegulation/GlobalSettlement/index.htm and Kadan, Madureira, Wang, and Zach (2006) for more information on the Global Settlement 2003. The recent $1.4 billion settlement between major investment banks and regulators is testimony for the allegation that analysts compromise the quality of their investment research in order to generate investment-banking business and trading commissions. For details see "SEC Fact Sheet on Global Analyst Research Settlements" (http://www.sec.gov/news/speech/factsheet.htm) and the "joint press release" of the SEC, NYAG, NASAA, NASD, and NYSE. (http://www.sec.gov/news/press/2003–54.htm).

an attractive choice for managers when investor sentiment is high (i.e., stock price run-up). Consequently, the main issue examined in Chang, Dasgupta, and Hilary is the prediction that equity issuance by firms that are more susceptible to information asymmetry will be driven by market conditions that managers consider favorable, enabling the managers to take advantage of a window of opportunity to time their equity issuance. Apparently, their paper does not address whether excessive analyst coverage, driven by investment-banking incentives and analysts' self-interests, affects firms' external financing, which is the focus of our analysis. Their evidence shows that firms with low coverage, and especially very small firms, have low external financing. They attribute this result to information asymmetries, captured by the number of analysts, and investors' adverse selection behavior. While this finding seems consistent with our evidence for firms with low excessive analyst coverage, but not necessarily for very small firms, the low external financing of these firms in our tests is not related to unfavorable market conditions. Our evidence shows that the low external financing for thinly covered firms is the result of the negatively skewed analyst coverage of these firms. Contrary to Chang, Dasgupta, and Hilary, our results show that excessive analyst coverage creates favorable market conditions that lead to excessive external financing. In fact, the positive relation between excessive analyst coverage and external financing, documented in this study, is also supported by the evidence of Chang, Dasgupta, and Hilary since their results become weaker for firms with higher analyst coverage.

Ljungqvist, Marston, and Wilhelm (2006), on the other hand, look into the possible connection between investment-banking deals and analysts' favorable recommendations. Their study builds on the premise that analysts' stock attention is driven by incentives and examines whether analysts' favorable recommendations raise their investment bankers' probability of winning investment deals. Despite the abundance of anecdotal evidence, Ljungqvist, Marston, and Wilhelm find no evidence in support of the view that such behavior favorably influenced banks to win either debt or equity mandates. Hence, the focus of their investigation is not on the possible association between excessive analyst coverage and firms' external financing. While these studies provide insightful information about the role of analysts, they are not designed to examine the effects of excessive analyst coverage on the firm's external financing decision. However, unlike previous studies, our work centers on the cross-section of abnormal analyst coverage and its potential impact on external financing. In addition, our analysis looks at the impact of analysts' coverage initiations on firms' external financing decisions. To date, there is no systematic evidence that abnormal analyst coverage affects firms' external financing decision.

Our analysis shows that excessive analyst coverage influences the capital allocation process. Our findings are consistent with the notion that excessive coverage, which typically results in frequent stories and multiple analyst reports, tends to enhance the credibility of the information generated by analysts, which affects the investment decisions of existing and new investors. First, we find that firms with high analyst coverage tend to have greater external financing and investment than do firms with low analyst coverage. Second, we find that firms with high analyst coverage, external financing, and capital spending realize lower future returns than do firms with low analyst coverage, external financing, and capital spending. This evidence suggests that the impact of analysts on a firm's external financing and investment stems from excessive analyst coverage, which is a result of analysts' self-interest and pressures to promote investment-banking transactions.

We also find that analysts' earnings forecast errors do not become more optimistic when coverage increases. This finding suggests that the firm's excessive external financing and investment decisions are not triggered by analysts' recommendations and/or forecast biases per se. This may be the reason that Ljungqvist, Marston, and Wilhelm (2006) fail to find a strong link between optimistic analyst recommendations and banks' increased chances of winning investment-banking business. The impact of analyst coverage on firms' financing and investment decisions seems to be rooted in the market's perception that there is a link between high coverage and growth prospects due to the potential involvement of many investment banks.

Third, our findings suggest that excessive analyst coverage could make investors feel that they know more about a firm than they actually do, thus developing a sense of overconfidence about that firm's future prospects. This removes uncertainty about future cash flows and raises the demand for the stock of firms with excessive coverage. Excessive analyst coverage may also add credibility to rumors, news, and information that investors already have, and thus influence their investment decisions. This finding is consistent with the psychological principle that much of human thinking that results in action is driven by storytelling and justification, rather than quantitative factors.

This study contributes to the literature in several ways. It highlights that the process of information diffusion that plays a limited role in economic models, performs a very important function in the financing decisions of the firm. In contrast to the traditional asset pricing theories that assume investors have unlimited information capacity, in reality few investors pay attention to all sources of information, and much less understand their impact on assets prices (Hong, Torous, and Valkanov, 2007). The paper also contributes in understanding the capital allocation process when analyst coverage is driven by investment-banking incentives and trading commissions. We provide evidence that analysts play a key role in the capital allocation process. Our work also shows that analyst coverage has an influence on real investments. Finally, our findings have regulatory policy implications.

The paper is organized as follows. In Section I we discuss the relation between excessive analyst coverage and external financing. Section II describes our data sources, the creation of the excess analyst coverage measure, and the other variables used in the analysis. Section III presents and describes the empirical results. Section IV concludes.

I. Excessive Analyst Coverage and External Financing

The conventional view of the security analyst role is that it can mitigate the agency problems associated with corporate financing and investment decisions. For example, Jensen and Meckling (1976) argue that security analysts have the potential to reduce agency costs arising from the separation of ownership and control by restricting managers' nonvalue-maximizing activities. Myers and Majluf (1984), who propose asymmetric information between corporate managers and investors as an explanation for financing and investment distortions, show that asymmetry of information between outside investors and corporate managers has adverse effects on the ability of the firm to raise capital, which results in underinvestment. To the extent that security analysts are paid to generate and provide valuable information to the market, they could potentially lessen informational asymmetries, and consequently reduce the financing and investment distortions of the firm. This view of the security analyst's role suggests that firms with analyst coverage are less likely to engage in managerial misconduct and suffer from financing and investment problems. Moreover, this view suggests that the protection of investors' interests increases with analyst coverage.

If the number of analysts covering a firm reflects the total resources spent on private information acquisition (Bhushan, 1989), then firms that are covered by many analysts should have more private information diffused to investors. Thus, in response to numerous (few) analyst inquiries, firms covered by a relatively large (small) number of analysts should be inclined to release more (less) private information. In turn, investors might regard excessively covered firms as more attractive investments, since they would be perceived as being more transparent and subject to greater external monitoring. Collectively, if analysts' monitoring activities reduce managerial misconduct and informational asymmetries between managers and outside investors, then such monitoring activities should increase the ability of firms to raise capital. To the extent that analyst coverage increases a firm's access to external financing, it should also have a positive influence on the firm's investment.[2] However, this view of the role of security analysts ignores the fact that analysts' incentives influence their decision to cover a particular stock. Therefore, it cannot explain why certain firms have greater analyst coverage than others.

Analysts who work for a brokerage firm are expected to gather information about stocks, analyze it, and supply it to brokers' clients in the form of stock reports that investors can use to assess the rewards and risks of their investments. In return for their commissions and transaction fees, brokers must weigh the benefits of committing resources to covering one stock against the opportunity costs of covering a different stock. Since analysts' compensation increases in direct proportion to the commissions they generate on the stocks they follow, their incentives to generate investment-banking business and trading commissions affect their information-gathering and coverage decision. Brokers may also initiate analyst coverage of a company because their important clients have significant holdings in that company (see Irvine, 2003). These facts suggest that investment-banking and trading commission-based incentives affect the quality and quantity of information reported by analysts.

In the competitive world of brokers, firms with greater chances of generating investment-banking business and trading commissions are the focus of attention of a large number of analysts. Heightened brokerage attention on specific stocks results in disproportionate analyst coverage relative to the coverage the average stock receives in the same industry. We label this difference "excessive analyst coverage." If the raison d'être of analysts is to promote investment-banking transactions and trading commissions, they must influence the market's capital allocation process. Given analysts' self-interest and the pressures on them to promote investment-banking business, they are likely to spend considerable efforts and resources on firms that have the potential to engage in external financing. In an effort to win investment-banking business, analysts may be forced by bankers to withhold negative information or compromise their stock research (Lin and McNichols, 1998). Hence, the pay structure of analysts, which favors upward earnings expectations and discourages the reporting of bad news for firms they cover, combined with investment-banking incentives and managerial self-interest, may lead to disproportionate external financing for firms with excessive analyst coverage, as the valuation of these firms increases with analyst coverage.

Moyer, Chatfield, and Sisneros (1989), Chung and Jo (1996), and Doukas, Kim, and Pantzalis (2005) show that there is a positive association between analyst coverage and firm value and attribute this relationship to analysts' monitoring role. Similarly, Chang, Dasgupta, and Hilary (2006) find that firms with few analysts tend to issue less equity than debt because they are susceptible to greater information asymmetries. Brennan and Subrahmanyam (1995) argue that, under conditions of asymmetric information, the required rates of return should be higher for securities that are relatively illiquid. Using security analysts as a proxy for the market depth of a stock, they show that the adverse selection costs of transacting decrease with the number of analysts. Brennan and Tamarowski (2000), who view analysts as an integral part of the firm's investor-relation activities, suggest that the number of analysts who follow a firm has a positive

[2] See for example, Fazzari, Hubbard, and Petersen (1998) and Hoshi, Kashyap, and Scharfstein (1991) for a discussion on the relation between investment and external financing. Kaplan and Zingales (2000), however, have raised concern about the importance of external financing constraint. See also Hubbard (1998) for an extensive review of this literature.

effect on the liquidity of trading in the firm's shares by reducing informational asymmetries, resulting in a lower cost of capital. Irvine (2003), using analyst initiations, provides evidence supporting the liquidity argument. The positive effect of analyst coverage on firm value, detected in these studies, is mainly attributed to analysts' ability to increase stock liquidity. Brennan, Jagadeesh, and Swaminathan (1993) show that stocks with high analyst coverage react faster to common information than stocks with low coverage, implying that the informational efficiency of stocks increases with analyst coverage. Hence, firms may be able to reduce their cost of capital by increasing the number of analysts who follow them. Moreover, since investors pay more attention to stocks that are in the news and analysts' reports, increased analyst coverage is likely to have an incremental price effect by raising investor awareness and consequently stock's investor base (Merton, 1987).

However, analysts may also decide to drop coverage of a firm. This self-censoring is mainly driven by analysts' economic incentives and their interest in promoting lucrative investment-banking transactions. Hence, it is reasonable to argue that analyst coverage is likely to be concentrated in companies that analysts "perceive" as having the potential to engage in external financing (i.e., companies with the most expected investment-banking business). Therefore, it is not surprising that managers of firms that are not covered complain that they are unable to get their "story" out to investors, resulting in lower liquidity and price of their firm's stock (Friedlander, 2005).

The depth of a firm's analyst coverage is expected to have profound effects on investors' decisions since analyst coverage plays a major role in drawing investors' attention to a particular stock.[3] For firms with high analyst coverage there is an abundance of opinions (i.e., stories) and information. As a result, investors will feel that they know more about highly covered firms and will be more inclined to invest in their stock. Investors, who often rely on the expert opinion of security analysts to make investment decisions, are expected to compare analyst coverage across similar firms, since they often engage in classifying stocks into different categories (Barberis and Shleifer, 2003). It follows that firms with high (low) coverage will be categorized by investors as firms that they know more (less). Investors tend to view firms with high analyst coverage as more familiar and are more likely to make investment decisions that favor these firms for two reasons. First, investors feel more confident. Second, investors relate familiarity of information to its validity. Consequently, high analyst coverage could produce an investor bias analogous to the "home bias" in equity portfolios, encouraging investors to own stocks with greater availability of information in greater proportion in their portfolios relative to stocks with low analyst coverage (Coval and Moskovitz, 1999). Such preferred habitat arises from lack of information (Merton, 1987) or higher cost of information for a certain class of stocks.

Firms with high analyst coverage are also likely to gain media attention and thus enhance investor familiarity as they disseminate information issued by analysts. Stocks that get the attention of mass media can also emerge as "celebrity" stocks. Investors are willing to buy stocks that catch their attention and they feel more familiar with. Furthermore, firms with high (low) analyst coverage are likely to be categorized by investors as high (low) growth firms and, therefore, are perceived more (less) favorably resulting in lower (higher) external financing costs. Cost of capital increases tend to reduce the external financing of the firm and, rationally, harm its investment opportunities (Fazzari, Hubbard, and Petersen, 1998). Therefore, firms with lower (higher) analyst

[3]Merton (1987), in his capital market equilibrium model with incomplete information, argues that investors do not have equal information and, therefore, they invest only in assets of which they are aware. If analyst reports are an important source of information, then Merton's argument suggests that firms with low analyst coverage will have a smaller investor base (neglected stocks) and trade at a discount because of limited risk sharing.

coverage are expected to be associated with lower (higher) external financing and capital spending. Consequently, we expect that companies that raise capital to finance new projects will invest more. However, we do not expect to find a positive relation between excessive analyst coverage and firm's investment unless managers' capital spending is driven by analysts' pressures, as argued in Jensen (2004, 2005). Consistent with Jensen's (2004, 2005) conjecture, our second hypothesis addresses whether excessive coverage leads to overinvestment. If excessive analyst coverage does not influence the capital spending of the firm, then the relation between excess coverage and investment is expected to be weak. For example, in the asymmetric information setting of Myers and Majluf (1984), where financial slack is desirable and the link between external financing and investment wanes, the impact of excess coverage on investment is expected to decline. To the extent that analyst coverage is driven by incentives, its impact on the external financing of the firm is of great interest in understanding the capital allocation process.[4]

II. Sample Selection and Measures of Variables

Here, we describe our data sources and the construction of the sample. We also provide details about the estimation of the excess analyst coverage and other measures we use in our empirical tests.

A. Sample Selection

We base our analysis on all firms covered in the *Standard & Poor's Compustat Primary, Secondary and Tertiary* (*PST*)*, Full Coverage, Research and Industry Segment* databases over the 1980-2003 period. The procedure we use to estimate the excess analyst coverage measure follows that of the excess value measure by Berger and Ofek (1995). Therefore, the construction of the excess analyst coverage measure requires the following restrictions on the Compustat data: to ensure that our excess coverage measure has adequate variation, we exclude firms with total sales of less than $20 million because they are not followed by analysts. We also require that firms have no segments in the financial services industries (i.e., no segments with Standard Industrial Classification (SIC) codes between 6000 and 6999) and that their sum of segment sales is within 1% of the total sales reported for the firm in the Compustat database.

For the construction of the excess analyst coverage measure, we require that firms have analyst coverage data available in the 2003 Institutional Brokers Estimate System (IBES) database. Our data set combines financial variables, which are as of the end of fiscal year, with security analysis variables that we obtain from the IBES database. Following Easterwood and Nutt (1999), we select the number of analyst forecasts issued eight months prior to fiscal year-end for all stocks covered by security analysts. By doing so, we can create an analyst coverage measure that is uniform in terms of forecast horizon across all firms. We also establish the eight-month horizon to ensure that analysts have the previous year's annual report available to them when they make their forecast.[5] We assign observations to particular calendar years based on the month that IBES records the forecast. Our final sample includes over 24,000 firm-year observations for close to

[4]Doukas, Kim, and Pantzalis (2005) show that stocks of firms with strong excess analyst coverage trade at prices far from their fundamental values (i.e., trade at a premium relative to the value of comparable firms with weak analyst coverage in the same industry).

[5]According to Penman (1987), a vast majority of firms (about 92%) file their annual reports with the SEC within three months after the fiscal year-end.

5,000 firms with complete excess analyst coverage and financial information. The Appendix provides definitions of all variables used in our analysis.

B. Measures of External Financing, Capital Spending, and Excess Analyst Coverage

To gauge the external financing and investment rate of the firm, we use industry-adjusted metrics. External financing is our industry-adjusted measure, which we compute as: [(external financing for firm *i*) minus (median value of external financing for all firms in firm *i*'s primary two-digit SIC industry)]. We measure external financing as [Δ(equity)$_t$ plus Δ(long-term debt)$_t$ plus Δ(short-term debt)$_t$]/(total assets)$_{t-1}$, where Δ(equity)$_t$ equals the book value of new equity issued in year t, Δ(long-term debt)$_t$ equals the book value of new long-term debt issued in year t, and Δ(short-term debt)$_t$ equals the book value of new current debt and accounts payable in year t.

We compute capital spending, which we define as the industry-adjusted investment rate, as [(investment rate for firm *i*) minus (median value of investment rates for all firms in firm *i*'s primary two-digit SIC industry)]. We measure the investment rate as the ratio of capital expenditures over net property, plant, and equipment.

In our empirical investigation we measure analyst coverage relative to a meaningful benchmark. To do so, we construct an excess analyst coverage measure, *EXCOVER*, which we define as the natural logarithm of the ratio of a firm's actual number of analysts following to its expected coverage (i.e., the average number of analysts covering a firm of similar size in the same industry). A firm's imputed analyst coverage, which is our proxy for the expected coverage, is the sum of the imputed analyst followings of its segments. The sum of its segment's imputed analyst following is equal to the segment's sales multiplied by the ratio of its industry median analyst following to sales. We compute this ratio for single-segment firms in the industry. Hence, the excess analyst coverage metric captures the abnormal coverage (i.e., concentration and resources spent by analysts), given firm characteristics, relative to firms of similar size in the same industry.[6]

We assume that the number of analysts covering the average firm in an industry represents the market's expected analyst coverage in that industry. This benchmark (i.e., industry- and size-adjusted imputed analyst coverage) measures the minimum number of analysts required to monitor managerial behavior and to disseminate information that would enable investors to achieve a satisfactory level of awareness and, therefore, assign market prices close to firms' intrinsic values.[7] Stocks of firms with weaker analyst coverage are more likely to be viewed as less transparent and with greater information asymmetry due to low diffusion of information. In addition, investors may view them as more likely to engage in nonvalue-maximizing corporate activities. Unlike the raw and the residual analyst coverage, the relative analyst measure avoids the problems associated with firm size and industry effects. Since analysts provide information to the capital market, by using the relative analyst coverage measure we can gauge not only the extent of coverage, but also the possible valuation effects through shifts of investor demand from one stock to another within an industry. Negative (positive) excess analyst coverage values denote

[6]We also experimented with the residual analyst coverage measure, as defined in Hong, Lim, and Stein (2000). Results based on the residual analyst coverage measure were similar to those presented here and are available on request.

[7]This may also lead to increased trading and valuation by expanding stocks' ownership base. Merton (1987) argues that firms benefit when additional investors become aware of their existence because this increases the liquidity of the firms' equity. Huberman (2001), Brennan and Hughes (1991), and Chung and Jo (1996) also argue that investors tend to trade only securities that they are familiar with. Gervais, Kaniel, and Mingelrin (2001) suggest that firms with small investor base are likely to be undervalued due to limited risk sharing.

weak (strong) coverage. We expect to observe higher external financing for firms with positive excess analyst coverage (i.e., firms whose analyst coverage is higher than that of their imputed analyst coverage). We also expect these firms to overinvest. Since conglomerates generally attract low analyst coverage and rely more on internal financing, this hypothesis is unlikely to hold for conglomerates. We address this issue in a later section.

III. Empirical Results

A. Excess Analyst Coverage and External Financing

Panel A of Table I supports the prediction of the incentives' hypothesis that excessive analyst coverage facilitates the external financing process. The evidence shows a positive relation between analyst coverage and external financing. Firms with high excess analyst coverage (Q5) have greater external financing than do firms with low excess analyst coverage (Q1). The mean difference (Q5-Q1) in external financing for firms with high and low analyst coverage is 0.1439 and is statistically significant at the 1% level (*t*-statistic 14.34).

The relation between analyst coverage and the firm's industry-adjusted investment rate is also positive and consistent with the view that firms with high analyst coverage tend to invest more. The mean difference (Q5-Q1) for firms with high and low analyst coverage is 0.0902 and is statistically significant at the 1% level (*t*-statistic 31.19). Firms with high (low) analyst coverage have higher (lower) investment opportunities, as evidenced by the higher Tobin's q and industry-adjusted q values. The mean difference in raw (industry-adjusted) q values between firms with high and low analyst coverage in the same industry is 0.4250 (0.4295) with a *t*-statistic of 14.09 (14.98).

Another interesting pattern that emerges from Panel A is that firms with excessive analyst coverage (Q4 and Q5) are smaller in size and have lower book-to-market ratios than do firms with low analyst coverage. This relation is consistent with the view that analysts are attracted to smaller firms with high growth prospects for two reasons: 1) these firms have better trading-profit potential and greater investment-banking needs, and 2) analysts extend coverage to less-transparent firms (i.e., firms with greater information asymmetry) because such firms have stronger investor information needs. Moreover, high (low) analyst coverage is associated with high (low) excess valuation. The mean difference between high (Q5) and low (Q1) excess valuation firms is 0.5024 with a *t*-statistic of 47.56. We also note that the mean difference in forecast errors between high (Q5) and low (Q1) analyst coverage firms is not statistically significant.

These results illustrate that the positive association between the firm's external financing and investment decisions and analyst coverage is unlikely to be affected by the nature of analysts' forecasts per se. Studies, then, that focus on the relationship between analysts' forecasts and their banks' probability of winning investment-banking deals in an attempt to shed light on whether analysts have an impact on firms' financing decision are most likely to produce tenuous results. Hence, we find that by generating strong impressions about a firm's long-term future growth prospects, it is the depth of analyst coverage itself that affects the external financing and investment decisions.

We expect that the industry-adjusted investment and external financing for firms in the Q4 and Q5 quintiles will be close to their industry levels. However, the evidence does not support this expectation. Instead, our findings support the incentives' hypothesis, which predicts a positive association between excess analyst coverage and external financing. Furthermore, the value of the Q5-Q3/Q3-Q1 ratio reported in the last column of Table I is invariably above one for external

Table I. Descriptive Statistics and Univariate Tests

Panel A reports mean values of Tobin's q, the industry-adjusted mean values of Tobin's q, industry-adjusted investment rate, and external financing for quintile portfolios that we form after ranking all firms each year on excess analyst coverage. Panel A also reports the difference in means between the top and bottom quintiles (Q5-Q1), as well as the corresponding t-statistic (in brackets). Panel B reports mean excess values for firms that we sort based on industry-adjusted external financing and excess analyst coverage. Panel C reports the average monthly future returns for portfolios of firms that we construct after sorting on industry-adjusted external financing and excess analyst coverage. Panel D reports mean excess values for firms that we sort based on industry-adjusted investment rate and excess analyst coverage. Panel E reports average monthly future returns for portfolios of firms that we construct after sorting on industry-adjusted investment rate and excess analyst coverage. The future returns are geometric monthly averages computed over a one-year period starting four months after the fiscal year-end to ensure that the information included in the firms' annual reports is available at the beginning of the return period. In Panels B through E firms are assigned to low (bottom 30th percentile), medium, or high (top 30th percentile) groups. The number of firms in each cell appears in parentheses. In Panels B through E we also report the mean differences between the high and low groups and the corresponding t-statistics. We compute industry-adjusted values as the difference in the raw value of a variable and the median value of the variable in the firm's primary two-digit SIC industry. The sample spans the period 1980-2003. Here z indicates that the mean value is not different from one (in the case of Tobin's q and book-to-market) or from zero (in the case of the industry-adjusted variables and the excess value variable) at the 5% significance level.

Panel A. Descriptive Statistics for Portfolios of Firms Sorted on Excessive Analyst Coverage

	Q1 Low *EXCOVER*	**Q2**	**Q3**	**Q4**	**Q5 High *EXCOVER***	**All Firms**	**Q5-Q1 [*t*-Stat.]**	**[Q5-Q3]/[Q3-Q1]**
Industry-adjusted external financing (IA_IR)	0.0058^z	0.0269	0.0657	0.0894	0.1497	0.0677	0.1439***	1.4025
	(6,286)	(6,315)	(6,248)	(6,379)	(6,336)	(31,564)	[14.34]	
Industry-adjusted investment rate (IA_IR)	−0.0197	−0.0021^z	0.0142	0.0363	0.0705	0.0199	0.0902***	1.6605
	(6,292)	(6,328)	(6,263)	(6,382)	(6,336)	(31,601)	[31.19]	
Tobin's q	1.0334	1.0956	1.1738	1.2976	1.4584	1.2121	0.4250***	2.0282
	(6,371)	(6,378)	(6,325)	(6,437)	(6,392)	(31,903)	[14.09]	
Industry-adjusted Tobin's q (IA_Q)	0.0813	0.1768	0.2556	0.3704	0.5108	0.2793	0.4295***	1.4654
	(6,371)	(6,378)	(6,325)	(6,437)	(6,392)	(31,903)	[14.98]	
Book-to-market (BM)	0.6700	0.7210	0.7201	0.6919	0.6472	0.6900	−0.0229**	−1.4565
	(6,371)	(6,378)	(6,325)	(6,437)	(6,392)	(31,903)	[−1.96]	
Size	6.7442	5.9527	5.5634	5.2949	4.9955	5.7091	−1.7487***	0.4809
	(6,371)	(6,378)	(6,325)	(6,437)	(6,392)	(31,903)	[−61.80]	
Excess value	−0.1923	−0.0745	0.0337	0.1257	0.3100	0.0409	0.5024***	1.1222
	(6,371)	(6,378)	(6,325)	(6,437)	(6,392)	(31,903)	[47.56]	
Forecast error	0.0313	0.0278	0.0305	0.0335	0.0294	0.0305	−0.0019	1.2808
	(5,566)	(5,482)	(5,394)	(5,512)	(5,490)	(27,444)	[−0.66]	

Panel B. Average Excess Value for Portfolios Formed on EXCOVER and IA_EF

	Low *IA_EF*	**Medium**	**High *IA_EF***	**All Firms**	**High-Low [*t*-Stat.]**
Low *EXCOVER*	−0.3020	−0.1085	0.0144	−0.1534	0.3164***
	(3,434)	(4,064)	(1,951)	(9,447)	[20.27]
Medium *EXCOVER*	−0.1625	0.0318	0.1964	0.0220	0.3589***
	(3,798)	(5,087)	(3,730)	(12,615)	[27.89]

Table I. Descriptive Statistics and Univariate Tests (*Continued*)

Panel B. Average Excess Value for Portfolios Formed on EXCOVER and IA_EF (*Continued*)

	Low *IA_EF*	Medium	High *IA_EF*	All Firms	High-Low [*t*-Stat.]
High *EXCOVER*	0.0313 (2,226)	0.2140 (3,477)	0.4440 (3,797)	0.2631 (9,500)	0.4127*** [24.98]
All firms	−0.1675 (9,458)	0.0368 (12,628)	0.2581 (9,478)	0.0420 (31,564)	0.4256*** [49.25]
High-low [*t*-Stat.]	0.3332*** [21.17]	0.3224*** [25.27]	0.4295*** [25.85]	0.4165*** [48.47]	

Panel C. Average Monthly Future Returns for Portfolios Formed on EXCOVER and IA_EF

	Low *IA_EF*	Medium	High *IA_EF*	All Firms	High-Low [*t*-Stat.]
Low *EXCOVER*	0.0131 (3,258)	0.0114 (3,922)	0.0102 (1,893)	0.0118 (9,073)	−0.0029*** [−2.71]
Medium *EXCOVER*	0.0123 (3,560)	0.0118 (4,888)	0.0100 (3,568)	0.0114 (12,016)	−0.0023** [−2.20]
High *EXCOVER*	0.0105 (2,077)	0.0116 (3,304)	0.0099 (3,661)	0.0107 (9,042)	−0.0006 [−0.46]
All firms	0.0122 (8,895)	0.0116 (12,114)	0.0100 (9,122)	0.0113 (30,131)	−0.0023*** [−3.33]
High-low [*t*-Stat.]	−0.0026** [−2.10]	0.0002 [0.21]	0.0003 [0.22]	−0.0011* [−1.85]	

Panel D. Average Excess Value for Portfolios Formed on EXCOVER and IA_IR

	Low *IA_IR*	Medium	High *IA_IR*	All Firms	High-Low [*t*-Stat.]
Low *EXCOVER*	−0.2054 (3,456)	−0.1228 (4,122)	−0.1273 (1,877)	−0.1539 (9,455)	0.0781*** [4.74]
Medium *EXCOVER*	−0.0450 (3,823)	0.0297 (5,128)	0.0807 (3,693)	0.0220 (12,644)	0.1257*** [9.31]
High *EXCOVER*	0.1728 (2,187)	0.2101 (3,395)	0.3584 (3,920)	0.2627 (9,502)	0.1856*** [10.92]
All firms	−0.0533 (9,466)	0.0284 (12,645)	0.1542 (9,490)	0.0417 (31,601)	0.2075*** [22.97]
High-low [*t*-Stat.]	(0.3782*** [23.79]	0.3329*** [25.88]	0.4857*** [27.33]	0.4166*** [48.51]	

Panel E. Average Monthly Future Returns for Portfolios Formed on EXCOVER and IA_IR

	Low *IA_IR*	Medium	High *IA_IR*	All Firms	High-Low [*t*-Stat.]
Low *EXCOVER*	0.0132 (3,287)	0.0113 (3,989)	0.0101 (1,803)	0.0118 (9,079)	−0.0032*** [−2.94]
Medium *EXCOVER*	0.0128 (3,602)	0.0118 (4,920)	0.0094 (3,522)	0.0114 (12,044)	−0.0034*** [−3.28]
High *EXCOVER*	0.0123 (2,069)	0.0119 (3,246)	0.0087 (3,729)	0.0107 (9,044)	−0.0036*** [−2.69]
All firms	0.0128 (8,958)	0.0117 (12,155)	0.0092 (9,054)	0.0113 (30,167)	−0.0036*** [−5.54]
High-low [*t*-Stat.]	−0.0010 [−0.85]	0.0006 [0.80]	−0.0014 [−1.04]	−0.0011* [−1.81]	

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

financing (investment). This result suggests that the positive relation between abnormal analyst coverage and external financing (investment) is stronger when analyst coverage is high than when it is low.

We now examine whether there is a direct relation between excess analyst coverage and future returns, as suggested by the trading commissions and investment-banking incentives hypothesis. If analyst coverage does increase the external financing (investment) of the firm by raising investor recognition, optimism, and overconfidence, then firms with high analyst coverage should be overvalued (i.e., trade at prices above their industry peers with low analyst coverage) and thus realize lower future returns.

To further examine the role of excess analyst coverage on stock valuations and future returns, in Table I, Panels B and C, we sort firms on excess analyst coverage and external financing. We sort stocks into low (bottom 30th percentile), medium, and high (top 30th percentile) groups. The results in Panels B and C indicate that firms with high (low) analyst coverage are overvalued (undervalued) and realize lower (higher) future returns. This result is consistent with the evidence of Chung and Jo (1996) who show a positive association between analyst following and Tobin's q ratio.

In Table I, Panels D and E, we also sort firms on excess analyst coverage and investment rate. We compute the excess values at fiscal year-end. We compute the geometric future returns over a one-year period starting four months after the fiscal year-end. We do this to ensure that the information included in the annual report is available at the beginning of the return period. The results in Panels D and E show that holding the level of capital spending constant, low (high) excess analyst coverage is associated with undervaluation (overvaluation) and higher (lower) future returns.

The results always show that excess analyst coverage is positively associated with firms' external financing (capital spending).[8] The evidence suggests that information intermediaries play an important role in explaining the external financing (investment) of the firm. Our findings indicate that firms with abnormally high analyst coverage are associated with excessive external financing, overinvestment, higher valuations, and lower future returns. This finding is consistent with the hypothesis that analyst coverage is driven by the economic incentives of investment bankers.

B. Book-to-Market and Excess Analyst Coverage

The relations examined earlier and attributed to excess analyst coverage might be driven by the firms' book-to-market ratio proxying for overvaluation. To address this concern, we perform additional univariate tests. We double-sort firms into quintile portfolios based on book-to-market and on excess analyst coverage. We then compare the mean values of industry-adjusted external financing (investment rate) across extreme portfolios to examine whether the results presented in Table I persist after we control for book-to-market effects.

Panel A of Table II reports mean values of external financing for portfolios of firms created when we double sort on book-to-market and excess analyst coverage. Consistent with our hypothesis, the new evidence confirms that excess analyst coverage has a positive and significant association with the firm's external financing, indicating that firms with high (low) excess analyst coverage engage in more (less) external financing.

We note that the mean difference between the extreme excess analyst coverage portfolios of firms (Q5-Q1) is statistically significant at the 1% level for all five book-to-market portfolios.

[8] Using the corporate governance index of Gompers, Ishii, and Metrick (2003) to control for firm governance characteristics does not alter the findings of this study. These results are available upon request.

Table II. Industry-Adjusted External Financing and Industry-Adjusted Investment Rate for 25 Portfolios Formed on Book-to-Market and Excess Analyst Coverage

Panel A reports means of industry-adjusted external financing, and Panel B reports the means of industry-adjusted investment rate for 25 portfolios formed on book-to-market (*BM*) and excess analyst coverage (*EXCOVER*). Each portfolio consists of stocks belonging to different combinations of *BM* and *EXCOVER* quintiles. The number of firms in each cell appears in parentheses. Also reported is the difference in means between the top and bottom quintiles (Q5-Q1), and the corresponding *t*-statistic (in brackets). We compute the industry-adjusted values as the difference in the raw value of a variable and the median value of the variable in the firm's primary two-digit SIC industry. The sample spans the period 1980-2003. The *z* indicates that the mean value is not different from zero at the 5% significance level.

	Q1 Low *EXCOVER*	**Q2**	**Q3**	**Q4**	**Q5 High *EXCOVER***	**All Firms**	**Q5-Q1 [*t*-Stat.]**
Panel A. Industry-Adjusted External Financing for 25 Portfolios Formed on Book-to-Market and Excess Analyst Coverage							
Q1	0.0377	0.0893	0.1731	0.1785	0.2808	0.1598	0.2431***
Low *BM*	(1,176)	(1,128)	(1,183)	(1,335)	(1,505)	(6,327)	[9.62]
Q2	0.0265	0.0722	0.0979	0.1341	0.1697	0.1023	0.1432***
	(1,233)	(1,221)	(1,191)	(1,274)	(1,407)	(6,326)	[9.67]
Q3	0.0289^z	0.0260	0.0696	0.0901	0.1498	0.0711	0.1210***
	(1,363)	(1,281)	(1,263)	(1,220)	(1,194)	(6,321)	[3.54]
Q4	−0.0213	−0.0004^z	0.0265	0.0429	0.0789	0.0231	0.1002***
	(1,346)	(1,346)	(1,228)	(1,246)	(1,123)	(6,289)	[7.05]
Q5	−0.0437	−0.0388	−0.0227	−0.0017^z	0.0177^z	−0.0186	0.0613***
High *BM*	(1,168)	(1,339)	(1,383)	(1,304)	(1,107)	(6,301)	[4.57]
All firms	0.0058	0.0269	0.0657	0.0894	0.1497	0.0677	0.1439***
	(6,286)	(6,315)	(6,248)	(6,379)	(6,336)	(31,564)	[14.34]
Q5-Q1	−0.0813***	−0.1281***	−0.1959***	−0.1802***	−0.2631***	−0.1783***	
[*t*-Stat.]	[−6.48]	[−12.06]	[−12.57]	[−11.04]	[−10.03]	[−22.78]	
Panel B. Industry-Adjusted Investment Rate for 25 Portfolios Formed on Book-to-Market and Excess Analyst Coverage							
Q1	0.0031^z	0.0337	0.0608	0.0813	0.1285	0.0657	0.1254***
Low *BM*	(1,175)	(1,127)	(1,182)	(1,336)	(1,504)	(6,324)	[17.20]
Q2	−0.0185	0.0148	0.0282	0.0523	0.0793	0.0328	0.0978***
	(1,233)	(1,220)	(1,191)	(1,274)	(1,408)	(6,326)	[15.59]
Q3	−0.0229	−0.0045^z	0.0121	0.0351	0.0638	0.0154	0.0866***
	(1,363)	(1,282)	(1,264)	(1,220)	(1,195)	(6,324)	[14.90]
Q4	−0.0259	−0.0144	−0.0008^z	0.0162	0.0373	0.0011^z	0.0632***
	(1,349)	(1,353)	(1,233)	(1,248)	(1,124)	(6,307)	[11.52]
Q5	−0.0329	−0.0326	−0.0221	−0.0053^z	0.0212	−0.0150	0.0541***
High *BM*	(1,172)	(1,346)	(1,393)	(1,304)	(1,105)	(6,320)	[7.93]
All firms	−0.0197	−0.0021	0.0142	0.0363	0.0705	0.0199	0.0902***
	(6,292)	(6,328)	(6,263)	(6,382)	(6,336)	(31,601)	[31.19]
Q5-Q1	−0.0360***	−0.0662***	−0.0829***	−0.0866***	−0.1073***	−0.0810***	
[*t*-Stat.]	[−5.37]	[−10.00]	[−13.23]	[−12.92]	[−14.41]	[−26.33]	

***Significant at the 0.01 level.

The difference is much more pronounced in low book-to-market (growth) firms (0.2431 with a *t*-value of 9.62), which suggests that when their analyst coverage increases, they are more likely to raise larger amounts of capital than high book-to-market (value) firms. The difference in high book-to-market (value) firms is 0.0613 with a *t*-value of 4.57. Within each analyst coverage quintile, although value (high book-to-market) firms have significantly lower industry-adjusted external financing than do growth (low book-to-market) firms, the results also show that the external financing of value and growth firms increases as excess analyst coverage increases. Furthermore, with the exception of the highest excess coverage quintiles, the external financing for all high book-to-market firms (Q5) is below the industry median, but for low book-to-market (Q1) firms it exceeds the industry median.

To see if our previous results are sensitive to firm size, we replicate the above analysis by creating triple-sorted portfolios. We assign firms to low (bottom 30th percentile), medium (middle 40th percentile), or high (top 30th percentile) portfolios on the basis of independent annual sorts on book-to-market, size, and *EXCOVER*, respectively. This procedure ensures that within each *EXCOVER* portfolio we will have firms with roughly the same size and book-to-market characteristics. These results, not reported here for the sake of brevity,[9] provide supplemental evidence that supports the view that excess analyst coverage plays an important role in explaining the firm's external financing.

Jensen (2004, 2005) argues that managers' capital spending decisions are influenced by analysts' pressures. That is, while firms are expected to invest more when they raise capital, a positive relation between excessive analyst coverage and firm's investment is unlikely to emerge unless managers respond to analysts' pressures. Therefore, Jensen's (2004, 2005) conjecture predicts that excessive coverage leads to overinvestment. An alternative story is that when managers find that the external cost of financing is low because of investor sentiment, but have no good projects and as they are not under analysts' pressure to invest, they may decide to build up the financial slack of the firm by not investing (Myers and Majluf, 1984). Financial slack (excess cash holdings), is typically used by managers to repurchase shares when the market price of the stock declines. Hence, in the absence of analyst pressure and to the extent that analysts influence managerial investment decisions, external financing may not necessarily lead to overinvestment. To examine the merits of this hypothesis, we look at firms' industry-adjusted investment rate and excess coverage.

Panel B of Table II reports the industry-adjusted investment rate for 25 portfolios sorted by book-to-market and excess analyst coverage. The evidence, consistent with the results reported in Table I, shows that there is a strong, positive relation between the firm's industry-adjusted investment rate and excess analyst coverage. This result supports the view that firms with high (low) analyst coverage tend to invest more (less) than their industry peers. Consistent with Jensen's (2004, 2005) conjecture that analysts' impact on managers' capital spending decisions, this result suggests that to support their higher stock valuations, managers respond to analysts' expectations with greater investment activity. In addition, the evidence demonstrates that low book-to-market (growth) stocks with high analyst coverage have higher investment rates than do comparable stocks in the same industry. The mean difference between the high- and low-excess analyst coverage portfolios (Q5-Q1) for all book-to-market portfolios is consistently statistically significant at conventional levels.

However, the difference is more pronounced in the low book-to-market stocks (Q1). This result suggests that the effect of excess analyst coverage on investment is stronger in growth firms. The difference for the low book-to-market stocks (Q1) is 0.1254 (with a *t*-value of 17.2), but for the high book-to-market stocks (Q5) it is 0.0541 (with a *t*-value of 7.93).

[9]These results are available from the authors on request.

Our findings indicate that firms with high (low) excess analyst coverage have higher (lower) external financing and capital spending. We find that firms with excessive analyst coverage have excessive external financing, overinvestment, and higher excess values, while firms with low analyst coverage are found to be associated with lower external financing, underinvestment, and negative excess values. These results support the hypothesis that analyst coverage is driven by economic incentives and are consistent with the view that analyst coverage increases firm's external financing and investment by stirring up investor optimism and overconfidence in the analysts' excessive coverage signal, which in turn leads to an upward bias on share prices.

C. Multivariate Regression Results

If analyst coverage is driven by the economic incentives of investment bankers, then we conjecture that firms with high analyst coverage should experience excessive external financing and investment. To find out how the excess analyst coverage relates to the external financing of the firm, we run regressions, using the following model:

$$IA\_EF_t = \alpha_0 + \alpha_1 BM_t + \alpha_2 SIZE_t + \alpha_3 IA\_Q_{t-1} + \alpha_4 IA\_IR_{t-1} + \alpha_5 IA\_EF_{t-1} + \alpha_6 CF_{t-1} + \alpha_7 EXCOVER_t + \varepsilon_t, \quad (1)$$

where *IA_EF* is the dependent variable that measures the firm's industry-adjusted external financing. In this and the following regression we control for book-to-market (*BM*), size (*SIZE*), and lagged cash flow (*CF*) effects, as well as for the impact of the lagged *IA_IR*, *IA_EF*, and *IA_Q*. Here *CF* is measured by the ratio of net income before extraordinary items plus depreciation to net property, plant, and equipment; *IA_Q* is the firm's industry-adjusted investment opportunities measured as the industry adjusted Tobin's q ratio;[10] and *EXCOVER* is the excess analyst coverage measure.

We use the same specification, with the firm's industry-adjusted investment rate, *IA_IR*, as the dependent variable, to examine the relation between excessive analyst coverage and firm's investment rate.

$$IA\_IR_t = \alpha_0 + \alpha_1 BM_t + \alpha_2 SIZE_t + \alpha_3 IA\_Q_{t-1} + \alpha_4 IA\_IR_{t-1} + \alpha_5 IA\_EF_{t-1} + \alpha_6 CF_{t-1} + \alpha_7 EXCOVER_t + \varepsilon_t. \quad (2)$$

We test both of these models by using both ordinary least squares (OLS) regressions with heteroskedasticity-adjusted standard errors and panel data (fixed-effects) regressions.[11] We include the lagged cash flow variable in the regression analysis because other studies show that cash flow explains capital expenditures (see, e.g., Fazzari, Hubbard, and Petersen, 1998) and, therefore, it may also influence the firm's external financing and investment.

If analysts' decision to cover a particular firm depends on firm-specific characteristics, the positive relation between analyst coverage and firm's financing does not automatically establish causation. For example, firms that have good investment opportunities but limited funds are more likely to seek external financing, and thus draw the attention of various investment banks and

[10] Gertner, Powers, and Scharfstein (2002), among others, use Tobin's q to capture investment opportunities. The industry-adjusted q is computed as: ((Tobin's q for firm i) – (median value of the Tobin's q for all firms in firm i's primary two-digit SIC industry)). Tobin's q is measured as: (market value of common equity + preferred stock liquidating value + book value of long-term debt + (short-term debt – short-term assets))/total assets.

[11] For the sake of brevity we do not report these results, but they are available on request.

their security analysts. That is, we could treat the choice of the depth of analyst coverage as an endogenous variable. Therefore, we need to control for the possible endogeneity of analyst coverage in evaluating its effects on firm's external financing (investment). If there is endogeneity between analyst coverage and external financing (investment), then the estimation of the coefficient of *EXCOVER* using OLS regressions will be biased. To control for the potential endogeneity problem of excess analyst coverage, we conduct tests relying on fixed-effects two-stage least squares (2SLS) regressions and Heckman's (1979) self-selection estimation procedure.

1. 2SLS

First, we use a fixed-effects 2SLS method and model the analyst coverage as a function of industry and firm characteristics:

$$\begin{aligned} EXCOVER_t = {} & \beta_0 + \beta_1 BM_t + \beta_2 SIZE_t + \beta_3 IA\_Q_{t-1} + \beta_4 IA\_IR_{t-1} + \beta_5 IA\_EF_{t-1} \\ & + \beta_6 CF_{t-1} + \beta_7 (NSEG)_t + \beta_8 (1/PRICE)_t + \beta_9 RET_{t-1} \\ & + \beta_{10} TRENDCOV_t + \beta_{11} VARRET_{t-1} + c_i + \mu_t, \end{aligned} \tag{3}$$

where c_i is the unobserved heterogeneity, assumed constant over time, and μ_t is the time-varying error. Following previous studies (see, e.g., Brennan and Hughes, 1991) we use the reciprocal of the share price at the beginning of each fiscal year, 1/*PRICE*, as an explanatory variable of analyst coverage in this model. Also, to control for the effect of the firm's degree of diversification on *EXCOVER*, we include the number of business segments, *NSEG*, as a second instrumental variable.[12] In addition, following Brennan and Hughes (1991), we include the average monthly return over the past 12 months, *RET*, and the variance of the daily returns over the 200-day period preceding the month in which we measure analyst coverage (*VARRET*) in the first-stage estimation.

To ensure that the analysis is not plagued by the endogeneity of analyst coverage, we must identify at least one instrumental variable that is not related to firms' financing and investment. Such a candidate is a variable that describes differences in analyst coverage trends between the firm's primary industry and other industries. We define this variable, *TRENDCOV*, as the percentage difference between the median analyst coverage in the firm's two-digit SIC industry and the median analyst coverage in the firm's primary four-digit SIC industry. Here *TRENDCOV* captures industry-wide shifts in analyst coverage that are unlikely to be related to firm-specific investment and financing decisions and compares the median analyst coverage of the firm's narrowly defined industry (four-digit SIC) to that of other related industries (two-digit SIC).[13] It follows that a high *TRENDCOV* value indicates that the trend in analyst coverage has tilted away from the firm's primary industry toward other industries. Therefore, we expect *TRENDCOV* to be negatively associated with *EXCOVER*.

[12] Since the excess analyst coverage measure is similar to the Berger and Ofek (1995) excess valuation measure that relies on business segment information, it is important to control for the effect of the number of business segments on the level of *EXCOVER*. Descriptive statistics indicate that the level of *EXCOVER* declines with the number of business segments.

[13] For example, take SIC industry 7375 ("Online Services"), which for a number of years in the late 1990s was heavily followed by security analysts relative to other related industries in the two-digit SIC industry range of 73 ("Business Services"). Note that the first digit of the SIC code designates a major economic division, such as "Services" (e.g., one-digit SIC code 7). The second digit designates an economic major group, such as "Business Services" (e.g., two-digit SIC code 73). The third digit designates an industry group, while the fourth digit fine-tunes the hierarchical structure into a specific industry, such as "Online Services" (i.e., SIC code 7375).

We then use the predicted coverage from Equation (3) as an instrument for the excess analyst coverage in evaluating its effect on the firm's industry-adjusted external financing using model (1). We also use model (2) to gauge the association between firm's investment rate and excess analyst coverage. By using this procedure we can purge the excess analyst coverage measure from firm- and industry-specific characteristics and use the predicted excess analyst coverage to examine its influence on firms' external financing (investment) decisions.

2. Heckman's Self-Selection Method

We also construct an endogeneous self-selection model. We use Heckman's (1979) two-step correction procedure to control for analysts' self-selection bias when we examine the effect of excess analyst coverage on the firm's investment rate and external financing as a function of firm and industry characteristics. We denote the variable of interest by F_{it}, where F_{it} stands for the external financing IA_EF_{it} (investment rate, IA_IR_{it}). We model F_{it} as

$$F_{it} = \alpha_0 + \alpha_1 X_{it} + \alpha_2 EXCOVDUM_{it} + \varepsilon_{it}, \tag{4}$$

where *EXCOVDUM* is a dummy variable that takes the value of one if *EXCOVER* is greater than zero, and zero if *EXCOVER* is either equal to or less than zero; X_{it} is a set of exogenous observable characteristics of the firm; α equals (α_0, α_1, α_2) and is a vector of parameters to be estimated; and ε_{it} is an error term.

Our hypothesis is that firms selected by an abnormally large number of analysts (i.e., firms with $EXCOVER > 0$) do not represent a random sample of firms. If the decision of the analysts to undertake extensive coverage is correlated with F_{it} (i.e., with the firms' investment rate, or external financing), the $EXCOVDUM_{it}$ variable will be correlated with the error term in Equation (4), and therefore, the OLS estimate of α_2 will be biased. We assume that analysts' decision to engage in a certain level of coverage is determined by

$$EXCOVER^*_{it} = \beta Z_{it} + \mu_{it} \tag{5}$$

$$EXCOVDUM_{it} = 1 \quad \text{if} \quad EXCOVER^*_{it} > 0$$

$$EXCOVDUM_{it} = 0 \quad \text{if} \quad EXCOVER^*_{it} \leq 0,$$

where $EXCOVER^*_{it}$ is an unobservable latent variable, Z_{it} is a set of firm and industry characteristics that are likely to affect analysts' coverage decision, and μ_{it} is an error term.

The correlation between $EXCOVDUM_{it}$ and ε_{it} in Equation (4) emerges when some of the exogenous variables in the *EXCOVER* equation affect F_{it}. However, we do not include them as regressors in Equation (4), or when the error terms ε_{it} and μ_{it} are correlated. In either case, the estimation of α_2 using OLS will be biased.

Following Heckman's (1979) two-step procedure, we first estimate Equation (5) using a probit model to get consistent estimates of β. We then use these estimates to obtain estimates of λ, the correction for self-selection (a.k.a., the inverse Mills ratio).

In the second step we get α_λ by estimating

$$F_{it} = \alpha_0 + \alpha_1 X_{it} + \alpha_2 EXCOVDUM_{it} + \alpha_\lambda \lambda + \eta_{it}, \tag{6}$$

where a significant α_λ indicates that there is self-selection bias.

Moreover, the sign of α_λ indicates whether the OLS model over- or underestimates the impact of $EXCOVER_{it}$ on F_{it}. The probit model that we estimate in the first step is similar to the one in Equation (3), using the high/low coverage dummy (*EXCOVDUM*) as the left-hand side variable.

$$\begin{aligned} EXCOVDUM_t = {} & \beta_0 + \beta_1 BM_t + \beta_2 SIZE_t + \beta_3 IA\_Q_{t-1} + \beta_4 IA\_IR_{t-1} \\ & + \beta_5 IA\_EF_{t-1} + \beta_6 CF_{t-1} + \beta_7 (NSEG)_t + \beta_8 (1/PRICE)_t \\ & + \beta_9 RET_{t-1} + \beta_{10} TRENDCOV_t + \beta_{11} VARRET_{t-1} + \mu t. \end{aligned} \tag{7}$$

We perform the second-step estimation for *IA_EF* (*IA_IR*) using the following model, which is similar to model (1), except that it uses *EXCOVDUM* instead of *EXCOVER* and it includes the inverse Mills ratio, λ.

$$\begin{aligned} IA\_EF_t = {} & \alpha_0 + \alpha_1 BM_t + \alpha_2 SIZE_t + \alpha_3 IA\_Q_{t-1} + \alpha_4 IA\_IR_{t-1} \\ & + \alpha_5 IA\_EF_{t-1} + \alpha_6 CF_{t-1} + \alpha_7 EXCOVDUM_t + \alpha_\lambda \lambda + \mu_{it}. \end{aligned} \tag{8}$$

An insignificant coefficient of Mills ratio, lambda (λ), would imply that analysts' selection bias was not empirically relevant. That is, characteristics that make firms targets of excessive analyst coverage due to analysts' self-selection bias, arising from investment-banking interests and trading revenues, are not significantly correlated with firms' external financing (investment). To control for potential endogeneity problems in excess analyst coverage, we conduct these two tests as outlined above.

3. 2SLS Results

Table III reports the results from two alternative 2SLS firm-year fixed-effects regression models of the endogenous relation between excess analyst coverage and industry-adjusted external financing (*IA_EF*, Models a and b) and investment rate (*IA_IR*, Models c and d), respectively. *TRENDCOV* has a negative and significant coefficient.

In the second set of regressions, we examine the role of excess analyst coverage on firms' external financing. Our key conclusion from Models a and b is that there is a strong, positive association between external financing and analyst coverage. The evidence suggests that firms with excess analyst coverage tend to have higher external financing than do their industry peers with low coverage. In both regressions (Models a and b), the coefficient of the excess analyst coverage variable is statistically significant at the 1% level.

Consistent with our previous evidence, excess analyst coverage invariably has a positive, significant influence on the firm's external financing, even though the relation between *IA_EF* and *EXCOVER* in the first-stage regression is also positive and significant. The positive relation between analyst coverage and external financing is consistent with the view that high (low) excess analyst coverage does encourage greater (lower) external financing. Hence, the data support the notion that greater capital allocation takes place in response to analysts' excessive coverage.

The regression results also demonstrate a positive and significant relation between lagged *IA_Q* and external financing, indicating that external financing increases considerably for firms with high growth opportunities. The coefficients of the lagged *IA_IR* variable indicate that firms that invest more than do their industry peers raise more capital as well. This relation is positive and significant in both regressions.

The association between lagged cash flows and external financing is also positive and statistically significant. This result is consistent with the view that firms with low cash flows tend

Table III. Two-Stage Least Squares Fixed Effects Regressions

This table reports coefficients and corresponding *t*-statistics (in brackets) using a two-stage least squares fixed effects model of the endogenous relation between excess analyst coverage and industry-adjusted external financing (*IA_EF,* Models a and b), and investment rate (*IA_IR,* Models c and d), respectively. The model estimates are based on the structural model specification of external financing (investment) (1). In the first stage, we estimate *EXCOVER*. In the second stage, we use the fitted values from the first stage as an instrument and examine its effects on *IA_EF* (Models a and b) and *IA_IR* (Models c and d), respectively. We compute the industry-adjusted values as the difference in the raw value of a variable and the median value of the variable in the firm's primary two-digit SIC industry.

Variable	External Financing Models				Investment Rate Models			
	Model a		Model b		Model c		Model d	
	Dep. Variable: $EXCOVER_T$	Dep. Variable: IA_EF_T	Dep. Variable: $EXCOVER_T$	Dep. Variable: IA_EF_T	Dep. Variable: $EXCOVER_T$	Dep. Variable: IA_IR_T	Dep. Variable: $EXCOVER_T$	Dep. Variable: IA_IR_T
Intercept	1.3523***	−0.4701***	1.5318***	−0.4623	1.3523***	−0.0306***	1.5318***	−0.0108
	[31.76]	[−18.41]	[29.44]	[−14.66]	[31.76]	[−2.94]	[29.44]	[−0.80]
BM_T	−0.0779***	0.0209***	−0.1022***	0.0260***	−0.0779***	−0.0082***	−0.1022***	−0.0083***
	[−8.66]	[4.12]	[−9.02]	[4.19]	[−8.66]	[−3.97]	[−9.02]	[−3.14]
$SIZE_T$	−0.2402***	0.0922***	−0.2637***	0.0913***	−0.2402***	0.0087***	−0.2637***	0.0047*
	[−37.73]	[19.34]	[−34.22]	[15.48]	[−37.73]	[4.46]	[−34.22]	[1.85]
IA_IR_{T-1}	0.4488***	0.0937***	0.4016***	0.0825***	0.4488***	0.1056***	0.4016***	0.0916***
	[14.03]	[4.84]	[10.08]	[3.17]	[14.03]	[13.36]	[10.08]	[9.60]
IA_Q_{T-1}	0.0390***	0.0510***	0.0835***	0.0510***	0.0390***	0.0128***	0.0835***	0.0240***
	[10.55]	[24.53]	[13.42]	[14.20]	[10.55]	[15.06]	[13.42]	[15.63]
IA_EF_{T-1}	0.0632***	−0.1125***	0.0815***	−0.1052***	0.0632***	0.0250***	0.0815***	0.0164***
	[5.70]	[−18.85]	[5.53]	[−13.86]	[5.70]	[10.26]	[5.53]	[5.04]
CF_{T-1}	−0.0001	0.014***	−0.0011	0.0084***	−0.0001	0.0096***	−0.0011	0.0107***
	[−0.02]	[6.38]	[−0.28]	[4.23]	[−0.02]	[14.50]	[−0.28]	[12.55]
$EXCOVER_T$		0.1938***		0.2184***		0.0650***		0.0563***
		[10.07]		[9.96]		[8.26]		[5.99]

Table III. Two-Stage Least Squares Fixed Effects Regressions (*Continued*)

Variable	External Financing Models				Investment Rate Models			
	Model a		Model b		Model c		Model d	
	Dep. Variable: $EXCOVER_T$	Dep. Variable: IA_EF_T	Dep. Variable: $EXCOVER_T$	Dep. Variable: IA_EF_T	Dep. Variable: $EXCOVER_T$	Dep. Variable: IA_IR_T	Dep. Variable: $EXCOVER_T$	Dep. Variable: IA_IR_T
$NSEG_T$	−0.0758***		−0.0793***		−0.0758***		−0.0793***	
	[−9.59]		[−8.54]		[−9.59]		[−8.54]	
$1/PRICE_T$	−0.9430***		−0.7564***		−0.9430***		−0.7564***	
	[−18.23]		[−10.50]		[−18.23]		[−10.50]	
RET_{T-1}	0.0136**		0.0169**		0.0136**		0.0169**	
	[2.19]		[1.96]		[2.19]		[1.96]	
$TRENDCOV_T$	−0.1174***		−0.1127***		−0.1174***		−0.1127***	
	[−17.72]		[−13.83]		[−17.72]		[−13.83]	
$VARRET_{T-1}$			−47.160***				−47.160***	
			[−6.48]				[−6.48]	
N	24,298	24,240	17,428	17,387	24,298	24,249	17,428	17,395
No. of firms	4,552	4,548	4,263	4,257	4,552	4,548	4,263	4,258
F-value	228.99	293.17	165.47	165.71	228.99	272.74	165.47	188.51
Prob > F	0	0	0	0	0	0	0	0
R^2	0.2473	0.0544	0.2581	0.0459	0.2473	0.1280	0.2581	0.1237

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

to have less external financing. That is, firms with low cash-flow-generating ability eventually become credit constrained.

The regression results of Model b indicate that *EXCOVER* has a strong positive impact on firms' external financing. These findings are consistent with our univariate results reported in Table I. A similar relation emerges between the firm's investment rate *IA_IR* and *EXCOVER* in Models c and d. The positive association between analyst coverage and investment suggests that high (low) excess analyst coverage does encourage greater capital spending.

The regression results also point out that firms with high growth opportunities (*IA_Q*) tend to invest more. Consistent with previous studies, our results show that there is a positive, significant link between lagged cash flow and investment spending, implying that firms with higher cash flow availability tend to invest more. These findings suggest that abnormal analyst coverage results in excessive external financing (i.e., inefficient allocation of capital) and overinvestment problems.

While these findings indicate that excess analyst coverage is likely to be higher for firms with high external financing and capital spending, excess analyst coverage remains an important determinant of the firm's future external financing and investment. As shown in the second-stage regressions of Models a- d, the coefficient of the *EXCOVER* variable is statistically significant at the 1% level. The remaining independent and instrumental variables have the expected coefficient signs.

4. Self-Selection Regression Results

To address the potential self-selection bias in analysts' coverage, we conduct tests using Heckman's (1979) self-selection two-step estimation procedure as outlined above. Table IV presents the results.

We present our regression results on the relation between analyst coverage and external financing in Models a and b, respectively. In both models, the coefficients of the *EXCOVDUM* variable remain positive and significant at conventional levels. The coefficient of Mills λ is negative and significant for the external financing model, suggesting that the corresponding OLS coefficient of the *EXCOVDUM* variable is understated.

When we correct for analysts' self-selection bias, the evidence continues to support the view that analyst coverage has a positive, significant impact on firms' external financing decisions. The remaining independent variables mostly behave as in the previous models. The last two regressions (c and d) show a similar positive relation between analyst coverage and firms' investment rate. However, self-selection bias is not prevalent, since Mills λ does not enter the last two regressions with a significant coefficient. Hence, correction for self-selection bias in the investment regressions is unnecessary.

From the evidence in the 2SLS fixed effects and the self-selection models (reported in Tables III and IV, respectively) we conclude that the relation between analyst coverage external financing (investment rate) of the firm remain robust even after we control for endogeneity problems in analyst coverage. These results offer additional support for the hypothesis that analyst coverage plays an important role in explaining the firm's external financing and investment. The positive, significant relation between excess analyst coverage and firms' excessive external financing and overinvestment also suggests that analyst coverage is motivated by investment-banking economic incentives.

5. Excess Coverage and Internal Capital Markets: Conglomerate Tests

Because conglomerates (multidivisional large firms), on average, receive less analyst coverage (Panel A of Table I) and tend to rely more on internal capital markets for investment financing,

Table IV. Heckman's Self-Selection Two-Stage Regressions

This table reports self-selection bias corrected regression coefficients and corresponding t-statistics (in brackets) using Heckman's (1979) estimation procedure. Following Heckman, we first estimate the probability of providing a high level of coverage by using a probit model to get consistent estimates of coefficients. We then use these estimates to obtain estimates of the correction for self-selection. In the second step, we estimate *IA_EF* (Models a and b) and *IA_IR* (Models c and d), respectively, while also providing the correction for self-selection bias, as reflected in the coefficient of the Mills λ. We compute the industry-adjusted values as the difference in the raw value of a variable and the median value of the variable in the firm's primary two-digit SIC industry.

Variable	External Financing Models				Investment Rate Models			
	Model a		Model b		Model c		Model d	
	Probit Model Dep. Var.: $EXCOVDUM_T$	Second-Stage Dep. Var.: IA_EF_T	Probit Model Dep. Var.: $EXCOVDUM_T$	Second-Stage Dep. Var.: IA_EF_T	Probit Model Dep. Var.: $EXCOVDUM_T$	Second-Stage Dep. Var.: IA_IR_T	Probit Model Dep. Var.: $EXCOVDUM_T$	Second-Stage Dep. Var.: IA_IR_T
Intercept	1.8159***	−0.2373***	1.8824***	−0.2164***	1.8158***	−0.0304***	1.8820***	−0.0254***
	[38.55]	[−10.51]	[32.39]	[−8.13]	[38.56]	[−3.31]	[32.39]	[−2.23]
BM_T	−0.0891***	−0.0023	−0.0890***	−0.0028	−0.0886***	−0.0067***	−0.0885***	−0.0053***
	[−6.03]	[−0.62]	[−4.99]	[−0.67]	[−6.00]	[−4.53]	[−4.96]	[−2.99]
$SIZE_T$	−0.2952***	0.0308***	−0.3119***	0.0286***	−0.2952***	0.0030***	−0.3121***	0.0022*
	[−42.25]	[12.71]	[−36.68]	[9.80]	[−42.26]	[3.08]	[−36.70]	[1.74]
IA_IR_{T-1}	0.9340***	0.0575***	0.8762***	0.0448***	0.9316***	0.4574***	0.8725***	0.4406***
	[16.61]	[3.72]	[12.97]	[2.56]	[16.57]	[73.05]	[12.93]	[59.19]
IA_Q_{T-1}	0.1076***	0.0336***	0.1901***	0.0376***	0.1077***	0.0082***	0.1901***	0.0147***
	[16.63]	[21.59]	[18.08]	[13.29]	[16.65]	[11.25]	[18.09]	[12.20]
IA_EF_{T-1}	0.2123***	0.0365***	0.2073***	0.0479***	0.2127***	0.0158***	0.2079***	0.0102***
	[8.90]	[6.64]	[7.29]	[7.21]	[8.92]	[7.10]	[7.31]	[3.61]
CF_{T-1}	−0.0064*	0.0029***	−0.0060	0.0040***	−0.0063*	0.0046***	−0.0060	0.0040***
	[−1.86]	[3.37]	[−1.62]	[4.39]	[−1.85]	[13.03]	[−1.61]	[10.40]

Table IV. Heckman's Self-Selection Two-Stage Regressions (*Continued*)

Variable	External Financing Models				Investment Rate Models			
	Model a		Model b		Model c		Model d	
	Probit Model Dep. Var.: $EXCOVDUM_T$	Second-Stage Dep. Var.: IA_EF_T	Probit Model Dep. Var.: $EXCOVDUM_T$	Second-Stage Dep. Var.: IA_EF_T	Probit Model Dep. Var.: $EXCOVDUM_T$	Second-Stage Dep. Var.: IA_IR_T	Probit Model Dep. Var.: $EXCOVDUM_T$	Second-Stage Dep. Var.: IA_IR_T
$EXCOVDUM_T$		0.2153***		0.1908***		0.0254***		0.0238**
		[9.63]		[7.36]		[2.79]		[2.14]
$NSEG_T$	−0.2440***		−0.2464***		−0.2441***		−0.2464***	
	[−23.10]		[−19.45]		[−23.11]		[−19.44]	
$1/PRICE_T$	−0.8032***		−0.5683***		−0.8005***		−0.5689***	
	[−11.05]		[−5.70]		[−11.03]		[−5.71]	
RET_{T-1}	0.0307**		0.0398**		0.0306**		0.0393**	
	[2.21]		[2.18]		[2.19]		[2.15]	
$TRENDCOV_T$	−0.1165***		−0.1130***		−0.1157***		−0.1129***	
	[−10.18]		[−8.33]		[−10.13]		[−8.33]	
$VARRET_{T-1}$		−0.0978***	−16.5763	−0.0859***		−0.0054	−15.7854	−0.0071
Mills λ		[−7.13]	[−1.63]	[−5.41]		[−0.97]	[−1.56]	[−1.04]
N	24,240	24,240	17,387	17,387	24,249	24,249	17,395	17,395
Chi-squared	4,100.47	4,609.64	3,124.83	3,111.07	4,102.12	12,856.23	3,127.33	8,710.71
[Prob > chi-sq.]	[0]	[0]	[0]	[0]	[0]	[0.0000]	[0]	[0]
Pseudo R^2-	0.1267		0.1348		0.1267		0.1349	

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

we expect excess coverage to have only a very weak impact on their financing and investment decisions. We address this issue by replicating our previous tests for the subsample of multisegment firms. We report the results in Table V.

Our results suggest that conglomerates' external financing and investment are not affected by excess analyst coverage. In both financing Models a and b, the *EXCOVER* and *EXCOVDUM* variables enter the regressions with a positive but insignificant coefficient. We also observe the insignificant impact of analyst coverage in the investment regressions. We conclude that excess analyst coverage does not have a bearing on the financing and investment decisions of conglomerates. In the remaining tests we use the entire sample even though the inclusion of multisegment firms tends to weaken the power of our tests.

6. Additional Empirical Results: Sensitivity Analysis by Year and Industry

To examine whether the positive association between analyst coverage and external financing (investment) is year and industry sensitive, we replicate the analysis by year and industry. Following the sector definition of Fama and French (1997), we use 12 industries. Table VI reports these results.

In Table VI, Panel A, the coefficients of *EXCOVER* (2SLS regression estimates) and *EXCOVDUM* (self-selection regression estimates) variables based on the external financing regression models indicate that throughout the 1981-2003 period they are mostly positive and statistically significant. The coefficient of the *EXCOVER* variable is statistically significant in 19 out of the 21 years, and the coefficient of the *EXCOVDUM* variable has a statistically significant coefficient in 18 out of the 21 years. These findings do not appear to be driven by year effects.

Panel B shows that the relation between analyst coverage and external financing is positive and statistically significant in most industries. However, this association is not statistically significant in both models for the telecommunications, utilities, and money and finance industries. The relation between analyst coverage and financing, especially in the telecommunications sector, is surprising, in the light of the widely held view that analysts systematically sacrifice objectivity, for example in the WorldCom debacle. A possible explanation for this result is that the external financing of telecom firms may be influenced by factors other than analysts' excessive coverage. Heavy coverage of this industry by the mass media may be the reason why the excess coverage variable does not appear to have a strong influence on external financing. Private information provided by managers to analysts may have already been disseminated to the public through managers' media interviews and other means of disclosure. This result also suggests that the practice of nonselective disclosure and less analyst involvement is probably more prevalent in this sector than in other industries. An alternative explanation for this result could be that security analysis of the telecommunication firms was dominated by a small number of star analysts.

The weak influence of analyst coverage on firms' financing in the utilities, and money and finance sectors is less surprising, given the nature of these industries. On the one hand, the role of analysts is less crucial in the money and finance sector, because the capital markets are the business domain of firms in this industry. Thus, firms' expertise in financial markets makes them less reliant on security analysts when they raise capital. On the other hand, firms in the utilities industry are regulated and known to have more stable cash flows and predictable financing patterns.

Although the link between analyst coverage and financing remains almost always positive, its significance varies across industry sectors.

Table V. Two-Stage Least Squares Fixed Effects and Heckman's Self-Selection Regressions for Diversified Firms (Conglomerates)

This table reports coefficients and corresponding *t*-statistics (in brackets) for the second-stage regression of two-stage least squares (2SLS) fixed effects and Heckman (1979) self-selection models using the subsample of industrially diversified firms (conglomerates). The dependent variables are the industry-adjusted external financing (*IA_EF,* Models a, b, c, and d) and the investment rate (*IA_IR,* Models e, f, g, and h), respectively. We compute the industry-adjusted values as the difference in the raw value of a variable and the median value of the variable in the firm's primary two-digit SIC industry. Industry-adjusted values are computed as the difference in the raw value of a variable and the median value of the variable in the firm's primary two-digit SIC industry.

Variable	External Financing Models				Investment Rate Models			
	2SLS Models		Heckman (1979) Self-Selection Models		2SLS Models		Heckman (1979) Self-Selection Models	
	Model a	Model b	Model c	Model d	Model e	Model f	Model g	Model h
Intercept	−0.2550***	−0.2382***	−0.0546	−0.0978	−0.0024	0.0314	0.0524	0.0515
	[−7.50]	[−5.11]	[−0.60]	[−1.47]	[−0.15]	[1.40]	[1.06]	[1.13]
BM_T	0.0426***	0.0197***	−0.0123	−0.0001	0.0013	−0.0046	−0.0049	−0.0067*
	[6.25]	[4.39]	[−1.42]	[−0.02]	[0.43]	[−1.11]	[−1.48]	[−1.81]
$SIZE_T$	0.0426***	0.0413***	0.0092	0.0113*	−0.0023	−0.0079*	−0.0062	−0.0067
	[3.06]	[4.39]	[1.09]	[1.65]	[−0.70]	[−1.74]	[−1.27]	[−1.40]
IA_IR_{T-1}	0.0971***	0.0905**	0.0974*	0.0393	0.0389**	−0.0293	0.4726***	0.4255***
	[3.06]	[2.28]	[1.87]	[0.80]	[2.49]	[−1.53]	[12.65]	[8.43]
IA_Q_{T-1}	0.1259***	0.1403***	0.0165	0.0731***	0.0547***	0.0661***	0.0177***	0.0317***
	[16.12]	[13.11]	[0.77]	[3.75]	[14.25]	[12.80]	[2.95]	[2.95]

Table V. Two-Stage Least Squares Fixed Effects and Heckman's Self-Selection Regressions for Diversified Firms (Conglomerates) (*Continued*)

Variable	External Financing Models				Investment Rate Models			
	2SLS Models		Heckman (1979) Self-Selection Models		2SLS Models		Heckman (1979) Self-Selection Models	
	Model a	Model b	Model c	Model d	Model e	Model f	Model g	Model h
IA_EF_{T-1}	−0.1384***	−0.1473***	0.1060**	0.1334**	0.0107	0.0356***	−0.0176	−0.0085
	[−10.01]	[−7.37]	[2.16]	[2.42]	[1.58]	[3.69]	[−0.69]	[−0.24]
CF_{T-1}	0.0082	0.0054	0.0100	0.0000	0.0078***	0.0033	0.0117***	0.0102**
	[1.56]	[0.88]	[1.35]	[0.01]	[3.00]	[1.10]	[2.95]	[2.41]
$EXCOVER_T$	0.0291	0.0376	0.0509	0.1149	0.0061	−0.0041	−0.0730	−0.0559
$EXCOVDUM_T$	[1.12]	[1.14]	[0.48]	[1.60]	[0.48]	[−0.26]	[−1.35]	[−1.15]
Mills λ			−0.0048	−0.0547			0.0505	0.0383
			[−0.07]	[−1.25]			[1.06]	[1.28]
N	6,214	4,511	6,214	4,511	6,215	4,512	6,215	4,512
No. of firms	1,286	1,210	1,286	1,210	1,286	1,210	1,286	1,210
F-value	62.91	43.72	24.07	18.95	39.35	27.72	72.97	66.00
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R^2	0.0129	0.0341	0.0528	0.0893	0.0304	0.0304	0.2282	0.2105

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

Table VI. Two-Stage Least Squares Fixed Effects and Self-Selection Results by Year and Industry

Panel A reports coefficients and corresponding *t*-statistics (in brackets) for the excess coverage variable obtained from year-by-year estimations of the two-stage least squares (2SLS) fixed effects and the Heckman (1979) self-selection bias models of the endogenous relation between excess analyst coverage and industry-adjusted external financing and investment rate, respectively. Panel B reports coefficients and corresponding *t*-statistics (in brackets) for the excess coverage variable we obtain from industry-by-industry estimations of the 2SLS and the Heckman self-selection bias models of the endogenous relation between excess analyst coverage and industry-adjusted external financing and investment rate, respectively. We use a 12-industry sector definition as in Fama and French (1997).

Panel A. 2SLS and Self-Selection Results by Year

Year	External Financing Models			
	2SLS Model		Self-Selection Model	
	***EXCOVER* Coefficient**	***t*-Statistic**	***EXCOVDUM* Coefficient**	***t*-Statistic**
1981	0.0250**	2.15	0.0819*	1.84
1982	0.0429***	3.30	0.0901***	2.70
1983	0.0924***	4.37	0.2100***	3.29
1984	0.1139***	3.20	0.1941**	2.52
1985	0.0189	0.76	0.0688	1.33
1986	−0.0067	0.19	−0.1634*	−1.67
1987	0.0764***	2.74	0.1513	1.46
1988	0.0609***	3.07	0.1890*	1.78
1989	0.0675***	2.71	0.1867***	2.59
1990	0.0962***	2.56	0.5757***	3.77
1991	0.0855***	5.11	0.2626***	4.49
1992	0.1068***	5.12	0.3230***	3.49
1993	0.0955***	2.96	0.1675*	1.65
1994	0.1084***	3.75	0.2777***	3.49
1995	0.1245***	3.58	0.2387*	1.70
1996	0.0704	1.15	0.0540	0.48
1997	0.2036***	5.16	0.3344***	3.52
1998	0.1249***	3.01	0.2119*	1.93
1999	0.2445***	2.83	0.3818**	2.30
2000	0.4218***	4.79	1.2009***	6.73
2001	0.2668***	6.31	0.6131***	5.35
2002	0.1436***	4.91	0.4390***	3.18
2003	−0.0097	−0.25	−0.2489**	−2.10
Number positive	21		21	
Number positive & significant	19		18	

Panel B. 2SLS and Self-Selection Results by Industry

Fama-French 12-Industry Sectors	External Financing Models	
	2SLS Model	Self-Selection Model
	***EXCOVER* Coefficient [*t*-Statistic]**	***EXCOVDUM* Coefficient [*t*-Statistic]**
Consumer nondurables	0.1308** [2.37]	0.1200** [2.07]

Table VI. Two-Stage Least Squares Fixed Effects and Self-Selection Results by Year and Industry (*Continued*)

Panel B. 2SLS and Self-Selection Results by Industry (Continued)

Fama-French 12-Industry Sectors	External Financing Models	
	2SLS Model	Self-Selection Model
	***EXCOVER* Coefficient [*t*-Statistic]**	***EXCOVDUM* Coefficient [*t*-Statistic]**
Consumer durables	0.2928***	0.0377
	[4.38]	[0.66]
Manufacturing	0.0186	0.0889***
	[0.55]	[3.00]
Energy	0.0460	0.2278**
	[0.27]	[2.47]
Chemicals and allied products	−0.0254	0.1044**
	[−0.44]	[2.09]
Business equipment	0.4645***	0.2233***
	[7.68]	[3.26]
Telecommunications	−0.1373	0.1499
	[−1.34]	[0.71]
Utilities	0.0322	−0.0004
	[0.77]	[−0.02]
Wholesale, retail, and some services	0.1054**	0.0969**
	[2.42]	[2.37]
Health care	0.3164***	0.1809
	[3.16]	[1.25]
Money and finance	0.0232	0.3604
	[0.38]	[1.42]
Other	0.0939**	0.3331***
	[2.09]	[4.09]
Number positive	10	11
Number positive & significant	6	7

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

7. Additional Empirical Results: Analyst Coverage Initiations

Finally, we examine analyst coverage initiations (*INIT*).[14] The motivation behind the use of analyst coverage initiations is to determine whether the relation between excessive coverage and external financing (investment) is driven by an omitted factor. Since analyst coverage initiations represent distinct coverage changes in a specific direction (i.e., increased coverage), by using them we can gain additional insights into the relationship between coverage and firms' external financing (investment).

Analyst coverage initiation represents the first report produced by an analyst about a stock. Analyst initiations appear to be important corporate events that receive considerable media coverage that, in turn, enhance investor recognition and stocks' liquidity. Consequently, our hypothesis predicts a positive, significant association between analyst coverage initiations and firms' external financing.

[14]We would like to thank an anonymous referee for this suggestion.

In our study we define analyst initiations when brokerage firms previously not covering a firm start their coverage. Thus, we measure analyst initiation by the number of new brokerage companies that initiated analyst coverage. We identify initial coverage, following the procedure of Irvine (2003) and McNichols and O'Brien (1997). First, we identify the first appearance date of a specific brokerage firm in the IBES database, based on the availability of one-year-ahead earnings forecasts. We then determine all companies followed by that brokerage firm's analysts for the first six months following the date the brokerage firm made its first appearance in IBES. We allow the first six-month period to control for the first appearance of a brokerage firm on IBES, as opposed to the first coverage of a company followed by that brokerage firm. Finally, we identify initial coverage as any new coverage of a company not followed by that brokerage firm in the first six months the brokerage firm appeared on IBES.[15]

Table VII reports the results. Panel A reports 2SLS regression results when we use the *INIT* variable to capture the influence of analyst coverage initiations on external financing (investment). Panel B presents Heckman's (1979) self-selection regression results relying on an initiation dummy variable (*INITDUM*) instead. The coefficients of the analyst initiation variables are positive and statistically significant at the 1% level of significance in all regressions. These results are consistent with our previous evidence, reported in Tables III and IV, and provide additional evidence that supports the hypothesis predicting that analyst coverage initiations have a positive and statistically significant impact on firms' external financing (investment). These new results are also consistent with the view that analyst initiations are driven by investment-banking interests and trading commissions.

IV. Conclusion

In this paper, we examine whether the external financing of a firm is influenced by abnormal analyst coverage and analyst initiations, driven by analysts' self-interests and the economic incentives of their investment bankers. Our findings suggest that when excessive analyst coverage causes stock prices to deviate from fundamentals, these deviations have real consequences on the financing decisions of the firm. Excessive analyst coverage and initiations have a similar positive impact on the investment decisions of the firm.

We draw several conclusions from our evidence. First, our findings indicate that abnormal analyst coverage plays an important role in explaining the firm's external financing and capital spending. The evidence shows that firms with high (low) excess analyst coverage have consistently higher (lower) external financing and investment rates than do their industry peers of similar size. This evidence is consistent with the hypothesis that analyst coverage, motivated by the pay structure of analysts and investment-banking incentives, fuels the growth prospects of firms that have the potential to engage in profitable investment-bank business (i.e., external financing) that, in turn, leads to greater external financing and investment by reducing the hurdle rate for investment.

Second, we find that analyst coverage initiations have a positive impact on external financing. This evidence suggests that analysts' access to management, coupled with investment-banking incentives, is a leading indicator of firms' financing activity. Hence, the impact of analyst coverage on firms' capital structure decisions seems to work through analysts' behavior, the information environment surrounding the firm, and brokerage-firm coverage decisions.

[15]We allow the first six months period to control for the first appearance of a brokerage firm on IBES, as opposed to the first coverage of a company followed by that brokerage firm.

Table VII. Robustness Tests: The Role of Analyst Coverage Initiations

This table reports coefficients and corresponding *t*-statistics (in brackets) for the two-stage least squares fixed effects model of the endogenous relation between analyst coverage initiation (*INIT*) and industry-adjusted external financing (*IA_EF,* Models a and b) and investment rate (*IA_IR,* Models c and d), respectively. The model estimates are based on the structural model specification of external financing (investment) (1). In the first stage, we estimate *INIT*. In the second stage, we use the fitted values from the first stage as an instrument and examine its effects on *IA_EF* (Models a and b) and *IA_IR* (Models c and d), respectively. We compute the industry-adjusted values as the difference in the raw value of a variable and the median value of the variable in the firm's primary two-digit SIC industry. In the second step, we estimate *IA_EF* (Models a and b) and *IA_IR* (Models c and d), respectively, while also providing the correction for self-selection bias, as reflected in the coefficient of the Mills λ. We compute the industry-adjusted values as the difference in the raw value of a variable and the median value of the variable in the firm's primary two-digit SIC industry.

Panel A. Two-Stage Least Squares Fixed Effects Procedure

Variable	External Financing Models				Investment Rate Models			
	Model a		Model b		Model c		Model d	
	Dep. Variable: $INIT_T$	Dep. Variable: IA_EF_T	Dep. Variable: $INIT_T$	Dep. Variable: IA_EF_T	Dep. Variable: $INIT_T$	Dep. Variable: IA_IR_T	Dep. Variable: $INIT_T$	Dep. Variable: IA_IR_T
Intercept	1.9474***	−0.5098***	2.4456***	−0.3853***	1.9474***	−0.0063	2.4456***	0.0205**
	[9.51]	[−24.18]	[8.87]	[−15.93]	[9.51]	[−0.72]	[8.87]	[1.97]
BM_T	−0.0115	0.0155***	0.0776	0.0046	−0.0115	−0.0127***	0.0776	−0.0143***
	[−0.27]	[3.34]	[1.29]	[0.83]	[−0.27]	[−6.64]	[1.29]	[−5.94]
$SIZE_T$	−0.0525	0.0447***	−0.1732***	0.0465***	−0.0525	−0.0052***	−0.1732***	−0.0070***
	[−1.17]	[14.44]	[−4.24]	[13.05]	[−1.17]	[−4.07]	[−4.24]	[−4.58]
IA_IR_{T-1}	1.1102***	0.0325*	1.3147***	0.0968***	1.1102***	0.1142***	1.3147***	0.1021***
	[7.21]	[1.83]	[6.22]	[4.72]	[7.21]	[15.51]	[6.22]	[11.55]
IA_Q_{T-1}	0.1336***	0.0350***	0.3005***	0.0476***	0.1336***	0.0118***	0.3005***	0.0249***
	[7.51]	[16.31]	[9.11]	[14.12]	[7.51]	[13.31]	[9.11]	[17.13]
IA_EF_{T-1}	0.6784***	−0.2010	0.5503***	−0.1278***	0.6784***	0.0140***	0.5503***	0.0139***
	[12.71]	[−28.11]	[7.05]	[−16.45]	[12.71]	[4.75]	[7.05]	[4.15]
CF_{T-1}	0.0261*	0.0068***	0.0441**	0.0060***	0.0261*	0.0091***	0.0441**	0.0103***
	[1.75]	[4.23]	[2.08]	[3.00]	[1.75]	[13.67]	[2.08]	[12.02]

Table VII. Robustness Tests: The Role of Analyst Coverage Initiations (*Continued*)

Panel A. Two-Stage Least Squares Fixed Effects Procedure (*Continued*)

Variable	External Financing Models				Investment Rate Models			
	Model a		Model b		Model c		Model d	
	Dep. Variable: $INIT_T$	Dep. Variable: IA_EF_T	Dep. Variable: $INIT_T$	Dep. Variable: IA_EF_T	Dep. Variable: $INIT_T$	Dep. Variable: IA_IR_T	Dep. Variable: $INIT_T$	Dep. Variable: IA_IR_T
$INIT_T$		0.1486***		0.0713***		0.0226***		0.0126***
		[23.99]		[15.69]		[8.83]		[6.45]
$NSEG_T$	0.1463***		0.1948***		0.1463***		0.1948***	
	[3.85]		[3.96]		[3.85]		[3.96]	
$1/PRICE_T$	−1.9610***		−2.3877***		−1.9610***		−2.3877***	
	[−7.88]		[−6.25]		[−7.88]		[−6.25]	
RET_{T-1}	0.4178***		0.8326***		0.4178***		0.8326***	
	[14.02]		[18.21]		[14.02]		[18.21]	
$TRENDCOV_T$	−0.0612*		−0.1487**		−0.0612*		−0.1487**	
	[−1.92]		[−3.44]		[−1.92]		[−3.44]	
$VARRET_{T-1}$			79.1223**				79.1223**	
			[2.05]				[2.05]	
N	24,298	24,240	17,428	17,387	24,298	24,249	17,428	17,395
No. of firms	4,552	4,548	4,263	4,257	4,552	4,548	4,263	4,258
F-value	78.31	367.55	62.58	188.37	78.31	274.24	62.58	189.41
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
R^2	0.0613	0.0302	0.0416	0.0343	0.0613	0.1426	0.0416	0.1489

Table VII. Robustness Tests: The Role of Analyst Coverage Initiations (*Continued*)

Panel B. Self-Selection Using Heckman's (1979) Two-Stage Regressions

Variable	External Financing Models				Investment Rate Models			
	Model a		Model b		Model c		Model d	
	Probit Model Dep. Var.: $INITDUM_T$	Second-Stage Dep. Var.: IA_EF_T	Probit Model Dep. Var.: $INITDUM_T$	Second-Stage Dep. Var.: IA_EF_T	Probit Model Dep. Var.: $INITDUM_T$	Second-Stage Dep. Var.: IA_IR_T	Probit Model Dep. Var.: $INITDUM_T$	Second-Stage Dep. Var.: IA_IR_T
Intercept	−1.1702***	−0.0963***	−1.3386***	−0.0742***	−1.1688***	−0.0212***	−1.3363***	−0.0128***
	[−25.81]	[−8.52]	[−23.73]	[−6.33]	[−25.79]	[−5.21]	[−23.71]	[−2.76]
BM_T	−0.0071	0.0013	0.0217	−0.0039	−0.0079	−0.0045***	0.0203	−0.0044**
	[−0.46]	[0.30]	[1.16]	[−0.84]	[−0.51]	[−2.84]	[1.09]	[−2.39]
$SIZE_T$	0.2639***	−0.0403***	0.2821***	−0.0296***	0.2637***	−0.0117***	0.2819***	−0.0101***
	[38.42]	[−11.41]	[34.12]	[−8.04]	[38.41]	[−8.99]	[34.10]	[−6.85]
IA_IR_{T-1}	0.4028***	0.0405**	0.4110***	0.0405**	0.4013***	0.4437***	0.4105***	0.4314***
	[6.83]	[2.34]	[5.75]	[2.22]	[6.81]	[71.43]	[5.74]	[59.99]
IA_Q_{T-1}	0.1093***	0.0395***	0.1037***	0.0412***	0.1094***	0.0072***	0.1039***	0.0140***
	[10.05]	[20.42]	[7.74]	[15.15]	[10.06]	[10.41]	[7.75]	[13.37]
IA_EF_{T-1}	0.4658***	0.0022	0.4835***	0.0186***	0.4665***	0.0055**	0.4842***	0.0009
	[13.86]	[0.30]	[11.82]	[2.29]	[13.88]	[2.14]	[11.84]	[0.29]
CF_{T-1}	−0.0170***	0.0044***	−0.0141***	0.0051***	−0.0170***	0.0050***	−0.0141***	0.0043***
	[−3.43]	[4.07]	[−2.59]	[4.92]	[−3.43]	[12.78]	[−2.59]	[10.53]
$INITDUM_T$		0.5633***		0.4308***		0.1359***		0.1084***
		[16.23]		[12.09]		[10.58]		[7.55]
$NSEG_T$	−0.0428***		−0.0484***		−0.0427***		−0.0483***	
	[−5.00]		[−4.81]		[−4.99]		[−4.80]	

Table VII. Robustness Tests: The Role of Analyst Coverage Initiations (*Continued*)

Panel B. Self-Selection Using Heckman's (1979) Two-Stage Regressions (*Continued*)

Variable	External Financing Models				Investment Rate Models			
	Model a		Model b		Model c		Model d	
	Probit Model Dep. Var.: $INITDUM_T$	Second-Stage Dep. Var.: IA_EF_T	Probit Model Dep. Var.: $INITDUM_T$	Second-Stage Dep. Var.: IA_EF_T	Probit Model Dep. Var.: $INITDUM_T$	Second-Stage Dep. Var.: IA_IR_T	Probit Model Dep. Var.: $INITDUM_T$	Second-Stage Dep. Var.: IA_IR_T
$1/PRICE_T$	−0.0282		−0.1547		−0.0288		−0.1521	
	[−0.38]		[−1.47]		[−0.39]		[−1.45]	
RET_{T-1}	0.2025***		0.2558***		0.2019***		0.2550***	
	[12.01]		[12.15]		[11.98]		[12.12]	
$TRENDCOV_T$	−0.0511***		−0.0441***		−0.0514***		−0.0438***	
	[−4.71]		[−3.45]		[−4.75]		[−3.43]	
$VARRET_{T-1}$			48.5006***				47.8672***	
			[4.53]				[4.48]	
Mills λ		−0.3228***		−0.2427***		−0.0765***		−0.0604***
		[−15.41]		[−11.26]		[−9.83]		[−6.94]
N	24,240	24,240	17,387	17,387	24,249	24,249	17,395	17,395
Chi-squared	3,750.63	3,955.75	2,797.32	2,900.97	3,752.31	11,142.27	2,798.52	8,029.86
[Prob > chi-sq.]	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0000]		[0.0000]	[0.0000]
Pseudo R^2	0.1178		0.1223		0.1178	[0.0000]	0.1222	

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

Third, our results indicate that there are profound differences between value (high book-to-market) and growth (low book-to-market) firms. Value firms have weaker analyst coverage than do growth firms. The evidence also shows that high book-to-market (value) firms have considerably lower external financing and investment than do low book-to-market (growth) firms. These findings suggest that the low future returns of low book-to-market stocks documented in other studies reflect that such firms are overpriced as a result of excessive analyst coverage that feeds about their future prospects.

Our empirical results remain robust after controlling for the possibility of endogeneity in analysts' coverage. ■

Appendix

Definition of Variables

Variable	Measurement of Variables
1/*PRICE*	Reciprocal of the stock price at the beginning of the fiscal year.
BM	Book-to-market ratio computed as in Fama and French (1996).
CF	Ratio of net income before extraordinary items plus depreciation to net property, plant, and equipment.
EXCOVER	We measure excess analyst coverage as the natural logarithm of the ratio of a firm's actual number of analyst following to its imputed analyst following. We measure these analyst followings as of eight months prior to the fiscal year-end. A firm's imputed analyst following is the sum of the imputed analyst followings of its segments. The segment's imputed analyst following is equal to the segment's sales multiplied by its industry median analyst following to sales ratio (computed for single-segment firms in the industry).
EXCOVDUM	Dummy variable that takes the value of one if *EXCOVER* is positive, and zero otherwise.
Excess Value	Computed as in Berger and Ofek (1995).
EF	We measure external financing as $[\Delta(\text{equity})_t + \Delta(\text{long-term debt})_t + \Delta(\text{short-term debt})_t]/(\text{total assets})_{t-1}$, where $\Delta(\text{equity})_t$ = book value of new equity issued in year t, $\Delta(\text{long-term debt})_t$ = book value of new long-term debt issued in year t, and $\Delta(\text{short-term debt})_t$ = book value of new current debt and accounts payable in year t.
Forecast Error	Difference between the mean forecast issued eight months prior to the fiscal year-end and the actual earnings per share (EPS), deflated by the stock price at the beginning of the year.
IA_EF	Firm's industry-adjusted external financing (*EF*).
IA_IR	Firm's industry-adjusted investment rate (*IR*).
IA_Q	Firm's industry-adjusted investment opportunities measured as the industry-adjusted Tobin's q ratio.

Definition of Variables (Continued)

Variable	Measurement of Variables
INIT	Number of new broker companies that initiated analyst coverage. We identify initial coverage following the procedure of Irvine (2003) and McNichols and O'Brien (1997). First, we identify the first appearance date of a specific brokerage firm in the IBES database, using one-year-ahead earnings forecasts. We then identify all companies followed by that brokerage firm for the first six months following the date the brokerage firm made its first appearance in IBES. Finally, we identify initial coverage as any new coverage of a company not followed by that brokerage firm in the first six months the brokerage firm appeared on IBES.
INITDUM	Dummy variable that takes the value of one (zero) if $INIT > 0$ ($INIT \leq 0$).
IR	We measure the investment rate as the ratio of capital expenditures over net property, plant, and equipment.
NSEG	Number of business segments.
RET	Average monthly return over the past 12 months.
Size	Firm's market capitalization.
Tobin's q	(Market value of common equity + preferred stock liquidating value + book value of long term debt + (short-term debt – short-term assets))/total assets.
TRENDCOV	Percentage difference in median analyst coverage between the firms two-digit SIC and four-digit SIC primary industries.
VARRET	Variance of the daily returns over the 200-day period preceding the month when analyst coverage is measured (see Brennan and Hughes, 1991).

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