Who Benefits from Industry Knowledge of Sell-Side Analysts? Evidence from Broker Commission Payments and Client Fund Performance*

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Abstract

Using novel data on financial analyst biographical information and mutual fund broker commission payments, we examine the impact of sell-side analyst industry knowledge on buy-side institutions' commission allocation decisions and investment performance. We find that mutual funds allocate higher equity trading commissions to brokers providing industry expert analyst coverage for a larger proportion of fund holding firms. Client funds generate higher abnormal holding returns and execute more profitable trades on stocks with access industry expert analysts compared to stocks with no such analyst coverage. Exploiting shocks to research coverage emanating from analyst departures for identification, we find that client funds reduce commission allocations to brokers losing industry expert analysts and suffer declines in investment performance on stocks affected by the loss of industry expert analysts. Overall, our results are consistent with the view that brokerage houses as well as their buy-side clients benefit from the industry knowledge of sell-side analysts.

Keywords: Sell-side research, industry knowledge, broker commissions, analyst coverage terminations, asset management, mutual funds

JEL classifications: G11, G14, G17, G20

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1. Introduction

Sell-side analysts are prominent information intermediaries in the financial markets. Through their ability to gather, analyze and disseminate value-relevant data, analysts represent a major source of information to market participants.[1] Buy-side investors are among the largest consumers of sell-side analyst research and services. Each year they budget millions of dollars of trading commission fees as soft-dollar payments to brokerage firms for premier analyst client services[2] (e.g., Conrad, Johnson and Wahal, 2001; Goldstein, Irvine, Kandel and Wiener, 2009; Groysberg, Healy, Serafeim and Shanthikumar, 2013; Green, Jame, Markov and Subasi, 2014). A 2011 survey conducted by Greenwich Associates among 217 institutions suggest that buy-side investors increased equity brokerage commissions spent to reward sell-side client research services from 53% in 2010 to 59% in 2011 (or $6.8 billion), a 10-year high.[3]

To gauge sell-side analysts' research services and skills deemed most important by their primary customers, the *Institutional Investor* (*II*) magazine polls buy-side institutions each year and lists the attributes that makes a top analyst. Industry knowledge has consistently been ranked the most important attribute. Corroborating the *II* magazine's annual polls, Groysberg and Healy (2013) and Brown et al. (2014b) likewise find that executives, portfolio managers and analysts at buy-side institutions consider industry expertise as the most important research service provided by sell-side analysts. Despite this widely-held view on sell-side analysts' industry knowledge, whether it actually affects any economic decision making in the exchange relationship between buy-side institutions and brokerage houses remains an unexplored issue.

In this paper, we aim to fill this important void and investigate two closely related questions. First, does sell-side analysts' industry expertise factor into buy-side investors' trading commission allocation decisions across brokerage houses? Second, do buy-side clients benefit from the industry knowledge of sell-side analysts employed at these brokers in generating more valuable investment ideas? There are at least three potential channels through which industry expert analysts can contribute to buy-side investor's investment decisions and therefore attract larger commission

[1] Prior research finds that analyst earnings forecasts, stock recommendations, and target price estimates elicit significant stock price reactions (Womack, 1996; Francis and Soffer, 1997, Gleason and Lee, 2003, Ivkovic and Jegadeesh, 2004, Brav and Lehavy, 2003, and Bradley et al. 2014). Analyst coverage has also been shown to affect firm information asymmetry (Kelly and Ljungqvist, 2012), lending further support to analysts' information production role.

[2] These services include customized research reports, white papers, analyst notes, high-touch meetings and private phone calls, batch level analyst client notifications, broker-hosted research conferences, and non-deal road shows.

[3] Blume (1993) provides an excellent review of the prevalent use of soft dollar payments to purchase research. He reports that almost 40% of total commissions involved soft dollar payments based on a survey conducted by Greenwich Associates in 1989.

allocations for their brokerage firms. First, industry insights obtained from these analysts can help client funds better understand the operational details of portfolio firms, including product lines, procurement channels, marketing, sales, & distributional networks, and major customers and suppliers. Second, industry expert analysts can provide superior insights on macroeconomic trends and industry dynamics, portfolio firms' strategic policies, major opportunities and challenges, and key financial metrics. Third, sell-side analysts possessing superior industry knowledge may either directly share their more refined earnings estimation and stock valuation models with client funds or provide feedback on clients' financial models to help them obtain a superior ability in ranking/selecting investment stocks within industries (Boni and Womack, 2006; Groysberg and Healy, 2013; Xie, 2014). Recognizing these potential benefits, institutional investors can use commission allocations to brokerage firms to gain access to industry expert analysts. The insights from analyst industry expertise can help buy-investors obtain competitive advantages in formulating more accurate assessments of portfolio firms' investment value.

We empirically evaluate these hypotheses exploiting two novel datasets. The first dataset contains biographical information on analysts' pre-analyst work experience, which we use to to capture their industry knowledge.[4] The second dataset is based on semi-annual N-SAR filings,[5] which we use to obtain information on broker commission payments for an extensive sample of diversified, actively managed equity mutual funds in the merged Thomson Financial CDA/Spectrum and CRSP Mutual Fund database. In a sample of 2,204 mutual funds and 2,161 analysts from 161 brokerage houses during the period of 1999 to 2010, we find that brokerage houses providing industry expert analyst coverage for a higher percentage of firms in a mutual fund's portfolio receive a larger share of trading commission allocation from the fund. Economically, a one-standard-deviation increase in the percentage of fund portfolio covered by industry expert analysts is associated with 0.16% (approximately 1/6 of the unconditional mean) higher relative broker share of trading commissions from the fund in the following year. The results are robust to the inclusion of

[4] Validating the importance of industry knowledge extrapolated from pre-analyst related industry work experience, Bradley, Gokkaya and Liu (2014) show that industry expert analysts generate higher quality research and are associated with more favorable career outcomes.

[5] Other studies using N-SAR filings include Edelen (1999), Reuters (2006), and Christoffersen, Evans, and Musto (2013). N-SAR filings report broker commissions at the registered investment company level. Therefore, we follow prior work and employ a proration algorithm to allocate trading commissions down to the fund level by assuming an equal allocation across brokerage houses (e.g. Edelen, Evans and Kadlec, 2012). We also repeat analysis using only a subsample of 924 single-fund series to avoid potential noise introduced by proration algorithm. To further calibrate findings from N-SAR data, we also conduct analysis using institutional transaction data obtained from Ancerno Ltd., a proprietary institutional transaction database that measures broker commissions at the fund-broker level. These results are robust and discussion of these analyses is presented in Section 5.

other cross-sectional determinants of broker commissions and the economic impact of industry expert analyst coverage on broker trading market share is at least as large as any other documented analyst and brokerage characteristics. This lends support to notion that industry knowledge of sell-side analysts is indeed a unique and economically important factor related to buy-side investors' trade allocation decisions.

Our analysis further indicates that industry expert analysts who have longer industry experience, issue more accurate earnings forecasts, and receive an "All-Star" recognition from the *II* magazine have a more pronounced impact on funds' commission allocations, suggesting that buy-side clients also consider the quality of industry knowledge possessed by sell-side analysts. In addition, expert analysts generate higher commissions from buy-side investors whose portfolios are more tilted toward firms that are associated with higher idiosyncratic stock return volatility and stock market illiquidity and whose operations contain larger industry components. These results suggest that mutual funds especially value the research services of industry expert analysts for stockholding firms that are harder to value, less likely to be covered by in-house buy-side analysts (Groysberg et al., 2013; Groysberg and Healy, 2013) and for which industry expert analysts likely have a competitive advantage in providing insights.

To help establish causality of our results, we examine a dynamic setting by exploring natural shocks created by sell-side analyst departures from brokerage houses. Using a difference-in-difference (DiD) approach, we find that in response to loss of industry expert analyst coverage on portfolio holding firms, client mutual funds significantly reduce trading commissions allocated to the affected broker, compared to other clients of the same brokerage that do not experience such analyst coverage loss on portfolio firms. Differentiating between departures of industry expert analysts and other analysts, we find that the marginal impact of industry expert analyst departures on the reduction of client funds' allocation of commissions to brokers is 1.02% higher, which is significant both statistically and economically.

Given the strong evidence of higher broker commission allocations as a result of industry expert analyst coverage, our second line of inquiry examines the value of information that client mutual funds can obtain from these analysts. In particular, we look within each client fund's portfolio and compare the abnormal holding performance of stocks with industry experienced analyst coverage to that of stocks lacking such coverage. This within-fund-portfolio analysis allows us to effectively remove the effects of time-variant and time-invariant manager, fund and fund family characteristics related to investment performance. We find that stocks covered by industry

expert analysts indeed outperform other stocks in the same fund's portfolio. For instance, buy-side clients generate a five-factor monthly abnormal holding return of 22 basis points on a value-weighted portfolio of stocks with access to industry expert analysts. This abnormal monthly return compounds to a statistically and economically significant 2.67%over 12 months. The differences in portfolio holding returns between stocks covered by expert analysts and other stocks (covered by other analysts/no coverage) are also significant. This evidence is consistent with practitioner views that industry knowledge acquired from sell-side analysts helps client funds generate higher abnormal returns on stockholding firms. Also underlining the importance of access to premium analyst client services, our results indicate that a fund's stock holdings covered by industry expert analysts from the fund's brokers outperform stocks covered by industry expert analysts from brokers unaffiliated with the fund. Using the same dynamic setting emanating from analyst departures out of brokerage houses, we find more pronounced deteriorations in abnormal investment performance on client funds' portfolio firms losing industry expert analyst coverage in the post-event year relative to portfolio firms losing other types of analyst coverage.

We further buttress the fund holding-based performance by investigating the profitability of trades within each client funds' portfolio (Chen, Jegadeesh and Wermers, 2000; Kothari and Warner, 2001). We find that buy (sell) trades executed by client mutual funds on stocks covered by industry experienced analysts generate significantly positive (negative) abnormal monthly returns. In economic terms, a long-short portfolio strategy based entirely of buy and sell trades on such stocks generate abnormal return of about 46 basis points per month, compounding to 5.66% annually. This is also 29 basis points higher than the abnormal monthly return of similar long-short portfolios constructed on stocks with only other types of analyst coverage. All these findings are robust to a range of widely used asset pricing models, including the 3-factor, 4-factor, and 5-factor models (Fama and French, 1993; Carhart, 1997; Pastor and Stambaugh, 2003), the Ferson and Schadt (1996) conditional model, and the Daniel, Grinblatt, Titman, and Wermers (1997) characteristic-based model.

Our evidence suggests that mutual funds indeed obtain value relevant information from the industry expert analysts employed by their brokers and such information translates into more profitable investment strategies. This provides an explanation for our earlier finding of mutual funds allocating a larger share of total commissions to brokerage firms providing industry expert analyst coverage on more of their portfolio firms. However, when we break down the trade and commission allocation at the individual stock level, we sometimes observe instances in which funds

route trades on certain stocks to brokerage firms that do not provide industry expert analyst coverage on these stocks. To gain a better understanding of this seemingly puzzling pattern, we investigate the determinants of mutual funds allocation of stock-level trading and commission across brokerage houses. In other words, we examine the fund-broker pairing at the individual stock level. We find that when there is a shortage of industry expert analysts for a stock from available brokers, funds are more likely to allocate trades on the stock to a broker providing only non-expert analyst coverage on that stock. Such instances are also more likely when the broker offers industry experienced analyst coverage on a greater percentage of the other stocks in the fund's portfolio. This is consistent with the notion that client funds indirectly reward brokers for their industry experienced analyst coverage on some stocks through channeling of trades on other stocks to these brokers (O'Brien and Bhushan, 1990; Irvine, 2001; Maber, Groysberg, and Healy, 2014).

In summary, our paper presents a coherent picture in which both brokerage firms and their buy-side clients are well served by the industry knowledge of sell-side analysts. On the one hand, brokerage firms receive larger shares of trading commission from mutual funds when they provide greater industry expert analyst coverage for funds' investment portfolios. On the other hand, by allocating commission fees to the brokers employing industry expert analysts, mutual fund clients gain access to superior research services provided by these analysts and improve their investment performance.

We make four primary contributions to several strands of literature. First, we provide the first evidence that sell-side analysts' industry knowledge helps their brokerage houses attract greater commission revenues from buy-side institutions. As such, our paper sheds light on the microeconomics of the investment research industry and extends a growing academic literature on the determinants of order flow and trading commissions, e.g., analyst reputation, optimism, boldness and forecast frequency (e.g. Ljungqvist, Marston, and Wilhelm, 2006; Jackson, 2005; Juergens and Lindsey, 2009), broker size (Irvine, 2000; Juergens and Lindsey, 2009), affiliated investment banking units (Ellis, Michaely and O'Hara, 2002; Choi, Clarke, Ferris and Jayaraman, 2009), historical broker commission shares (Conrad et al., 2001; Goldstein et al., 2009), and investor conferences (Green et al., 2014).

Second, our finding of the positive effect of sell-side analysts' industry expertise on mutual funds' investment performance provides concrete evidence of how information flows from sell-side analysts contribute to the investment decision of buy-side investors. Consequently, our findings are relevant to extensive academic work attempting to identify the value of information transfers to buy-

side investors from various economics agents such as in-house research departments (Cheng, Liu and Qian, 2006; Groysberg et al., 2013), board members in portfolio firms (Cohen, Frazzini and Malloy, 2008), and commercial lending units and loan market (Massa and Rehman, 2008; Ivashina and Sun, 2011). More importantly, this finding also sheds further light on the recently emerged debate on whether sell-side analysts are important information agents or sell-side analyst research on firms is largely "information-free" (Altinkilic and Hansen, 2009; Altinkilic, Hansen, Ye, 2015). Our findings suggest that analysts are indeed prominent information intermediaries in the capital markets and can improve their client funds' performance through value added information provided on portfolio holding stocks.

Third, we extend the body of research on cross-sectional characteristics related to fund performance (e.g., fund size, age and turnover (Chevalier and Ellison, 1999; Chen, Hong, Huang, and Kubik, 2004), expense ratio (Kacperczyk and Seru, 2007; size of fund family (Polet and Wilson, 2008), geographic distance to portfolio firms (Coval and Moskowitz, 2001), manager skill and education (e.g., Berk and Green, 2004; Cohen, Coval and Pastor, 2005; Fama and French, 2010).[6] Specifically, our results accentuate the investment value of sell-side analyst industry expertise for buy-side clients and suggest that access to industry expert analysts through broker commission allocation is one mechanism through which mutual funds can improve their investment decisions.

Finally, we contribute to a growing literature that highlights the importance of industry knowledge in various corporate and financial settings, including buy-side managers (Kacpercyzk, Sialm and Zheng, 2005; Bushee and Goodman, 2007; Huang and Kale, 2013), investment and commercial banks (Stomper 2006; Liu and Ritter. 2011), sell-side and buy-side analysts (Bradley et al. 2014; Brown et al., 2014 a,b), CEOs (Custodio and Mertzer, 2013), and boards of directors (Wang, Xie, Zhu, 2013; Dass, Kini, Nanda, Onal and Wang, 2014). Our paper adds to this growing literature by being the first to study the role of sell-side analyst industry experience for broker commission allocations and abnormal performance of buy-side investors.

The remainder of the paper proceeds as follows. Section 2 describes our dataset and summary statistics. Section 3 presents the analysis of buy-side clients' commission allocations. Section 4 examines the effect of industry expert analyst coverage on buy-side clients' investment performance. Section 5 presents several robustness tests and additional analyses. Section 6 concludes the paper.

[6] See Wermers (2011) for an excellent review of related literature.

2. Data and Descriptive Statistics

The dataset employed in this study is constructed from a variety of sources. First, we obtain broker trading commission allocation data from semi-annual N-SAR filings by an exhaustive sample of mutual funds during the period of 1999 to 2010. Within each N-SAR filing, registered investment companies are required to provide information on the names of 10 brokerage firms to which they paid the most trading commissions along with the amount paid to each corresponding broker. Broker commissions are reported at the investment company level in N-SAR filings, therefore, we use a proration algorithm to allocate broker commissions down to the fund level by assuming an equal allocation across brokerage houses (Edelen, Evans and Kadlec, 2012).

We start by hand-matching the names of investment companies in N-SAR filings to those reported in Thomson Financial's CDA/Spectrum Mutual Fund Holdings database. Thomson Financial provides stock holdings of each fund filed under Section 30 of the Investment Company Act of 1940 and has no known survivorship bias (Kacperczyk, Sialm and Zheng, 2008; Busse and Tong, 2012). Following the methodology in prior work, we next merge Thomson Financial with CRSP Mutual Fund Database in order to obtain information on fund characteristics (Chen, Jegadeesh, and Wermers, 2000; Kacperczyk, Sialm and Zheng, 2005). [7]

We apply several filters to this merged mutual fund sample. First, we exclude bond, balanced, international, index and sector funds from our sample (e.g., Chen et al, 2004; Kacperzyk et al., 2005; Kacperzyk and Seru, 2007; Brown, Wei, and Wermers, 2013).[8] We require that the fund reports assets under management and have at least one year of reported returns (Chen et al., 2004). To eliminate incubation bias, we further remove funds with missing names, those with fewer than 10 stocks in their portfolios, and funds for which the year of observations is before the fund's starting year (Kacperzyk and Seru, 2007; Kacperzyk, Nieuwerburgh and Veldkamp, 2013). Finally, we include funds with multiple share classes only once to avoid the double-counting bias (Kacperzyk and Seru, 2007).

For firms held by funds in our mutual fund sample, we obtain stock returns and financial characteristics from CRSP/COMPUSTAT, and use the Institutional Broker Estimate System (*I/B/E/S*) database to identify sell-side analysts providing research coverage. The initial sample of analysts is then merged with I/*B*/*E*/*S* recommendation files to retrieve each analyst's last name, first

[7] To ensure the mapping between N-SAR filings and merged Thomson Financial/CRSP Mutual is correct, we confirm that the monthly purchase values in both databases are the same (Edelen, Evans and Kadlec, 2012).
[8] Sectors funds are defined as funds containing text strings associated with a sector such as energy, financials, health care, precious metals, real estate, technology, utilities and etc.

name initials and brokerage house information. Analysts sharing the same last name and first name initial and working at the same broker are excluded from the sample. Analyst teams are likewise eliminated since I/B/E/S furnishes only the last names of analysts assigned to a team. This initial screening criterion yields 9,427 analysts.

For each analyst remaining in our sample, we first search *Zoominfo.com,* an employment indexing website, to obtain her entire first name. Next, we search on *LinkedIn.com,* the world's largest professional network, to gather employment history using the analyst's first and last name along with the corresponding brokerage house. We capture detailed information on the names of their former employers as well as years of employment at each company irrespective of their public/private status. Analyst employment experience is then classified as "related" and "unrelated" at the coverage firm level. Specifically, a sell-side analyst is defined to have "related experience" in a firm if the analyst's prior employer (s) and the firm share the same Fama-French (FF) 5-industry classification. Otherwise, pre-analyst experience is defined as "unrelated". Analysts without pre-analyst industry work experience are defined as "inexperienced".[9] This leaves us with 2,161 unique analysts and 2,204 distinct mutual funds holding 7,923 companies over the period of 1999 to 2010.

****Table 1 here****

Panel A of Table 1 provides descriptive statistics for the distribution of our overall sample across time periods. We report the number of unique funds and number of unique stocks in investment portfolios of mutual funds. Our sample contains a total of 2,204 unique funds investing in 7,923 distinct firms. About 43% of stockholding firms have sell-side analyst coverage irrespective of trading commission commitments. Decomposing pre-analyst industry work experience based on its relevance to stockholding firms, we find that 28% (26%) of stockholding firms are followed by analysts with related (unrelated) industry experience. We observe that the percentage of analysts providing coverage on mutual fund investment portfolios rises slightly through time. This is likely due to the increasing popularity of *LinkedIn.com* among investment professionals including sell-side analysts. While there is no reason to believe this would systematically bias results, we nevertheless

[9] We recognize that a legitimate concern with our analysis is that we define analyst industry experience "related" based on broad Fama-French industry classifications. This is because a majority of pre-analyst employment firms in our sample are private firms and it is very difficult to assign private firms into finer industries. Specifically, we conduct a thorough search for private firms on Securities and Exchange Commission (SEC)'s website, official company websites or other business news websites such as Bloomberg and BusinessWeek and assign each firm manually to one of FF-5 industry groups based on the business description provided in these sources. It is worth noting that any misclassification should intro more noise into our analysis and bias against us. Nevertheless, Section 5 repeats the main analysis using Global Industry Classification Standard (GICS) industry codes by focusing on a subset of analysts with pre-analyst experience only in public firms and finds similar results.

include year fixed effects to control for this time trend. Our sample spans approximately 27% of the total number of mutual funds and 50% of the total market capitalization of mutual fund portfolio holding firms in the 'cleaned' Thomson Financial /CRSP mutual universe.[10]

Panel B of Table 1 reports summary statistics on mutual fund portfolio firms by time period. Variable definitions are in the appendix. We find that 28.53% of mutual fund firms have coverage from analysts employed at top 10 brokers (*Top 10 Broker*) and 6.1% of firms have covering analysts employed at brokerage houses associated with investment banks underwriting the coverage firm's IPO or SEO (*Affiliated Investment Bank*). About 32% of such firms have research coverage from sell-side analysts at brokers sharing the same industry expertise as the funds investing in these firms (*Same Industry Expertise*). In addition, 10.53% (8.63%) of fund stockholding firms have All-star (Leader) analyst coverage, 24.65% (27.40%) of these firms are followed by analysts with higher general forecasting experience (larger portfolio size). Finally, about 17.40% (5.37%) of fund firms have coverage from sell-side analysts providing optimistic (bold) recommendations and earnings forecasts.[11]

3. Broker Commission Allocations and Industry Expert Analysts

3.1. Baseline analysis

We begin our analysis by examining the association between coverage by industry experienced analysts and trading commission allocations of buy-side investors across brokerage houses. We test whether mutual funds reward brokers providing industry expert sell-side analyst coverage on their stockholding firms with a greater allocation of trading commissions.

In similar spirits to prior work (e.g. Irvine, 2000; Goldstein et al., 2009; Green et al., 2014), a broker's relative commission share from a mutual fund is defined as the total commissions allocated to broker j by mutual fund i during period t scaled by total commissions paid by mutual fund i to all brokers during the same time period (*%Broker share*). We estimate OLS regressions of a broker's

[10] The 'cleaned' Thomson Financial /CRSP mutual universe is constructed by merging Thomson Financial and CRSP Mutual Fund Database and imposing the mutual fund sample filtering criteria as described above (e.g. U.S. equity mutual funds, reporting return requirements and etc.)

[11] Untabulated analysis also examines time-series averages for main fund characteristics in our sample. We find that the average fund has a total net asset (TNA) of $466 million. Average fund family size is $761 million, where family size is computed as the cumulative TNA of other funds in the corresponding fund's family (i.e., excluding the focal fund's own TNA). The turnover ratio, defined as the minimum of purchases and sales over average TNA, is 101% per year for the average fund. The funds in our sample have an expense ratio as a fraction year-end TNA that averages approximately 1.4%. The mean (median) fund age is 8.3 (6.3) years. These values are of similar magnitude to those reported in prior work (e.g. Chen et al., 2004, Kacperzyk et al., 2005; Kacperzyk and Seru, 2007).

relative commission share from a mutual fund against analyst coverage provided by the broker for the fund's stockholding firms. The primary variables of interest are the percentages of the fund's portfolio firms covered by various categories of analysts employed by the broker, including all sell-side analysts (*% Analyst Coverage*) and analysts with related industry experience*(% Related Experience Analyst Coverage)*, with unrelated industry experience (*% Unrelated Experience Analyst Coverage*), and without any prior industry experience (*% Inexperienced Analyst Coverage*).

Next, we include a comprehensive set of controls that may also be important determinants for broker commission commitments. For instance, Conrad et al. (2001) and Goldstein et al. (2009) suggest that the most important determinant of broker commissions on any trade is the prior-period commission allocations. Large brokerage houses with greater resources may also promote their research services to potential buy-side clients more effectively, resulting in a greater market share (Irvine, 2000; Choi et al., 2009). In addition, Ellis et al. (2002) argue that broker commitments may respond to affiliated investment banking relationships on portfolio holding stocks. [12] Therefore, we control for one-year lagged relative broker market share (*% Lag (Broker Share)*), broker size (*Top10 Broker*) and the percentage of portfolios stocks with investment bank affiliation to the broker (*%Affiliated Investment Bank*). A legitimate concern with our analysis is that analyst industry expertise might be correlated with the industry specialization of the employing brokers. To mitigate this concern, we explicitly control for a binary indicator that equals one if a brokerage house and a mutual fund share the same industry specialization (*Same Industry Expertise*), defined as the industry code with the highest percentage of analysts (firms) in a broker (mutual fund portfolio). Endogenous mutual fund and broker pairing may also bias our results. For instance, there may be unobserved time-invariant broker characteristics that are correlated with commission allocation decisions of buy-side investors. Therefore, our econometric model also incorporates broker fixed effects in addition to year fixed effects. We adjust t-statistics for heteroskedasticity and within-mutual fund correlation using standard errors clustered at the fund level. To mitigate reverse causality concerns, control variables, in addition to *%Lag (Broker Share*), are also lagged by one year. Formally, our model is specified as follows:

$$\begin{aligned} \textit{Broker Share}_{ijt} = {} & \beta_1(\textit{\% Analyst Coverage}) / \beta_2(\textit{\% Related Experienced Analyst Coverage}) + \beta_3(\textit{\% Unrelated Experienced Analyst Coverage}) + \beta_4(\textit{\% Inexperienced Analyst Coverage}) + \beta_5(\textit{Top 10 Broker}) + \\ & \beta_6(\textit{\% Lag (Broker share)}) + \beta_7(\textit{\% Affiliated Investment Bank}) + \beta_8(\textit{Same Industry Expertise}) + \\ & \textit{Broker, Year Dummies} + \varepsilon \end{aligned} \quad (1)$$

[12] Consistent with this notion, Jackson (2005) documents that acting as a lead manager on an initial public offering (IPO) or secondary equity offering (SEO) increases the affiliated broker's market share of trading commissions.

****Table 2 here****

Table 2 reports the regression results. Model 1 includes our first primary variable of interest *(% Analyst Coverage)* and other controls. Consistent with broker commissions responding to analyst research, we find that the coefficient on *% Analyst Coverage* is positive and significant. Direction and significance of other controls are roughly in line with the evidence reported in prior work. For instance, our results reveal that the prior-period commission share is the most important determinant of the current-year commission share (Goldstein et al., 2009). Brokerage houses affiliated with investment banks that have underwritten equity offerings for more firms in a mutual fund's portfolio also receive larger commission shares.

In model 2, we decompose the total analyst coverage into coverage by analysts with related industry experience, unrelated industry experience, and no prior experience. Our results indicate that that the marginal impact of analyst coverage on broker commission shares is most pronounced for analysts possessing related pre-analyst industry work experience. A one standard deviation increase in related experienced analyst coverage transforms into 0.16% (t-stat=15.8) higher broker commission share in the following year, compared to 0.05% (t-stat=4.92) for analysts with unrelated experience and 0.05% (t-stat=5.46) for inexperienced analysts. We are also able to reject the hypothesis that the effect of related experienced analyst coverage is the same as unrelated analysts (p-value<0.001) or inexperienced analysts (p-value<0.001). [13] On the other hand, the coefficient on unrelated analyst coverage is not statistically different from that of inexperienced analyst coverage.

It is plausible that related industry experience of sell-side analysts is capturing other analyst characteristics that could also factor into mutual funds' commission allocation decisions across brokerage houses. For example, Jackson (2005) finds that the reputation and visibility of sell-side analysts are important determinants of broker market share of commissions. Therefore, model 3 controls for a wide array of variables to capture these analyst traits, such as All-star status (*%All-Star Analyst Coverage*) (Clarke, Khorana, Patel and Rau, 2007; Jackson, 2005), high general forecasting experience (*% High General Experience Analyst Coverage*) (Juergens and Lindsey, 2009; Choi et al., 2009; Groysberg, Healy and Maber, 2011), large portfolio size (*% Large Portfolio Analyst Coverage*) (Hong and Kubik, 2003; Groysberg, Healy and Maber, 2011), and high frequency and timeliness rank for earnings forecasts (*%Frequent Forecaster Analyst Coverage, % Leader Analyst Coverage*) (Hong, Kubik and

[13] Reported p-values are from Wald tests using an asymptotic Chi-Square distribution.

Solomon, 2000; Clarke et al., 2007). [14] The coefficient on industry expert analyst coverage remains economically and statistically robust. Prior research has also shown that extreme changes in recommendations and earnings estimates, and issuance of optimistic forecasts and recommendations may influence brokerage-firm trading (e.g. Irvine, 2004, Juergens, 2009). We thus re-estimate equation 1 with the inclusion of variables related to such forecasting behavior (*% Bold Analyst Coverage, % Optimistic Analyst Coverage*,) and find that our findings are largely unchanged (see model 4).

Overall, the analysis in this section suggests that we have identified a unique and important analyst trait related to the mutual fund allocation of trading commission payments. As such, we further the understanding of how sell-side analyst services and commission payments are exchanged, and document that buy-side investors indeed value the industry knowledge of sell-side analysts and reward brokers for such service, as suggested by *II* magazine polls and practitioner surveys.

3.2. Cross-sectional Variations

In this subsection, we investigate whether the effect of industry expert analyst coverage on broker commissions exhibits variations across analyst, coverage firm and mutual fund characteristics.

If industry knowledge obtained from sell-side analysts is valued by buy-side investors, then its effect should be more pronounced when the quality of such knowledge is higher. To test this conjecture, we partition *% Related Experienced Analyst Coverage* into two new explanatory variables at the median based on the length of pre-analyst related work experience (*long/short experience*), relative accuracy of earnings forecasts (*high/low PMAFE*), and All-American research team awards from the *II* magazine (*All-star/No All-star)*. [15] We re-estimate equation 1 and present only coefficients on the variables of interest for brevity.

****Table 3 here****

Columns 1 through 3 of Panel A in Table 3 present the coefficient estimates. We find that the sensitivity of broker commission market shares to industry expert analyst coverage increases with the quality of expert analysts' industry knowledge. For instance, a one standard deviation increase in the percentage coverage provided by expert analysts possessing longer industry

[14] An analyst's general forecasting experience (portfolio size) is defined as high (large) if the total number of years that the analyst forecasted (number of firms in coverage portfolio) in *I/B/E/S* is above the sample median. To compute timeliness (frequency), we rank analysts based on the time they issue their first earnings forecasts (number of revisions on earnings earnings) in a given year using the ranking methodology of Hong, Kubik and Solomon (2000). Sell-side analysts are classified as frequent forecasts (leaders) if frequency (timeliness) rank falls above sample median.

[15] $PMAFE_{i,j,t}$ is defined as the difference between the absolute forecast error, Absolute forecast error ($AFE_{i,j,t}$) of analyst *i* for firm *j* at time *t* and the mean absolute forecast error for coverage firm *j* at time *t*. This difference is then divided by the mean absolute forecast error for firm *j* at time *t*. By construction, negative values of $PMAFE_{i,j,t}$ represent better than average performance, while positive values indicate worse than average performance.

experience (lower PMAFE) is associated with higher relative broker commission market share compared to for those with shorter (higher) industry experience (PMAFE). Buy-side clients also pay more through greater commission allocation for research services offered by All-star industry expert analysts. In each pair of comparisons presented in Panel A, the coefficients are significantly different from each other at the 1% level, suggesting that mutual funds indeed consider the quality of industry knowledge possessed by industry expert analysts when allocating commissions across brokers.

Next, we examine whether the effect of industry expert analyst coverage on broker commission shares is stronger when enhanced industry knowledge is expected to provide even greater advantages for buy-side investors. First, we hypothesize that the benefits from industry knowledge of these sell-side analysts are higher for stockholding firms that are more difficult to value and less likely to be followed by buy-side analysts. Specifically, buy-side clients should have greater incentives to collect and process information from related experience analysts on firms with limited public information and likely without in-house research support. To put this conjecture to test, we use the idiosyncratic volatility (*high/low IV)* of stock returns and Amihud's (2002) stock market illiquidity measure (*high/low illiquidity)* to capture the quality of a firm's information environment as well as the availability of buy-side analyst coverage (Groysberg et al., 2013; Groysberg and Healy, 2013).[16] Column 1 of Panel B indicates that the effect of industry expert analysts on a broker's relative trading commission share is indeed stronger for firms with higher idiosyncratic volatility and greater illiquidity.

We also consider the level of information advantage industry experienced analysts possess in interpreting the operations of coverage firms. In particular, related experienced analysts are expected to have even higher competitive advantages in providing insights on firms whose operations are driven by larger industry components. Drawing upon prior literature, we use revenue synchronicity *(high/low synch*) to identify such firms (Hutton, Lee and Shu, 2012). Subsample regressions presented in Column 2 and 3 of Panel B show that the incremental effect of analyst industry expertise on trading commission allocations is higher when coverage firms' operations are more in synch with their corresponding industries.[17]

[16] Groysberg et al., (2013) and Groysberg and Healy (2013) find that buy-side analysts are less likely to cover volatile and illiquid stocks to meet demands of their portfolio managers. Nevertheless, these results should be interpreted with caution since we cannot ascertain the level of buy-side analyst coverage for stocks in our sample due to data limitations.

[17] Results are qualitatively similar when we employ number of industry segments (Cohen and Lou, 2012) and earnings synchronicity (Piotroski and Roulstone, 2004) to identify firms whose operations/earnings co-move more significantly with their primary industries.

Finally, we analyze whether industry knowledge of sell-side analysts is more important to some buy-side investors than others. If research produced by industry expert analysts *substitute* for mutual funds' existing information set, then its effect should be less pronounced for funds with higher expertise in these analysts' coverage industries. On the other hand, in-depth firm and industry specific information obtained from expert analysts can *complement* the information set of mutual funds and allow them to put together several pieces of related value-relevant information and develop better investment strategies. Therefore, the relationship between the two remains an empirical question. In panel C of Table 3, we attempt to shed light on this question by capturing mutual fund industry expertise with three commonly employed measures in the literature, namely, industry concentration (Kacperczyk, Sialm and Zheng, 2005), major industry (Huang and Kale, 2013), and the number of past industry shocks (Kempf, Manconi and Spalt, 2014). The results presented in Panel C of Table 3 suggest that the positive effect of industry expert coverage on broker commission commitments is unrelated to funds' industry expertise, suggesting that all mutual funds appear to benefit from the industry expertise of sell-side analysts.

3.3. Analyst Departures and Changes in Client funds' commission allocations: A difference-in-difference (DiD) approach

A potential econometric concern with our analysis is that broker analyst coverage decisions on mutual fund investment portfolios may not be random, and unobservable characteristics may be driving our results. To aid in mitigating these endogeneity concerns and further establishing the causality of our results, we examine a dynamic setting and exploit the shocks to the research coverage emanating from analyst departures from brokerage houses. If a client fund loses industry expert analyst coverage on its stockholding firms and client research services by these analysts are indeed valued, then we expect this fund to respond by reducing the relative share of commission allocated to the brokerage losing the analyst in this dynamic setting. Given that not all client funds of the brokerage house necessarily lose industry expert analyst coverage due to a particular analyst departure event, the non-impacted client funds serve as an ideal control group with the impacted client funds as the treatment group.

We identify 1,895 (650) cases where a client mutual fund experiences a loss in analyst (industry expert analyst) coverage due to analysts leaving their brokerage house. In an attempt to eliminate common influences that affect similar funds at the same time, we employ a difference-in-differences (DiD) approach (e.g., Kelly and Ljungqvist, 2012, and Derrien and Kecskés, 2013). In this methodology, we compare the *changes* in commission share of treatment client mutual funds

experiencing a loss of analyst coverage with *changes* in commission share of control client funds which employ the same broker but did not experience a loss of analyst coverage on their investment portfolios in the year before and after. To ascertain treatment and control client funds are similar in the pre-event year, we match treatment funds to control funds by their relative commission share, investment bank affiliation and the percentage of portfolio firms receiving analyst coverage in year t-1. We next retain the candidate control fund that has the smallest difference in the percentage of analyst coverage compared to the treatment fund. Next, we examine the effect of analyst coverage loss on commission commitments by computing the mean *change* in broker shares from year t-1 to year t+1 for our treatment funds (treatment difference), control funds (control difference) as well as the difference between treatment and control funds (differences-in-difference).

****Table 4 here****

Table 4 reports the mean differences. We find that, treatment funds decrease their broker commission shares by 1.99% in the year following the departure of analysts covering their stocks compared to the levels in the pre-analyst loss period. This is economically important given that the mean (median) *%Broker share* of these brokers is 10% (9.7%) for treatment funds in the pre-event year. Conversely, the control funds' commission commitments to the same brokerage houses do not change over the same time period.

In column 2, we decompose the loss of analyst coverage into the loss of industry expert analyst coverage and non-industry expert analyst coverage. We find that the mean relative broker commission share deteriorates by 2.55% following the departure of analysts with related industry experience. While treatment funds respond to the loss of analysts other than industry experts (1.56%), the marginal impact of industry expert analysts is significantly higher compared to the loss of analysts lacking such experience (0.99%, t-stats=14.7). The last column in Table 4 compares the differences in DiD between funds losing industry expert analysts and other analysts and shows that the loss of related experienced analyst coverage leads to economically and statistically more pronounced reductions in broker commitments.

In Panel B and C, we also consider the magnitude of changes in analyst coverage resulting from analyst departures. We hypothesize that treatment funds losing coverage on a higher fraction of investment portfolio firms following the departure of expert analysts reduce the allocation of commission to the affected broker even more. To test this conjecture, we partition lost analyst sample into two subsamples based on the change in analyst coverage resulting from loss of analysts and re-estimate mean changes in broker commission shares over the same time period. Panels B and

C show that the marginal impact of related analyst losses is indeed higher (lower) for client mutual funds that are more (less) affected by this loss. Untabulated analysis also indicates more significant differences in mean difference-in-difference for the loss of industry expert analysts across Panels B and C. Overall, the results from this section further corroborate that industry knowledge possessed by sell-side analysts is an important driver for brokerage commissions.[18]

4. Client Fund Performance and industry experienced analyst coverage

Having established that mutual funds pay higher trading commissions to obtain insights from industry experienced analysts, in this section we examine the impact of these analysts on client funds' investment performance. Industry expert analysts can help client funds develop superior understanding of portfolio holding firms' operations and future prospects, improve their ability in ranking these stocks within their corresponding industries and/or share their superior valuation models directly with the clients (e.g. Boni and Womack, 2006; Groysberg and Healy, 2013). Therefore, we expect buy-side client funds to generate higher abnormal returns on stocks where access to industry expert analysts' research services is available through their brokers compared to stocks lacking such access.

4.1. Holding Performance of Client Mutual Funds

To measure the impact of sell-side analyst research on investment performance of client funds, we start with comparing the holding performance of stocks in a client fund's portfolio that receive analyst coverage from the fund's brokers to that of stocks in the same funds' portfolio that do not receive analyst coverage from the fund's brokers. Such a within-fund comparison of stocks with and without analyst coverage allows us to effectively remove time-variant and time-invariant manager, fund and fund family characteristics related to investment performance of portfolio holding stocks (e.g. Cici, Gehde-Trapp, Göricke and Kempf, 2014)

We follow an extensive body of prior research (e.g., Chen, Jegadeesh and Wermers, 2000; Kacperczyk, M., Van Nieuwerburgh, Veldkamp, 2013; Chen, Hong, Jiang and Kubik, 2013) and measure the gross abnormal holding performance of stocks in a client mutual fund's portfolio. Specifically, at the beginning of each quarter, we classify stock holdings according to research coverage provided by sell-side analysts at brokers receiving broker commissions and construct two main portfolios for each client fund: coverage portfolio and no-coverage portfolio. Once a stock is

[18] Untabulated analysis documents that broker market share of treatment funds diverge from control funds only following the loss of analysts, a necessary condition for the implementation of a difference-in-difference approach.

assigned to one of the portfolios, we hold that stock for the entire duration of the quarter and rebalance these portfolios at the end of the quarter in accordance with updated analyst coverage. Our main measures of monthly stock performance are based on Fama and French (1993) three-factor model (*3-Factor alpha*), Carhart (1997) four-factor factor (*4-Factor alpha)* and the Pastor and Stambaugh (2003) five-factor (*5-Factor alpha)*. Specifically, we compute value-weighted monthly alphas of stocks belonging to each corresponding portfolio for each mutual fund from the following regressions:[19]

$$R_{i,t} - R_{F,t} = a_i + \beta_{i,M}(R_{M,t} - R_{F,t}) + \beta_{i,\text{SMB}}\text{SMB}_t + \beta_{i,\text{HML}}\text{HML}_t + \beta_{i,\text{MOM}}\text{MOM}_t + \beta_{i,\text{LIQ}}\text{LIQ}_t + e_{i,t} \quad (2)$$

where R_{pt} is the return on the value-weighted stock portfolio (coverage or no coverage), $R_{f,t}$ is the risk free rate on the three-month treasury bill, $R_{m,t}$ is the monthly return on the value-weighted market index, SMB_t is the size factor defined as the difference between the returns of small and large stocks, and HML_t is the book-to-market factor formed by using the difference between the returns of high and low book-to-market stocks. MOM_t is the difference between the returns of high and low momentum portfolios. Pastor and Stambaugh's (2003) liquidity factor (LIQ) is also added as the fifth factor since the cross-sectional differences in stock returns may reflect differences in liquidity.[20]

****Table 5 here****

Panel A of Table 5 presents the results. Column 1 of Panel A illustrates that no-coverage portfolio generates abnormal monthly returns that are insignificantly different from zero across the three factor models we use. On the other hand, buy-side client portfolio of stocks with access to sell-side analyst research earns a 5-factor monthly abnormal return of 17 basis points, which is statistically significant at the 1% level. The abnormal return difference between the coverage and no-coverage portfolios is significant (19 basis points, t-stats=8.84), underlining the impact of sell-side analysts on buy-side client funds' investment performance.

In column 4 through 9, we segment the client funds' coverage portfolios based on the covering analysts' industry knowledge. Our results indicate that a value-weighted portfolio comprised only of stocks covered by industry expert analysts earn a significant 5-factor monthly

[19] The dollar value of investment position in a given firm by the corresponding mutual fund is used as weights to calculate value-weighted returns. We require each stockholding firm to have stock return data for at least 12 months to measure the abnormal returns from factor models. As additional robustness checks, Table A.5 of the Internet Appendix reports abnormal returns for each of these factor models using alternative classifications such as requiring six or 24 month of stock trading data. The results are similar.

[20] Each of the variables in the four-factor variables is obtained from Kenneth French's website. The LIQ factor is obtained from Lubos Pastor's website.

alpha of 22 basis points, which compounds to an economically significant 2.67% over 12 months. While the portfolio of stocks followed by other types of analysts also earns statistically significant, albeit economically weak, abnormal returns, columns 5 and 6 indicate that the abnormal returns of the client funds' portfolio of stocks covered by industry expert analysts significantly exceed that of other stocks (either those covered by non-industry expert analysts or those without analyst coverage). These results suggest that access to industry knowledge of analysts helps client mutual funds make superior investment decisions and deliver higher abnormal returns on their stock selections. Furthermore, column 7 of Panel A shows that coverage by industry experienced analyst at one of the fund's brokerage houses results into significantly higher holding returns (13 basis points) relative to coverage by industry experts at brokers not employed by the fund. This finding underlines the importance of access to premium analyst client services for the generation of superior investment decisions (Valentine, 2011; Groysberg and Healy, 2013; Green et al., 2014). It also eliminates potential concerns that our results are driven by superior identification of higher performing stocks by industry expert analysts compared to other analysts. [21]

Ferson and Schadt (1996) argue that traditional measures of abnormal performance obtained from factor models might be confounded by common variations in risk levels and risk premia. It is therefore critical to check the robustness of the results presented in Panel A using the conditional asset pricing model proposed by Ferson and Schadt (1996), which includes interaction terms of the excess market returns with lagged macroeconomic variables. We follow prior work (e.g. Kacperczyk, Sialm and Zheng 2005; Huang and Kale, 2013) and estimate the following model:

$$R_{i,t} - R_{F,t} = a_i + \beta_{i,M}(R_{M,t} - R_{F,t}) + \beta_{i,\text{SMB}}\text{SMB}_t + \beta_{i,\text{HML}}\text{HML}_t + \beta_{i,\text{MOM}}\text{MOM}_t + \beta_{i,\text{LIQ}}\text{LIQ}_t + \sum_{j=1}^{4} \beta i,j\,[z_{j,t-1}(R_{M,t} - R_{F,t})] + e_{i,t} \quad (3)$$

where Z represents a vector of demeaned macro-economic variables, including the yield on 1-month Treasury bill, dividend yield of the S&P 500 index, Treasury yield spread between long and short-term bonds, and the quality spread in the corporate bond market (low minus high-grade bonds). The intercept of this model represents the Ferson and Schadt (1996) abnormal performance for each factor model.

[21] As an additional way of addressing this concern, ,we also compare the abnormal performance of stocks covered by analysts with industry knowledge to stocks covered by other analysts irrespective of stockholding of buy-side clients; however fail to find any differences.

Consistent with earlier results, Panel B of Table 5 shows that the difference between the Ferson and Schadt (1996) alphas of the coverage and no-coverage portfolios continues to be significant (16 basis points, t-stats=5.75). Testing the difference in alphas between the expert analyst coverage portfolio and other portfolios, we continue to find improved performance on stocks covered by analysts with related industry experience. This lends support to the notion that superior abnormal performance of client funds on industry expert coverage portfolios is not due to their greater response to changes in macro-economic conditions. Overall, the evidence in Panel A and B paints a consistent picture that industry insights gleaned from sell-side analysts foster enhanced investment performance for buy-side clients.

4.2. Holding Performance of Client Mutual Funds: Cross-sectional analysis

Next, we consider the cross-sectional variations in the performance benefits that client funds receive from industry expert analysts. An important benefit of this analysis is that it can shed further light on the situations where acquisition of superior industry insights from sell-side analysts is expected to provide client portfolio managers with a greater advantage in generating abnormal returns.

****Table 6 here****

In column 1 and 2 of Panel A, we first examine if industry knowledge obtained from analysts provides client funds a greater advantage for harder-to-value firms that are less likely to be covered by buy-side analysts. These firms are associated with greater information asymmetries, tend to deviate more often from their fundamental values and have lower in-house analyst research inputs. Thus, more in-depth knowledge of the industries in which these firms operate may enable fund managers to better understand and evaluate these firms as candidates for investment. Consistent with section 3.2, we segment client investment portfolio firms at the median based on the idiosyncratic volatility of stock returns and stock market illiquidity and then re-estimate portfolio alphas within each client fund separately for stocks belonging to high/low volatility/illiquidity portfolios. We find that the marginal impact of industry expert analyst coverage on investment performance of client funds is indeed higher for firms with higher idiosyncratic volatility and greater illiquidity.

Analysts with related industry experience may likewise provide buy-side investors a greater competitive advantage in processing information of stockholding firms whose operations are better explained by industry fundamentals. In columns 7 through 9, we segment expert analyst coverage firms based on a firm's revenue synchronicity with its industry. We find that access to industry

expert analysts leads to 12 basis points higher abnormal holding returns for a portfolio comprised of firms with above median revenue synchronicity.

In Panel B, we evaluate the impact of expert analyst coverage conditional upon client funds' industry expertise. Results in column 1 through 9 illustrate that industry knowledge of analysts helps client funds generate abnormal performance irrespective of their own industry expertise, lending empirical support to the notion that industry insights gathered from these expert analysts complement the private information set of client fund.[22]

4.3 Analyst Departures and Change in Client funds' performance: A difference-in-difference (DiD) approach

Similar to the analysis in Section 3.3., we investigate the benefits accrued to client funds from analyst research services in a *dynamic* setting created by sell-side analyst departures from brokerage houses. If client funds improve their investment performance on stocks with access to industry expert analyst coverage, we expect a decline in the funds' performance on stocks affected by such analyst departures. Employing a within-client fund approach and a DiD methodology, we compare the *change* in fund performance of a portfolio of *treatment* stocks losing analyst coverage to the fund performance *change* of a portfolio of *control* stocks that do not experience analyst coverage loss. In particular, we match control stocks to treatment stocks by Daniel et al.'s (1997) algorithm where control firms are in the same size, book-to-market ratio and momentum quintile as the treatment stocks during the month of June prior to the event and did not experience a change in analyst coverage in the pre or post-event year.

****Table 7 here****

Table 7 present this analysis, with Panels A and B based on unconditional and conditional factor models, respectively. Focusing on the mean DiD for the 5-factor monthly abnormal returns reported in column 1 of Panel 1, we find that abnormal monthly holding performance of a portfolio of stocks where client funds lose access to analyst research services is significantly lower in the post-event year (t+1) compared to pre-event year (t-1) (43 basis points, t-stats=-5.49).[23] In Column 2 and 3, we distinguish treatment firms based on loss of coverage by industry experts (*Lost Related Exp. Analyst Coverage*) and other analysts (*Lost Other Analyst Coverage*). In column 4, we also report

[22] Untabulated analysis also sorts buy-side clients based on several fund specific characteristics (e.g., fund size, fund family size, expense ratio, age, and turnover) and shows that the impact of industry expert coverage is orthogonal to these characteristics.

[23] There is no significant change in the investment performance of control stocks that are not impacted by analyst departures.

differences in DiD across these two groups. Our results show that the portfolio of treatment stocks losing expert analysts is associated with 48 basis points lower monthly abnormal investment performance in the post-event period during which client fund lacks research services from such analysts. Likewise, for the portfolio of stocks losing coverage by other analysts, the monthly abnormal holding performance deteriorates by 17 basis points. However, the loss of expert analyst coverage leads to economically and statistically more pronounced declines in client fund performance (31 basis points, t-stats=-3.29). Collectively, results from this dynamic setting further ascertain the importance of industry expert analysts' research services for client buy-side managers' investment performance.

4.4. Industry Expert Analyst Coverage and Trade-Based Client Fund Performance

In addition to examining the holding based returns of stocks invested by buy-side institutions, we also analyze the performance of trades within each client fund manager's portfolio. Chen, Jegadeesh and Wermers (2000), Kothari and Warner (2001), Punnick (2003), among others, suggest that an examination of trades as opposed to stock holdings provides a relatively more powerful way of detecting abnormal performance. The trade-based approach further alleviates concerns that the holding-based return results are driven by mis-specified regression models (Kempf et al., 2014).

Similar to the framework developed in related work, we compare the abnormal performance of buy and sell trades within each client mutual fund's investment portfolio of stocks. Specifically, for each holding quarter, we classify a stock as net buy (sell) if the change in portfolio weight is positive (negative) from the beginning to the end of a quarter. Next, we distinguish stocks covered by analysts with industry experience from others (i.e. no coverage, other analyst coverage) for each fund, and separately place them into net buy and sale portfolios. We then compute the value-weighted gross returns of each portfolio using the dollar value of purchased or sold shares as the weight. The portfolios are rebalanced at the end of each quarter according to the updated trade direction on each stock in each fund's portfolio. We estimate the abnormal returns of each portfolio by running the same set of factor-based asset pricing models as in Table 5 of Section 5.1.[24]

****Table 8 here****

Table 8 presents the results. Panel A documents that client funds' buys earn an average five-factor monthly alpha of 30 basis points in stocks covered by analysts with related industry

[24] Similar to Section 4.1, each net buy/sell firm is required to have post-transaction returns for at least 12 months to compute abnormal returns from the factor models. The findings are also robust using a 6- or 24-month data requirement. These results are reported in internet appendix Table A.6.

experience. Conversely, sell trades earn significantly negative monthly abnormal returns in these stocks (-15 basis points, t-stats=-4.06). A long-short portfolio strategy comprised entirely of trades in expert analyst coverage stocks (buys minus sells) earns an average five-factor abnormal monthly return of 46 basis points (t-stats=7.93), which compounds to an economically significant 5.66 % over 12 months.

Next, we compare the returns of long-short portfolios mimicking trades on industry expert analyst coverage stocks with those of stocks where no coverage is available. The findings in columns 4-5 suggest that the long-short portfolio of stocks covered by industry expert analysts from the fund's brokers generates significantly higher abnormal returns than the long-short portfolios of other stocks held by the same fund. Similar to results presented for portfolio holding performance, column 6 of Table 8 shows that the profitability of a client fund's trades on firms with access to industry expert analysts from one of its brokers exceeds that of firms covered by industry expert analysts employed by non-affiliated brokers. This further emphasizes the importance of analyst client research services on trading performance of client funds. Panel B reports similar results using the conditional asset pricing models of Ferson and Schadt (1996). Overall, these findings reaffirm the evidence from our earlier analysis, and continue to suggest that acquisition of industry knowledge from sell-side analysts translates into higher performance for client funds' stock purchases and sells.

5. Robustness Tests, Discussion and Additional Analysis

5.1. Broker Commissions using Ancerno Ltd. and finer N-SAR Classifications

A plausible concern with our analysis is that in the N-SAR filings, commissions are reported only for top 10 brokerage houses at the investment company level and are allocated to the fund level using a proration algorithm for multi-fund series. To mitigate the potential noise introduced by these data limitations and corroborate the findings based on information from N-SAR filings, we conduct a robustness analysis using a proprietary institutional transaction data obtained from Ancerno Ltd. (formerly Abel Noser), a consulting firm for institutional investors that tracks and evaluates transaction costs.[25] Ancerno reports the dates, number of stocks, broker commissions, broker name for each trade in the dataset, providing an opportunity to measure broker commission market shares

[25] Prior studies that use Ancerno data include, among others, Goldstein et al. (2009), Chemmanur, He, and Hu (2009), Puckett and Yan (2011), Green et al. (2014).

for executed trades at the fund-broker level. Ancerno contains a total of 166 brokers, 176 unique institutions, and 323 money managers during our sample period.

****Table 9 here****

Panel A of Table 9 repeats the analysis on broker commissions allocations using actual transactions of institutional money managers and documents that inferring broker level commissions from N-SAR data has little impact on main results. For instance, the relative trading commission share for a broker increases by 0.34% for a one standard-deviation increase in the percentage of industry expert analyst coverage provided on these traded stocks. In panel B, we exploit the shocks to research coverage of these traded stocks stemming from analyst departures as in Section 3.3. Using a DiD approach, we find that money managers in Ancerno lower the relative trading commission share of treatment brokers more significantly if they lose coverage from industry expert analysts compared to cases where there is only loss of coverage from other analysts. In panel C, we follow the framework in Section 4.4 and re-examine the impact of industry expert analyst coverage for client funds' trading performance. Confirming earlier results, we document that access to industry experienced analysts transforms into more profitable buy and sell trades compared to trades executed on stocks with non-expert analyst coverage or expert analyst coverage from other brokers to which the fund does not allocate trading commission.

In a further attempt to alleviate concerns over the N-SAR data proration algorithm on multi-fund series, we also repeat our analysis using only a subsample of 924 single-fund series from N-SAR filings where no such proration is necessary. Model 1 and 2 of Table 10 reports the results on broker commission allocations. We find that the coefficient on industry expert analysts continue to be significant and larger than other types of analysts for funds that file their N-SAR reports as single-fund series. Untabulated analysis also documents robust results for the holding and trading performance of stocks in single-fund clients' investment portfolio. In sum, the proration algorithm and N-SAR filings commission data reporting system do not introduce bias into our analysis.

5.2. Analyst industry knowledge using with finer classifications, fixed effects and alternative investment performance measures

Another potential concern with our analysis is that analyst industry experience is based on the coarse Fama-French 5-industry classification due to the majority of pre-analyst employers being private firms. However, if anything, this would introduce noise and bias against finding significant results for our main conjectures. Nevertheless, to deal with this concern, we repeat our main analysis

using a subset of analysts who worked only at public firms prior to becoming a sell-side analyst. Boni and Womack (2006) suggest that the Global Industry Classification System (GICS) classification matches well with analyst industries. Therefore, we redefine related and unrelated experience using the 4-digit GICS of these public firms. In model 3 and 4 of Table 10, we re-estimate equation 1 with this subsample of analysts and continue to find that a broker's share of commission allocation is higher when it provides industry expert analysts coverage on a larger proportion of a fund's portfolio firms. In addition, Table A.1 and A.2 of the Internet Appendix also replicate the analysis on portfolio holdings and client fund trades employing finer GICS classifications, and report robust results, suggesting that our industry classification scheme does not pose an important problem for our research questions.

****Table 10 here****

In another robustness check, we include mutual fund fixed effects to control for time-invariant fund characteristics that could also affect broker allocation decisions. Model 5 of Table 10 reports the results. Consistent with earlier evidence, we find that funds increase the allocation of trading commissions to brokerage houses by 0.14% for a one standard deviation increase in industry experienced analyst coverage. In model 6, we further include a fixed effect for each fund-year pair to examine the association between analyst coverage and broker allocation decisions within the *same* fund's portfolio at the *same* point in time. Our results remain robust.

Throughout our paper, we use widely-accepted measures of abnormal performance based on factor models. However, as indicated by Griffin and Xu (2009), the Daniel, Grinblatt, Titman, and Wermers (DGTW, 1997) characteristic-adjusted excess returns might have more statistical power to detect abnormal performance relative to factor models. This is due to characteristic matching yielding benchmarks that explain a higher fraction of realized variances in returns relative to factor models. In Panel A and B of Internet Appendix Table A.3, we re-estimate abnormal stock returns with the DGTW approach and continue to find strong results.

Finally, to account for potential differences in industry expert and other stocks' idiosyncratic risk exposure, we follow Kacpercyzk, Sialm and Zheng (2005) and compute the appraisal ratio of Treynor and Black (1973). Specifically, we scale the factor model alphas by the standard deviation of residuals from these models. Internet Appendix Table A.4 presents these results. Consistent with our earlier findings, we observe a significant and positive relationship between access to research by industry experienced analysts and client funds' returns in these stocks, suggesting our main results are not driven by the level of idiosyncratic risk.

5.3. Stock-level commission allocation to brokers providing only non-expert analyst coverage

Our evidence suggests that through higher broker commission allocations, buy-side investors gain access to industry knowledge of sell-side analysts, which contributes to superior investment performance for client funds. This is consistent with the fact that buy-side institutions, executives and buy-side analysts rank industry knowledge as the most important attribute of sell-side analysts. However, we do observe from the stock-level trade and commission allocation data in Ancerno that funds sometimes direct order flows on certain stocks to brokers that do not provide industry expert analyst coverage on these stocks. This appears to be at odds with the evidence presented in this paper, because it would seem puzzling that buy-side funds reward non-expert analyst (i.e. unrelated experience or inexperienced) coverage with commissions.

To gain a better understanding of this pattern and more insights into buy-side institutions' trade and commission allocation decisions, we investigate trading commission allocations for each fund-stock pair across brokerage houses. In particular, we look at the availability of industry expert analyst coverage from other brokers on a particular stock held by a fund and examine how it affects the same fund's selection of a broker providing only non-expert coverage on the *same* stock. The lack of expert analyst coverage provided by other brokers on this stock will make it more likely for the fund to executive trades through brokers providing only non-expert analyst coverage. Furthermore, we consider the indirect compensation for industry expert analyst coverage provided on the same fund's *other* stocks. Prior work suggests that client funds might reward brokers for the research services by allocating commissions on other stock transactions (e.g. O'Brien and Bhushan, 1990; Irvine, 2001; Maber, Groysberg, and Healy, 2014). Our presumption is that it is more likely to observe funds allocate trading commissions on a stock with only non-expert analyst coverage if the same broker offers industry expert analyst coverage on a greater percentage of the rest of the fund's portfolio firms.

We estimate a logistic regression and investigate the allocation of commissions on stocks with only non-expert analysts following from the employed brokerage houses. Our first primary variable of interest captures the availability of industry experienced analysts on the same stock by other brokers (*Related Experienced Analyst coverage-other brokers*) and equals one if there exists such an expert analyst coverage, zero otherwise. Our second variable of interest, *%Related Experienced Analyst Coverage-other client stocks,* equals the fraction of the same client fund's stocks covered by industry

expert analysts at the employed broker. We also control for various analyst and broker characteristics as in equation 1 and include broker and year fixed effects. Our model is as follows:

$$Logit\ (Other\ Analyst\ Coverage_{ijt}=1) = \beta_1(Related\ Experienced\ Analyst\ coverage\text{-}other\ brokers) + \beta_2(\%\ Related\ Experienced\ Analyst\ Coverage\text{-}Other\ client\ fund\ stocks) + \beta_3(Affiliated\ Broker) + \beta_4(Top\ 10\ Broker) + \beta_5(Same\ Industry\ Expertise) + \beta_6(\%\ Lag\ (Broker\ share)) + \beta_7(All\text{-}star\ Analyst) + \beta_8(Leader\ Analyst) + \beta_9(Frequent\ Forecaster\ Analyst) + \beta_{10}(High\ General\ Experience\ Analyst) + \beta_{11}(Large\ Portfolio\ Analyst) + \beta_{12}(Optimistic\ Analyst) + \beta_{13}(Bold\ Analyst) + Broker,\ Year\ Dummies + \varepsilon \quad (4)$$

Table 11 presents the results from the logistic regressions. Model 1 shows that the coefficient on *Related Experienced Analyst coverage-other brokers* is significantly negative. This suggest that a fund is less likely to execute trades on an investment firm through a broker providing only non-expert analyst coverage on this stock if there exist industry expert analysts following the same firm from other brokers. In economic terms, coverage by industry experienced analysts at other brokers decreases the likelihood of funds allocating commissions to a broker providing only non-expert analyst research services by 36%. The coefficient estimate on *%Related Experienced Analyst Coverage-other client stocks* is significantly positive, implying that client funds reward the brokers on non-expert coverage stocks for industry experienced analyst coverage provided on other stocks in their investment portfolios. Other control variables have expected signs. In sum, the results in this section furthers our understanding of client-broker pairings at the fund-stock level and suggests that trading commission allocations for non-expert analyst coverage are likely due to shortage in industry expert analyst coverage available from other brokers as well as indirect compensation for expert coverage offered on other fund stocks.

6. Conclusion

Buy-side institutions are among the prominent consumers of sell-side analyst research services and allocate millions of dollars in trading commissions to brokerage houses for premier client services. Practitioner surveys and *II* magazine annual poll consistently indicate that industry knowledge on investment portfolios is the most important research service provided by sell-side analysts. Despite this commonly held view on analyst industry expertise, there is no evidence on how this analyst attribute affects mutual fund commission allocations across brokerage houses, and more importantly, their investment performance. In this paper, we aim to fill this important void in the academic literature.

We empirically examine these research questions using hand-collected biographical data on a large sample of sell-side analysts and mutual fund broker commission payment data during the

period of 1999 to 2010. We find that mutual funds allocate larger shares of commissions to brokerage firms providing industry expert analyst coverage on a larger proportion of the funds' holdings. Cross-sectional analysis reveals that our results are more pronounced for analysts possessing longer relevant industry experience, superior forecasting performance and All-Star status from the *II* magazine. Industry expert coverage on firms with limited public information, lacking buy-side analyst coverage, and more synchronous with corresponding industries draw more commission allocations from buy-side investors. To establish the causality of our results, we exploit shocks in a dynamic setting created by analyst departures with a DiD approach. We find that industry expert analyst departures from brokerage firms lead to large reductions in the commission allocation from funds whose holding stocks are affected by such departures.

Our analysis of fund investment decisions shows that client funds generate economically and statistically higher abnormal holding returns on stocks covered by industry expert analysts compared to stocks that are held by the same funds, but lack coverage by such analysts. Further results suggest that research coverage by industry experienced analysts at one of the fund's brokers leads to significantly higher returns relative to coverage by industry expert analysts from brokers not employed by the fund, underlining the value of premium analyst client services for investment performance. We obtain similar results investigating the profitability of client funds' buy and sell-trades.. Exploiting the same dynamic setting mentioned above, we find that client funds' investment performance on stocks losing industry expert analyst coverage experiences significant deterioration.

Finally, we perform a stock-level commission allocation analysis and examine why fund managers sometimes route trades on certain stocks to brokerage firms that do not provide industry expert analyst coverage on these stocks. We find that such instances are more likely when there is a shortage of industry expert analysts for those stocks from other brokers. In addition, we find that a fund's trade allocation to a broker providing only non-expert analyst coverage on a stock is more likely when the broker offers industry experienced analyst coverage on a greater percentage of the other stocks in the fund's portfolio, suggesting indirect compensation by buy-side investors for analyst industry expertise.

Overall, our paper paints a clear picture that mutual fund managers recognize the value of superior industry knowledge provided by expert analysts on portfolio holding firms and allocate more commissions to compensate for these research services. In return, client funds improve their investment performance, and generate higher holding returns and execute more profitable trades.

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Appendix. Variable Definitions

Variable	Definition
% Analyst Coverage	Percentage of mutual fund *i*'s stockholding firms covered by broker *j*.
% Related Experienced Analyst Coverage	Percentage of mutual fund *i*'s stockholding firms covered by analysts with related industry experience working at broker *j.*
% Unrelated Experienced Analyst Coverage	Percentage of mutual fund *i*'s stockholding firms covered by analysts with unrelated industry experience working at broker *j.*
% Inexperienced Analyst Coverage	Percentage of mutual fund *i*'s stockholding firms covered by analysts without prior industry experience working at broker *j.*
Broker share	Total commissions allocated to broker *j* by mutual fund *i* during period *t* scaled by total broker commissions across all brokers for the mutual fund *i* during period *t*
Top 10 Broker	A binary indicator that equals one if the broker is one of the top decile brokerage houses.
Affiliated Investment Bank Coverage	Percentage of mutual fund *i*'s stockholding firms with investment banking affiliation to broker *j.*
Same Industry Expertise	A binary indicator that equals one if brokerage house and mutual fund share the same industry specialization, defined as the industry code with the highest percentage of analysts (firms) in a broker (mutual fund portfolio).
%All-Star Analyst Coverage	Percentage of mutual fund *i*'s covered firms that are followed by All-Star ranked analysts working at broker *j.*
%Leader Analyst Coverage	Percentage of mutual fund *i*'s covered firms that are followed by broker *j's* analysts who made the first annual EPS forecast on firm k for current year.
%Frequent Forecaster Analyst Coverage	Percentage of mutual fund *i*'s covered firms that are followed by broker *j's* analysts who made above median number of revisions on

	firm k's EPS forecasts for current year.
%High General Experience Analyst Coverage	Percentage of mutual fund *i*'s covered firms that are followed by broker *j's* analysts with above median length of experience.
%Large Portfolio Analyst Coverage	Percentage of mutual fund *i*'s covered firms that are followed by broker *j's* analysts with above median coverage portfolio size.
%Optimistic Analyst Coverage	Percentage of mutual fund *i*'s covered firms that are followed by analysts with above median experience working at broker *j*.
%Bold Analyst Coverage	Percentage of mutual fund *i*'s covered firms that are followed by broker *j's* analysts who issue bold forecast.
% Related Experienced Analyst Coverage (long/short experience)	Percentage of mutual fund *i*'s stockholding firms covered by broker *j*'s related industry experienced analysts with above/below median related industry work experience length.
% Related Experienced Analyst Coverage (high/low PMAFE)	Percentage of mutual fund *i*'s stockholding firms covered by broker *j*'s related industry experienced analysts with above/below median forecast accuracy (PMAFE).
% Related Experienced Analyst Coverage (All-Star/ No All-star)	Percentage of mutual fund *i*'s stockholding firms covered by broker *j*'s related industry experienced All-Star (no All-star) analysts.
% Related Experienced Analyst Coverage (high/ low IV)	Percentage of mutual fund *i*'s stockholding firms with above/below median idiosyncratic volatility that are covered by broker *j*'s related industry experienced analysts. (Idiosyncratic volatility is measured as the standard deviation of the residual from FF3 factor model daily return regression in year t)
% Related Experienced Analyst Coverage (high/low illiquidity)	Percentage of mutual fund *i*'s stockholding firms with above/below median Amihud illiquidity that are covered by broker *j*'s related industry experienced analysts. (Amihud illiquidity measure is computed as the average of absolute value of the daily

	return-to-volume ratio in year t.)
% Related Experienced Analyst Coverage (high/low synch.)	Percentage of mutual fund *i*'s stockholding firms with above/below median revenue synchronicity that are covered by broker *j*'s related industry experienced analysts. (Revenue synchronicity is measured as the R^2 from the firm-level estimation of the model $REV_{i,t} = \alpha 0 + \alpha 1\ INDREV_{i,t} + \varepsilon_{i,t}$ over the prior 12 quarters)
% Related Experienced Analyst Coverage (high/low Ind. concentration)	Percentage of mutual fund *i*'s stockholding firms with above/below median industry concentration that are covered by broker *j*'s related industry experienced analysts. (industry concentration is computed as the percentage weight of an industry out of the total market value of mutual fund i's portfolio holdings)
% Related Experienced Analyst Coverage (major/non-major industry)	Percentage of mutual fund *i*'s stockholding firms in mutual fund *i*'s major/non-major industry that are covered by broker *j*'s related industry experienced analysts.(Major industry is defined as the industry with largest market value of mutual fund holdings among all FF5 industries)
% Related Experienced Analyst Coverage (high/low ISP)	Percentage of mutual fund *i*'s stockholding firms with above/below median number of past industry shocks (Kempf, Manconi and Spalt, 2014) that are covered by broker *j*'s related industry experienced analysts.
Related Experienced Analyst coverage-other brokers	A binary indicator that equals one if the firm is covered by a related experienced analyst from another brokerage house and 0 otherwise.
% Related Experienced Analyst Coverage-Other client fund stocks	Percentage of mutual fund *i*'s stockholding firms (excluding current firm) covered by analysts with related industry experience working at broker *j*.

Table 1. Summary statistics

This table reports summary statistics of the sample. Panel A presents summary statistics on number of unique mutual funds and portfolio holding firms, analyst coverage according to pre-analyst industry work experience for a sample of diversified, actively managed equity mutual funds with broker commission information available from N-SAR semi-annual filings. % Analyst coverage, % Related Experienced Coverage, % Unrelated Experienced coverage, % Inexperienced coverage are the percentage of coverage provided by any analyst, analysts with related (unrelated) industry work experience, analysts without work experience for mutual fund portfolio holding firms, respectively. % Funds and % Stocks is the percentage of mutual fund and portfolio holding firms representing the overall 'clean' merged Thomson Financial CDA/CRSP Mutual universe of US funds/firms. Panel B presents descriptive statistics for analyst coverage on portfolio holding firms. See Appendix for a description of control variables. Broker commission data are from N-SAR semi-annual reports filed with the Securities and Exchange Commission (SEC). Mutual fund data are from merged Thomson Financial CDA/ Spectrum and CRSP Mutual Fund Database. Analyst data are from *I/B/E/S*, stock price data are from CRSP, and firm characteristics are obtained from Compustat. Analyst employment history is collected from *LinkedIn.com* and supplemented with *Zoominfo.com*

Panel A. Funds, Portfolio Holding firms and Analyst Coverage by industry experience

Year	N Mutual Funds	N Portfolio Holding Firms	% Analyst Coverage	% Related Experienced Coverage	% Unrelated Experienced Coverage	% Inexperienced Coverage	% Mutual Funds	% Portfolio Holding Stocks
Overall	2,204	7,923	42.74	27.88	26.38	28.92	26.59	49.74
1999-2001	1,551	5,744	29.09	14.80	14.94	18.49	32.15	56.94
2002-2004	1,600	4,791	39.24	24.38	21.90	26.19	35.20	55.41
2005-2007	1,298	4,468	50.74	33.08	29.66	31.56	34.36	56.74
2008-2010	1,068	3,772	49.26	31.34	29.64	28.74	23.90	52.27
Average	1,379	4,694	42.08	25.90	24.03	26.24	31.40	55.34

Panel B. Control Variables (expressed in %)

Year	Top 10 Broker	Affiliated Investment Bank	Same Industry Expertise	All-Star Analyst	Leader Analyst	Frequent Forecaster Analyst	High General Experienced Analyst	Large Portfolio Analyst	Optimistic Analyst	Bold Analyst
Overall	28.53	6.10	32.25	10.53	8.63	24.65	27.40	30.32	17.40	5.37
1999-2001	18.11	5.69	22.23	8.07	4.40	12.91	17.90	20.27	10.94	1.43
2002-2004	26.90	5.75	30.76	11.64	7.93	22.20	26.61	29.06	15.30	5.71
2005-2007	35.95	6.50	39.88	13.73	11.26	32.24	34.54	37.82	23.13	7.29
2008-2010	36.93	6.64	39.65	9.08	12.48	35.69	33.80	37.66	22.65	8.34
Average	29.47	6.14	33.13	10.63	9.02	25.76	28.21	31.20	18.01	5.69

Table 2. Mutual Fund Broker Commission Allocations and Analyst Coverage

This table presents OLS regression results for fund-level relative broker commission shares and % analyst coverage offered on fund portfolio holding firms. The dependent variable is the commission share of a broker for a mutual fund, which is defined as total commissions allocated to broker j for mutual fund i during period t scaled by total broker commissions across all brokers for the same mutual fund i at the same point in time. The primary variables of interest are *% Analyst Coverage, % Related Experienced Coverage, % Unrelated Experienced Coverage and % Inexperienced Coverage*, which represent the percentage of MF *i*'s portfolio holding firms that are covered by broker *j*'s analysts, analysts with related and unrelated industry experience or no work experience, respectively. Broker commission data are from N-SAR semi-annual reports filed with the Securities and Exchange Commission (SEC). Mutual fund data are from merged Thomson Financial CDA/ Spectrum and CRSP Mutual Fund Database. Analyst data are from *I/B/E/S*, stock price data are from CRSP, and firm characteristics are obtained from Compustat. Analyst employment history is collected from *LinkedIn.com* and supplemented with *Zoominfo.com*. See Appendix for a description of control variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Model 1	Model 2	Model 3	Model 4
% Analyst Coverage	2.71***			
	(16.07)			
% Related Experienced Analyst Coverage		4.42***	3.65***	3.56***
		(15.81)	(7.66)	(7.50)
% Unrelated Experienced Analyst Coverage		1.65***	1.10**	1.01**
		(4.92)	(2.28)	(2.10)
% Inexperienced Analyst Coverage		1.63***	0.84*	0.75
		(5.46)	(1.72)	(1.54)
Top 10 Broker	-0.01	-0.01	-0.01	-0.01
	(-0.68)	(-0.99)	(-1.06)	(-1.19)
% Lag (Broker share)	41.01***	40.99***	40.97***	40.96***
	(43.08)	(43.03)	(42.99)	(42.94)
% Affiliated Investment Bank	14.87***	14.91***	14.60***	14.61***
	(8.61)	(8.63)	(8.46)	(8.47)
Same Industry Expertise	0.01*	0.01*	0.01**	0.01**
	(1.73)	(1.72)	(1.98)	(1.97)
% All-Star Analyst Coverage			0.42***	0.42***
			(7.11)	(7.11)
% Leader Analyst Coverage			0.01	0.01
			(0.99)	(0.93)
% Frequent Forecaster Analyst Coverage			0.40	0.36
			(1.05)	(0.94)
% High General Experience Analyst Coverage			-0.34	-0.31
			(-0.98)	(-0.89)
% Large Portfolio Analyst Coverage			0.79**	0.79**
			(2.10)	(2.11)
% Optimistic Analyst Coverage				-0.01
				(-0.66)
% Bold Analyst Coverage				2.62**
				(2.23)
H_0: Related = Inexperienced		2.78***	2.55***	2.55***
H_0: Related = Unrelated		2.79***	2.81***	2.81***
H_0: Unrelated = Inexperienced		0.01	0.26	0.27
R^2	45.63%	45.64%	45.66%	45.66%
N	892,672	892,672	892,672	892,672
Broker, Year Fixed Effects	Y	Y	Y	Y

Table 3. Cross-Sectional Variations in the effect of Related Experienced Analysts and Mutual Fund Broker Commission Allocations

This table presents OLS regression results for fund-level relative broker commission shares and % analyst coverage offered on fund portfolio holding firms. The dependent variable is the commission share of a broker for a mutual fund, which is defined as total commissions allocated to broker j for mutual fund i during period t scaled by total broker commissions across all brokers for the same mutual fund i at the same point in time. For brevity, only the coefficient estimates on key variables are presented; all other explanatory variables are suppressed. Reported differences are from Wald tests of joint hypotheses using an asymptotic Chi-Square distribution. See Appendix for a description of these variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Panel A: Quality of Analyst Industry Experience	Model 1	Model 2	Model 3
% Related Experienced Analyst Coverage (long experience)	5.98***		
	(9.46)		
% Related Experienced Analyst Coverage (short experience)	1.65***		
	(3.03)		
% Related Experienced Analyst Coverage (high PMAFE)		1.90***	
		(2.92)	
% Related Experienced Analyst Coverage (low PMAFE)		4.32***	
		(8.40)	
% Related Experienced Analyst Coverage (All-Star)			8.34***
			(8.33)
% Related Experienced Analyst Coverage (No All-Star)			2.74***
			(5.84)
Difference	4.32***	-2.42***	5.60***
	(6.27)	(-3.74)	(5.99)
Control Variables	Y	Y	Y
Broker, Year Fixed Effects	Y	Y	Y

Panel B: Portfolio Holding Firm Characteristics	Model 1	Model 2	Model 3
% Related Experienced Analyst Coverage (high IV)	6.22***		
	(8.36)		
% Related Experienced Analyst Coverage (low IV)	2.98***		
	(6.07)		
% Related Experienced Analyst Coverage (high illiquidity)		9.14***	
		(13.91)	
% Related Experienced Analyst Coverage (low illiquidity)		2.81***	
		(5.70)	
% Related Experienced Analyst Coverage (high synch)			6.46***
			(8.20)
% Related Experienced Analyst Coverage (low synch)			2.81***
			(5.70)
Difference	3.25***	7.30***	3.65***
	(4.67)	(12.32)	(4.75)
Control Variables	Y	Y	Y
Broker, Year Fixed Effects	Y	Y	Y

Panel C: Mutual Fund Industry Expertise

	Model 1	Model 2	Model 3
% Related Experienced Analyst Coverage (high ind. concentration)	3.39***		
	(6.60)		
% Related Experienced Analyst Coverage (low Ind. concentration)	3.94***		
	(6.69)		
% Related Experienced Analyst Coverage (major industry)		3.85***	
		(6.66)	
% Related Experienced Analyst Coverage (non-major industry)		3.33***	
		(6.72)	
% Related Experienced Analyst Coverage (high ISP)			4.36***
			(6.97)
% Related Experienced Analyst Coverage (low ISP)			3.33***
			(6.72)
Difference	-0.55	0.51	1.03*
	(-1.01)	(0.94)	(1.86)
Control Variables	Y	Y	Y
Broker, Year Fixed Effects	Y	Y	Y

Table 4. Analyst Departures and Changes in Client Funds' commission allocations: Differences-in-Difference (DiD) Approach

This table reports the effect of losing analysts emanating from analyst departures on the change in client funds' brokerage commission allocations. The first column provides the cross-sectional means of mean treatment difference, mean control difference and differences-in-difference (DiD) for the full sample of treatment client funds affected by the loss of analyst coverage (Lost Analyst). Lost Related Experienced Analyst (Lost Other Analyst) provides results for sample of client funds associated with terminations of coverage by related industry experienced analysts (all other analysts). The last column reports the differences between these two groups. Control client funds are matched by their relative commission share (*%Broker share)*, investment bank affiliation (*Affiliated Investment Bank*) and percentage of analyst coverage (*% Analyst coverage*) in year t-1. See text (Appendix) for complete description of matching process (control variables). *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Panel A. Overall Sample	Lost Analyst Coverage	Lost Related Exp. Analyst Coverage	Lost Other Analyst Coverage	Difference
Mean Treatment Client Fund Difference (Year T+1 vs T-1)	-1.99***	-2.55***	-1.56***	0.99***
Mean Control Client Fund Difference (Year T+1 vs T-1)	0.01	0.03	0.00	-0.03
Mean of DiD (Treatment vs Control Client Fund)	-2.01***	-2.58***	-1.56***	1.02***

Panel B: High % Lost Analyst Coverage	Lost Analyst Coverage	Lost Related Exp. Analyst Coverage	Lost Other Analyst Coverage	Difference
Mean Treatment Client Fund Difference (Year T+1 vs T-1)	-2.44***	-3.27***	-1.81***	1.46***
Mean Control Client Fund Difference (Year T+1 vs T-1)	-0.03	-0.04	-0.01	0.03
Mean of DiD (Treatment vs Control Client Fund)	-2.41***	-3.22***	-1.80***	1.43***

Panel C: Low % Lost Analyst Coverage	Lost Analyst Coverage	Lost Related Exp. Analyst Coverage	Lost Other Analyst Coverage	Difference
Mean Treatment Client Fund Difference (Year T+1 vs T-1)	-1.74***	-2.01***	-1.38***	0.64***
Mean Control Client Fund Difference (Year T+1 vs T-1)	0.03	0.09*	0.00	-0.08
Mean of DiD (Treatment vs Control Client Fund)	-1.77***	-2.10***	-1.38***	0.72***

Table 5. Analyst Coverage and Client Funds' Monthly Portfolio Holding Performance

This table reports mean monthly value-weighted portfolio holding returns for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. A firm k is included in the mutual fund i's corresponding portfolio at the beginning of quarter t and held between quarter t and t+1. Each within-fund portfolio is rebalanced at the beginning of quarter t+1 in accordance with updated analyst coverage from fund i's brokers. Difference portfolios are at within-fund portfolio level and represent performance comparison of stocks receiving the corresponding analyst coverage. Measures of stock performance are based on Fama and French (1993) three-factor model (*3-Factor alpha)*, Carhart (1997) four-factor factor (*4-Factor alpha)* and the Pastor and Stambaugh (2003) five-factor (*5-Factor alpha)*. Panel B reports results from these factor regressions employing Ferson and Schadt (1996) model. The dollar value of an investment position in firm k by mutual fund i is used as the weight to calculate value-weighted returns. ***, ** and *denote significance at 1%, 5%, and 10%, respectively.

Panel A: Factor Regressions

	No Coverage	Analyst Coverage	Diff (Coverage -No Coverage)	Related Exp. Coverage	Diff (Related Exp. -No Coverage)	Diff (Related Exp. -Other Coverage)	Diff (Related Exp.-Unaffiliated Related Exp.)	Other Analyst Coverage	Diff (Other-No Coverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3-Factor alpha	-0.02	0.21***	0.24***	0.25***	0.28***	0.15***	0.17***	0.09***	0.12***
	(-1.28)	(11.50)	(11.61)	(9.76)	(10.32)	(5.63)	(5.97)	(4.21)	(5.09)
4-Factor alpha	-0.03	0.22***	0.25***	0.25***	0.29***	0.15***	0.17***	0.10***	0.14***
	(-1.61)	(11.49)	(11.78)	(9.83)	(10.44)	(5.36)	(5.94)	(4.70)	(5.76)
5-Factor alpha	-0.01	0.17***	0.19***	0.22***	0.24***	0.16***	0.13***	0.05**	0.08***
	(-0.76)	(8.81)	(8.84)	(8.14)	(8.37)	(5.64)	(4.46)	(2.20)	(3.04)

Panel B: Ferson and Schadt (1996) Model

	No Coverage	Analyst Coverage	Diff (Coverage -No Coverage)	Related Exp. Coverage	Diff (Related Exp. -No Coverage)	Diff (Related Exp. -Other Coverage)	Diff (Related Exp.-Unaffiliated Related Exp.)	Other Analyst Coverage	Diff (Other-No Coverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3-Factor alpha	0.00	0.22***	0.21***	0.23***	0.23***	0.11***	0.15***	0.10***	0.10***
	(0.14)	(10.17)	(8.77)	(8.01)	(7.61)	(3.72)	(4.68)	(4.39)	(3.82)
4-Factor alpha	0.00	0.22***	0.22***	0.24***	0.25***	0.13***	0.16***	0.11***	0.12***
	(0.15)	(9.56)	(8.73)	(8.00)	(7.68)	(3.94)	(4.93)	(4.44)	(4.10)
5-Factor alpha	0.02	0.18***	0.16***	0.21***	0.19***	0.13***	0.13***	0.07**	0.05
	(0.87)	(7.08)	(5.75)	(6.33)	(5.45)	(3.69)	(3.48)	(2.49)	(1.52)

Table 6. Cross-Sectional Variations in effect of Analyst Coverage and Client Funds' Monthly Portfolio Holding Performance

This table reports mean monthly value-weighted portfolio holding returns for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. A firm k is included in the mutual fund i's corresponding portfolio at the beginning of quarter t and held between quarter t and t+1. Each within-fund portfolio is rebalanced at the beginning of quarter t+1 in accordance with updated analyst coverage from fund i's brokers. Difference portfolios are at within-fund portfolio level and represent performance comparison of stocks receiving the corresponding analyst coverage. Measures of stock performance are based on Fama and French (1993) three-factor model (*3-Factor alpha)*, Carhart (1997) four-factor factor (*4-Factor alpha)* employing Ferson and Schadt (1996) model. The dollar value of an investment position in firm k by mutual fund i is used as the weight to calculate value-weighted returns. ***, ** and *denote significance at 1%, 5%, and 10%, respectively.

Panel A: Related Experienced Analysts and Portfolio Holding Firm Characteristics

	High IV	Low IV	Difference	High illiquidity	Low illiquidity	Difference	High *synch*	Low *synch*	Difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3-Factor alpha	0.32***	0.10***	0.24***	0.39***	0.17***	0.23***	0.33***	0.12***	0.21***
	(5.15)	(3.47)	(3.49)	(9.57)	(4.63)	(4.11)	(9.28)	(3.31)	(4.14)
4-Factor alpha	0.32***	0.13***	0.20***	0.39***	0.18***	0.23***	0.32***	0.14***	0.18***
	(5.19)	(4.19)	(2.88)	(9.55)	(4.99)	(4.12)	(8.21)	(3.89)	(3.30)
5-Factor alpha	0.38***	0.11***	0.31***	0.34***	0.18***	0.18***	0.27***	0.15***	0.12**
	(5.84)	(3.34)	(4.17)	(7.81)	(4.75)	(3.08)	(6.38)	(3.67)	(2.02)

Panel B: Related Experienced Analysts and Mutual Fund Industry Expertise

	High Ind. Concentration	Low Ind. Concentration	Difference	Major Industry	Non-Major Industry	Difference	High ISP	Low ISP	Difference
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3-Factor alpha	0.26***	0.26***	0.00	0.27***	0.29***	-0.01	0.19***	0.25***	-0.06
	(6.93)	(6.39)	(-0.06)	(5.86)	(7.93)	(-0.21)	(3.48)	(7.35)	(-2.00)
4-Factor alpha	0.25***	0.23***	0.02	0.24***	0.28***	-0.05	0.17***	0.24***	-0.07
	(6.33)	(5.40)	(0.29)	(5.01)	(7.64)	(-0.79)	(4.01)	(6.64)	(-1.22)
5-Factor alpha	0.22***	0.19***	0.03	0.21***	0.25***	-0.04	0.25***	0.17***	0.08
	(5.39)	(4.26)	(0.58)	(4.12)	(6.38)	(-0.69)	(5.10)	(4.48)	(1.24)

Table 7. Analyst Departures and Changes in Client Funds' Monthly Holding Performance: DiD Approach

This table reports the effect of losing analysts emanating from analyst departures on the change in client funds' abnormal monthly holding performance over the post-departure year (T+1) compared to pre-departure year (T-1). The first column provides the cross-sectional means of mean differences-in-difference (DiD) between treatment and control investment stocks for the full sample of stocks affect by the loss of analyst coverage (Lost Analyst). Lost Related Experienced Analyst (Lost Other Analyst) provides results for sample of client funds associated with terminations of coverage by related industry experienced analysts (all other analysts). The last column reports the differences between these two groups. Control stocks are in the same client's investment portfolio and matched to treatment stocks by Daniel et al. (1997) algorithm. See text (Appendix) for complete description of matching process. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Panel A. Factor Regressions	Lost Analyst Coverage	Lost Related Exp. Analyst Coverage	Lost Other Analyst Coverage	Difference
3-Factor alpha DiD (Treatment vs Control Stocks: Year T+1 vs T-1)	-0.52***	-0.58***	-0.28***	-0.30***
	(-6.94)	(-8.11)	(-3.95)	(-3.17)
4-Factor alpha DiD (Treatment vs Control Stocks: Year T+1 vs T-1)	-0.48***	-0.52***	-0.25***	-0.27***
	(-6.56)	(-7.35)	(-3.55)	(-2.91)
5-Factor alpha DiD (Treatment vs Control Stocks: Year T+1 vs T-1)	-0.43***	-0.48***	-0.17**	-0.31***
	(-5.49)	(-6.75)	(-2.30)	(-3.29)

Panel B. Ferson and Schadt (1996) Model	Lost Analyst Coverage	Lost Related Exp. Analyst Coverage	Lost Other Analyst Coverage	Difference
3-Factor alpha DiD (Treatment vs Control Stocks: Year T+1 vs T-1)	-0.45***	-0.55***	-0.29***	-0.25**
	(-5.38)	(-7.29)	(-3.56)	(-2.47)
4-Factor alpha DiD (Treatment vs Control Stocks: Year T+1 vs T-1)	-0.42***	-0.51***	-0.26***	-0.25**
	(-4.95)	(-6.72)	(-3.11)	(-2.44)
5-Factor alpha DiD (Treatment vs Control Stocks: Year T+1 vs T-1)	-0.34***	-0.49***	-0.15*	-0.34***
	(-3.83)	(-6.20)	(-1.71)	(-3.09)

Table 8. Analyst Coverage and Client Funds' Monthly Trading Performance

This table reports mean monthly value-weighted trading performance for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. For each holding quarter, we classify a stock as net buy (sell) if the change in the portfolio weight for firm k is positive (negative) from the beginning to the end of a quarter t for mutual fund i. Each within-fund portfolio is rebalanced at the beginning of quarter t+1 in accordance with updated analyst coverage from fund i's brokers and updated trade direction on firm k for fund i. Difference and Long-Short (L-S) portfolios are at within-fund portfolio level and represent performance comparison of stocks receiving the corresponding analyst coverage. Measures of stock performance are based on Fama and French (1993) three-factor model (*3-Factor alpha)*, Carhart (1997) four-factor factor (*4-Factor alpha)* employing Ferson and Schadt (1996) model. The dollar value of an investment position in firm k by mutual fund i is used as the weight to calculate value-weighted returns. ***, ** and *denote significance at 1%, 5%, and 10%, respectively.

Panel A: Factor Regressions

	Related Exp. Coverage Buys	Related Exp. Coverage Sells	L-S Related Exp. Buys-Sells	Diff (L-S Related Exp. Buys-Sells)- (L-S No coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Other coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Unaffiliated Related Exp. Buys-Sells)
	(1)	(2)	(3)	(4)	(5)	(6)
FF3 alpha	0.34***	-0.15***	0.49***	0.36***	0.34***	0.36***
	(8.92)	(-4.34)	(9.30)	(6.15)	(5.57)	(5.64)
4-Factor alpha	0.32***	-0.12***	0.45***	0.34***	0.32***	0.35***
	(8.48)	(-3.38)	(8.23)	(5.56)	(5.02)	(5.12)
5-Factor alpha	0.30***	-0.15***	0.46***	0.36***	0.33***	0.36***
	(7.47)	(-4.06)	(7.93)	(5.54)	(4.86)	(4.99)

Panel B: Trading performance and Ferson and Schadt (1996) Model

	Related Exp. Coverage Buys	Related Exp. Coverage Sells	L-S Related Exp. Buys-Sells	Diff (L-S Related Exp. Buys-Sells)- (L-S No coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Other coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Unaffiliated Related Exp. Buys-Sells)
	(1)	(2)	(3)	(4)	(5)	(6)
3-Factor alpha	0.35***	-0.16***	0.51***	0.38***	0.38***	0.36***
	(8.49)	(-4.27)	(8.90)	(5.87)	(5.35)	(4.87)
4-Factor alpha	0.33***	-0.11**	0.43***	0.30***	0.29***	0.27***
	(7.22)	(-2.43)	(6.60)	(3.95)	(3.85)	(3.37)
5-Factor alpha	0.31***	-0.16***	0.47***	0.35***	0.29***	0.35***
	(6.10)	(-3.13)	(6.38)	(4.18)	(3.24)	(3.73)

Table 9. Analyst Coverage, Broker Commission Allocations and Client Funds' Monthly Trading Performance: Ancerno institutional transaction data

This table presents results for broker commission allocations and client fund trade performance using Ancerno institutional transaction data. Panel A presents OLS regression results for fund-level relative broker commission shares and % analyst coverage offered on fund portfolio holding firms. Panel B reports the effect of losing analysts emanating from analyst departures on the change in client funds' brokerage commission allocations. Panel C documents mean monthly value-weighted trading performance for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. See Appendix for a description of control variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

Panel A: Fund Broker Commission Allocations

% Analyst Coverage	10.85*	
	(1.77)	
% Related Experienced Coverage		18.80**
		(2.58)
% Unrelated Experienced Coverage		9.58
		(1.47)
% Inexperienced Coverage		8.60
		(1.43)

Panel B. Analyst Departures and Changes in Client Funds' commission allocations

	Lost Analyst Coverage	Lost Related Exp. Analyst	Lost Other Analyst	Difference
Mean Treatment Difference (Year T+1 vs T-1)	-0.97***	-1.19***	-0.68***	-0.51***
Mean Control Difference (Year T+1 vs T-1)	-0.12*	-0.08	-0.17	-0.09
Mean of DiD (Treatment vs Control)	-0.85***	-1.11***	-0.51***	0.60**

Panel C: Analyst Coverage and Client Mutual Fund Trade Performance - Ferson and Schadt (1996) Model

	Related Exp. Coverage Buys	Related Exp. Coverage Sells	L-S Related Exp. Buys-Sells	Diff (L-S Related Exp. Buys-Sells)- (L-S No coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Other coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Unaffiliated Related Exp. Buys-Sells)
	(1)	(2)	(3)	(4)	(5)	(6)
3-Factor alpha	0.35***	-0.27***	0.62***	0.61***	0.57***	0.58***
	(3.53)	(-3.51)	(5.67)	(4.64)	(3.73)	(4.71)
4-Factor alpha	0.32***	-0.28***	0.62***	0.62***	0.52***	0.44***
	(3.23)	(-3.67)	(5.52)	(4.51)	(3.20)	(4.33)
5-Factor alpha	0.36***	-0.28***	0.64***	0.67***	0.63***	0.51***
	(3.45)	(-3.68)	(5.43)	(4.50)	(3.65)	(4.15)

Table 10. Robustness Tests: Broker Commission Allocations and Industry Experienced Analysts

This table presents OLS regression results for fund-level relative broker commission shares and % analyst coverage offered on fund portfolio holding firms. The dependent variable is the commission share of a broker for a mutual fund, which is defined as total commissions allocated to broker j for mutual fund i during period t scaled by total broker commissions across all brokers for the same mutual fund i at the same point in time. Model 1 and 2 reports results for only single-fund series, Model 3 and 4 for overall sample of funds redefining analyst experience with 4-digit GICS of pre-analyst industry work experience only in public firms, model 5 (6) for overall sample of funds with addition of fund (fund-year) fixed effects. using only analyst public firm experience See Appendix for a description of control variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
% Analyst Coverage	3.43***		1.73***			
	(3.33)		(5.28)			
% Related Experienced Analyst Coverage		5.35***		4.08***	3.83***	3.81***
		(4.30)		(6.28)	(18.07)	(17.85)
% Unrelated Experienced Analyst Coverage		2.67**		1.20***	1.27***	1.33***
		(2.31)		(3.34)	(6.24)	(6.49)
% Inexperienced Analyst Coverage		1.02			1.12***	1.10***
		(0.85)			(4.89)	(4.79)
Top 10 Broker	0.04	0.03	0.00	0.00	-0.02	-0.02
	(1.15)	(1.04)	(-0.16)	(-0.20)	(-1.18)	(-1.20)
% Lag (Broker share)	39.36***	39.34***	40.97***	40.97***	40.78***	40.90***
	(17.19)	(17.16)	(42.98)	(42.97)	(502.48)	(503.20)
% Affiliated Investment Bank	18.37***	18.45***	14.45***	14.46***	14.19***	14.19***
	(4.56)	(4.57)	(8.37)	(8.37)	(28.45)	(28.14)
Same Industry Expertise	0.00	0.00	0.02**	0.02**	0.40***	0.41***
	(0.17)	(0.12)	(2.35)	(2.27)	(14.27)	(14.58)
% All-Star Analyst Coverage	0.56***	0.56***	0.43***	0.44***	-0.04**	-0.04***
	(4.24)	(4.18)	(7.37)	(7.45)	(-2.34)	(-2.84)
% Leader Analyst Coverage	0.00	0.01	0.00	0.00	-0.02	-0.03
	(-0.03)	(0.26)	(-0.27)	(-0.45)	(-0.98)	(-1.26)
% Frequent Forecaster Analyst Coverage	0.02	0.03	0.02	0.02	0.01**	0.01
	(0.63)	(0.70)	(1.51)	(1.55)	(2.18)	(1.37)
% High General Experience Analyst Coverage	0.34	0.17	0.85**	0.86**	0.35**	0.41**
	(0.38)	(0.19)	(2.41)	(2.46)	(2.16)	(2.56)
% Large Portfolio Analyst Coverage	5.61*	5.59*	3.07***	2.99**	2.15***	2.04***
	(1.93)	(1.93)	(2.61)	(2.55)	(4.15)	(3.93)
% Optimistic Analyst Coverage	0.09	0.43	0.10	0.01	-0.28*	-0.26*
	(0.11)	(0.48)	(0.32)	(0.03)	(-1.80)	(-1.72)
% Bold Analyst Coverage	0.11	0.23	1.44***	1.48***	0.59***	0.55***
	(0.13)	(0.25)	(4.67)	(4.82)	(3.56)	(3.29)
R^2	41.67%	41.69%	45.65%	45.65%	46.04%	46.79%
N	199,794	199,794	892,672	892,672	892,672	892,672
Year, Broker FE	Y	Y	Y	Y	N	N
Fund, Year, broker FE	N	N	N	N	Y	N
Fund-Year, broker FE	N	N	N	N	N	Y

Table 11: Shortage in Expert Coverage and Indirect Compensation for Analyst Industry Knowledge

This table presents logistic regression results for the probability that mutual fund allocated broker commissions on a stock with non-expert (i.e. inexperienced/unrelated experienced) analyst coverage using Ancerno institutional transaction data. The dependent variable in each model is a binary variable, which equals 1 if the firm is covered by a non-industry expert analyst, 0 otherwise. See Appendix for a description of control variables. Analyst data are from *I/B/E/S*, stock price data are from CRSP, and firm characteristics are obtained from Compustat. Analyst employment history is collected from *LinkedIn.com* and supplemented with *Zoominfo.com*. See Appendix for a description of control variables. *, **, and *** indicate statistical significance at the 10%, 5%, and 1%, respectively.

	Model 1	Model 2
Related Experienced Analyst coverage-other brokers	-44.50***	-44.89***
	(-101.83)	(-102.26)
% Related Experienced Analyst Coverage-Other client fund stocks	18.58***	18.63***
	(189.35)	(189.37)
Affiliated Broker	8.57***	9.12***
	(5.36)	(5.66)
Top 10 Broker	7.19***	7.65***
	(6.66)	(7.02)
Same Industry Expertise	7.35***	7.64***
	(14.44)	(15.01)
% Lag (Broker share)	7.44***	7.44***
	(156.90)	(156.87)
All-star Analyst		7.62***
		(11.85)
Leader Analyst		1.07
		(1.26)
Frequent Forecaster Analyst		3.25***
		(7.59)
High General Experience Analyst		9.66***
		(20.42)
Large Portfolio Analyst		2.14***
		(4.14)
Optimistic Analyst		0.11
		(0.15)
Bold Analyst		0.75
		(0.80)
Broker, Year Fixed Effects	Y	Y
R^2	19.32%	19.37%
N	1,557,088	1,557,088

Internet appendix

Table A.1 Analyst Coverage and Client Funds' Monthly Portfolio Holding Performance: Analyst work experience at public firms with GICS classifications

This table reports mean monthly value-weighted portfolio holding returns for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. A firm k is included in the mutual fund i's corresponding portfolio at the beginning of quarter t and held between quarter t and t+1. Each within-fund portfolio is rebalanced at the beginning of quarter t+1 in accordance with updated analyst coverage from fund i's brokers. Difference portfolios are at within-fund portfolio level and represent performance comparison of stocks receiving the corresponding analyst coverage. Measures of stock performance are based on Fama and French (1993) three-factor model (*3-Factor alpha)*, Carhart (1997) four-factor factor (*4-Factor alpha)* and the Pastor and Stambaugh (2003) five-factor (*5-Factor alpha)*. Panel B reports results from these factor regressions employing Ferson and Schadt (1996) model. The dollar value of an investment position in firm k by mutual fund i is used as the weight to calculate value-weighted returns. ***, ** and *denote significance at 1%, 5%, and 10%, respectively.

Panel A: Factor Regressions

	No Coverage	Analyst Coverage	Diff (Coverage -No Coverage)	Related Exp. Coverage	Diff (Related Exp. -No Coverage)	Diff (Related Exp. -Other Coverage)	Diff (Related Exp.-Unaffiliated Related Exp.)	Other Analyst Coverage	Diff (Other-No Coverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3-Factor alpha	0.00	0.22***	0.23***	0.38***	0.38***	0.21***	0.23***	0.18***	0.18***
	(-0.02)	(11.97)	(11.15)	(13.37)	(12.52)	(6.58)	(6.25)	(8.73)	(8.23)
4-Factor alpha	0.00	0.23***	0.23***	0.37***	0.38***	0.20***	0.25***	0.18***	0.19***
	(-0.06)	(12.08)	(11.12)	(13.06)	(12.38)	(6.25)	(6.83)	(8.92)	(8.31)
5-Factor alpha	0.01	0.19***	0.19***	0.32***	0.32***	0.17***	0.21***	0.16***	0.16***
	(0.55)	(10.31)	(9.13)	(11.64)	(10.87)	(5.68)	(6.04)	(8.04)	(7.40)

Panel B: Ferson and Schadt (1996) Model

	No Coverage	Analyst Coverage	Diff (Coverage -No Coverage)	Related Exp. Coverage	Diff (Related Exp. -No Coverage)	Diff (Related Exp. -Other Coverage)	Diff (Related Exp.-Unaffiliated Related Exp.)	Other Analyst Coverage	Diff (Other-No Coverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3-Factor alpha	0.03*	0.23***	0.20***	0.35***	0.32***	0.19***	0.24***	0.18***	0.16***
	(1.69)	(11.17)	(9.07)	(11.72)	(10.23)	(5.65)	(6.60)	(7.86)	(6.55)
4-Factor alpha	0.02	0.23***	0.22***	0.32***	0.31***	0.16***	0.26***	0.18***	0.17***
	(1.14)	(10.71)	(9.18)	(10.40)	(9.43)	(4.61)	(6.78)	(7.79)	(6.94)
5-Factor alpha	0.03*	0.21***	0.18***	0.26***	0.23***	0.10***	0.19***	0.17***	0.14***
	(1.75)	(8.84)	(6.84)	(8.02)	(6.62)	(2.68)	(4.87)	(6.74)	(5.26)

Table A.2. Analyst Coverage and Client Funds' Monthly Trading Performance: Analyst work experience at public firms with GICS classifications

This table reports mean monthly value-weighted trading performance for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. For each holding quarter, we classify a stock as net buy (sell) if the change in the portfolio weight for firm k is positive (negative) from the beginning to the end of a quarter t for mutual fund i. Each within-fund portfolio is rebalanced at the beginning of quarter t+1 in accordance with updated analyst coverage from fund i's brokers and updated trade direction on firm k for fund i. Difference and Long-Short (L-S) portfolios are at within-fund portfolio level and represent performance comparison of stocks receiving the corresponding analyst coverage. Measures of stock performance are based on Fama and French (1993) three-factor model (*3-Factor alpha)*, Carhart (1997) four-factor factor (*4-Factor alpha)* employing Ferson and Schadt (1996) model. The dollar value of an investment position in firm k by mutual fund i is used as the weight to calculate value-weighted returns. ***, ** and *denote significance at 1%, 5%, and 10%, respectively.

Panel A: Factor Regression

	Related Exp. Coverage Buys	Related Exp. Coverage Sells	L-S Related Exp. Buys-Sells	Diff (L-S Related Exp. Buys-Sells)- (L-S No coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Other coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Unaffiliated Related Exp. Buys-Sells)
	(1)	(2)	(3)	(4)	(5)	(6)
FF3 alpha	0.45***	-0.11***	0.56***	0.40***	0.27***	0.39***
	(12.61)	(-3.32)	(11.29)	(7.24)	(4.84)	(5.65)
4-Factor alpha	0.43***	-0.09***	0.52***	0.38***	0.27***	0.37***
	(11.95)	(-2.79)	(10.30)	(6.74)	(4.64)	(5.25)
5-Factor alpha	0.40***	-0.14***	0.54***	0.38***	0.28***	0.40***
	(10.31)	(-3.96)	(10.19)	(6.53)	(4.84)	(5.56)

Panel B: Trading performance and Ferson and Schadt (1996) Model

	Related Exp. Coverage Buys	Related Exp. Coverage Sells	L-S Related Exp. Buys-Sells	Diff (L-S Related Exp. Buys-Sells)- (L-S No coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Other coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Unaffiliated Related Exp. Buys-Sells)
	(1)	(2)	(3)	(4)	(5)	(6)
3-Factor alpha	0.38***	-0.14***	0.54***	0.36***	0.21***	0.31***
	(9.90)	(-3.75)	(9.68)	(6.24)	(3.35)	(4.23)
4-Factor alpha	0.34***	-0.15***	0.50***	0.32***	0.26***	0.29***
	(8.57)	(-3.74)	(8.80)	(5.46)	(4.36)	(4.01)
5-Factor alpha	0.32***	-0.19***	0.52***	0.30***	0.23***	0.35***
	(6.96)	(-4.42)	(8.40)	(4.87)	(3.77)	(4.75)

Table A.3. Analyst Coverage and Client Funds' Monthly Portfolio Holding and Trading Performance: Daniel, Grinblatt, Titman, and Wermers (1997) (DGTW) characteristic adjusted returns

Panel A presents results for mean monthly value-weighted portfolio holding returns for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. A firm k is included in the mutual fund i's corresponding portfolio at the beginning of quarter t and held between quarter t and t+1. Each within-fund portfolio is rebalanced at the beginning of quarter t+1 in accordance with updated analyst coverage from fund i's brokers. Difference portfolios are at within-fund portfolio level and represent performance comparison of stocks receiving the corresponding analyst coverage Panel B reports mean monthly value-weighted trading performance for client funds' stocks. Stock performance is measured with DGTW characteristic portfolio-adjusted excess stock returns. The dollar value of an investment position in firm k by mutual fund i is used as the weight to calculate value-weighted returns. ***, ** and *denote significance at 1%, 5%, and 10%, respectively.

Panel A: Portfolio Holding Performance

	No Coverage	Analyst Coverage	Diff (Coverage -No Coverage)	Related Exp. Coverage	Diff (Related Exp. -No Coverage)	Diff (Related Exp. -Other Coverage)	Diff (Related Exp.-Unaffiliated Related Exp.)	Other Analyst Coverage	Diff (Other-No Coverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
DGTW returns	-0.08***	0.09***	0.17***	0.17***	0.25***	0.10***	0.08**	0.05**	0.13***
	(-4.79)	(4.54)	(7.36)	(4.68)	(7.47)	(3.39)	(2.31)	(2.14)	(5.15)

Panel B: Trade Performance

	Related Exp. Coverage Buys	Related Exp. Coverage Sells	L-S Related Exp. Buys-Sells	Diff (L-S Related Exp. Buys-Sells)- (L-S No coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Other coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Unaffiliated Related Exp. Buys-Sells)
	(1)	(2)	(3)	(4)	(5)	(6)
DGTW returns	0.29***	-0.25***	0.53***	0.40***	0.33***	0.30***
	(6.99)	(-6.43)	(9.90)	(6.48)	(5.50)	(4.29)

Table A.4. Analyst Coverage and Client Funds' Monthly Portfolio Holding Performance: Modified Appraisal Ratio (AR) of Treynor and Black(1973)

This table reports mean monthly value-weighted appraisal ratios (AR) for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. *Appraisal ratios* are calculated by dividing the abnormal return by the standard deviation of the residuals from factor models. A firm k is included in the mutual fund i's corresponding portfolio at the beginning of quarter t and held between quarter t and t+1. Each within-fund portfolio is rebalanced at the beginning of quarter t+1 in accordance with updated analyst coverage from fund i's brokers. Difference portfolios are at within-fund portfolio level and represent performance comparison of stocks receiving the corresponding analyst coverage. Measures of stock performance are based on Fama and French (1993) three-factor model (*3-Factor alpha)*, Carhart (1997) four-factor factor (*4-Factor alpha)* and the Pastor and Stambaugh (2003) five-factor (*5-Factor alpha)*. The dollar value of an investment position in firm k by mutual fund i is used as the weight to calculate value-weighted returns. ***, ** and *denote significance at 1%, 5%, and 10%, respectively.

	No Coverage	Analyst Coverage	Diff (Coverage -No Coverage)	Related Exp. Coverage	Diff (Related Exp. -No Coverage)	Diff (Related Exp. -Other Coverage)	Diff (Related Exp.-Unaffiliated Related Exp.)	Other Analyst Coverage	Diff (Other-No Coverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3-Factor AR	0.17	6.19***	6.23***	5.38***	5.92***	2.20***	3.00***	2.88***	3.23***
	(0.25)	(10.13)	(10.42)	(8.89)	(9.67)	(3.83)	(5.11)	(4.87)	(5.41)
4-Factor AR	-0.30	5.85***	6.88***	6.17***	6.91***	1.80***	3.76***	4.53***	5.02***
	(-0.47)	(11.43)	(13.12)	(11.43)	(12.59)	(3.46)	(7.12)	(8.41)	(9.14)
5-Factor AR	0.13	5.07***	5.81***	5.35***	5.89***	2.19***	2.98***	2.85***	3.20***
	(0.19)	(8.76)	(9.97)	(8.88)	(9.66)	(3.81)	(5.09)	(4.85)	(5.38)

Table A.5. Analyst Coverage and Client Funds' Portfolio Holding Performance: Ferson and Schadt (1996) Model and Alternative Classifications

This table reports mean monthly value-weighted portfolio holding returns for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. A firm k is included in the mutual fund i's corresponding portfolio at the beginning of quarter t and held between quarter t and t+1. Each within-fund portfolio is rebalanced at the beginning of quarter t+1 in accordance with updated analyst coverage from fund i's brokers. Difference portfolios are at within-fund portfolio level and represent performance comparison of stocks receiving the corresponding analyst coverage. Measures of stock performance are based on Fama and French (1993) three-factor model (*3-Factor alpha)*, Carhart (1997) four-factor factor (*4-Factor alpha)* and the Pastor and Stambaugh (2003) five-factor (*5-Factor alpha)*. Panel B reports results from these factor regressions employing Ferson and Schadt (1996) model. The dollar value of an investment position in firm k by mutual fund i is used as the weight to calculate value-weighted returns. ***, ** and *denote significance at 1%, 5%, and 10%, respectively.

Panel A: *Ferson and Schadt (1996) Model* with 6-month stock trading data requirement

	No Coverage	Analyst Coverage	Diff (Coverage -No Coverage)	Related Exp. Coverage	Diff (Related Exp. -No Coverage)	Diff (Related Exp. -Other Coverage)	Diff (Related Exp.-Unaffiliated Related Exp.)	Other Analyst Coverage	Diff (Other-No Coverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3-Factor alpha	0.01	0.23***	0.23***	0.25***	0.26***	0.14***	0.17***	0.12***	0.12***
	(0.22)	(8.87)	(7.60)	(7.38)	(6.91)	(3.65)	(4.61)	(4.26)	(3.61)
4-Factor alpha	0.03	0.26***	0.25***	0.26***	0.27***	0.12**	0.19***	0.15***	0.15***
	(0.84)	(7.46)	(6.52)	(6.16)	(6.00)	(2.56)	(4.08)	(4.27)	(3.56)
5-Factor alpha	0.06*	0.19***	0.14***	0.21***	0.17***	0.11**	0.10**	0.08**	0.04
	(1.95)	(5.44)	(3.50)	(4.77)	(3.64)	(2.36)	(2.03)	(2.32)	(1.06)

Panel B: *Ferson and Schadt (1996) Model* with 24-month stock trading data requirement

	No Coverage	Analyst Coverage	Diff (Coverage -No Coverage)	Related Exp. Coverage	Diff (Related Exp. -No Coverage)	Diff (Related Exp. -Other Coverage)	Diff (Related Exp.-Unaffiliated Related Exp.)	Other Analyst Coverage	Diff (Other-No Coverage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
3-Factor alpha	-0.02	0.22***	0.24***	0.22***	0.25***	0.09***	0.17***	0.13***	0.15***
	(-1.34)	(12.68)	(12.67)	(10.30)	(10.73)	(3.97)	(6.73)	(6.82)	(7.20)
4-Factor alpha	-0.03*	0.22***	0.24***	0.23***	0.26***	0.09***	0.18***	0.14***	0.17***
	(-1.80)	(12.66)	(12.93)	(10.44)	(11.19)	(3.72)	(7.30)	(7.19)	(7.93)
5-Factor alpha	0.00	0.18***	0.18***	0.20***	0.22***	0.13***	0.16***	0.07***	0.08***
	(-0.30)	(9.74)	(9.21)	(9.08)	(9.05)	(5.21)	(6.29)	(3.78)	(3.88)

Table A.6. Analyst Coverage and Client Funds' Monthly Trading Performance: Ferson and Schadt (1996) Model and Alternative Classifications

This table reports mean monthly value-weighted trading performance for client funds' stocks according to analyst coverage provided from brokers receiving commission allocations. For each holding quarter, we classify a stock as net buy (sell) if the change in the portfolio weight for firm k is positive (negative) from the beginning to the end of a quarter t for mutual fund i. Each within-fund portfolio is rebalanced at the beginning of quarter t+1 in accordance with updated analyst coverage from fund i's brokers and updated trade direction on firm k for fund i. Difference and Long-Short (L-S) portfolios are at within-fund portfolio level and represent performance comparison of stocks receiving the corresponding analyst coverage. Measures of stock performance are based on Fama and French (1993) three-factor model (*3-Factor alpha)*, Carhart (1997) four-factor factor (*4-Factor alpha)* employing Ferson and Schadt (1996) model. The dollar value of an investment position in firm k by mutual fund i is used as the weight to calculate value-weighted returns. ***, ** and *denote significance at 1%, 5%, and 10%, respectively.

Panel A: *Ferson and Schadt (1996) Model* with 6-month stock trading data requirement

	Related Exp. Coverage Buys	Related Exp. Coverage Sells	L-S Related Exp. Buys-Sells	Diff (L-S Related Exp. Buys-Sells)- (L-S No coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Other coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Unaffiliated Related Exp. Buys-Sells)
	(1)	(2)	(3)	(4)	(5)	(6)
FF3 alpha	0.29***	-0.14***	0.43***	0.25***	0.27***	0.21***
	(6.12)	(-3.41)	(7.23)	(3.94)	(4.23)	(3.10)
4-Factor alpha	0.26***	-0.11**	0.34***	0.21***	0.20***	0.18**
	(5.26)	(-2.03)	(5.15)	(3.18)	(3.14)	(2.53)
5-Factor alpha	0.30***	-0.09*	0.35***	0.20***	0.23***	0.21***
	(5.40)	(-1.81)	(5.48)	(2.99)	(3.46)	(2.95)

Panel B: *Ferson and Schadt (1996) Model* with 24-month stock trading data requirement

	Related Exp. Coverage Buys	Related Exp. Coverage Sells	L-S Related Exp. Buys-Sells	Diff (L-S Related Exp. Buys-Sells)- (L-S No coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Other coverage Buys-Sells)	Diff (L-S Related Exp. Buys-Sells)- (L-S Unaffiliated Related Exp. Buys-Sells)
	(1)	(2)	(3)	(4)	(5)	(6)
FF3 alpha	0.32***	-0.14***	0.45***	0.32***	0.23***	0.37***
	(9.28)	(-4.38)	(10.04)	(6.43)	(4.24)	(6.35)
4-Factor alpha	0.32***	-0.13***	0.44***	0.31***	0.22***	0.36***
	(9.06)	(-4.07)	(9.83)	(6.11)	(4.13)	(6.00)
5-Factor alpha	0.31***	-0.14***	0.44***	0.32***	0.23***	0.37***
	(8.25)	(-4.24)	(9.02)	(5.81)	(4.03)	(5.96)