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The Client Is King: Do Mutual Fund Relationships Bias Analyst Recommendations?

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ABSTRACT

This paper investigates whether the business relations between mutual funds and brokerage firms influence sell-side analyst recommendations. Using a unique data set that discloses brokerage firms' commission income derived from each mutual fund client as well as the share holdings of these mutual funds, we find that an analyst's recommendation on a stock relative to consensus is significantly higher if the stock is held by the mutual fund clients of the analyst's brokerage firm. The optimism in analyst recommendations increases with the weight of the stock in a mutual fund client's portfolio and the commission revenue generated from the mutual fund client. However, this favorable recommendation bias toward a client's existing portfolio stocks is mitigated if the stock in question is highly visible to other mutual fund investors. Abnormal stock returns are significantly greater both for the announcement period and, in the long run, for favorable stock recommendations

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from analysts not subject to client pressure than for equally favorable recommendations from business-related analysts. In addition, we find that, subsequent to announcements of bad news from the covered firms, analysts are significantly less likely to downgrade a stock held by client mutual funds. Mutual funds increase their holdings in a stock that receives a favorable recommendation but this impact is significantly reduced if the recommendation comes from analysts subject to client pressure.

1. Introduction

"Institutional investors, such as mutual funds, that are clients of the analyst's firm may have a significant position in the security of a company covered by an analyst. An analyst may be inhibited from issuing a rating downgrade that would adversely affect the performance of an institutional client's portfolio for fear that the client would take its brokerage business elsewhere."

—Laura S. Unger, Acting Chair, U.S. Securities and Exchange Commission[1]

The activities and conflicts of interest of sell-side analysts have been under careful scrutiny by policy-makers and researchers during the past decade. Much of the academic research in this area has focused on the investment banking relationships that the brokerage firms have and their impact on analyst optimism (e.g., Lin and McNichols [1998], O'Brien, McNichols, and Lin [2005]). However, another important source of conflicts that has long been identified by the regulators, yet remains an under-researched issue in the literature, is the pressure from the buy side. This issue is particularly interesting because there are different views among regulators, practitioners, and scholars on the roles of buy-side institutional investors in shaping analyst behavior. On the one hand, as both the Securities and Exchange Commission (SEC) and the Financial Industry Regulatory Authority (FINRA) have pointed out, institutional investors who are clients of an analyst's brokerage firm and hold a significant position in a stock covered by the analyst may put pressure on the analyst to refrain from offering negative opinions or issuing a rating downgrade on that security (Unger [2001], FINRA [2009]). Supportive investment recommendations from affiliated stock analysts can help boost the value of institutional investors' portfolios, while negative opinions from such analysts send strong negative signals about the prospects of the covered stocks to the market. Importantly, institutional investor clients have not only the incentives but also the ability to exert significant influence on affiliated analysts by allocating (or threatening the withdrawal of) trading commissions to brokers who

[1] The quote is from Unger's "Written testimony concerning conflicts of interest faced by brokerage firms and their research analysts," testified before Congress on July 31, 2001 (Unger [2001]).

employ the analysts. If an analyst issues an unfavorable report that harms the performance of an institutional client's portfolio, the client could take a part or all of its brokerage business elsewhere, directly affecting the brokerage firm's income. Sell-side analysts are under pressure to help generate brokerage commissions, and their incentives to boost commission income are particularly high following the separation of the research and investment banking divisions at brokerage firms (e.g., Irvine [2001, 2004], Jackson [2005], Cowen, Groysberg, and Healy [2006]). Institutional investors' power to allocate their trading commissions among various brokerage firms therefore gives them considerable leverage in dealing with sell-side analysts and generates a distinct type of conflict of interest related to brokerage commission income. Moreover, displeasing institutional investor clients can have severe negative consequences for analysts' career prospects. Out of career concerns, an analyst may feel compelled to issue favorable recommendations on the stocks currently held in their clients' portfolios (Unger [2001]). Indeed, anecdotal evidence from interviews with industry insiders at the Association for Investment Management and Research (AIMR) and the Securities Industry Association indicates that sell-side analysts face pressure from institutional clients to "keep the recommendation up" on a day-to-day basis (Hansard [2002]). Survey results in the United States show that about 70% of investment professionals regard the pressure from buy-side clients not to downgrade the stocks in their portfolios as an important motivation for sell-side analysts (Boni and Womack [2003]). Similar evidence has also been reported in China, where sell-side analysts yielding to the will of their institutional clients and "protecting" the stocks held by clients is an unspoken rule in the industry (Liu and Zhang [2008], Wang [2009]).

On the other hand, it is also argued in the literature that the provisions of value-added forecasts and recommendations are the most important criteria when fund managers evaluate analysts' qualities and vote for all-star analysts (e.g., Hong and Kubik [2003]). Institutional investors prefer unbiased, high-quality research from sell-side analysts, and analysts, in turn, build reputation by providing valuable and accurate reports and opinions to institutional investors. Accordingly, star analysts are more likely to be hired by prestigious financial institutions and receive higher compensation, and reputational risk and career concerns mitigate analysts' optimism on stocks highly visible to institutional investors (e.g., Hong, Kubik, and Solomon [2000], Kothari [2001], Hong and Kubik [2003]). Consistent with this view, Frankel, Kothari, and Weber [2006] show that analyst reports have greater effects on security prices for stocks with higher institutional ownership. Similarly, Ljungqvist et al. [2007] find that the presence of institutional investors reduces analyst optimism.

The existing evidence therefore provides two competing views on the role of institutional investors in influencing analyst behavior. To disentangle the two possible sides of the role, however, is rather difficult because it requires detailed data on the trading commissions paid by each institutional investor to each brokerage in order to identify client relations and

measure the buy-side pressure faced by analysts, yet this information is typically not publicly available. [2] As a result, the extant studies cannot separate institutional investor clients from other independent institutional investors and, moreover, lack direct and precise proxies for the economic incentives imposed on analysts. Consequently, their results might merely reflect a commingled effect of independent and client institutional investors and thus provide limited, or even biased, information about the precise link between buy-side pressure and analyst optimism. In this paper, we are able to overcome this shortcoming and examine the analyst-institutional investor client relationship and its effect on analyst optimism using a unique data set from China. While previous studies have investigated the indirect business relations stemming from investment banking mandates given to affiliates of brokerages, we examine the direct business relations that involve trading commissions paid by institutional investors to brokerage firms and the resulting conflict of interest. The China Securities Regulatory Commission's (CSRC) mandatory requirement for each mutual fund to publicly report its stockholdings and trading commission payment details, including the total amount and distribution of commissions among brokerage firms, allows us to clearly identify the client relations between brokerages and mutual funds and separate client mutual funds from other independent mutual fund investors.[3] Moreover, the unique data allow us to proxy for the strength of the incentive to bias recommendations and thus investigate cross-sectional variations in analyst incentives. We can therefore propose and empirically test an integrated framework that incorporates and accommodates both views discussed above. To our knowledge, this is the first in-depth study that uses trading commissions paid by institutional investors to brokerages to examine potential conflicts of interest faced by sell-side analysts.

Specifically, based on the conflict of interest argument, we hypothesize that mutual fund clients have incentives to use their commission payments to pressure the business-related sell-side analysts to issue optimistically biased ratings on the stocks in their portfolios and to refrain from issuing negative ratings on these stocks to avoid sending strong and negative signals to the market and hurting the clients' fund performance. Based on the reputation argument, and notwithstanding that brokerages, and through them their analysts, have incentives to appease their institutional investors with supportive investment recommendations, analysts also have to beware of damaging their general reputations through issuing overly optimistic reports. Since analysts' reputational capital is mainly forged on the recommendations they make on highly visible stocks that are often constituents of institutional investors' portfolios (Ljungqvist et al. [2007]), the costs of

[2] For example, in the United States, institutional investors are not required to disclose to which brokerage firms they make commission payments, nor are brokerages required to disclose the sources of their commission income.

[3] Mutual funds are the primary and major institutional investors in China (Firth, Lin, and Zou [2010]).

publishing biased reports tend to be larger for such stocks. Analysts under client pressure may therefore be more likely to promote stocks in their institutional investor clients' portfolios that are less visible to other institutional investors as a strategy to support the interests of the clients while at the same time avoiding the substantial risk of reputation loss. Thus, we expect that the analyst optimism effect induced by pressure from institutional clients should be less pronounced for stocks that are highly visible to and widely held by other institutional investors.

Our results indicate that the business relations between brokerage firms and their mutual fund clients indeed exert a significant impact on analyst optimism. In particular, we find that an analyst working for a brokerage firm issues more favorable recommendations (relative to the market consensus) on the stocks already owned by the brokerage firm's mutual fund clients. This relative optimism strengthens as the stock's weight in the mutual fund clients' portfolios increases and as the trading commissions paid by those mutual fund clients to the brokerage firm increase. These results are robust to a series of different test specifications and to controls for covered firm, brokerage firm, and analyst characteristics as well as various factors that might affect analyst optimism, including preexisting investment banking relationships between the analyst's employer and the covered firm, and institutional investor holdings of the stock. Moreover, we find that analyst recommendations on stocks that are highly visible to other mutual fund investors are less likely to be influenced by client pressure.

We also examine the stock market's reaction to analyst recommendations as well as the long-run returns of the covered stocks following the issue of an analyst recommendation. Upon announcement, a favorable recommendation from a business-related analyst on a stock already held by mutual fund clients yields significantly positive three-day abnormal returns. This benefits the mutual fund clients as the performance of their portfolios, which hold the covered stock, increases as a result. However, these returns are lower than the abnormal returns associated with favorable recommendations made by independent analysts not subject to client pressure. This suggests that investors might partially recognize or adjust for the optimistic bias in business-related analysts' recommendations and react less positively to their favorable opinions. In the long run, a strategy that invests in stocks highly recommended by business-related analysts yields a one-year abnormal return of 1.48%, compared to a one-year abnormal return of 3.33% for stocks highly recommended by independent analysts. Thus, overall, an optimistic recommendation from an independent analyst is more desirable for the mutual funds. However, since it would be very difficult for the mutual funds to affect the optimism of independent analysts due to the lack of economic and business ties, an overly optimistic recommendation from a business-related analyst is still a desirable good (though second best) for the mutual funds and their managers. Therefore, analysts' upward bias on stocks held by mutual fund clients may benefit not only the analysts' brokerage firms (in terms of higher commissions) but also their mutual fund

clients (positive short-term and long-term abnormal returns). The client mutual funds will be able to declare a better performance, which will drive up performance fees and generate more business. Likewise, the fund managers will benefit from the better performance of the fund through higher bonuses, promotions, enhanced reputations, and better job prospects.

In contrast, negative (i.e., hold or worse) recommendations issued by business-related analysts are associated with more negative abnormal returns upon issuance as well as in the long run than negative recommendations from independent analysts. These results suggest that business-related analysts' pessimism is powerful: a negative report from a business-related analyst generates more destructive price effects on the stock held by mutual fund clients. Because business-related analysts are in general reluctant to issue unfavorable ratings on stocks held by their mutual fund clients, a negative report from such a related analyst contains more negative information content about the covered stock.[4] As a result, mutual fund clients have strong incentives to pressure business-related analysts to issue optimistic recommendations on the stocks in their portfolios; for fear of hurting the clients' performance, business-related analysts under pressure are more likely to refrain from issuing negative ratings on these stocks to avoid sending strong and negative signals to the market.

While our results are consistent with the hypothesis that institutional investors use their commission payments to pressure the sell-side analysts to issue optimistically biased ratings on the stocks in their portfolio, one potential cause for concern is the issue of simultaneity where favorable opinions from business-related analysts could induce mutual funds to buy into the recommended stock. To address this issue and infer the analyst behavior more precisely, we conduct two further tests. First, we examine analysts' reactions to bad news events from the covered companies. We find that, subsequent to announcements of bad news from the covered firms, analysts are significantly less likely to downgrade a stock held by client mutual funds. We then examine the investment decisions of client mutual funds after the issue of favorable analyst reports on stocks that are already in the funds' portfolios. Our results show that favorable stock recommendations from either business-related or nonrelated analysts lead mutual funds to increase their proportional holdings in the covered stocks. However, the increase is less when the favorable recommendation comes from a business-related analyst. Overall, the results from these tests further support our hypothesis that it is client pressure that drives analyst optimism.

Taken together, our results suggest that the business relations between mutual funds and brokerage firms influence sell-side analyst recommendations. Focusing on the impact of pressure from the buy side on analyst

[4] Similarly, Barber, Lehavy, and Trueman [2007] show in the investment banking pressure setting that negative reports from investment bank analysts convey more negative information than negative reports from analysts in independent research firms.

optimism, our paper adds to the literature on conflicts of interest in financial institutions (e.g., Mehran and Stulz [2007]) and, in particular, the studies that focus on the conflicts of interest that impede an analyst's ability to function as an objective financial intermediary.[5] We also contribute to the literature on the role of institutional investors in shaping firm decisions and economic outcomes (e.g., Hartzell and Starks [2003], Parrino, Sias, and Starks [2003]) and, in particular, in shaping analyst behavior, differentiating institutional clients from other independent institutional investors. Our results indicate that, while institutional investors in general value unbiased, high-quality research, institutional clients may have different incentives and use commissions to pressure business-related analysts into issuing overly optimistic recommendations on the stocks in the clients' portfolios. Similarly, from the analysts' perspective, while analysts are concerned about their reputations in the presence of institutional investors in general, they might at the same time bow to the pressure from their institutional clients and become overly optimistic in their recommendations.

The remainder of the paper is organized as follows. Section 2 provides an overview of China's mutual fund and brokerage industries and describes the data and variables. Section 3 presents our empirical findings. Section 4 concludes.

2. *Data and Variables*

2.1 CHINA'S MUTUAL FUND AND BROKERAGE INDUSTRIES

China's mutual fund industry has grown dramatically since the Chinese government made a strategic decision in the early 2000s to develop the industry as active institutional investors to help enhance corporate governance and stabilize the stock market. The number of mutual funds has increased from 34 in 2000 to 473 in 2008. The aggregate net asset value of mutual funds has grown from 12.3 billion U.S. dollars in 2000 to 477.5 billion U.S. dollars seven years later.[6] The mutual fund industry in China draws its inspiration from and is organized along the lines of its counterparts in the United States and other developed countries. Fund management fees are based on fund net asset value, and fund performance is closely monitored, regularly ranked, and widely publicized. Faced with fierce competition for

[5] Previous studies have examined conflicts of interest faced by analysts stemming from maintaining good relationships with company management (e.g., Das, Levine, and Sivaramakrishnan [1998]), boosting trading commissions from investors (e.g., Irvine [2001, 2004], Jackson [2005], Cowen, Groysberg, and Healy [2006], Agrawal and Chen [2008]), investment banking relationships (e.g., Lin and McNichols [1998], O'Brien, McNichols, and Lin [2005]), and common ownership (Mola and Guidolin [2009]).

[6] The numbers in this section are compiled from China Finance Online and Wind Financial Database (WindDB). All amounts in the Chinese currency (RMB) in the paper are converted into U.S. dollars (USD) based on an exchange rate of 1 USD = 6.8591 RMB as of June 30, 2008.

investments, mutual fund managers are under constant pressure to improve fund performance. With the rapid development of the Chinese stock market, China's brokerage industry has also flourished, witnessing steady increases over the years in the number of brokerage firms in the industry, the number of analysts employed, and the number of stocks covered. The research reports and stock recommendations issued by sell-side analysts are promptly distributed to existing and potential institutional clients such as mutual funds as well as to individual investors. Summary reports are often disclosed on Web sites and in financial newsletters and publications. Analysts' recommendations are therefore widely circulated and effectively publicly available, and influence the investment decisions of many investors.

A major feature of China's brokerage industry is the substantial proportion of trading commissions in a brokerage firm's total revenue. From 2004 to 2008, trading commissions account for approximately half of brokerage firms' operating income, while security underwriting fees contribute less than 10% on average. For an average brokerage firm, annual trading commissions from mutual funds have grown substantially, from approximately 3 million U.S. dollars in 2004 to 32 million U.S. dollars in 2008. The average annual commissions from mutual funds amount to 12 million U.S. dollars for a brokerage firm in our study. For an average stock covered by an analyst, there are seven mutual fund clients holding that stock in their portfolios. These clients' commission contributions to the analyst's brokerage firm account for approximately 15% of the brokerage's total commission revenue from the mutual fund industry. Similar to the commission allocation process in the United States, mutual fund companies in China allocate their trading commissions among brokerage firms by polling their fund managers and other departments (e.g., the marketing department) in quarterly broker evaluations (Wang and Xie [2011]).

Because commissions are an important source of revenue for brokerage firms in a highly competitive industry, mutual fund clients' power to allocate their trading commissions among various brokerage firms gives them significant leverage in dealing with sell-side analysts and influencing their behaviors. Anecdotal evidence indicates that, upon receiving unfavorable analyst reports on stocks heavily held in their portfolios, mutual funds exert pressure on the analysts' employers and retaliate by reducing or even suspending commissions allocated to these brokerage firms (Wang [2009]).[7] Moreover, analysts may be compelled to issue optimistic reports on the

[7] For example, in October 2008, an analyst issued a downgrade commentary on Kweichow Moutai Co., a major liquor maker in China, after observing a declining trend in its sales. Kweichow Moutai was a significant component in the portfolios of several mutual fund clients of the analyst's employer. The analyst's commentary triggered a plunge in the stock price of Kweichow Moutai and enraged these mutual fund clients, who complained that the analyst should have communicated with them and sought their opinions before issuing such a negative report. As a punishment, these mutual fund clients retaliated by cutting commission payments to the analyst's employer. In the end, the analyst succumbed to the pressure. To appease the mutual fund clients, in a report on the stock issued shortly after, the analyst merely noted "increased uncertainties about future price increases and sales prospects," but argued that "the

stocks held in their clients' portfolios out of career concerns. Displeasing mutual fund clients often has severe negative consequences for analysts' career prospects (Wang [2009]). J. Li [2008] and Q. Li [2008] detail a case where an analyst was forced out of her career after issuing a downgrade report that enraged her broker's mutual fund clients who held a significant number of related shares. Interviews with sell-side analysts in China indicate that, similar to their counterparts in the United States, many analysts in China face pressure from mutual fund clients not to downgrade the stocks in their portfolios on a day-to-day basis (J. Li [2008], Q. Li [2008] Liu and Zhang [2008], Wang [2009]).

In China, the brokerage industry is regulated by a set of rules issued in 1997 by the CSRC titled *Interim Measures for Administration of Securities and Futures Investment Consultancy* ("the Measures" hereafter). Much like the self-regulatory organization (SRO) rules in the United States, the Measures largely focus on pressures originating from within the brokerage firms and do not address pressures originating from outside the firms such as those from institutional investors. Although the CSRC requires mutual funds to publicly disclose the identities of their brokers and the trading volume and commission payments to each broker, the disclosure is chiefly a perfunctory filing requirement. Commission allocation, for example, is not monitored or scrutinized by the authorities and remains at the sole discretion of mutual fund companies. More generally, it is important to note that, even after the enactment of rules and regulations that are designed to reduce analysts' conflicts of interest, pressure from institutional investors may persist as a significant source of conflict because it is "largely outside the control of the [brokerage] firm" and thus "more difficult for the firm to address" (Unger [2001]).[8]

In summary, pressures from institutional investors and the associated conflicts of interest faced by sell-side analysts are a general issue present both in an emerging market setting such as China and in more developed markets including the United States. Understanding how analysts bias their recommendations under the pressure from institutional investors is highly relevant to investors as well as to regulators.

2.2 SAMPLE CONSTRUCTION

The data used in this study are mainly constructed from three databases: Thomson Reuters's I/B/E/S, China Stock Market and Accounting

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new anticounterfeit technology and the planned franchise stores would lessen such uncertainties," and gave the stock a "Buy" rating, the highest in the brokerage firm's rating system (J. Li [2008], Q. Li [2008]).

[8] Both scholars and regulators suggest that institutional investors may supplant investment bankers to be the main source of conflicts of interest in the sell-side stock research industry (Unger [2001], Cullen [2004]). For example, in the United States, the SRO staff analyzing the operation and effectiveness of the analyst conflict of interest rules points out that, as the rules lessen the "internal pressure" on analysts, "external pressures" may become important sources of conflicts of interest for analysts, including the pressure from "large institutional investors who may be clients of the brokerage firm" (NASD and NYSE [2005]).

Research (CSMAR), and the Wind Financial Database (WindDB). I/B/E/S's coverage includes analyst recommendations on Chinese stocks from international brokerage firms or their branches in China (e.g., JP Morgan China). CSMAR and WindDB contain analyst recommendations from domestic brokerage firms. Our sample period is from the first quarter of 2004 (when the data first became available) to the second quarter of 2008. To maximize our sample coverage, we integrate analyst recommendation data from these three sources based on the stock exchange code of the covered firm, the names of the analyst and the brokerage firm, and the issuance date of the recommendation.[9] Two recommendations from different data sources are regarded as identical if all the above identifiers are the same. Quarterly financial data and stock return data for the covered firms are extracted from WindDB and CSMAR, respectively. We also obtain information on the brokerage firms, such as the amount and composition of revenue (including commission revenue) and headquarters location, from WindDB, which compiles the information from the brokerage firms' mandatory filings. We exclude from our data set duplicate recommendations, recommendations with anonymous issuer names, and recommendations on firms whose financial information is missing from the source databases.

In addition to the analyst recommendations database, WindDB also has a mutual fund research database that is constructed from the regulatory filings of each mutual fund in China as mandated by the CSRC. It covers details on the total amount of stock trading commission payments made by each mutual fund and the distribution of the commissions among individual brokerage firms, as well as the stockholdings of each fund.[10] We link the mutual fund data with our analyst recommendation data by manually matching the names of the brokerage firms. Our final sample consists of 40,000 recommendations made by 2,717 analysts from 67 brokerage firms, with detailed information on which mutual funds paid commissions to each of these brokerage firms, how much each commission payment was, and which stocks each of these mutual funds holds in its portfolio.

2.3 VARIABLE DEFINITIONS

Table 1 presents the detailed definitions for all the variables used in the paper. We describe and discuss these variables in this section.

2.3.1. Analyst Recommendations. Analyst recommendations are recorded in our data set in real-time sequence with standardized five-digit ratings

[9] Analyst recommendations in I/B/E/S and in WindDB are recorded using the same numerical rating system. A recommendation in CSMAR contains a description of the analyst's opinion together with the brokerage firm's rating system. We manually translate these recommendations into numerical ratings consistent with I/B/E/S.

[10] Every year, each mutual fund discloses details on its commission payments as well as the market value and the number of shares of each stock in its holdings in two half-year reports released in the second and fourth quarters. In the first and third quarters, each mutual fund reports its top 10 largest holdings based on market value.

TABLE 1
Definitions of Variables

Variable Names	Variable Definitions
Relative recommendation	Individual investment recommendation minus the market consensus (the median investment rating among all the existing analysts covering the same stock)
Client pressure	A dummy variable, which, for a recommendation on stock j issued by analyst i working for brokerage firm b, equals one if the stock j is held by at least one of brokerage firm b's mutual fund clients and zero otherwise. For a given quarter, a mutual fund is regarded as a client of a brokerage firm if the brokerage firm has received commission payments from the mutual fund in the last quarter.
Commission	For a recommendation on stock j issued by analyst i working for brokerage firm b, the commission payments paid to b by its mutual fund clients that already hold stock j in quarter $t-1$, as a proportion of brokerage firm b's total trading commission revenue from the mutual fund industry
Related holding	For a recommendation on stock j issued by analyst i working for brokerage firm b, stock j's weight in the aggregate portfolio of brokerage firm b's mutual fund clients that hold stock j in quarter $t-1$, calculated as the aggregate market value of stock j held by all of b's mutual fund clients divided by the total net asset value of these clients
Investment banking relation	A dummy variable, which, for an analyst i employed by brokerage firm b covering stock j, equals one if the investment banking department of brokerage firm b served as a lead or co-lead underwriter in j's most recent equity or debt issue prior to the recommendation and zero otherwise
Political tie	A dummy variable that equals one if both the CEO of the analyst's brokerage firm and the CEO of the covered listed firm were government officials or People's Congress members before taking the CEO position
Covered firm characteristics	
Firm size	Log of total assets
Profitability	Net income divided by total assets
Q	The ratio of total assets minus book value of equity plus market value of equity all over total assets
State ownership	Percentage of shares owned by various levels of central and local government and their agencies
Overseas listed	A dummy variable that is equal to one if a firm has shares traded on an overseas stock exchange or the China B share market when the recommendation is issued and zero otherwise
No. of analysts covering stock	Number of analysts covering the stock
Other mutual fund holdings	The number of shares in the listed firm held by all mutual funds other than the brokerage firm's clients divided by the total number of shares outstanding

(*Continued*)

TABLE 1—*Continued*

Variable Names	Variable Definitions
Brokerage firm characteristics	
Foreign broker	A dummy variable that is equal to one if the headquarters of the analyst's brokerage firm is located overseas and zero otherwise
Broker experience	Number of years since the brokerage firm was first established in China
Trading revenue	Brokerage firm's revenue from stock trading commissions divided by total revenue
Mutual ownership relation	A dummy variable that is equal to one if the brokerage firm and the mutual fund that holds the stock covered by the brokerage firm's analyst are owned by the same financial institution and zero otherwise
Analyst characteristics	
All-star analyst	A dummy variable that is equal to one if the analyst is an "all-star" analyst according to the most recent *New Fortune Chinese Best Analysts* survey
Analyst seniority	Number of quarters since the analyst first appeared in the database
No. of stocks covered	The number of stocks covered by the analyst issuing the recommendation

This table provides detailed definitions for all the variables used in the paper.

from 1 (strong buy) to 5 (sell) in an identical way to that used by I/B/E/S. We reverse the rating order in this study so that 1 denotes a "sell" rating, while 5 denotes a "strong buy."

In order to measure analyst optimism, we focus on relative recommendations, computed by subtracting the market consensus from individual investment recommendations featured in an analyst's report (strong buy, buy, hold, underperform, and sell). The market consensus is defined as the median investment rating among all the existing analysts covering the same stock in a given quarter (e.g., Chen and Matsumoto [2006]). Adjusting by the market consensus provides a natural proxy for an individual analyst's bias. Focusing on relative recommendations also ensures comparability across stocks.

2.3.2. Pressure from Mutual Fund Clients. We focus our tests on how the business relations between brokerage firms and their mutual fund clients affect analyst recommendations. For a given quarter, a mutual fund is regarded as a client of a brokerage firm if the brokerage firm has received commission payments from the mutual fund in the immediately prior quarter.[11] For a recommendation on stock j issued by analyst i working for brokerage firm b, our main variable to capture the impact of the broker-mutual

[11] We use lagged commission payments to avoid simultaneity. Our results are robust to using contemporaneous commission payments to identify the client relationship. As commission payments are reported on a half-year basis, we divide the amount of payments equally between the two quarters in the half year.

fund business relation on analyst optimism is the dummy variable, *Client Pressure*, which equals one if stock *j* is held by at least one of brokerage firm *b*'s mutual fund clients and zero otherwise. In other words, analyst *i* from brokerage firm *b* covering stock *j* is considered to be subject to pressure from *b*'s mutual fund clients if at least one of the mutual fund clients already holds stock *j* in its portfolio.

In order to measure the strength and extent of the business relation and thereby the severity of the client pressure faced by the analyst issuing the recommendation, we construct two additional variables. For a recommendation on stock *j* issued by analyst *i* working for brokerage firm *b*, we define *Commission* as the commission payments paid to *b* by its mutual fund clients that already hold stock *j* in quarter $t-1$, as a proportion of brokerage firm *b*'s total trading commission revenue from the mutual fund industry. This variable captures the economic importance of these mutual fund clients to brokerage firm *b*. The second variable we define is *Related Holding*, calculated as stock *j*'s weight in the aggregate portfolio of brokerage firm *b*'s mutual fund clients that hold stock *j* in quarter $t-1$. To construct this variable, we first aggregate the market values of stock *j* held by every mutual fund client of brokerage firm *b* at the end of quarter $t-1$. This aggregate market value of stock *j* is then divided by the total net asset value of all of *b*'s mutual fund clients that held stock *j* at the end of quarter $t-1$.[12] The *Related Holding* measure captures the importance of stock *j* for the mutual fund clients. As the trading commissions paid by the mutual fund clients to the brokerage firm increase and as the covered stock's weight in the mutual fund clients' portfolios increases, the pressure from those mutual fund clients on sell-side analysts also increases.

2.3.3. Control Variables. To assess the impact of client pressure on analyst optimism, we control for a series of other factors that might affect analyst recommendations. We use a dummy variable to control for the potential preexisting investment banking relationship between an analyst's brokerage firm and the covered company, which has been previously documented to optimistically bias analyst research. For an analyst *i* employed by brokerage firm *b* covering stock *j*, the dummy variable *Investment Banking Relation* is equal to one if the investment banking department of brokerage firm *b* served as a lead or co-lead underwriter in *j*'s most recent equity offering or debt issue prior to the recommendation being issued.[13]

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[12] Detailed information on the top 10 largest holdings of each mutual fund based on market value is available each quarter. Detailed information on all stocks in the portfolio holdings is available in the half-year and annual reports. For the first and third quarters, if a stock is not in the top 10 list in that quarter, we use the average of its holdings in the adjacent half-year and annual reports to proxy for the actual stock holding. Our results are highly robust to focusing only on the top 10 stocks in a mutual fund's portfolio in determining related holdings.

[13] This variable is constructed using information from WindDB, which reports the identities of the underwriters for the equity and debt issuance activities undertaken by the covered firms.

As the state is a major stockholder in many listed firms and brokerage firms in China, analysts may be subject to political pressure to inflate their recommendations on state-owned firms, especially if the CEOs of brokerage firms and the CEOs of the covered firms are former government officials and thus might try to curry favor with each other to gain political credits and maximize their political career prospects (Firth, Lin, and Zou [2010]). To control for such political pressure, we define a dummy variable *Political Tie*, which equals one if both the CEO of the analyst's brokerage firm and the CEO of the covered listed firm were government officials or People's Congress members before taking the CEO position.[14]

We also control for covered firm characteristics, brokerage firm characteristics, as well as analyst characteristics. The covered firm characteristics that we control for include firm size, profitability, *Q*, and state ownership stake. Adding other controls such as leverage ratio, revenue-to-asset ratio, and dividend yield produces robust results. Some covered firms are listed on overseas stock exchanges or the China B share market (which is open mainly to foreign investors), and therefore have a better information environment. Since the information environment of a firm influences the accuracy of an analyst's report on that firm (Hope [2003]), we include the dummy variable *Overseas Listed* as a control variable. In addition, we control for the number of analysts covering the listed firm in a given quarter. We use the variable, *Other Mutual Fund Holdings*, as a proxy for institutional shareholdings in the listed company. This variable is defined as the number of shares in the listed firm held by all mutual funds other than the brokerage firm's clients divided by the total number of shares outstanding.

The brokerage firm characteristics we control for include broker reputation and trading revenue. Previous studies suggest that prestigious investment banks are less likely to risk their reputation capital by pressuring their analysts to issue bullish reports (Ljungqvist, Marston, and Wilhelm [2006]). Analysts from internationally renowned institutions may care more about their reputation than analysts at domestic brokerages do, and therefore may be more conservative in their recommendations. We thus include a dummy variable, *Foreign Broker*, indicating whether the headquarters of the analyst's brokerage is located overseas. As another proxy for reputation, we also control for the number of years (*Broker Experience*) since the brokerage was first established in China. A brokerage firm's trading departments may compel their in-house analysts to generate optimistic reports in order to boost trading commissions. As a result, we control for the brokerage's revenue from stock trading commissions divided by total revenue (*Trading Revenue*). In addition, we control for whether the mutual fund holding a stock and the brokerage firm of the analyst covering the stock are owned by the same financial institution (*Mutual Ownership Relation*) as Mola and Guidolin [2009] find evidence of analyst optimistic bias in this situation.

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[14] We manually collect the CEO political status data from news articles, company Web sites, and annual reports.

TABLE 2
Summary Statistics

Variable Names	Mean	STD
Relative recommendation	0.15	0.75
Client pressure	0.49	0.50
Commission	0.07	0.15
Related holding	0.01	0.01
Investment banking relation	0.04	0.19
Political tie	0.17	0.37
Covered firm characteristics		
Firm size ($MM)	14,400	91,100
Profitability	0.04	0.04
Q	2.65	2.14
State ownership	0.32	0.25
Overseas listed	0.16	0.36
No. of analysts covering stock	10.61	10.21
Other mutual fund holdings	0.21	0.18
Broker characteristics		
Foreign broker	0.05	0.22
Broker experience	10.02	8.49
Trading revenue	0.48	0.54
Mutual ownership relation	0.01	0.09
Analyst characteristics		
All-star analyst	0.13	0.34
Analyst seniority	6.12	5.63
No. of stock covered	8.76	9.41

This table presents the mean and standard deviation (STD) for all the variables used in the paper. The total number of observations is 40,000. Definitions of all the variables are reported in table 1.

We also control for analyst characteristics. For an analyst i covering a stock j in quarter t, we define the analyst i as an all-star analyst, i.e., the *All-Star Analyst* dummy equals one, if i ranks in the top three of all the analysts covering stock j's industry according to the most recent *New Fortune Chinese Best Analysts* survey. We further control for *Analyst Seniority*, measured as the number of quarters since the analyst first appeared in the database, as well as the total number of stocks covered by the analyst (*No. of Stocks Covered*). Our results are robust to controlling for additional analyst characteristics such as analyst productivity (defined as the number of reports issued by an analyst as a proportion of the total number of reports issued by the analyst's brokerage firm in the year the recommendation is issued) and the total number of industries the analyst covers.

Table 2 presents the summary statistics for the sample. About one half of the recommendations (49%) are on stocks that are already held in the portfolios of the clients of the brokerage for which the analyst works. The sample means for *Commission* and *Related Holding* are 7% and 1%, respectively. Note that for independent analyst recommendations (i.e., when *Client Pressure* equals zero), both *Commission* and *Related Holding* are zero by definition. If we focus on recommendations from business-related analysts only, for which the two variables *Commission* and *Related Holding* are relevant,

their mean values are 14.7% and 2.2%, respectively. Since by regulation, mutual funds in China are allowed to hold no more than 10% of their net asset value in any single stock, the magnitudes of these variables are economically significant. On average, a sample stock is covered by approximately 11 analysts, and an individual analyst covers nine stocks. For an average covered stock, holdings by other mutual funds amount to approximately 21% of the outstanding shares. Given that the free float of shares in China is about 40% during the period of our study (approximately 60% of shares are held by the state in the form of nontradable shares; see, e.g., Firth, Lin, and Zou [2010]), holdings by other mutual funds are substantial and can have a significant influence on analyst behavior that is distinct from the impact exerted by mutual fund clients.

3. Results

3.1 MUTUAL FUND CLIENT PRESSURE ON ANALYST RECOMMENDATIONS

Table 3 provides univariate analyses on the impact of the business relations between mutual funds and brokerage firms on analyst optimism. We examine all the analyst recommendations in our sample, distinguishing between whether or not the analyst making the recommendation is subject to pressure from the mutual fund clients of his or her brokerage firm, i.e., whether or not at least one of the mutual fund clients of the analyst's brokerage firm already holds the covered stock in its portfolio. We report the percentages of strong buy, buy, and hold or worse recommendations, as well as the average raw and average relative recommendations, for the full sample first, followed by a breakdown by year.

The results from table 3 show that analysts are more optimistic, both in absolute levels and relative to market consensus, toward stocks that are held by their mutual fund clients. Analyst recommendations on stocks subject to client pressure have significantly more strong-buy and buy ratings and significantly fewer hold or worse ratings compared to those without such pressure. The average raw recommendation and relative recommendation are 4.17 and 0.22, respectively, on stocks held by clients, significantly higher than the corresponding ratings of 3.83 and 0.08 on stocks that are not in clients' portfolios. This pattern of analyst optimistic bias toward mutual fund clients' stock holdings is consistently observed across each year of the sample.

In table 4, we explore how client pressure stemming from the business relations between mutual funds and brokerage firms influence analyst recommendations using multivariate regression analysis. We estimate the following baseline empirical model:

$$\begin{aligned} \textit{Recommendation}_{ijt} = f(&\textit{Client pressure}_{ijt-1}, \textit{Other pressures}_{ijt-1}, \\ &\textit{Covered firm characteristics}_{jt-1}, \\ &\textit{Brokerage firm characteristics}_{it-1}, \\ &\textit{Analyst characteristics}_{it-1}). \end{aligned} \tag{1}$$

TABLE 3

Univariate Analysis on Client Pressure and Analyst Optimism

	Full Sample: 2004–2008			2004			2005			2006			2007			2008		
	Client Pressure = 1	*Client Pressure* = 0	Diff.	*Client Pressure* = 1	*Client Pressure* = 0	Diff.	*Client Pressure* = 1	*Client Pressure* = 0	Diff.	*Client Pressure* = 1	*Client Pressure* = 0	Diff.	*Client Pressure* = 1	*Client Pressure* = 0	Diff.	*Client Pressure* = 1	*Client Pressure* = 0	Diff.
5: Strong buy	34.70%	23.20%	***	11.20%	12.14%		20.68%	10.96%	***	30.24%	22.97%	***	38.38%	31.66%	***	40.26%	24.20%	***
4: Buy	49.52%	42.66%	***	62.77%	32.58%	***	50.93%	38.60%	***	51.11%	40.65%	***	47.98%	40.96%	***	48.37%	52.32%	***
1–3: Hold or worse	15.78%	34.14%	***	26.03%	55.28%	***	28.39%	50.44%	***	18.65%	36.38%	***	13.64%	27.38%	***	11.37%	23.48%	***
Avg. raw recommendations	4.17	3.83	***	3.79	3.30	***	3.86	3.48	***	4.09	3.82	***	4.24	4.01	***	4.28	3.98	***
Avg. relative recommendations	0.22	0.08	***	0.03	−0.17	***	0.08	−0.05	***	0.21	0.12	***	0.25	0.17	***	0.25	0.08	***
No. of recommendations	19,563	20,437		607	1,013		1,881	3,785		4,177	4,566		6,584	6,362		6,314	4,711	
No. of analysts	1,745	2,288		222	408		453	760		689	810		996	1,165		1,032	1,130	
No. of brokerage firms	42	67		19	51		33	58		35	55		38	57		39	55	
No. of covered firms	688	1,345		180	478		274	863		435	875		534	1,019		437	853	

This table presents univariate analyses on the impact of the business relations between mutual funds and brokerage firms on analyst optimism. We examine all the analyst recommendations in our sample, distinguishing between whether or not the analyst making the recommendation is subject to pressure from the mutual fund clients of his or her brokerage firm, i.e., whether or not at least one of the mutual fund clients of the analyst's brokerage firm already holds the covered stock in its portfolio. We report the percentages of strong buy, buy, and hold or worse recommendations, as well as the average raw analyst recommendations and average relative recommendations, for the full sample first, followed by a breakdown by year. ***denotes the significant differences at the 1% level.

TABLE 4

Regression Analysis on Client Pressure and Analyst Optimism

	Dependent Variable											
					Heckman Selection Model				*Relative Recommendations* OLS (Consensus Based on Independent Analyst Recommendations)		*Relative Recommendations* OLS (Subsample of Non reiteration Recommendations)	
Independent Variables	*Relative Recommendations* OLS		Three Choices Ordered Probit		Coverage = 1? 1st Step	*Relative Recommendations* 2nd Step	Coverage = 1? 1st Step	*Relative Recommendations* 2nd Step				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Client pressure	0.051***	0.092***	0.098***	0.180***	0.551***	0.120***	0.722***	0.188***	0.107***	0.199***	0.039***	0.079***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.002]	[0.000]
Investment banking relation	0.084***	0.083***	0.131**	0.129**	0.412***	0.130***	0.407***	0.129***	0.085**	0.082**	0.104***	0.103***
	[0.006]	[0.007]	[0.012]	[0.013]	[0.000]	[0.000]	[0.000]	[0.000]	[0.011]	[0.014]	[0.000]	[0.000]
Political tie	0.046**	0.045**	0.068**	0.065**	0.144***	0.062***	0.138***	0.060***	0.061**	0.058**	0.028*	0.026
	[0.012]	[0.014]	[0.018]	[0.024]	[0.000]	[0.000]	[0.000]	[0.000]	[0.011]	[0.015]	[0.095]	[0.110]
Other mutual fund holdings	−0.100**	−0.016	−0.088	0.082	−0.092***	−0.096***	0.165***	0.030	−0.029	0.161***	−0.058	0.019
	[0.022]	[0.758]	[0.181]	[0.274]	[0.000]	[0.000]	[0.000]	[0.420]	[0.613]	[0.007]	[0.177]	[0.712]
*Client pressure * Other mutual fund holdings*		−0.184***		−0.371***			−0.759***	−0.294***		−0.419***		−0.186***
		[0.004]		[0.000]			[0.000]	[0.000]		[0.000]		[0.004]
Firm size	0.014	0.013	0.017	0.015	0.000	0.015***	−0.004	0.013***	0.039***	0.036***	0.017*	0.016*
	[0.124]	[0.158]	[0.154]	[0.217]	[0.895]	[0.000]	[0.131]	[0.000]	[0.000]	[0.000]	[0.074]	[0.092]
Profitability	−0.030	−0.055	0.119	0.069	1.249***	0.147	1.134***	0.111	−0.171	−0.228	0.009	−0.017
	[0.852]	[0.730]	[0.589]	[0.755]	[0.000]	[0.220]	[0.000]	[0.345]	[0.411]	[0.271]	[0.957]	[0.917]
Q	0.012**	0.012**	0.017**	0.017**	−0.007***	0.011***	−0.006***	0.011***	0.018***	0.018***	0.007	0.007
	[0.016]	[0.016]	[0.035]	[0.035]	[0.001]	[0.000]	[0.002]	[0.000]	[0.002]	[0.001]	[0.122]	[0.116]
State ownership	−0.075**	−0.073**	−0.117**	−0.112**	−0.022**	−0.077***	−0.012	−0.073***	−0.067	−0.062	−0.031	−0.030
	[0.036]	[0.044]	[0.018]	[0.024]	[0.047]	[0.000]	[0.271]	[0.000]	[0.190]	[0.225]	[0.354]	[0.385]
Overseas listed	−0.074***	−0.072***	−0.104***	−0.101**	−0.007	−0.074***	−0.001	−0.072***	−0.103***	−0.099***	−0.085***	−0.083***
	[0.007]	[0.009]	[0.008]	[0.011]	[0.395]	[0.000]	[0.881]	[0.000]	[0.002]	[0.002]	[0.001]	[0.002]
No. of analysts covering stock	0.002	0.002	0.004**	0.004**	0.057***	0.008***	0.057***	0.008***	0.001	0.001	0.001	0.001
	[0.123]	[0.114]	[0.044]	[0.040]	[0.000]	[0.000]	[0.000]	[0.000]	[0.663]	[0.617]	[0.528]	[0.514]
Foreign broker	−0.428***	−0.438***	−0.459***	−0.481***	−0.622***	−0.504***	−0.638***	−0.521***	−0.351***	−0.376***	−0.425***	−0.436***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

(*Continued*)

TABLE 4 — *Continued*

	Dependent Variable											
					Heckman Selection Model				*Relative Recommendations* OLS (Consensus Based on Independent Analyst Recommendations)		*Relative Recommendations* OLS (Subsample of Non reiteration Recommendations)	
Independent Variables	*Relative Recommendations* OLS		Three Choices Ordered Probit		Coverage = 1? 1st Step	*Relative Recommendations* 2nd Step	Coverage = 1? 1st Step	*Relative Recommendations* 2nd Step				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Broker experience	−0.000	−0.000	−0.001	−0.001	0.000	−0.000	0.000	−0.000	−0.000	−0.000	−0.001	−0.001
	[0.475]	[0.504]	[0.120]	[0.139]	[0.337]	[0.405]	[0.397]	[0.438]	[0.739]	[0.804]	[0.279]	[0.293]
Trading revenue	−0.005	−0.004	−0.010	−0.009	−0.104***	−0.017**	−0.104***	−0.017**	−0.002	−0.001	−0.008	−0.007
	[0.555]	[0.593]	[0.475]	[0.518]	[0.000]	[0.045]	[0.000]	[0.046]	[0.799]	[0.896]	[0.341]	[0.381]
Mutual ownership relation	0.285***	0.286***	0.529***	0.533***	0.418***	0.325***	0.423***	0.328***	0.317***	0.319***	0.195***	0.198***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
All-star analyst	0.136***	0.136***	0.224***	0.223***		0.136***		0.136***	0.133***	0.132***	0.126***	0.126***
	[0.000]	[0.000]	[0.000]	[0.000]		[0.000]		[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Analyst seniority	−0.007***	−0.007***	−0.009***	−0.009***		−0.007***		−0.007***	−0.007***	−0.007***	−0.007***	−0.007***
	[0.000]	[0.000]	[0.000]	[0.000]		[0.000]		[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
No. of stocks covered by analyst	0.004***	0.004***	0.005***	0.005***		0.004***		0.004***	0.004***	0.004***	0.003***	0.003***
	[0.000]	[0.000]	[0.000]	[0.000]		[0.000]		[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Brokerage industry coverage					0.435***		0.432***					
					[0.000]		[0.000]					
Brokerage location coverage					0.270***		0.266***					
					[0.000]		[0.000]					
Inverse Mill's ratio						0.151***		0.156***				
						[0.006]		[0.006]				
No. of observations	40,000	40,000	40,000	40,000	1,136,866	1,136,866	1,136,866	1,136,866	39,761	39,761	28,016	28,016
R-squared	0.05	0.04	0.02	0.02	N.A.	N.A.	N.A.	N.A.	0.05	0.05	0.04	0.04

This table presents the regression results of estimating the impact of the client pressure stemming from the mutual fund–brokerage firm business relationship on analyst optimism. In columns 1 and 2, we perform OLS regressions with *Relative Recommendation* as the dependent variable. In columns 3 and 4, we estimate ordered probit regressions. The dependent variable in columns 3 and 4 is the three-level choice facing a typical analyst: issuing an investing rating that is below (−1), at (0), or above (1) consensus. In columns 5 through 8, we estimate the Heckman selection model. Columns 5 and 7 perform first-stage probit regressions, with the dummy dependent variable indicating coverage. Columns 6 and 8 report results from the second stage. The instruments used are: *Brokerage Industry Coverage*, defined as the number of existing recommendations from the brokerage firm that cover stocks belonging to the given stock's industry as a proportion of the number of total existing recommendations issued by that brokerage firm, and *Brokerage Location Coverage*, defined as the number of existing recommendations from the brokerage firm that cover listed companies whose headquarters are in the same location as the given company, divided by the number of total existing recommendations issued by that brokerage firm. In columns 9 and 10, we perform OLS regressions in which the dependent variable is *Relative Recommendation* calculated using consensus based on independent analyst recommendations. In columns 11 and 12, we perform OLS regressions with *Relative Recommendation* as the dependent variable on the subsample of nonreiteration recommendations only. Definitions of all the other variables are reported in table 1. All the independent variables are one quarter lagged. Year fixed effects are included. *P*-values based on robust standard errors clustered by covered stock are reported in brackets. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

Each unit of observation is a single analyst recommendation. In equation (1), the dependent variable is analyst *i*'s stock recommendation, relative to consensus, on company *j* at time *t*. The key independent variable of interest is a dummy variable that captures whether the analyst is subject to client pressure from the mutual fund clients of the analyst's brokerage that already hold the covered stock in their portfolios. As detailed in the data section, other independent variables include the investment banking relationship and political ties between the analyst's brokerage firm and the covered company, as well as controls for covered firm characteristics, brokerage firm characteristics, and analyst characteristics. We also include year fixed effects. All the independent variables are one quarter lagged, measured at the end of $t-1$.

Table 4 presents the results of estimating equation (1). In column 1, we perform an ordinary least squares (OLS) regression, with standard errors clustered by the covered stock. Our key independent variable, *Client Pressure*, enters into the regression positively, and its coefficient is significant at the 1% level. Everything else equal, compared to recommendations made on stocks without such pressure, the average relative ratings issued by analysts on stocks subject to client pressure are higher by 0.05. The magnitude is economically significant considering that the sample mean of relative recommendations is 0.15. The result is consistent with analysts making more optimistic recommendations than market consensus on stocks held by the mutual fund clients of their employers.

Regarding the control variables, our proxy for the political pressures placed on analysts is significantly and positively related to analyst optimism. Analysts tend to issue more optimistic reports on listed firms when the managements of covered firms and brokerage firms are politically connected. Similar to findings documented in the United States, preexisting investment banking relationships between the covered company and the analyst's brokerage firm are also associated with optimistic analyst behavior.

The results for the other explanatory variables in column 1 are also largely consistent with the literature. For example, if the stock covered by an analyst is held by mutual funds that are owned by the same financial institution that owns the analyst's brokerage firm (*Mutual Ownership Relation*), it is more likely to receive an optimistic recommendation from the analyst. Analysts with more experience (*Analyst Seniority)* and analysts employed by international brokerage firms (*Foreign Broker*) tend to be more conservative in issuing optimistic recommendations. Similar to evidence in the United States, we find that all-star analysts issue more optimistically biased reports. The coefficient on *Other Mutual Fund Holdings* in column 1 is negative and significant, suggesting that the presence of other mutual fund investors holding the stock moderates analyst optimism. This is consistent with previous findings in the United States that analysts are less likely to be optimistically biased on stocks that are highly visible to institutional investors.

To further explore the moderating role of institutional investors, we add an interaction term between *Client Pressure* and *Other Mutual Fund Holdings* to the baseline model and test the hypothesis that the client pressure effect on analyst optimism should be less pronounced for stocks highly visible to other mutual fund investors (column 2). The coefficient on the interaction term is negative and significant, suggesting that the presence of other institutional investors helps curb analysts' optimism on stocks held by mutual fund clients. Thus, for a stock that has high institutional holdings by other mutual fund investors, the analyst optimism caused by client pressure is offset by analysts' reputational concerns. These results extend our understanding of institutional investors' influences on analyst behavior and suggest that different institutional investors can have countervailing influences on analyst behavior. Analysts' concerns about their reputations in the presence of institutional investors may reduce the optimistic bias in general, including the bias induced by client pressure; yet, at the same time, analysts might yield to the pressure from their institutional clients to issue more aggressive recommendations.

To check the robustness of our results, we use several alternative estimation methods. The results shown in column 3 of table 4 are estimated using an ordered probit regression in which we model the three-level choice facing a typical analyst: issuing an investment rating that is below (−1), at (0), or above (1) consensus. In column 4, we again add an interaction term between *Client Pressure* and *Other Mutual Fund Holdings* to the baseline ordered probit model. Our results are robust to using ordered probit estimations: analysts tend to issue more favorable recommendations on stocks already held by the mutual fund clients of their brokerage firms, and the effect of client pressure on analyst optimism is more pronounced for stocks less visible to other mutual fund investors.[15]

One potential concern with our results is that we observe a recommendation on a stock only if the analyst finds it worthwhile to cover the stock. Stocks held by the mutual fund clients of the analysts' brokerage firms may be more likely to receive coverage because analysts may selectively choose to publish reports on stocks that are held primarily by institutional investors and that they have positive views on (O'Brien and Bhushan [1990], McNichols and O'Brien [1997]). To address the endogenous selection of analyst coverage, we re-estimate our regression using the Heckman selection model. This estimation is achieved in two steps. In the first stage, we model the coverage decision by estimating the probability that a listed firm's stock receives coverage using a probit regression with instruments. In the second stage, we include the inverse Mills ratio (lambda) obtained from the first stage in the regression to correct for the self-selection bias.

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[15] Our results are also robust to estimating ordered probit regressions using the categorical analyst raw recommendations (sell: 1, underperform: 2, hold: 3, buy: 4, and strong buy: 5) as the dependent variable, estimating generalized least squares (GLS) regressions, or clustering standard errors by analyst.

We use two instruments in our first-step probit regression. For a given brokerage-stock combination, the first instrument is *Brokerage Industry Coverage*, defined as the number of existing recommendations from the brokerage firm that cover stocks belonging to the given stock's industry as a proportion of the total number of existing recommendations issued by that brokerage firm (Ljungqvist et al. [2007]). The broader the brokerage firm's existing coverage of the given stock's industry, the more likely the analysts in that brokerage firm are to cover the given stock, as the cost of coverage is lower. Our second instrument is based on geographical coverage (Malloy [2005]). For a given brokerage-stock combination, the instrument (*Brokerage Location Coverage*) is defined as the number of existing recommendations from the brokerage firm that cover listed companies whose headquarters are in the same location (provinces or autonomously managed cities) as the given company, divided by the number of total existing recommendations issued by that brokerage firm. The broader the brokerage firm's existing coverage of the region in which the given company's headquarters is located, the more likely the analysts in that brokerage firm are to initiate coverage of the given company, because of the information advantage developed by the brokerage firm in that specific region.

Columns 5 and 6 in table 4 present the results from estimating the Heckman selection model. The first-stage probit regression results are reported in column 5. The observations that receive active coverage consist of our original sample, for which the dependent variable *Coverage* equals one. We then create every possible brokerage-stock quarter in which a given stock is not covered by a given brokerage firm in that quarter. We delete all the observations before a stock first enters into our sample or after it permanently leaves the sample. This results in 1,096,866 observations for which *Coverage* equals zero. In addition to the two instruments, we include all our independent variables except for analyst characteristics. Because there is no specific analyst associated with the no-coverage observations, the analyst characteristics for these observations are missing by default. The positive and significant coefficients on the two instruments in column 5 confirm that analysts are more likely to cover a stock if their brokerage firms have broad coverage in the stock's industry and location. Furthermore, analyst coverage probability increases when a stock is held in a client's portfolios. Companies that have investment banking relationships with or political connections to brokerage firms are also more likely to receive coverage.

The second-stage estimation results are reported in column 6, with *Relative Recommendation* as the dependent variable. The coefficients in this second step largely mirror those in column 1 of table 4. Notably, after controlling for endogenous selection, the coefficient on *Client Pressure* continues to be positive and significant. In fact, its magnitude increases substantially. The inverse Mill's ratio is statistically significant at the 1% level, confirming the existence of a selection bias. In columns 7 and 8, we add the interaction term between *Client Pressure* and *Other Mutual Fund Holdings* to the baseline Heckman selection model. As can be seen in column 8, the coefficient on

the interaction term remains negative and statistically significant after controlling for endogenous selection.

As an alternative way to address the endogeneity issue, we restrict our sample to include only large firms in their respective sectors. Analysts generally have little discretion in covering the largest firms in their industries, and thus selection bias will be minimized and negligible when one examines large firms only (Kolasinski and Kothari [2008]). We therefore re-estimate the model in columns 1 and 2 but restrict our analysis to firms whose total assets in the most recent quarter rank in the top five of all the firms in the same industry.[16] The results (unreported but available upon request) are qualitatively similar to the full sample results from columns 1 and 2, further alleviating the endogeneity concern.

We also test the robustness of our results using an alternative definition of the dependent variable. Specifically, we redefine the market consensus as the median investment rating of all the existing *independent* analysts covering the same stock in a given quarter. We then recalculate the *Relative Recommendation* measure based on the newly defined market consensus measure and use it as the new dependent variable to re-estimate the models in columns 1 and 2. As can be seen from columns 9 and 10 in table 4, all the results are highly robust to this alternative definition.

In addition, as reiterations might contain less information content compared to other recommendations, we distinguish reiterations from initiations and revisions in our sample and re-estimate the baseline model focusing on nonreiteration recommendations only. In columns 11 and 12 of table 4, we exclude from the full sample 11,984 recommendations that are reiterations and re-estimate the baseline model. Our results are robust to using this subsample of recommendations: analyst optimism significantly increases in client pressure, especially for stocks that are less visible to other mutual funds.

3.2 THE STRENGTH OF BUSINESS RELATIONS AND ANALYST OPTIMISM

So far, we have shown that the business relations between mutual funds and brokerage firms influence analyst optimism. In this section, we explore the variations in the strength and extent of the relationship to gain further insights into how client pressures stemming from such relations bias analyst recommendations. We construct two variables as detailed in section 2.3 in order to measure the strength of the business relation between a brokerage firm and its mutual fund clients and thereby the severity of the client pressure faced by the brokerage firm's analysts issuing recommendations. We use *Commission* to capture the relative importance of the mutual fund clients to a brokerage firm's commission revenue. We use *Related Holding* to measure the importance of the covered stock to the mutual fund clients'

[16] Our results are robust to using the top 10 in each industry to separate out large firms. We use the industry classification of the CSRC to categorize a firm's industry.

portfolios. The intuition is that the more trading commissions the brokerage firm receives from its mutual fund clients and the higher weight the covered stock has in the mutual fund clients' portfolios, the higher pressure these mutual fund clients can exert on the brokerage firm's analysts, and, therefore, the more optimistic the analyst recommendations are on the stock.

In table 5, we estimate equation (1) using analyst recommendation relative to the market consensus as the dependent variable in OLS regressions with standard errors clustered by the covered stock. In addition to all the independent variables in our baseline specification including our key variable *Client Pressure*, we also include the interaction between *Client Pressure* and *Commission* in column 1 of table 5, the interaction between *Client Pressure* and *Related Holding* in column 2, and both interactions in column 3. Note that, since, by definition, the continuous variables *Commission* and *Related Holding* both equal zero when the dummy variable *Client Pressure* equals zero, we do not need to include *Commission* or *Related Holding* in the regression by itself, as they are exactly the same as their respective interaction terms with *Client Pressure*.

As can be seen from table 5, there are positive and statistically significant coefficients on the interaction terms in all specifications. As the importance of the mutual fund clients to the brokerage firm's commission revenue increases and as the importance of the covered stock to the mutual fund clients' portfolios increases, the pressure from these mutual fund clients on analysts at the relationship brokerage firms to inflate their recommendations on the covered stock also increases. These results are consistent with our argument that analyst optimism intensifies as the business relations between mutual funds and brokerage firms become stronger and more important for both parties.

3.3 STOCK RETURNS ASSOCIATED WITH ANALYST RECOMMENDATIONS

In this section, we examine the value implication of analyst recommendations, distinguishing between recommendations made by business-related analysts who are subject to pressure from their brokerage firms' mutual fund clients and recommendations made by independent analysts without such pressures. We first examine the stock market's reaction to analyst recommendations upon report issuance and then examine the long-run returns of the covered stocks following analyst recommendation issuance.

3.3.1. Short-Term Stock Returns upon Analyst Recommendation Issuance. To investigate the market's reaction to the announcement of analyst recommendations, we focus on the cumulative abnormal returns (CARs) centered on the recommendation date over the three-day event window from one day before the recommendation until one day after the recommendation. We use two measures of abnormal returns. The first is a simple measure based on the market-adjusted return, which is defined as the stock's return minus the market return (*Market-Adjusted Abnormal Return*). The

TABLE 5
The Strength of Business Relations and Analyst Optimism

	(1)	(2)	(3)
Client pressure	0.038***	0.001	0.007
	[0.008]	[0.955]	[0.770]
*Client pressure * Commission*	0.162**		0.130*
	[0.040]		[0.080]
*Client pressure * Related holding*		2.413**	1.655*
		[0.019]	[0.052]
Investment banking relation	0.084***	0.085***	0.084***
	[0.007]	[0.006]	[0.006]
Political tie	0.045**	0.046**	0.045**
	[0.014]	[0.012]	[0.014]
Other mutual fund holdings	−0.111**	−0.101**	−0.109**
	[0.013]	[0.021]	[0.014]
Firm size	0.009	0.012	0.008
	[0.368]	[0.208]	[0.402]
Profitability	−0.021	−0.019	−0.015
	[0.896]	[0.902]	[0.922]
Q	0.010**	0.011**	0.010**
	[0.033]	[0.027]	[0.042]
State ownership	−0.072**	−0.073**	−0.072**
	[0.044]	[0.041]	[0.046]
Overseas listed	−0.072***	−0.072***	−0.071***
	[0.009]	[0.009]	[0.010]
No. of analysts covering stock	0.001	0.002	0.001
	[0.216]	[0.138]	[0.206]
Foreign broker	−0.417***	−0.423***	−0.416***
	[0.000]	[0.000]	[0.000]
Broker experience	−0.000	−0.000	−0.000
	[0.552]	[0.482]	[0.541]
Trading revenue	−0.005	−0.005	−0.005
	[0.523]	[0.534]	[0.515]
Mutual ownership relation	0.273***	0.279***	0.271***
	[0.000]	[0.000]	[0.000]
All-star analyst	0.136***	0.136***	0.136***
	[0.000]	[0.000]	[0.000]
Analyst seniority	−0.007***	−0.007***	−0.007***
	[0.000]	[0.000]	[0.000]
No. of stocks covered by analyst	0.004***	0.004***	0.004***
	[0.000]	[0.000]	[0.000]
No. of observations	40,000	40,000	40,000
R-squared	0.05	0.05	0.05

This table reports the OLS regression results on the effect of the strength of the mutual fund–brokerage firm business relations on the relationship between client pressure and analyst optimism. The dependent variable is *Relative Recommendation*. For a recommendation on stock j issued by analyst i working for brokerage firm b, *Commission* is defined as the commission payments paid to b by its mutual fund clients that already hold stock j in quarter $t-1$, as a proportion of brokerage firm b's total trading commission revenue from the mutual fund industry. *Related Holding* is defined as stock j's weight in the aggregate portfolio of brokerage firm b's mutual fund clients that hold stock j in quarter $t-1$, calculated as the aggregate market value of stock j held by all of b's mutual fund clients divided by the total net asset value of these clients. Note that, since, by definition, the continuous variables *Commission* and *Related Holding* both equal zero when the dummy variable *Client Pressure* equals zero, we do not need to include *Commission* or *Related Holding* in the regression by itself, as they are exactly the same as their respective interaction terms with *Client Pressure*. Definitions of all the other variables are reported in table 1. All the independent variables are one quarter lagged. Year fixed effects are included. *P*-values based on robust standard errors clustered by covered stock are reported in brackets. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

market return is defined as the value-weighted returns on all stocks listed on the Shanghai and Shenzhen stock exchanges. The second measure is the standard abnormal returns estimated using the market model methodology for event studies with daily returns as in Brown and Warner [1985]. Specifically, for each observation (i.e., a recommendation on a stock) in the sample, we use trading days −246 through −42 relative to the analyst recommendation event date as the estimation period and regress the daily returns for the stock on the market return for this period. The difference between the stock's actual daily return in the event window and the market model predicted daily return using the estimated factor loading from the regression is defined as the abnormal return (*Market Model Abnormal Return*). We then add the daily abnormal returns over the three-day event window to arrive at the three-day CARs.

In panel A of table 6, we report the average three-day CARs around the analyst report issue date for the full sample of recommendations, with a breakdown by the optimism of recommendation relative to market consensus and a breakdown by the actual recommendation ratings. We categorize the analyst recommendations into two groups, recommendations made by business-related analysts who are subject to pressure from their brokerage firms' mutual fund clients and recommendations made by independent analysts without such pressures.

Panel A shows that optimistic business-related stock recommendations, on average, generate a positive three-day CAR (1.23% using the market-adjusted abnormal returns and 0.89% using the market model abnormal returns), significant at the 1% level. Therefore, the mutual fund clients benefit from the favorable recommendations as the value of their holdings increases. While favorable recommendations have a positive effect on short-term stock prices, panel A also shows that the abnormal returns for favorable independent stock recommendations are significantly greater than for equally favorable business-related recommendations. This suggests that investors might be able to partly recognize or partially adjust the optimistic bias in business-related analysts' reports (Jackson [2005]) and react less positively to their favorable recommendations.

On the other hand, a less optimistic recommendation issued by a business-related analyst generates, on average, a negative three-day CAR (−0.19% using the market-adjusted abnormal returns and −0.43% using the market model abnormal returns). The market's negative reaction is less pronounced for a similar report issued by an independent analyst. Similarly, a negative (i.e., hold or worse) recommendation issued by a business-related analyst yields a negative three-day market-adjusted return of −0.41%, compared to −0.22% for similar reports issued by independent analysts. The evidence indicates that a negative report from a business-related analyst delivers more (negative) signals to the market and generates more destructive price effects on the stock held by mutual fund clients.

TABLE 6

Stock Returns Associated with Analyst Recommendations

Panel A: Average Three-day cumulative abnormal returns around the recommendation date

			CAR(−1, +1)		
	No. of Obs.		Business-Related	Independent	Difference
More optimistic than market consensus	10,995	Market-adjusted	1.23%***	1.39%***	−0.17%*
		Market model	0.89%***	1.28%***	−0.39%***
Equal to market consensus	17,257	Market-adjusted	0.79%***	0.68%***	0.12%
		Market model	0.49%***	0.53%***	−0.04%
Less optimistic than market consensus	5,568	Market-adjusted	−0.19%*	−0.03%	−0.16%
		Market model	−0.43%***	−0.15%*	−0.28%**
Strong buy or Buy	25,449	Market-adjusted	1.01%***	1.16%***	−0.15%***
		Market model	0.68%***	1.02%***	−0.34%**
Hold or worse	8,371	Market-adjusted	−0.22%**	−0.09%	−0.13%
		Market model	−0.41%***	−0.22%***	−0.19%*

Panel B: Average one-year buy-and-hold abnormal returns

			One-year buy-and-hold		
	No. of obs.		Business-Related	Independent	Difference
Strong buy or Buy	29,505	Abnormal return	1.48%***	3.33%***	− 1.85%**
Hold or worse	9,907	Abnormal return	−1.98%*	−0.10%	−1.88%

This table presents the stock returns associated with analyst recommendations, distinguishing between recommendations made by business-related analysts who are subject to the pressure from their brokerage firms' mutual fund clients and recommendations made by independent analysts without such pressures. Panel A reports the average CARs centered on the recommendation date over the three-day event window from one day before the recommendation until one day after the recommendation. We use two measures of abnormal returns. The first is a simple measure based on the market-adjusted return, which is defined as the stock's return minus the market return (*Market-Adjusted Abnormal Return*). The second measure is the standard abnormal returns estimated using the market model methodology for event studies with daily returns. The difference between the stock's actual daily return in the event window and the market model predicted daily return using estimated factor loadings is defined as the abnormal return (*Market Model Abnormal Return*). We then add the daily abnormal returns over the three-day event window to arrive at the three-day CARs. Panel B reports the average one-year buy-and-hold abnormal returns of the covered stocks starting from the month after the recommendation is issued. The abnormal return is calculated as the difference between the buy-and-hold return of a covered stock and its corresponding benchmark portfolio's buy-and-hold return. The benchmark portfolio is matched based on size, book-to-market, and momentum. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

3.3.2. Long-Run Stock Returns Following Analyst Recommendation Issuance. We also examine the long-run returns of the covered stocks following analyst recommendation issuance. We focus on the one-year buy-and-hold abnormal returns starting from the month after the recommendation is issued. Following the Daniel et al. [1997] methodology, we form 27 benchmark portfolios that capture three stock characteristics: size, book-to-market, and momentum. At the end of year t, the universe of common stocks in the Shanghai and Shenzhen stock markets are sorted into three portfolios based on each firm's market capitalization. Firms in each size tercile portfolio are further sorted into terciles based on their book-to-market ratios. Finally, the firms in each of the nine size and book-to-market portfolios are further sorted into terciles based on their prior 12-month holding period returns estimated through the end of November of year t. The preceding 12-month return is calculated up through one month prior to the formation date to avoid problems associated with the bid-ask bounce and monthly return reversals (Jegadeesh [1990]).

Once the benchmark portfolios are formed, each stock is assigned to a benchmark portfolio according to its size, book-to-market, and momentum categories. The buy-and-hold return following each recommendation issuance is defined as the buy-and-hold return of the covered stock over 12 months starting from the month after the release of the recommendation. The benchmark portfolio's buy-and-hold return is calculated in a similar manner. The abnormal return is calculated as the difference between the buy-and-hold returns of the covered stock and its corresponding benchmark portfolio.

Panel B of table 6 presents the average one-year buy-and-hold abnormal returns of the covered stocks, distinguishing between stocks with recommendations from business-related analysts and those with recommendations from independent analysts. For favorable (strong buy or buy) recommendations, an investment strategy based on business-related recommendations generates a positive average abnormal return of 1.48%, compared to 3.33% associated with independent recommendations. The difference between the two is statistically significant. In contrast, holding a covered stock with a negative (hold or worse) recommendation from a business-related analyst yields a long-run negative abnormal return of −1.98%, while holding a covered stock with a similar report from an independent analyst yields only a mild and insignificant negative abnormal return (−0.10%) over the same period. Again, the evidence shows that business-related analysts' pessimism has a more negative effect on stock price than similar opinions from independent analysts. Therefore, for fear of hurting their clients' performance, business-related analysts may be particularly reluctant to issue negative reports on stocks held by mutual fund clients.

3.4 FURTHER EMPIRICAL TESTS

3.4.1. Analysts' Reactions to Bad News. As quoted from Laura Unger of the SEC at the beginning of the paper, "[a]n analyst may be inhibited from

issuing a rating downgrade that would adversely affect the performance of an institutional client's portfolio for fear that the client would take its brokerage business elsewhere." In this section, we specifically test this hypothesis by examining analyst behavior after bad news from the covered companies. We expect that pressure from the mutual fund clients of the analysts' brokerage firms will make the analysts reluctant to downgrade their ratings on the stocks held by these mutual fund clients after bad news in order to support the clients' investment performance. In a similar vein, previous studies document that, subsequent to new equity offerings, analysts are reluctant to downgrade investment ratings on investment banking clients' stocks following bad news (O'Brien, McNichols, and Lin [2005]).

To investigate this issue, we identify a sample of bad news event days for the covered stocks in our data set. In the spirit of the literature (e.g., Shroff, Venkataraman, and Zhang [2011]), we identify bad news events using large stock price drops, but are agnostic about what the news might be. We define a bad news event day for a covered company as a trading day on which the split-adjusted stock price drops by the maximum allowed limit (10%) imposed by the Chinese stock market. Alternatively, we define the bad news event day as the first day of a three-day period when the cumulative stock return losses over the three-day period exceed (in absolute value) three (or alternatively, four) times the company's prior-year standard deviation of three-day returns.[17] As Ljungqvist et al. [2007] point out, these unusually large price falls are likely, at least in part, caused by bad news.

We then examine the reaction of the analysts who cover these stocks subsequent to the bad news. We restrict the sample to analysts who have issued reports on the same stock within the 12 months prior to the bad news event day to focus on active analysts and analyst revisions that are likely to be related to the event. We define an indicator variable, *Negative Reaction*, which equals one if the analyst downgrades his or her ratings or holds the same negative rating within three months after the occurrence of the bad news and zero otherwise.[18]

In table 7, we explore whether the business relation between mutual funds and analysts' brokerage firms influences analysts' reactions to bad news. Our sample size ranges from 2,084 to 7,346 observations, depending on the definition of the bad news event. The bad news events are defined based on one-day returns in column 1 and three-day cumulative returns in column 2 (three times standard deviation) and column 3 (four times standard deviation). We use a probit model with *Negative Reaction*

[17] Our results are also robust to using a two-day period to identify the bad news event. We require that there are at least 31 days between two consecutive bad news events for the same firm in order to identify events that are more likely to be independent. This restriction does not affect the results.

[18] Negative ratings include underperformance and sell. Alternatively, we use a six-month window instead of a three-month window in the definition of the *Negative Reaction* dummy and find robust results.

TABLE 7
Analysts' Reactions to Bad News

	Dependent Variable: *Negative Reaction*		
	One-Day Return	Three-Day Cumulative Return	
Independent Variables	(1)	(2)	(3)
Client pressure	−0.207*	−0.265***	−0.341***
	[0.057]	[0.000]	[0.000]
Investment banking relation	−0.153	−0.295*	−0.078
	[0.584]	[0.073]	[0.696]
Political tie	0.016	−0.160**	−0.143
	[0.900]	[0.038]	[0.194]
Other mutual fund holdings	−0.282	−0.256	−0.346
	[0.294]	[0.104]	[0.155]
Firm size	−0.060	−0.079**	−0.042
	[0.201]	[0.011]	[0.246]
Profitability	−2.571*	−2.818***	−3.852***
	[0.089]	[0.009]	[0.008]
Q	−0.076	−0.033	0.026
	[0.300]	[0.311]	[0.592]
State ownership	0.238	0.149	0.171
	[0.133]	[0.196]	[0.264]
Overseas listed	−0.473**	−0.040	−0.139
	[0.021]	[0.627]	[0.245]
No. of analysts covering stock	0.008	−0.011	−0.006
	[0.581]	[0.127]	[0.586]
Foreign broker	0.335**	0.149	0.258**
	[0.046]	[0.106]	[0.030]
Broker experience	−0.002	0.001	0.001
	[0.682]	[0.570]	[0.785]
Trading revenue	0.097	0.117**	0.173**
	[0.297]	[0.039]	[0.016]
Mutual ownership relation	−0.222	−0.341	−0.281
	[0.651]	[0.143]	[0.309]
All-star analyst	−0.119	−0.095	0.003
	[0.392]	[0.253]	[0.982]
Analyst seniority	−0.009	−0.010*	−0.008
	[0.328]	[0.058]	[0.266]
No. of stocks covered by analyst	−0.012*	−0.019***	−0.015***
	[0.084]	[0.000]	[0.009]
No. of observations	2,084	7,346	3,775
R-squared	0.04	0.07	0.07

This table presents the probit regression results on the effect of client pressure on the likelihood of negative reactions from analysts subsequent to company bad news events. The dependent variable is a dummy variable, *Negative Reaction*, which equals one if the analyst downgrades his or her ratings or holds the same negative rating within three months after the occurrence of the bad news and zero otherwise. In column 1, a bad news event day for a covered company is defined as a trading day on which the split-adjusted stock price drops by the maximum allowed limit (10%) imposed by the Chinese stock market. Alternatively, we define the bad news event day as the first day of a three-day period when the cumulative stock return losses over the three-day period exceed (in absolute values) three times (column 2) or four times (column 3) the company's prior-year standard deviation of three-day returns. Definitions of all the other variables are reported in table 1. All the independent variables are one quarter lagged. Year fixed effects are included. *P*-values based on robust standard errors clustered by covered stock are reported in brackets. Significance at the 10%, 5%, and 1% level is indicated by *, **, and ***, respectively.

as the dependent variable. The independent variables are the same as in equation (1).

We see from table 7 that, across all definitions for the bad news event day, the coefficients on *Client Pressure* are negative and significant, which indicate that analysts are less likely to react negatively for the stocks held by the mutual fund clients even when faced with negative news. The odds ratios calculated from similar logit regressions (unreported) indicate that the odds for an independent analyst to react negatively to firm-specific bad news are about twice as large as the odds for a business-related analyst who is subject to such pressure.

Overall, these results are consistent with our hypothesis of client pressure driving analyst optimism and help to distinguish against an alternative story in which analysts' favorable ratings induce funds to buy into the recommended stock, because, under the alternative hypothesis, we should not expect to see that the business-related analysts behave differently in their recommendations from independent analysts following adverse information from the covered firm. These results suggest that analysts are pressured by their brokerage firms' mutual fund clients and are reluctant to issue negative recommendations to hurt the performance of these clients' portfolios even when the prospects of the stocks held by the mutual fund clients deteriorate.

3.4.2. Mutual Fund Clients' Reactions to Analyst Recommendations. In this section, we examine mutual funds' portfolio changes following analyst reports. For each stock-mutual fund observation in our sample, we first calculate the quarterly change in the stock's weight in the mutual fund's portfolio. We use two alternative definitions of the portfolio weight change of stock j in mutual fund m's portfolio. The first is a simple and straightforward measure (*Weight Change*), computed as the difference in the market value of j held by m as a percentage of m's net asset value between quarter t and quarter $t-1$. The second measure (*Active Weight Change*) follows the definition in Mola and Guidolin [2009] and aims to capture the active weight change decisions made by the mutual fund manager.[19] Intuitively, it is defined as the difference between the adjusted weight of stock j in mutual fund m's portfolio at the end of quarter t (as if the stock price of j has not changed since the end of quarter $t-1$) and the weight of stock j in m's portfolio at the end of quarter $t-1$.

We then define two dummy variables. For stock j held by mutual fund m, the *Optimistic Recommendation* dummy is equal to one if j has received an

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[19] Specifically, the active weight change of stock j is calculated as follows, where P and S are the stock price and the number of shares held at the end of the quarter, respectively, and i indexes for all the stocks in the portfolio:

$$\frac{p_{t-1}^{j} \times s_{t}^{j}}{\sum_i p_{t}^{i} \times s_{t}^{i} - s_{t}^{j}(p_{t}^{j} - p_{t-1}^{j})} - \frac{p_{t-1}^{j} \times s_{t-1}^{j}}{\sum_i p_{t-1}^{i} \times s_{t-1}^{i}}.$$

TABLE 8

Mutual Fund Clients' Reactions to Analyst Recommendations

	Dependent Variable			
	Weight Change		*Active Weight Change*	
Independent Variables	(1)	(2)	(3)	(4)
Optimistic recommendation$_t$	0.663***		0.544***	
	[0.000]		[0.000]	
Optimistic recommendation from business-related analysts$_t$	−0.221***		−0.121***	
	[0.000]		[0.000]	
Optimistic recommendation$_{t-1}$		0.721***		0.586***
		[0.000]		[0.000]
Optimistic recommendation from business-related analysts$_{t-1}$		−0.522***		−0.333***
		[0.000]		[0.000]
Change in covered firm size$_{t-1}$	−0.050***	−0.061***	0.008	−0.002
	[0.004]	[0.001]	[0.644]	[0.889]
Change in covered firm profitability$_{t-1}$	1.329***	1.279***	0.412**	0.406**
	[0.000]	[0.000]	[0.013]	[0.014]
Change in Q_{t-1}	−0.015***	−0.015***	−0.002	−0.002
	[0.000]	[0.000]	[0.117]	[0.142]
Change in weight in all other funds' portfolios$_t$	0.090***	0.089***	0.037***	0.036***
	[0.000]	[0.000]	[0.000]	[0.000]
Observations	230,435	230,435	230,435	230,435
R-squared	0.059	0.059	0.067	0.065

This table reports the OLS regression results on mutual funds' portfolio changes following analyst reports. For each stock-mutual fund observation in our sample, we calculate the quarterly change in the stock's weight in the mutual fund's portfolio. We use two alternative definitions of the portfolio weight change of stock j in mutual fund m's portfolio. The dependent variable in columns 1 and 2, *Weight Change*, is calculated as the difference in the market value of j held by m as a percentage of m's net asset value between quarter t and quarter $t-1$. The dependent variable in columns 3 and 4, *Active Weight Change*, is defined as the difference between the adjusted weight of stock j in mutual fund m's portfolio at the end of quarter t (as if the stock price of j has not changed since the end of quarter $t-1$) and the weight of stock j in m's portfolio at the end of quarter $t-1$. For stock j held by mutual fund m, the *Optimistic Recommendation* dummy is equal to one if j has received an optimistic report (relative to market consensus) from any analyst in a given quarter and zero otherwise; the *Optimistic Recommendation from Business-Related Analysts* dummy equals one if an optimistic report on j is issued by an analyst at a brokerage firm of which m is a mutual fund client. Other controls include the changes in covered firm size, profitability, and Q at the end of the last quarter and the change in the stock's weight in all the other mutual funds' portfolios. Year fixed effects are included. *P*-values based on robust standard errors clustered by covered stock are reported in brackets. Significance at the 5% and 1% level is indicated by ** and ***, respectively.

optimistic report (relative to market consensus) from any analyst in a given quarter and zero otherwise; the *Optimistic Recommendation from Business-Related Analysts* dummy equals one if an optimistic report on j is issued by an analyst at a brokerage firm of which m is a mutual fund client. We estimate OLS regressions using the weight change of a stock in a mutual fund's portfolio as the dependent variable, and include the two optimistic report dummies and other controls as independent variables. Table 8 presents the regression results.

The dependent variable is *Weight Change* in columns 1 and 2 of table 8 and *Active Weight Change* in columns 3 and 4. In columns 1 and 3, we examine analyst reports issued in the same quarter as the quarter we measure the portfolio weight change, and, in columns 2 and 4, we examine one quarter lagged reports. We control for covered firm fundamentals at the end of the last quarter and the change in the stock's weight in all the other mutual funds' portfolios and cluster the standard errors by fund.

As can be seen from table 8, the coefficients on the *Optimistic Recommendation* dummy, whether lagged or current, are positive and significant across specifications, indicating that optimistic reports on a stock from independent analysts are associated with an increase in the weight of that stock in the mutual fund's portfolio. The coefficients on the *Optimistic Recommendation from Business-Related Analysts* dummy (lagged or current) are always negative and significant, with magnitudes smaller than those of the coefficients on the *Optimistic Recommendation* dummy, indicating that, while mutual funds increase their proportional holdings in stocks following favorable stock recommendations from either independent analysts or business-related analysts, the increase is less if the recommendation comes from an analyst at a business-related brokerage. Using the estimates in column 1 for illustration, an optimistic recommendation from a business-related analyst will result in a mutual fund client increasing its weight on the stock on average by 0.442% (0.663 – 0.221 = 0.442), whereas the corresponding increase in portfolio weight after a favorable recommendation from an independent analyst is 0.663%. This difference in reaction indicates that mutual funds in general value unbiased, high-quality research. It is also consistent with the hypothesis that mutual fund clients pressure the analysts at business-related brokerage firms to make optimistically biased recommendations on the stocks held by the clients: fully or partially aware of this bias, the mutual fund clients respond less in their portfolio decisions to optimistic recommendations issued by these business-related analysts. In other words, mutual fund clients' muted response is because they know that business-related analysts' optimism is partially driven by client pressure and thus should be given less weight.

Overall, these results provide further support for our hypothesis that it is client pressure that drives analyst optimism instead of the alternative hypothesis that optimistic investment recommendations issued by business-related analysts drive stock purchases by the mutual funds.

4. Conclusion

In this study, we use a unique data set that discloses brokerage firms' commission income derived from each mutual fund client as well as the share holdings of these mutual funds to distinguish between two competing hypotheses regarding the link between institutional investors and the behavior of sell-side analysts. These two hypotheses relate to analysts' succumbing to pressure to give optimistically biased recommendations on stocks held

by their institutional clients and analysts' incentives to give unbiased recommendations due to career concerns.

We find that an analyst's recommendation on a stock relative to consensus is significantly higher if the stock is held by the mutual fund clients of the analyst's brokerage firm. Such relative optimism strengthens as the stock's weight in the mutual fund clients' portfolios increases and as the trading commissions paid by those mutual fund clients to the brokerage firm increase. In addition, we find that analysts are more likely to promote the stocks that are less visible to other institutional investors as a strategy to support the interests of the mutual fund clients while avoiding substantial risks of reputation loss. As a consequence, the analyst optimism effect is less pronounced for stocks highly visible to other mutual fund investors. Moreover, analysts are significantly less likely to issue negative ratings on stocks held by client mutual funds subsequent to bad news events, and client mutual funds respond less in their portfolio decisions to optimistic recommendations issued by these business-related analysts. The abnormal returns are significantly greater both in the announcement period and in the long run for favorable stock recommendations from analysts not subject to client pressures than for equally favorable recommendations from business-related analysts. Overall, our results show that analysts are subject to pressures from institutional investors who are clients of the analysts' brokerage firms and issue optimistically biased ratings on the stocks in the clients' portfolios.

The independence and objectivity of analysts have been called into question since a number of financial scandals and frauds were unearthed at the turn of the century. The results from this study indicate that client pressure resulting from business relations between the brokerage firms and the institutional investors can be an important source of conflict of interest that might impede an analyst's ability to function as an objective financial intermediary.

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