

Sending Mixed Messages: Investor Interpretations of Disclosures of Analyst Stock Ownership

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Sell-side securities analysts who recommend stocks that they own have a conflict of interest. If investors buy the stocks in response to the analysts' recommendations, the stocks' prices will rise, increasing the analysts' personal wealth. Thus, analysts are legally required to disclose financial interests in securities of companies they cover. However, investors might view this disclosure favorably—for example, as a sign of the analyst's confidence in the stock—rather than unfavorably as the law intends. This article presents the results of an experiment indicating that investors view analyst stock ownership more unfavorably than favorably. In addition, the experiment's results suggest that disclosures that also briefly explain why analyst stock ownership creates a conflict of interest would lead investors to view it even more unfavorably.

Keywords: conflict of interest, investor decision making, disclosure, securities analyst

Many investors rely on sell-side securities analysts for investment advice.¹ These analysts often provide this advice in the form of research reports regarding specific companies. In a research report, an analyst typically provides facts and opinions about the company and its stock and recommends whether investors should purchase the stock.

Although investors hope to obtain unbiased advice from sell-side analysts, these analysts often have conflicts of interest that could skew their advice. One such conflict exists if the analyst owns stock of a company that the analyst covers. An analyst's recommendation that causes investors to purchase a stock can cause the stock's price to rise. Thus, analysts who own a stock might be able to increase their own personal wealth by recommending the stock. Because of this conflict of interest, the Securities and Exchange Commission approved rule changes by national securities exchanges and associations, pursuant to the Sarbanes-Oxley Act of 2002, that require analysts to disclose their financial interests in securities of companies they cover. These rules were adopted despite the absence of research regarding whether analysts' stock ownership actually biases analysts. Also, little is known about how investors perceive this conflict of interest and how it affects their investment decisions.

How Investors View Analyst Stock Ownership

Previous research suggests why an investor might view analyst stock ownership unfavorably. Analysts who own stock that they cover have a conflict of interest: They have an incentive to recommend the stock to increase their own personal wealth. This incentive could affect analysts consciously or unconsciously. In other words, dishonest analysts might insincerely recommend a stock. Even honest analysts' recommendations, however, might be unconsciously affected by concerns about their effect on the analysts' own personal wealth. Indeed, considerable research suggests that bias created by conflicts of interest is often the result of unintentional and unconscious motivational processes rather than overt corruption (see Cain, Loewenstein, & Moore, 2005). In addition, analysts who own a stock have made a greater commitment to the stock and, thus, might have a harder time admitting that their recommendation was incorrect (Arkes & Blumer, 1985; Festinger, 1957).

Thus, investors might view an analyst's stock recommendation more skeptically if the analyst owns the stock. Indeed, persuasion research has found that acknowledging a personal connection to a cause can undermine an advocate's effectiveness (Eagly, Wood, & Chaiken, 1978; Walster, Aronson, & Abrahams, 1966). Specifically, people perceive greater ambiguity associated with the advocacy of a vested than a nonvested advocate. When an advocate might benefit from the cause, the audience cannot confidently determine the causal attribution of the advocacy. In other words,

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¹ Sell-side analysts typically are employed by a full-service broker-dealer to produce research for its brokerage clients. Buy-side analysts typically are employed by an institutional money manager (such as a mutual fund, pension fund, or insurance company) that buys and sells securities for its own account.

such advocacy might reflect an objective representation of reality or a self-interested and/or distorted one (Kelley, 1972).²

On the other hand, many investors might consider analyst stock ownership to be desirable despite the conflict of interest it creates. That is, investors might give more weight to an analyst's recommendation to purchase a stock if the analyst also owns the stock. Analysts who own stock that they recommend are "putting their money where their mouths are." Thus, some investors might view analyst stock ownership as a sign of the analyst's confidence in, and positive attitude toward, the stock. Attitude and attitude change research has repeatedly shown that attitudes held with high, rather than low, certainty yield greater attitude-behavior correspondence (for reviews, see Petrocelli, Tormala, Rucker, 2007; Tormala & Rucker, 2007).

Therefore, rather than serve its intended purpose of warning investors of a conflict of interest, the mandated disclosure of analyst stock ownership might actually encourage investors to follow the recommendations of analysts who have this conflict. Indeed, economists encourage people to request from service professionals (such as doctors and real estate agents) the same service that the professionals would want for themselves (Levitt & Dubner, 2005). Also, owning stock in a company that one advocates can be viewed by others as providing positive psychological standing or legitimacy to one's advocacy (Miller, 1999; Miller & Ratner, 1998; Ratner & Miller, 2001). Furthermore, the combination of verbal instruction and live (or symbolic) modeling by an advocate is fundamental to social learning theory (Bandura, 1977).

A signal of an analyst's confidence in a recommended stock could be particularly important because of other conflicts of interest analysts face. For example, sell-side analysts who work for companies that also provide investment banking services face a conflict of interest because recommending a company's stock to investors might help secure investment banking business from that company (Agrawal & Chen, 2008). Imagine that an investor is concerned that an analyst's stock recommendation might be motivated by a desire to secure investment banking business from the recommended company. The investor might interpret the analyst's ownership of the recommended stock as a sign that the analyst sincerely believes in the stock's investment potential and is not recommending it merely because of investment banking considerations.

Furthermore, analysts' bias in favor of stocks they own might be at least partly restrained by reputational concerns. The accuracy of analysts' recommendations and forecasts affects the analysts' reputations and, thus, their career prospects (Cohen, Frazzini, & Malloy, 2010). Therefore, an analyst's desire to develop and maintain a strong reputation provides an incentive to resist conflicts of interest. Investors aware of this incentive might view analyst ownership less negatively.

Also, an analyst who owns a stock has a financial stake in the company and, thus, might have a greater incentive to carefully value the company and to keep updated regarding the company's prospects. An investor might reason that such an analyst will be more informed and, thus, will provide more accurate forecasts and recommendations regarding the company and its stock (Boni & Womack, 2002).

In addition, an analyst's act of disclosing the conflict of interest might be perceived by some investors as an act of honesty (Cain et al., 2005). Thus, even if analyst stock ownership is viewed as a

conflict of interest, the fact that the analyst is disclosing the conflict might make the analyst seem more trustworthy. This could at least partly offset the intended impact of the disclosure. Indeed, in a study conducted within a different context, Mercer (2005) found that when a company's management voluntarily discloses bad news about the company, management's credibility with investors increases in the short-run.

In summary, it is unclear in theory whether investors should view analyst stock ownership favorably or unfavorably. In addition, there is little evidence that analyst stock ownership significantly affects analysts' recommendations and forecasts. We are aware of only one empirical study of the effect of analyst stock ownership on analysts' behavior. In that study, Johnston (2013) compared the recommendations and earnings forecasts of analysts who own stocks of companies they cover with those of analysts who do not own those stocks. Johnston found evidence that analysts who own a stock actually give slightly *less* favorable recommendations of the stock than do analysts who do not own the stock. In addition, he found no robust evidence that analysts who own a stock give more optimistic earnings forecasts regarding the stock than do other analysts. It is important to note that Johnston's study examined analyst reports only from 1987–2001, before any of the regulations requiring disclosure of analyst ownership took effect. This suggests that the lack of stock ownership's effect on analysts is not due to disclosure requirements.

Disclosure Requirements Related to Analyst Stock Ownership

Despite the lack of evidence that analysts' stock ownership biases analysts, disclosure of ownership is required by law. Analysts' conflicts of interest came under great scrutiny because of the stock market bubble in the late 1990s. As many stocks' prices soared to—and then fell from—what, at least in hindsight, were excessive levels, analysts continued to recommend investing in those stocks (Barber, Lehavy, McNichols, & Trueman, 2003). Especially following the bursting of this bubble, attention focused in part on whether analysts' conflicts of interest were a cause of these poor recommendations. Most of this attention was on the conflicts of interest of analysts who work for companies that also provide investment banking services (Orcutt, 2003). Substantial evidence exists that analysts would give more optimistic recommendations of particular companies' stock to help secure investment banking business from those companies (see Fisch, 2007).

Other analyst conflicts of interest, however, also received attention. The Sarbanes–Oxley Act of 2002 mandated disclosure of analysts' conflicts of interest, including analysts' ownership of securities of the companies they cover (Sarbanes–Oxley, 2002). The National Association of Securities Dealers (NASD) and New York Stock Exchange (NYSE) then amended their rules to satisfy this requirement. In particular, the current NASD Rule 2711(h)(1)(A) and NYSE Rules 472(k)(1)(iii)(b) and

² Even if investors view analyst stock ownership as a conflict of interest, they still might not sufficiently discount such analysts' advice. Much research has found that even information that individuals know is manipulated or irrelevant can serve as anchors, overly influencing their judgments (see Church & Kuang, 2009).

472(k)(2)(i)(b) require disclosure in research reports and analysts' public appearances

if the research analyst or a member of the research analyst's household has a financial interest in the securities of the subject company, and the nature of the financial interest, including, without limitation, whether it consists of any option, right, warrant, future, long or short position . . .³

Experimental Overview

This article presents the results of an experiment that tests how individual (i.e., retail) investors interpret the mandated disclosure of analyst stock ownership. Participants were shown a version of two research reports, each purportedly written by a different securities analyst and each of which recommended investing in a different stock. Participants were then asked to allocate an investment between these two recommended stocks and to report their perceptions of the honesty and confidence of the analysts. Versions of the research reports differed in whether they disclosed that one of the analysts owned the stock that analyst was recommending.

Under an *ownership is desirable hypothesis*, analyst stock ownership should signal to potential investors the analyst's relatively greater honesty and confidence in the stock. On the other hand, under an *ownership is undesirable hypothesis*, stock ownership should signal to potential investors the analyst's relatively lesser honesty and confidence. Our experiment directly tests these hypotheses. Additionally, we examine the possibility that the link between disclosure of analyst ownership and investment decisions is mediated by investors' perceptions of the analysts' honesty and confidence.

Method

Participants

A total of 329 students at a major private university participated in the experiment. Three different student populations were used: Masters of Business Administration (MBA) students ($n = 128$), law students ($n = 108$), and undergraduate students ($n = 93$). The MBA and law students completed the experiment during class and received a candy bar for their participation. The undergraduate students completed the experiment outside of class and received course credit for their participation. All participants completed the experiment during the same 3-week period. Before participating, all participants were informed that their participation was voluntary and that their individual responses would remain anonymous. Participants did not confer with each other during the experiment. One of the authors, or an assistant trained by the authors, was present at each experimental session.

We chose a diverse group of students because we expected them to vary in their investing sophistication (i.e., investing experience and financial literacy). Examining people with differing levels of investing sophistication permits testing the generalizability of the results. We computed an investor sophistication index by summing the standardized scores (z-scores) of the number of years of stock investing experience participants reported having; the number of economics or finance courses they reported completing; the number of hours per week they reported reading, watching, or listening to business-related media; and their performance on an investing literacy test. This test consisted of 10 questions largely drawn from

a 20-question investing literacy test developed by the Vanguard Group and *Money* magazine (The Vanguard Group, 2012).

Table 1 displays summary demographic information about the participants and the intercorrelations among these demographic characteristics and the investor sophistication index score. As expected, investor sophistication correlated positively and significantly with investing experience and plans. Specifically, more sophisticated participants were much more likely to report that they had previously invested in individual stocks, had seen a stock analyst's research report prior to participating in the study, and expected to invest in individual stocks in the future.

These demographic data indicate that our participants are an appropriate group for testing retail investor behavior. The significant variation in their investing experience and financial literacy allows testing of whether investor sophistication affects reactions to analyst stock ownership.

Procedure

Experimental participants were randomly assigned to receive one of three versions of analyst research reports on the stocks of two hypothetical steel companies, Company One and Company Two. Participants were informed that the report on Company One was written by Analyst X, and the report on Company Two was written by Analyst Y. These research reports were based on recent reports produced by Value Line Advisory Services analysts regarding real steel companies. Each report that participants viewed recommended the covered company's stock as both a short-term and long-term investment, and briefly explained the bases for this recommendation. The reports were constructed such that the analysts appeared equally enthusiastic about Companies One and Two, as confirmed by participants' near equal investment allocation to the stocks in the No Disclosure condition discussed below.

The three versions of the reports differed in the disclosure at the bottom of one of the reports. In one version—the "Standard Disclosure" condition—the end of one of the reports disclosed that "*The author of this report owns stock of Company One [Two].*"

This disclosure satisfies the legal requirement that analysts disclose financial interests in the securities of the companies they cover. It is very similar to the disclosure of analyst ownership in an actual research report by a prominent broker-dealer (Cohen & Company, 2011).

The second version—the "Explanatory Disclosure" condition—disclosed analyst ownership of one of the stocks and briefly explained the conflict of interest created by this ownership. Specifically, it stated:

The author of this report owns stock of Company One [Two]. The price of a stock is affected by investors' willingness to buy the stock. Therefore, the author's personal wealth could increase if he or she persuades investors to purchase the stock.

The third version—the "No Disclosure" condition—lacked any disclosure. In other words, participants in this condition viewed research reports that were identical to those in the other two conditions, except that they lacked disclosure of analyst ownership. This No Disclosure condition serves as a control. If investors

³ The NYSE and NASD rules have insignificant punctuation and wording differences in this requirement.

Table 1
Intercorrelations of Sample Descriptive Statistics

	1	2	3	4	5	6	7	<i>M</i>	<i>SD</i>
1. Investor sophistication index	—							.00	2.92
2. Expect to invest in future	.16*	—						.89 ^a	.32
3. Have invested in individual stocks	.64*	.22*	—					.41 ^b	.49
4. Years of investing experience	.69*	.17*	.74*	—				1.88	3.12
5. Seen report prior to participation	.63*	.16*	.57*	.46*	—			.57 ^c	.50
6. Finance or economics courses	.78*	.09	.37*	.34*	.54*	—		3.93	4.03
7. Hours consuming business media	.73*	.16*	.39*	.30*	.42*	.48*	—	2.67	3.29
8. Investing literacy test score	.74*	.05	.38*	.37*	.43*	.46*	.36*	5.82	1.96

Note. Whether participants expect to invest in individual stocks in the future, whether participants had previously invested in individual stocks, and whether participants had seen a securities analyst's research report prior to their participation in the study were coded as 0 = no and 1 = yes.

^a The proportion of "yes" responses was greater than "no" responses, $\chi^2(1, N = 325) = 193.85, p < .001$. ^b The proportion of "no" responses was greater than "yes" responses, $\chi^2(1, N = 328) = 11.72, p < .01$. ^c The proportion of "yes" responses was greater than "no" responses, $\chi^2(1, N = 325) = 5.65, p < .05$.

* $p < .01$.

in a particular disclosure condition have a different willingness to invest in the stocks than do investors in the control condition, it suggests that the disclosure affects their investment decisions.

Across all the experimental conditions, the same stock was owned by one of the analysts. Within each experimental condition, the order of the analyst reports was randomized to vary whether the stock that was owned by an analyst was presented first or second. To avoid confusion, the subject of the first report that participants read was always called "Company One" and the subject of the second report was always called "Company Two."

In summary, there are three conditions in the experiment. The Standard Disclosure condition discloses that one of the analysts owns the stock the analyst is recommending. The Explanatory Disclosure discloses that one of the analysts owns the stock the analyst is recommending and briefly explains why this is a conflict of interest. The No Disclosure condition does not disclose whether either analyst owns the stock he or she is recommending. Each experimental participant was assigned randomly to one of these three conditions.

Dependent Variables

After reading a version of the two research reports, participants answered a series of questions. First, they were asked to allocate a \$10,000 investment between the two stocks. Participants were also asked how honest they believed each analyst was being. In particular, participants answered the questions "How honest do you think ANALYST X is being in recommending COMPANY ONE stock?" and "How honest do you think ANALYST Y is being in recommending COMPANY TWO stock?" Participants responded on a continuous scale with endpoints labeled *Very Dishonest* (1) and *Very Honest* (7).

Also, participants were asked how confident they believed the analysts were in their recommendations. In particular, participants answered the questions "How confident do you believe ANALYST X is in his or her recommendation of COMPANY ONE stock?" and "How confident do you believe ANALYST Y is in his or her recommendation of COMPANY TWO stock." Participants responded on a continuous scale with endpoints labeled *Not at all Confident* (1) and *Very Confident* (7).

In addition, participants were explicitly asked how, in general, an analyst's stock ownership would affect their willingness to

invest in a stock recommended by the analyst. Specifically, participants were asked "How would the fact that an analyst owns a stock that he or she recommends affect your investment decisions?" Participants answered this question by choosing one of three possible answers: (a) It would make me LESS likely to invest in that stock, (b) It would NOT AFFECT the likelihood that I would invest in that stock, or (c) It would make me MORE likely to invest in that stock.

After answering these questions, participants answered a number of demographic and manipulation-check questions and completed the investing literacy test.

Results

Allocation of Investment

As discussed above, after reading analyst reports on two stocks, participants were asked to allocate a \$10,000 investment between these stocks. One of the stocks was owned by the analyst who recommended it (which we refer to as the "Owned" stock), and the other stock was not owned by either analyst (the "Non-Owned" stock).

Table 2 presents, by experimental condition, the mean amount participants allocated to the Owned stock. These means differed across conditions, $F(2, 323) = 15.29, p < .001, \eta^2 = .09$. Participants allocated less to the Owned stock if it was disclosed that the analyst owned the stock than if this was not disclosed. In particular, participants in the Standard Disclosure condition allocated an average of only \$4,306 to the Owned stock, but participants in the No Disclosure condition allocated an average of \$5,284 to the Owned stock, $t(323) = 3.30, p < .01, d = .37$. Furthermore, participants in the Explanatory Disclosure condition, who received the disclosure explaining why analyst ownership is a conflict of interest, allocated even less to the Owned stock (\$3,637) than did participants in the Standard Disclosure condition, $t(323) = 2.24, p < .05, d = .25$.

To test whether these results generalize across investors of different sophistication levels, we then examined how participants' allocation decisions related to their investor sophistication index scores. Specifically, we subjected the amount allocated to the Owned stock to a hierarchical multiple regression in which we

Table 2
Mean Investment Allocation to Owned Stock by Experimental Condition

	No Disclosure (<i>n</i> = 109)	Standard Disclosure (<i>n</i> = 111)	Explanatory Disclosure (<i>n</i> = 106)
Allocation to Owned stock	\$5,284 (\$2,200)	\$4,306 (\$2,364)	\$3,637 (\$2,013)
	[\$4,869, \$5,698]	[\$3,895, \$4,717]	[\$3,216, \$4,057]

Note. Standard deviations in parentheses; 95% Confidence intervals in brackets.

entered Condition (No Disclosure = 1 vs. Standard Disclosure = 2 vs. Explanatory Disclosure = 3)⁴ and Investor Sophistication in Step 1 and their interaction term in step two. A significant main effect of Condition emerged from this analysis, $\beta = -.29$, $t(322) = -5.48$, $p < .001$, $d = -.61$, confirming that the disclosures affected investment allocation decisions. Investor Sophistication, however, did not have a significant main effect on participants' responses, $\beta = .17$, $t(322) = 1.22$, *ns*. More importantly, Investor Sophistication did not interact with Condition, $\beta = -.10$, $t(322) = -.72$, *ns*. This suggests that the effects of the disclosures are independent of the sophistication of the investor.

Perceived Analyst Honesty and Confidence

The above analyses indicate that disclosure of analyst stock ownership reduces the amount investors are willing to invest in a recommended stock. We expected that, if this result occurred, it would be because investors view analyst ownership as a conflict of interest and, thus, believe that such analysts are less honest or have less confidence in their recommendations than do other analysts. To test whether this is the process underlying the disclosures' effectiveness, we first computed separate 3 (Condition: No Disclosure vs. Standard Disclosure vs. Explanatory Disclosure) \times 2 (Stock: Owned vs. Non-Owned) repeated measures ANOVAs for both perceived analyst honesty and perceived analyst confidence in his or her recommendation. Table 3 displays the descriptive results of these analyses.

Table 3
Mean Perceived Honesty and Confidence of Analysts by Experimental Condition

	No Disclosure (<i>n</i> = 111)	Standard Disclosure (<i>n</i> = 112)	Explanatory Disclosure (<i>n</i> = 106)
Owned stock analyst's honesty	4.74 (.97)	4.29 (1.25)	3.82 (1.13)
	[4.53, 4.95]	[4.09, 4.50]	[3.61, 4.04]
Non-Owned stock analyst's honesty	4.74 (.98)	5.07 (1.04)	5.35 (1.10)
	[4.55, 4.94]	[4.88, 5.27]	[5.15, 5.55]
Owned stock analyst's confidence	5.22 (1.14)	4.97 (1.32)	4.57 (1.32)
	[4.98, 5.46]	[4.74, 5.21]	[4.33, 4.81]
Non-Owned stock analyst's confidence	4.81 (1.15)	5.12 (1.03)	5.13 (1.06)
	[4.61, 5.02]	[4.92, 5.32]	[4.92, 5.34]

Note. Standard deviations in parentheses; 95% Confidence intervals in brackets.

For perceived analyst honesty, a main effect was not observed for Condition, $F(2, 326) = 1.05$, *ns*, but was observed for Stock, $F(1, 326) = 92.37$, $p < .001$, $\eta^2 = .22$. However, this main effect was qualified by the interaction, $F(2, 326) = 30.24$, $p < .001$, $\eta^2 = .16$.

Disclosing ownership made participants believe that the analyst recommending the Owned stock was being less honest. In particular, participants in the Standard Disclosure condition perceived the Owned stock analyst to be less honest than did participants in the No Disclosure condition $t(326) = -3.28$, $p < .01$, $d = -.36$. In addition, participants viewing the Explanatory Disclosure perceived the Owned stock analyst to be even less honest than did participants viewing the Standard Disclosure, $t(326) = -3.40$, $p < .001$, $d = -.38$.

Interestingly, disclosure of one analyst's ownership made the other analyst appear more honest, even in absolute terms. Participants in the Standard Disclosure condition perceived the analyst who recommended the Non-Owned stock to be more honest than did participants in the No Disclosure condition, $t(326) = 2.41$, $p < .05$, $d = .27$. In addition, participants viewing the Explanatory Disclosure condition perceived the Non-Owned stock analyst to be even more honest than did participants viewing the Standard Disclosure, $t(326) = 1.99$, $p < .05$, $d = .22$.

For perceived analyst confidence in the recommended stock, a main effect was not observed for Condition, $F(2, 326) = 1.60$, *ns*, nor for Stock, $F(1, 326) = 1.32$, *ns*. However, these null main effects were qualified by the interaction, $F(2, 326) = 10.16$, $p < .001$, $\eta^2 = .06$. In particular, participants viewing the Explanatory Disclosure perceived the Owned stock analyst to be less confident than did participants viewing the Standard Disclosure, $t(326) = -2.64$, $p < .01$, $d = .29$, and participants viewing no disclosure, $t(326) = -4.27$, $p < .001$, $d = .47$. The confidence data did not differ significantly between the Standard and No Disclosure conditions, $t(326) = -1.47$, *ns*.

Interestingly, similar to the honesty data, disclosure of one analyst's ownership made the other analyst appear more confident. Participants in the Standard Disclosure and Explanatory Disclosure conditions perceived the analyst who recommended the Non-Owned stock to be more confident than did participants in the No Disclosure condition, Standard Disclosure: $t(326) = 2.07$, $p < .05$, $d = .23$; Explanatory Disclosure: $t(326) = 2.09$, $p < .05$, $d = .23$. The confidence data did not differ between the Explanatory and Standard Disclosure conditions, $t(326) = .06$, *ns*.

⁴ We used this coding scheme for ease of presentation and interpretation of the results. As an alternative, however, we reanalyzed the data using two binary dummy variables for the condition, one for the Standard Disclosure condition, and one for the Explanatory Disclosure condition. The results were virtually identical to those from our original coding scheme.

Mediation Analysis

These results suggest that disclosures that an analyst owns a recommended stock affect investors' perceptions of the analyst's honesty and confidence in the stock. To test whether the differences across conditions in the amount participants allocated to the Owned stock were due to differences in participants' perceptions of the analysts' honesty and confidence, we conducted a standard mediation analysis as recommended by methodologists and statisticians (Preacher & Hayes, 2004, 2008). The most conventional and efficient way to conduct this analysis involves a bootstrap procedure that constructs bias-corrected confidence intervals based on 5,000 random samples with replacement from the full sample. This method tests whether the size of an indirect effect differs significantly from zero.

As discussed above, differences in participants' ratings of the both the honesty and the confidence of the Non-Owned stock analyst versus the Owned Stock analyst were greatest for the Explanatory Disclosure condition, smaller for the Standard Disclosure condition, and minimal for the No Disclosure control condition. Thus, for this mediation analysis, we coded Condition using 0 for the No Disclosure condition, 1 for the Standard Disclosure condition, and 2 for the Explanatory Disclosure condition.⁵ We then tested the perceived honesty differential (i.e., Honesty of Non-Owned stock analyst minus Honesty of Owned stock analyst), as well as the perceived confidence differential (i.e., Confidence of Non-Owned stock analyst minus Confidence of Owned stock analyst) as simultaneous mediators of the relationship between Condition and participants' allocation to the Owned stock.

As discussed above and displayed in Figure 1, Condition significantly predicted allocation to the Owned stock, $\beta = -.29$, $t(324) = 5.50$, $p < .001$, $d = .61$. Condition also significantly predicted the difference in perceived honesty of the analysts; disclosures of analyst ownership increased the perceived honesty of the Non-Owned stock analyst versus that of the Owned stock analyst, $\beta = .40$, $t(327) = 7.79$, $p < .001$, $d = .86$. In addition, Condition significantly predicted the difference in perceived analyst confidence in the stocks they recommended; disclosures of analyst ownership increased the perceived confidence of the Non-Owned stock analyst versus that of the Owned stock analyst, $\beta =$

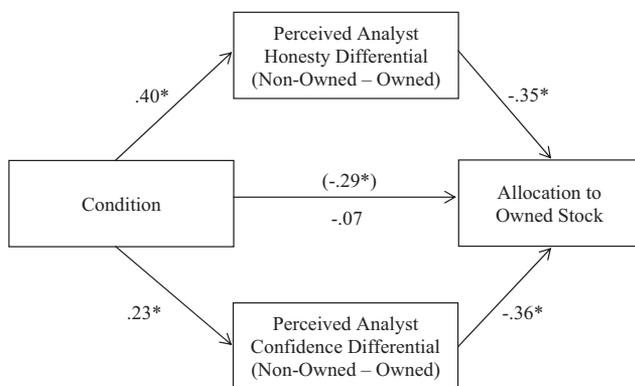


Figure 1. Mediation analysis. Note: Condition was coded using 0 for the No Disclosure control condition, 1 for the Standard Disclosure condition, and 2 for the Explanatory Disclosure condition. The values reported are the standardized regression (path) coefficients (β). * $p < .001$.

.23, $t(327) = 4.34$, $p < .001$, $d = .48$. However, when allocation to the Owned stock was regressed simultaneously onto Condition and the differences in perceived honesty and confidence of the analysts, the strength of the effect of Condition was reduced to statistical nonsignificance, whereas the difference in perceived honesty and confidence of the analysts were strong predictors. In other words, the greater the differences between the perceived honesty of the analysts and between the perceived confidence of the analysts, the less that participants invested in the Owned stock. The size of the indirect effect involving the Honesty differential was -386.05 ($SE = 73.47$), and the 95% confidence interval excluded zero, 95% CI $[-549.98, -254.19]$. The size of the indirect effect involving the Confidence differential was -235.57 ($SE = 63.58$), and the 95% confidence interval excluded zero, 95% CI $[-382.27, -128.44]$. The size of the total indirect effect was -621.62 ($SE = 94.68$), and the 95% confidence interval excluded zero, 95% CI $[-818.45, -450.67]$.

These results suggest that the perceived honesty and confidence of analysts is affected by whether and how it is disclosed that the analysts own stock in the companies they are recommending, and in turn, this perceived honesty and confidence affect investors' investment decisions. Disclosure of analyst ownership reduces investment at least in part because investors question the honesty and confidence of an analyst who recommends stocks that the analyst owns.

Likelihood of Investing

The investment allocation results show that investors overall view analyst stock ownership more negatively than positively. However, these results do not show how widespread this negative view is. For example, they do not indicate whether almost all investors view analyst stock ownership negatively, or whether a substantial minority of investors view it positively.

Thus, after having participants allocate an investment between two particular stocks, we also explicitly asked them how analyst stock ownership in general would affect their likelihood of investing in a stock. In particular, participants were asked whether an analyst's owning a stock that the analyst recommends would make them less likely, more likely, or not affect the likelihood that they would invest in that stock.

Table 4 displays, by experimental condition, participants' responses to this question. The disclosures appear to have affected participants' answers, $\chi^2(4, N = 328) = 26.67$, $p < .001$. Interestingly, participants in the Standard Disclosure condition responded differently (at a 10% significance level) than did participants in the No Disclosure condition, $\chi^2(2, N = 233) = 5.05$, $p = .08$. Of participants who viewed the Standard Disclosure, a plurality (42.0%) stated that analyst ownership would make them less likely to invest in a recommended stock and 31.3% reported that it would make them more likely to invest in the stock. In the No Disclosure condition, however, a plurality (45.0%) stated that analyst ownership would make them *more* likely to invest in the stock and only 36.9% reported it would make them less likely to do so.

⁵ As before, we used this coding scheme for ease of presentation and interpretation of the results. Using two binary dummy variables for the condition instead, one for the Standard Disclosure condition, and one for the Explanatory Disclosure condition, did not change the results.

Table 4
Observed Frequencies of Likelihood of Investing in Owned Stock by Experimental Condition

	No disclosure	Standard disclosure	Explanatory disclosure
Less likely to invest in Owned stock	36.9% <i>n</i> = 41	42.0% <i>n</i> = 47	58.1% <i>n</i> = 61
No effect on likelihood of investing in Owned stock	18.0% <i>n</i> = 20	26.8% <i>n</i> = 30	28.6% <i>n</i> = 30
More likely to invest in Owned stock	45.0% <i>n</i> = 50	31.3% <i>n</i> = 35	13.3% <i>n</i> = 14

Participants' answers to the previous investment allocation question revealed what they would do when given a specific example of analyst ownership. In contrast, participants' answers to this question reflect their reaction to a similar hypothetical situation in general. Psychological research has provided several reasons why judgments regarding general and specific cases can differ. For example, general and specific cases can activate—or contribute to the mental construction of—very different standards of comparison and reference points relevant to judgments (Petrocelli & Sherman, 2010; Sherman, Beike, & Ryalls, 1999).

Prior to answering how analyst stock ownership would generally affect their investment decisions, participants in the Standard Disclosure condition had been shown a specific example of a research report on an analyst-owned stock. Thus, they had a clear reference point, made salient by the investment allocation exercise they had just completed. Therefore, as should be expected, their answers to the general question were consistent with their allocation decisions in the specific example: more of these participants reported generally viewing analyst ownership unfavorably than favorably. In contrast, participants in the No Disclosure condition had not been exposed to a specific example of analyst ownership. As a result, these participants reported viewing analyst ownership more favorably.

In real world situations, investors see disclosures of analyst ownership in the context of specific cases, that is, the disclosures are in research reports in which analysts are recommending specific stocks. Thus, the responses of the participants in the Standard Disclosure condition are likely the most accurate measure of investors' opinions of analyst ownership.

Most participants in the Explanatory Disclosure condition stated that analyst stock ownership in general would make them less likely to buy a recommended stock. In fact, more than four times as many participants in the Explanatory Disclosure condition reported viewing analyst ownership unfavorably (58.1%) than favorably (13.3%). This is a much more negative response to analyst ownership than that expressed by participants in the Standard Disclosure condition, $\chi^2(2, N = 217) = 26.67, p < .001$. This is unsurprising because participants in the Explanatory Disclosure condition had just been exposed to a disclosure explaining that analyst ownership creates a conflict of interest.

In addition, note that participants' responses are consistent with the investment allocation decisions in the earlier part of the experiment. In the Standard Disclosure condition, more participants reported viewing analyst ownership negatively than positively, which is consistent with the smaller allocation to Owned Stock in Standard Disclosure condition relative to the No Disclosure con-

dition. Also, in the Explanatory Disclosure condition, even more participants reported viewing analyst ownership negatively, which is consistent with the lower allocation to the Owned Stock in Explanatory Disclosure condition relative to the Standard Disclosure condition. In addition, in the Standard Disclosure and Explanatory Disclosure conditions, a substantial correlation existed between individual participants' responses to this question and how much they allocated to the Owned stock ($r = .42, p < .001$).

Finally, to test whether participants' answers to this question generalize across investors of different sophistication levels, we also examined how participants' answers were related to their investor sophistication index scores. Specifically, we conducted a multinomial logistic regression using the "no effect" response as the reference category. Overall, we found that participants' answers to how analyst ownership in general would affect their likelihood of investing in a stock differed by investor sophistication level. The likelihood ratio test indicated that the investor sophistication index score significantly predicted the categorical criterion, $\chi^2(2, N = 328) = 8.68, p < .05$. Relative to the option that analyst stock ownership would not affect one's likelihood of investing in a particular stock, greater investor sophistication decreased both the likelihoods of reporting that analyst ownership would make one less likely to invest ($\beta = -.10, SE = .05$, Wald statistic = 4.84, $p < .05$) and more likely to invest ($\beta = -.15, SE = .05$, Wald statistic = 7.88, $p < .01$). This effect, however, appears to be driven only by the No Disclosure condition, likelihood ratio test: $\chi^2(2, N = 111) = 7.10, p < .05$. In neither the Standard Disclosure condition nor the Explanatory Disclosure condition did investor sophistication significantly affect participants responses (Standard Disclosure: likelihood ratio test: $\chi^2(2, N = 112) = 1.75, ns$; Explanatory Disclosure: likelihood ratio test: $\chi^2(2, N = 105) = 3.55, ns$). Thus, less sophisticated investors did not respond differently from more sophisticated investors in the two experimental conditions where there actually was a disclosure of analyst ownership (i.e., the Standard Disclosure and Explanatory Disclosure conditions). As with the earlier Investment Allocation results, this suggests that investor sophistication does not affect how the investor perceives analyst stock ownership.

Discussion and Conclusion

Analysts who own stock of companies that they cover have a conflict of interest. By recommending these stocks to investors, these analysts can cause the stocks' prices to rise, increasing the analysts' personal wealth. Because of this, analysts are required to disclose their financial interests in securities of companies they

cover. However, investors might perceive disclosure of analyst stock ownership differently from how policymakers intend. Analysts who own stock that they recommend are “putting their money where their mouths are.” Thus, analyst ownership might indicate that the analyst is more confident in, or will more closely follow, the stock. Therefore, a disclosure intended to discourage investors from relying on certain analysts’ recommendations might instead encourage investors to do so.

The results of our experiment indicate that, overall, investors perceive analyst stock ownership more unfavorably than favorably. Before discussing the implications of these findings, some limitations of the experiment should be noted.

As with any controlled experiment, ecological validity issues must be considered. Participants made their investment allocation decisions solely after reading one research report about each stock. They did not have access to any additional information. Indeed, we chose to use two steel stocks in the experiment partly because we believed participants would have little, if any, prior familiarity with the steel industry that would influence their investment allocation decisions. Because participants’ decisions were based solely on the supplied research reports, participants very likely gave more weight to analyst stock ownership than they would have if they had been given access to additional information about the stocks. Therefore, the investment allocation results likely overestimate the weight that investors normally give to analyst ownership.

In addition, the research reports in our experiment were short, and the disclosure of analyst ownership was the only disclosure in the reports. Real research reports often are much longer and can include lengthy disclosures regarding many subjects.⁶ As a result, the disclosure of analyst ownership in our experiment probably is more likely to have been read by participants than are most disclosures of analyst ownership in research reports. Therefore, for this reason as well, the experiment might overestimate the effect of disclosing analyst ownership.

Another issue is whether the types of experimental participants—MBA students, law students, and undergraduate students—limit the applicability of the results to the broader population of individual investors who use research reports. We do not believe that it does. Although the participants varied widely in their investing experience and financial literacy, the investor sophistication variable—which measures this experience and literacy—generally did not interact with the experimental conditions. This indicates that the effects of disclosure of analyst ownership are independent of the sophistication of the investor. Thus, the experiment’s results appear to generalize across investors of different sophistication levels.

Of course, our participants do not span the range of all possible sophistication levels. For example, none of the participants were professional, institutional investors. However, the participants we used are likely the appropriate group to study. Securities regulations generally are designed to protect individual investors rather than sophisticated, institutional investors, who are better able to protect themselves (Langevoort, 2009).

In summary, overall, we find that investors view analyst stock ownership more unfavorably than favorably. Participants allocated 19% less to a stock when informed that it was owned by the analyst who recommended it. This is consistent with the fact that more participants who were given the Standard Disclosure claimed that analyst ownership would make them less likely to invest in a

recommended stock than claimed that it would make them more likely to invest in the stock (42% vs. 31%).

Deriving clear public policy implications from these results is difficult because much relevant information is still unknown and requires future research. First, the extent to which analyst stock ownership actually affects analysts’ behavior must be determined. As discussed above, Congress required disclosure of analyst stock ownership as part of a law mandating disclosure of all analyst conflicts of interest (Sarbanes–Oxley, 2002). However, Congress might have acted prematurely. Unlike other conflicts of interest, analyst stock ownership might not be problematic. Indeed, as discussed above, the limited existing research has found evidence that analysts who own a stock actually make slightly *less* favorable recommendations of the stock than do other analysts. It also has found no robust evidence that they make more optimistic earnings forecasts regarding the stock than do other analysts (Johnston, 2013).

Information on such bias is necessary to determine if investors are appropriately discounting the advice of analysts with financial interests in securities of companies they cover. For example, it might indicate that the current disclosure is causing investors to appropriately discount conflicted analysts’ advice.

If, however, it suggests that stock ownership biases analysts to a greater extent than investors account for, then our experiment indicates that a stronger disclosure might be warranted, such as the Explanatory Disclosure we created. Recall that that disclosure states:

The author of this report owns stock of Company One [Two]. The price of a stock is affected by investors’ willingness to buy the stock. Therefore, the author’s personal wealth could increase if he or she persuades investors to purchase the stock.

Participants responded more negatively to this disclosure than they did to the current, legally required disclosure of analyst ownership. Participants who viewed the Explanatory Disclosure allocated an average of 16% less to the Owned stock than did participants who viewed the Standard Disclosure. Consistent with this, many more participants in the Explanatory Disclosure reported that analyst ownership would make them less likely to invest in a recommended stock than claimed that it would make them more likely to invest in the stock (58% vs. 13%). In contrast, participants who viewed the Standard Disclosure were more evenly split (42% vs. 31%).

Another possible scenario is that analyst ownership does not affect analysts’ recommendations. This article’s results indicate that, in that case, the current disclosure policy might be unwise. This experiment’s findings suggest that, to the extent that investors are seeing the current disclosure, investors overall are reducing the weight they give to such analysts’ recommendations. However, if analyst ownership does not affect analysts’ behavior, investors should instead ignore the disclosure.

An unnecessary disclosure can cause other harm as well. In general, the more disclosures that people are exposed to, the less likely they might be to pay attention to any particular one (Stewart & Martin, 1994). Thus, even if investors did not react to a disclo-

⁶ For example, the last four pages of a recent 27-page research report on Microsoft Corp. consisted of disclosures. Credit Suisse, *Microsoft Corp.: Why Microsoft Phone and Nokia Can Medal*, Jan. 5, 2012.

sure of analyst ownership, it might reduce their attention to disclosures that should concern them, such as disclosures of investment banking relationships, which are more likely to skew analysts' advice.

Finally, another possible scenario is that analyst ownership actually makes analysts' recommendations more trustworthy. In that case, the current disclosure policy might be especially unwise. This article's results indicate that, overall, investors view analyst ownership more unfavorably than favorably, which is opposite how they should view it under that scenario.

To determine the best disclosure policy, other research is also necessary. Interestingly, current law requires only the existence of the analyst's financial interest in the company—not the size of this interest—to be disclosed. If analyst stock ownership creates a problematic conflict of interest, however, then greater analyst ownership creates a greater conflict of interest. Thus, policymakers should consider requiring disclosure of the size of the analysts' financial interest in the companies they cover. However, research is first necessary regarding whether and how the size of analysts' financial interests affects analysts' behavior and the extent to which its disclosure would affect investors' discounting of analysts' advice.

In addition, the reaction of institutional investors to analyst stock ownership should also be studied. Institutional investors might react differently to disclosures of analyst ownership than do retail investors. For example, because of their greater experience, institutional investors might be aware of how particular analysts are affected by stock ownership, and adjust those analysts' recommendations and forecasts appropriately. The reaction of institutional investors to analyst stock ownership is relevant to the question of whether and how this ownership should be disclosed, however, it is beyond the scope of this article.

Finally, note that there is evidence that disclosing a conflict of interest can also change the behavior of the person who has the conflict of interest (Cain et al., 2005; Cain, Loewenstein, & Moore, 2011). In particular, advisors with conflicts of interest (such as analysts recommending stocks) might alter their advice if forced to disclose their conflicts. For example, if an advisor believes that the advisee (such as an investor) might discount the advice because the advisor has a conflict of interest, then the advisor might exaggerate the advice to offset the discounting. Similarly, because the advisee has been warned of the conflict, the advisor might feel morally licensed to exaggerate the advice. Such effects should be investigated before deciding what disclosure policy is best.

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