

Mitigating the Influence of Analysts Who Issue Aggressive Stock Price Targets: The Role of Joint versus Separate Evaluation

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ABSTRACT

Investors frequently rely on individual analysts' stock price targets. Aggressive price targets often reflect analysts' attempts to strategically influence investors. Therefore, investors' welfare may be compromised if they take aggressive price targets at face value. In this study we examine conditions under which investors are more likely to infer that analysts who issue aggressive price targets are acting strategically. Investors can evaluate multiple analysts' price targets with or without other related information (e.g., earnings estimates). Investors can also evaluate the information provided by multiple analysts jointly or separately. Two experiments find that as predicted, when investors evaluate multiple analysts' price targets without earnings estimates, there is no difference in investors' perceptions about whether the aggressive analyst is acting strategically across joint versus separate evaluation. However, also as predicted, when investors evaluate multiple analysts' price targets along with their earnings estimates, investors perceive the aggressive analyst as acting more strategically under joint evaluation than under separate evaluation. Our findings suggest that when investors evaluate multiple analysts' price targets with other related information such as earnings estimates, adopting joint evaluation can reduce the likelihood that investors are overly influenced by aggressive analysts.

Keywords: stock price targets; investor judgments; financial analysts; joint versus separate evaluation

1. Introduction

Investors frequently rely on stock price targets issued by financial analysts when making investment decisions (e.g., Brav and Lehavy 2003; Dechow and You 2020). Nevertheless, different analysts' price targets for a given firm tend to vary (e.g., Gleason, Johnson, and Li 2013). The extent to which a price target exceeds the consensus is an indication of the aggressiveness of the price target. Aggressive price targets are common, and actual returns typically fall short of the returns implied by such price targets (e.g., Dechow and You 2020). Analysts issue aggressive price targets because they have incentives to strategically influence investors' judgments (e.g., Jackson 2005; Malmendier and Shanthikumar 2007, 2014). Thus, if investors rely on analysts who issue these aggressive price targets, their welfare could be adversely affected. Regulators are concerned about investors being affected by analysts' strategic behavior, and researchers have identified features (e.g., including warnings or disclaimers) in analyst reports that could be included to attenuate the effects of such behavior (Kelly, Low, Tan, and Tan 2012; Liu, Huang, Jiang, and Messier Jr 2020). However, because investors may not notice these warnings or disclaimers, these measures might not be particularly effective.

When evaluating stock price targets issued by multiple analysts, investors can either evaluate these analysts' price targets with or without other related information (e.g., earnings estimates). Further, investors may evaluate information provided by different analysts one at a time (i.e., separate evaluation). For instance, many websites and news articles (e.g., news articles on CNBC, Seeking Alpha) report outputs by analysts one analyst at a time in isolation on separate pages (see Appendix 1 for examples). Because analyst reports comprise many pages, investors can only look at one report (i.e., one price target) at a time. Investors may also evaluate price targets by multiple analysts side-by-side (i.e., joint evaluation). For instance, some websites

(e.g., Tipranks; see Appendix 1) present information from multiple analysts following a particular firm on a single page. If they evaluate information from multiple analysts, investors can collate the relevant information they need into a single document, which allows them to view key information at a glance.

In this study we consider the effects of investors evaluating multiple analysts' price targets either with or without other related information in the form of earnings estimates. In each situation we examine whether investors perceive analysts who issue aggressive price targets as acting more strategically when they evaluate the information provided by all analysts jointly rather than separately.

Research in psychology and accounting has examined different forms of joint versus separate evaluation. Some studies examine individuals' choices among multiple options defined by multiple attributes; in these cases, participants evaluate the *options* either jointly or separately (e.g., Jackson 2008; Basu and Savani 2017). Other studies examine individuals' evaluations of a single option (i.e., a firm) that is defined by multiple attributes; in these cases, participants evaluate the *attributes* either jointly or separately (e.g., Hodge, Hopkins, and Wood 2010; Bucaro, Jackson, and Lill 2020). In yet other studies, participants in the joint evaluation condition evaluate multiple options, whereas those in the separate evaluation condition evaluate a single option (Hsee 1996; Hsee and Zhang 2004). In contrast with these prior studies, we examine a context in which there is a single option (i.e., one firm) that is defined by multiple attributes (i.e., price targets, earnings estimates). However, multiple parties (i.e., analysts) provide different versions of the attributes. In joint evaluation, investors evaluate the information provided by all analysts simultaneously and, in separate evaluation, one at a time. Importantly,

joint versus separate evaluation occurs between multiple information providers, an element that has not been examined in prior studies.

When investors evaluate multiple analysts' price targets, they may be more likely to realize that analysts have provided aggressive price targets when they evaluate all analysts jointly rather than separately. This occurs because individuals can better notice how information providers differ from each other under joint evaluation than under separate evaluation (Basu and Savani 2019). Nevertheless, because investors tend to give information providers the benefit of the doubt (Koonce, Williamson, and Winchel 2010; Kelly et al. 2012; Nelson and Rupar 2015; Erickson, Hewitt, and Maines 2017), it is possible that investors' perceptions about whether the aggressive analyst is acting strategically will not differ when investors evaluate information jointly versus separately.

When investors evaluate multiple analysts' price targets with other related information (e.g., earnings estimates), we propose that they will be more wary of aggressive analysts under joint evaluation than under separate evaluation. Investors' concerns regarding information providers' strategic intentions can increase or decrease as investors receive additional related information (e.g., Hutton, Miller, and Skinner 2003; Koonce et al. 2010; Chen, Han, and Tan 2016). When investors evaluate multiple analysts' price targets and earnings estimates separately, it is more difficult for them to compare an aggressive analyst's price target and earnings estimate with those of other analysts, so concerns about the analyst's strategic intentions are less likely to increase. Instead, investors may perceive that the analyst's earnings estimate provides justification for the analyst's price target, and investors' concerns could decrease. In contrast, when investors evaluate multiple analysts' price targets and earnings estimates jointly, the earnings estimates can result in the analyst who issues an aggressive price target differing

from other analysts on a greater number of dimensions, and joint evaluation could make it easier for investors to notice these differences. Although investors may give the benefit of the doubt when an aggressive analyst departs from the other analysts on one dimension, they might be less likely to do so when the analyst departs on multiple dimensions. As a result, investors' concerns about the analyst's strategic intentions could increase. We therefore propose that when investors evaluate multiple analysts' price targets with earnings estimates, investors are more likely to perceive an aggressive analyst as acting strategically when they evaluate information provided by analysts jointly rather than separately.

We conduct two experiments to test our research questions. Experiments allow us to control the type of analyst information participants receive while holding other firm characteristics and analyst characteristics constant, and manipulate separate versus joint evaluation while keeping all other factors constant. Experiments 1 and 2 each adopt a 2×2 between-participants design that manipulates *evaluation type* (separate versus joint) and *information set* (stock price target without earnings estimate versus stock price target with earnings estimate). The primary difference between the experiments is in the nature of the earnings estimate issued by the focal analyst. In Experiment 1, the focal analyst issues an aggressive stock price target and an aggressive earnings estimate. In Experiment 2, the focal analyst issues an aggressive stock price target but the earnings estimate issued is not aggressive. We conduct these two experiments to account for the possibility that an analyst who issues an aggressive stock price target may or may not also issue an aggressive earnings estimate. Results from both experiments indicate that when the information set does not include the earnings estimates, there is no difference in investors' perceptions about whether the focal aggressive analyst is acting strategically, regardless of whether investors evaluate information jointly or

separately. However, when the information set contains earnings estimates, investors perceive the aggressive analyst as acting more strategically under joint evaluation of information than under separate evaluation.

Our research makes multiple contributions. Regulators are concerned that investors' welfare is adversely affected when investors rely on strategic analysts (e.g., Kelly et al. 2012). Currently, the presentation of information provided by analysts in the digital world (e.g., on investment portals and in media articles) does not fall under the purview of the Securities and Exchange Commission (SEC). Multiple pieces of information from multiple analysts are typically not available in close proximity (i.e., where investors can view them jointly at a glance). As a result, investors' default mode of evaluation is likely separate evaluation. Our experiments show that by jointly considering multiple pieces of information by multiple analysts, investors are likely to be less susceptible to the influence of strategic analysts. In doing so, we complement existing research on investor reactions to financial analysts' outputs (e.g., Brav and Lehavy 2003; Kelly et al. 2012; Dechow and You 2020; Liu et al. 2020). We also contribute to research finding that investors become more wary when they encounter multiple pieces of related information that are consistently optimistic (e.g., Kelly et al. 2012) and when they encounter multiple pieces of related information that have inconsistent implications (e.g., Tan, Wang, and Zhou 2015). Additionally, we contribute to prior research on joint versus separate evaluation (e.g., Jackson 2008; Hodge et al. 2010; Basu and Savani 2019; Bucaro et al. 2020). Prior work finds that joint evaluation is optimal in some circumstances (e.g., Jackson 2008), and separate evaluation is optimal in other circumstances (e.g., Bucaro et al. 2020).

We organize the remainder of the paper as follows. Section 2 discusses the relevant literature and develops the hypothesis. Sections 3 and 4 present the research design, procedure, and results of Experiments 1 and 2, respectively. Section 5 concludes.

2. Literature Review and Hypothesis Development

Related Literature

Prior research in accounting and finance finds that information provided by financial analysts affects investors' investment decisions and generates market price reactions (e.g., Brav and Lehavy 2003; Mikhail, Walther, and Willis 2007; Malmendier and Shanthikumar 2007, 2014; Dechow and You 2020). Likewise, experimental research has also provided evidence that investors react to information provided by financial analysts (Hirst, Koonce, and Simko 1995; Kelly et al. 2012; Chen and Tan 2013; Winchel 2015; Liu et al. 2020).

Although investors seemingly trust financial analysts when making investment judgments, regulators are concerned about analysts exhibiting an optimistic bias in their outputs. This bias may be either unintentional (McNichols and O'Brien 1997), or an intentional attempt to strategically persuade others (Malmendier and Shanthikumar 2014). Strategic bias may occur because analysts need to maintain good relations with firms' management to access private information, generate more investment banking/corporate finance business, and generate more trades (Jackson 2005; Chen and Matsumoto 2006; Barber, Lehavy, and Trueman 2007).

There is typically disagreement across different analysts' price targets for a given stock, and no certainty on which price target is the most accurate (e.g., Gleason et al. 2013). Prior research suggests that stock price targets are not always accurate (e.g., Bradshaw, Brown, and Huang 2013; Gleason et al. 2013). It is common for actual returns to fall short of the implied

returns in a stock price target (e.g., Dechow and You 2020). The extent to which a price target exceeds the consensus is an indication of the aggressiveness of the price target. At present, there is little research on the conditions under which investors become wary of analysts who issue aggressive stock price targets when investors are evaluating information from multiple analysts. Prior research investigating the optimistic bias exhibited by analysts typically focuses on stock recommendations but not the accompanying price targets. Some research finds that warnings and disclaimers can reduce investors' susceptibility to over-optimistic recommendations (Kelly et al. 2012; Liu et al. 2020). Nevertheless, warnings and disclaimers are only effective if investors read them.

Prior research in psychology and accounting has examined how joint versus separate evaluation influences individuals' decision-making. In a context in which there are multiple options and multiple attributes associated with the options, research finds that joint evaluation of multiple options leads to better decisions (e.g., Jackson 2008; Basu and Savani 2017, 2019). For instance, Basu and Savani (2017) find that consumers are better able to locate the option with the highest attribute ratings across multiple options when they evaluate options simultaneously. In an accounting context, Jackson (2008) finds that simultaneous evaluation of firms can reduce scale compatibility bias. For example, when investors are asked to simultaneously rank multiple firms on customer satisfaction, investors are less likely to over-rely on attributes that adopt a ranking scale. Prior accounting research has looked at another variant of joint versus separate evaluation where there is one option (i.e., one firm) and multiple attributes associated with the option (e.g., Hodge et al. 2010; Bucaro et al. 2020). In this stream of research, investors either jointly or separately evaluate the attributes. For example, Hodge et al. (2010) find that when investors peruse financial information presented in a single statement rather than in two separate

statements, investors become more cognizant of the relationship between current period cash flows and accruals and future cash flow realizations. Bucaro et al. (2020) find that the effect of CSR measures on investors' judgments is larger when CSR information and financial information appear in separate reports rather than in a joint report.

In prior psychology and accounting research (e.g., Jackson 2008; Basu and Savani 2017), the context consists of multiple options and multiple attributes associated with the options. However, all information is presumed to come from one information provider. In Bucaro et al. (2020) and Hodge et al. (2010), the context consists of one option (i.e., a firm), multiple attributes associated with the option, and all of the attributes originate from one information provider. In our study, we investigate a context in which there is one option (i.e., a firm), multiple attributes (i.e., price targets, earnings estimates) associated with the option, and multiple information providers (i.e., analysts) providing different versions of the multiple attributes. We examine the effect of joint versus separate evaluation of information provided by multiple analysts, an element missing in prior research due to the absence of multiple information providers.

Hypothesis Development

In this section we first develop our theory about the influence of joint versus separate evaluation of information provided by multiple analysts on investors' judgments, both when each analyst provides a single piece of information versus multiple pieces of information. When investors separately evaluate a single piece of information provided by each analyst, they first view the information provided by one analyst, and then move on to the next analyst while holding information provided by the previous analyst in memory, and so on. Given that the information provided by the previously evaluated analyst(s) is held in memory, investors have to

devote mental resources to compare the information provided by different analysts. Because separate evaluation makes it harder to compare the analysts, investors may have a harder time identifying whether an analyst is acting strategically.

When investors jointly evaluate a single piece of information provided by each analyst, the information provided by all analysts is available readily at a glance. This makes it easier for investors to compare information provided by different analysts because investors do not need to hold any information in memory. Thus, if an analyst is trying to strategically influence investors' judgments, the strategic behavior would likely be more apparent. Nonetheless, prior research in accounting finds that investors tend to give information providers the benefit of the doubt (Koonce et al. 2010; Kelly et al. 2012; Nelson and Rupar 2015; Erickson et al. 2017). For example, even though investors are suspicious of the strategic intentions of managers who issue inaccurate estimates, investors give these managers the benefit of the doubt and do not penalize these managers (Koonce et al. 2010). Despite having suspicions of earnings management when they observe that a firm's earnings are smooth relative to the volatility of operating cash flows, investors give the firm's managers the benefit of the doubt and do not become more critical of the managers (Erickson et al. 2017). Therefore, even when jointly evaluating information provided by analysts, investors may still not infer that an analyst is trying to strategically influence them.

Nevertheless, prior research finds that if investors have additional pieces of information that can strengthen their suspicions of strategic behavior, they become less likely to give information providers the benefit of the doubt (e.g., Koonce et al. 2010; Erickson et al. 2017). This finding suggests that if there is more evidence that can strengthen investors' suspicions of strategic behavior by an analyst, investors may no longer give that analyst the benefit of the

doubt. In cases in which analysts have provided multiple pieces of information, investors can compare multiple analysts on more dimensions than when only a single piece of information is available. These comparisons may reveal additional evidence consistent with the idea that one of the analysts is trying to strategically influence investors. Further, joint evaluation makes it easier for investors to conduct multiple comparisons than separate evaluation. Thus, the evaluation approach may make a significant difference when multiple pieces of information provided by each analyst are available. Specifically, to the extent that an analyst is trying to strategically influence investors, investors are more likely to infer that this analyst is trying to influence them when investors jointly rather than separately evaluate multiple pieces of information provided by each analyst.

Having developed our theory at a conceptual level, we next apply it to specific pieces of information that analysts typically provide. We first consider the effect of joint versus separate evaluation when investors evaluate multiple analysts' price targets without earnings estimates (i.e., only a single piece of information is available). When investors evaluate analysts separately, the aggressiveness of any analyst's price target relative to that of other analysts' price targets is less salient. Thus, investors are less likely to perceive that the analyst issuing the aggressive price target is trying to influence them. When investors evaluate analysts jointly, the aggressiveness of any analyst's price target relative to that of other analysts' price targets is likely more apparent. However, because investors generally tend to give information providers the benefit of the doubt (e.g., Koonce et al. 2010; Erickson et al. 2017), it is still possible that there will be relatively little difference in investors' perception of whether the aggressive analyst is acting strategically when investors evaluate information jointly rather than separately.

We next consider the effect of joint versus separate evaluation when investors evaluate multiple analysts' price targets along with earnings estimates (i.e., multiple pieces of information are available). There are two possible scenarios here. In the first scenario, the analyst who issues an aggressive stock price target also issues an aggressive earnings estimate. When investors evaluate the information provided by multiple analysts separately, they may have a difficult time comparing the aggressive analyst's price target and earnings estimate with those of other analysts. Therefore, investors' judgment of the aggressive analyst is more likely to depend on the information provided by this focal analyst rather than on comparisons between this analyst's price target and earnings estimate and those of other analysts. In this case, investors' concerns about the analyst's strategic intentions may not increase. Investors are more likely to rely on predictions made by an information provider when the information provider provides supplementary information related to the predictions (Hutton et al. 2003). Thus, when the analyst's earnings estimate is available versus not available, investors may perceive that the earnings estimate provides support for the validity of the price target and instead are less likely to think that the analyst is trying to strategically influence investors' judgments.

Joint evaluation makes it easier for investors to compare this aggressive analyst's price target and earnings estimate with those of other analysts. Thus, joint evaluation could make it more apparent that the analyst is being more aggressive than other analysts who issue relatively less aggressive price targets and earnings estimates. In the presence of a buy recommendation from an analyst and information that the firm to which the analyst belongs has a history of providing optimistic recommendations, investors' judgments are less favorable when there are mitigating mechanisms (e.g., warnings) that make it more likely that investors would question the analyst's motives (Kelly et al. 2012). The availability versus unavailability of mitigating

mechanisms is analogous to our joint versus separate evaluation conditions. In our study, in the presence of earnings estimates the aggressive analyst differs from other analysts on more than one dimension. Investors may give the benefit of the doubt when they notice that the aggressive analyst differs from the other analysts on one dimension; however, they may be less likely to do so when they observe that the aggressive analyst differs on multiple dimensions. Joint evaluation makes it apparent to investors that an analyst is being consistently aggressive in both price target and earnings estimate whereas other analysts are not. Therefore, we propose that investors should perceive the aggressive analyst as acting more strategically when they jointly rather than separately evaluate the information provided by all analysts.

Analysts incur reputation costs if they issue aggressive outputs that are not realized in the future. Professionals and institutions are more aware of analysts' incentives and tend to focus on earnings estimates instead of other analyst outputs (Malmendier and Shanthikumar 2014). Because of this, some analysts are less inclined to issue aggressive earnings estimates to protect their reputations (Malmendier and Shanthikumar 2014). We thus consider a second scenario in which the analyst who issues an aggressive stock price target issues an earnings estimate that is not aggressive.

In this second scenario, although the aggressive analyst does not issue an aggressive earnings estimate, it is likely that the outcome with respect to investors' judgment of the aggressive analyst would be similar to when the analyst does so. Tan et al. (2015) find that investors penalize an information provider when they notice that the information provider is providing information with inconsistent implications (e.g., a firm reports inconsistent benchmark performance). In our case, while other analysts issue non-aggressive price targets and non-aggressive earnings estimates, the aggressive analyst issues an aggressive price target but a non-

aggressive earnings estimate. Thus, the aggressive analyst's ratio of price target to earnings estimate (analogous to the P/E ratio) would be higher than that of other analysts. Because joint evaluation combines all information from multiple analysts, it makes it more apparent that this analyst may be pushing for a price target that is too high relative to the analyst's own earnings estimate—other analysts who issue similar earnings estimates issue lower price targets. Therefore, in this scenario, we also propose that investors may perceive the aggressive analyst as acting more strategically when they evaluate the information provided by all analysts jointly rather than separately. In sum, we state our hypothesis as follows:

HYPOTHESIS. Investors will perceive an aggressive analyst as acting more strategically when they jointly rather than separately evaluate multiple analysts and analysts provide multiple pieces of information (e.g., price targets, earnings estimates). This effect is less likely to occur when analysts provide only a single piece of information (e.g., price targets).

3. Experiment 1

Overview

Experiment 1 employs a 2×2 between-participants full factorial design. The first manipulated factor is *evaluation type* (separate versus joint), and the second manipulated factor is *information set* (stock price target without earnings estimate versus stock price target with earnings estimate).¹ We hire a market research firm (Dataspring Singapore) to recruit nonprofessional investor participants. The research firm employs a verification process to ensure the legitimacy of the participants.² Our sample comprises 184 participants.³ Participants had 16.7

¹ Approval for the studies was granted by the Institutional Review Board at Nanyang Technological University.

² The average cost per participant for each of the two experiments is approximately four Singapore Dollars. We do not have information about the specific compensation arrangement between the market research firm and each participant.

³ We do not include one participant who had investment experience of less than a year, and two participants who completed the study twice.

years of working experience, 8.8 years of investing experience, and had taken an average of 3.4 (3.0) accounting (finance) courses.⁴

Procedure

We randomly assign participants to one of the four experimental conditions using Qualtrics. All participants assume the role of an investor who is thinking of investing in a fictitious firm called Astrix Inc. Participants begin the experiment by first reading selected financial information (e.g., balance sheet and income statement items) from the firm. Next, we provide participants with the firm's current stock price and summary analyst information (i.e., the consensus stock recommendation, average stock price target, and the consensus EPS forecast). Participants then view the information provided by each of the six analysts covering Astrix Inc. and provide judgments about each analyst. Participants end the study by answering supplementary and demographic questions.

Across all conditions, there are six analysts. We inform participants that the current stock price is \$250 and the stock price targets issued by the analysts range from \$260 (4% upside compared to the current stock price) to \$370 (48% upside compared to the current stock price). The more a stock price target exceeds the consensus, the more aggressive it is. Our focal analyst of interest issues the highest price target of \$370, which is equivalent to a 48% upside. See Appendix 2, Panel A for a complete description of the stimuli.

Manipulation of Independent Variables

Evaluation type. To operationalize joint evaluation, we present participants with information provided by all analysts on a single screen. To operationalize separate evaluation,

⁴ For both experiments, there is no significant difference in each of these characteristics across the experimental conditions.

we present participants with all information from each analyst one analyst at a time on different screens. Doing so allows participants to engage in separate evaluation. We randomize the order in which different participants view the analysts to account for potential order effects in both the joint evaluation and separate evaluation conditions.

Information set. There are two information sets, stock price target without earnings estimate versus stock price target with earnings estimate. We include stock recommendations in all the information set because stock recommendations tend to appear alongside stock price targets in practice, which increases the ecological validity of our information set. Note that the difference between the no earnings estimates condition and the earnings estimates condition is the presence or absence of each individual analyst's EPS forecast. For the information set/earnings estimates conditions, we make available the previous year's earnings (\$11.95) and each individual analyst's EPS forecast to participants. The EPS forecasts range from \$13.10 (9.6% upside compared to the previous year's earnings) to \$14.90 (24.7% upside compared to the previous year's earnings). Our design ensures that the focal analyst of interest is relatively more aggressive in both the price target and EPS forecast compared to the other analysts (EPS forecast: \$14.90; 24.7% upside compared to the previous year's earnings). See Appendix 2, Panel B for a complete description of the stimuli.

Dependent Variable

For each analyst we ask participants the following question: "Do you agree that this analyst is trying to strategically influence investors' judgments?" with a response scale ranging from 0 (Strongly Disagree) to 100 (Strongly Agree). In the separate evaluation condition, we ask the question right after participants see the information regarding the specific analyst. In the joint evaluation condition, we ask the question after participants finish seeing the information from all

six analysts. Our dependent variable is the *strategic influence judgment* pertaining to the focal analyst of interest who issued the most aggressive stock price target.

Results

We conduct an analysis of variance (ANOVA) with the *strategic influence judgment* of the focal analyst as the dependent variable, and *evaluation type* (separate evaluation = 0; joint evaluation = 1) and *information set* (no earnings estimates provided = 0; earnings estimates provided = 1), and their interactions as independent variables. We find a non-significant effect of *evaluation type* ($F(1, 180)=0.93, p=0.336$), a non-significant effect of *information set* ($F(1, 180)=0.42, p=0.516$) and a significant 2-way interaction effect ($F(1, 180)=3.89, p=0.025$, one-tailed equivalent). Figure 1 presents the strategic influence judgments graphically. Table 1, Panel A and Panel B provide the descriptive statistics and ANOVA results, respectively.

Table 1, Panel C indicates that investors perceive the focal aggressive analyst as being more strategic in the joint/earnings estimates condition than in the separate/earnings estimates condition (68.81 versus 59.61, $t(180)=2.08, p=0.019$, one-tailed). However, investors perceive the focal aggressive analyst as being similarly strategic in the joint/no earnings estimates condition and the separate/no earnings estimates condition (64.67 versus 67.83, $t(180)=-0.71, p=0.478$).⁵ Overall, the results are consistent with our hypothesis.

<Insert Figure 1>

⁵ We do not seek to interpret the difference between the separate/no earnings estimates condition and the separate/earnings estimates condition or the difference between the joint/no earnings estimates condition and the joint/earnings estimates condition. Any difference or lack of difference is due to a parameter issue, as moving from no earnings estimates to some earnings estimates necessitates that we develop hypothetical sets of earnings estimates, and this choice will affect the level of the judgments in the earnings estimates conditions depending on the nature of the estimates. Thus, it is difficult to make an a priori hypothesis about the ordering of the four cells. Our key focus is on whether the effect of joint versus separate evaluation is consistent with our theory when earnings estimates are present and when earnings estimates are absent.

<Insert Table 1>

4. Experiment 2

Overview

In Experiment 1, the focal analyst of interest who issued an aggressive stock price target is relatively more aggressive in both the price target and EPS forecast compared to the other analysts. In Experiment 2, we examine the situation in which the focal analyst of interest issued an EPS forecast that is not more aggressive compared to that issued by the other analysts. We conduct a 2×2 between-participants full factorial experiment. Our sample, recruited from Dataspring Singapore, comprises 202 nonprofessional investor participants.⁶ Participants had 16.1 years of working experience, 8.2 years of investing experience, and had taken an average of 3.3 (2.4) accounting (finance) courses.

Our experimental procedure and stimuli are identical to those in Experiment 1 except for the earnings estimates. In Experiment 2, in the condition with earnings estimates, the focal analyst who provided the most aggressive stock price target also provided an EPS forecast of \$14.00 (17.2% upside) that is relatively similar to the EPS forecasts issued by the other analysts. Therefore, unlike in Experiment 1, the focal analyst of interest who issued an aggressive stock price target issued an EPS forecast that is not aggressive. We use the same strategic influence judgment as in Experiment 1 as our dependent variable. See Appendix 2, Panel C for a complete description of the stimuli.

Results

⁶ We exclude three participants who did not provide a response to the dependent variable question, seven participants who had investment experience of less than a year, and one participant who completed the study twice.

We conduct an analysis of variance (ANOVA) with the *strategic influence judgment* of the focal analyst as the dependent variable, and *evaluation type* (separate evaluation = 0; joint evaluation = 1) and *information set* (no earnings estimates provided = 0; earnings estimates provided = 1), and their interactions as independent variables. We find a non-significant effect of *evaluation type* ($F(1, 198)=2.24, p=0.136$), a non-significant effect of *information set* ($F(1, 198)=0.15, p=0.702$) and a significant 2-way interaction effect ($F(1, 198)=2.76, p=0.049$, one-tailed equivalent). Figure 2 presents the *strategic influence judgments* graphically. Table 2, Panel A and Panel B provide the descriptive statistics and ANOVA results, respectively.

Table 2, Panel C indicates that investors perceive the focal aggressive analyst as being more strategic in the joint/earnings estimates condition than in the separate/earnings estimates condition (71.80 versus 62.00, $t(198)=2.17, p=0.016$, one-tailed). However, investors perceive the focal aggressive analyst as being similarly strategic in the joint/no earnings estimates condition and the separate/no earnings estimates condition (65.45 versus 65.96, $t(198)=-0.12, p=0.905$). Overall, the results are consistent with our hypothesis. Table 3 compares the results for Experiments 1 and 2. Specifically, regardless of whether the focal aggressive analyst also provided an EPS forecast that is more aggressive than or relatively similar to the EPS forecasts issued by the other analysts, investors perceive the aggressive analyst as acting more strategically when they evaluate information jointly rather than separately.

<Insert Figure 2>

<Insert Table 2>

<Insert Table 3>

5. Conclusion

We conduct two experiments to examine how investors judge an analyst who issues an aggressive price target. We find that in the absence of earnings estimates, investors do not infer that the aggressive analyst is acting more strategically when investors evaluate information provided by multiple analysts jointly versus separately. However, in the presence of earnings estimates, we find that investors perceive the aggressive analyst as acting more strategically when they evaluate jointly rather than separately. We observe this pattern irrespective of whether the analyst who issues an aggressive price target also issues an aggressive earnings estimate (Experiment 1) or a non-aggressive earnings estimate (Experiment 2).

Overall, we contribute to the literature on investors' judgments of financial analysts (Brav and Lehavy 2003; Malmendier and Shanthikumar 2007, 2014; Kelly et al. 2012; Liu et al. 2020). We show that when investors evaluate multiple analysts' price targets with other related information in the form of earnings estimates, by evaluating information jointly rather than separately, investors are less susceptible to the influence of aggressive analysts. Our results suggest that investors would benefit from being educated on the benefits of joint evaluation, and information providers (e.g., financial information websites) may wish to facilitate such a mode of evaluation.

As with all research, our results are subject to limitations that present future research opportunities. In our experiments we did not investigate investors' cognitive processes that yielded the observed pattern of findings. We submit that when investors evaluate multiple analysts' price targets and earnings estimates jointly rather than separately, investors are most likely engaging in critical comparisons. The earnings estimates provide additional reference

points for comparison, and joint evaluation allows investors to compare information provided by multiple analysts more easily.

In Experiment 1, the analyst who issued an aggressive stock price target also issued an aggressive earnings estimate. Although we did not collect evidence as to why investors perceived the aggressive analyst as acting more strategically, we speculate that investors compared the aggressiveness of all analysts' price targets and earnings estimates and noticed that the analyst departed from other analysts on multiple dimensions. This realization could have strengthened investors' suspicion that this analyst was acting strategically. In Experiment 2, the analyst who issued an aggressive price target issued a non-aggressive earnings estimate. Although we did not collect direct evidence as to why, our results are consistent with the idea that investors critically compared the price target–earnings estimate ratio of different analysts, and through this comparison, realized that this analyst's price target and earnings estimate were not commensurate. Our findings suggest that investors perceived that this analyst was issuing a price target that was “too high to be true” and, as a result, believed that this analyst was acting strategically. Although we observe similar effects across the two experiments (i.e., investors perceived the aggressive analyst as acting more strategically in joint evaluation when earnings estimates are present), it appears that different cognitive processes may be driving the effects in the two studies. We leave it to future research to test the underlying cognitive processes.

In our study, we used earnings estimates as the other related information in addition to price targets. However, there are other types of related information that could have been provided, including but not limited to the analyst's past performance, the analyst's opinions of other firms, the brokerage to which the analyst belongs, etc. Future research can investigate whether we would observe our effects with these types of related information. Future research

can also assess whether the related information has to be provided by analysts or can be provided by a platform (e.g., Estimote) that crowdsources opinions from a diverse group of contributors interested in the firm. Lastly, our experiments focused on six analysts. Investors may consider more or fewer analysts in the real world. Nevertheless, we expect the processing benefits of a joint relative to a separate mode of evaluation to hold, so long as information from multiple analysts is considered.

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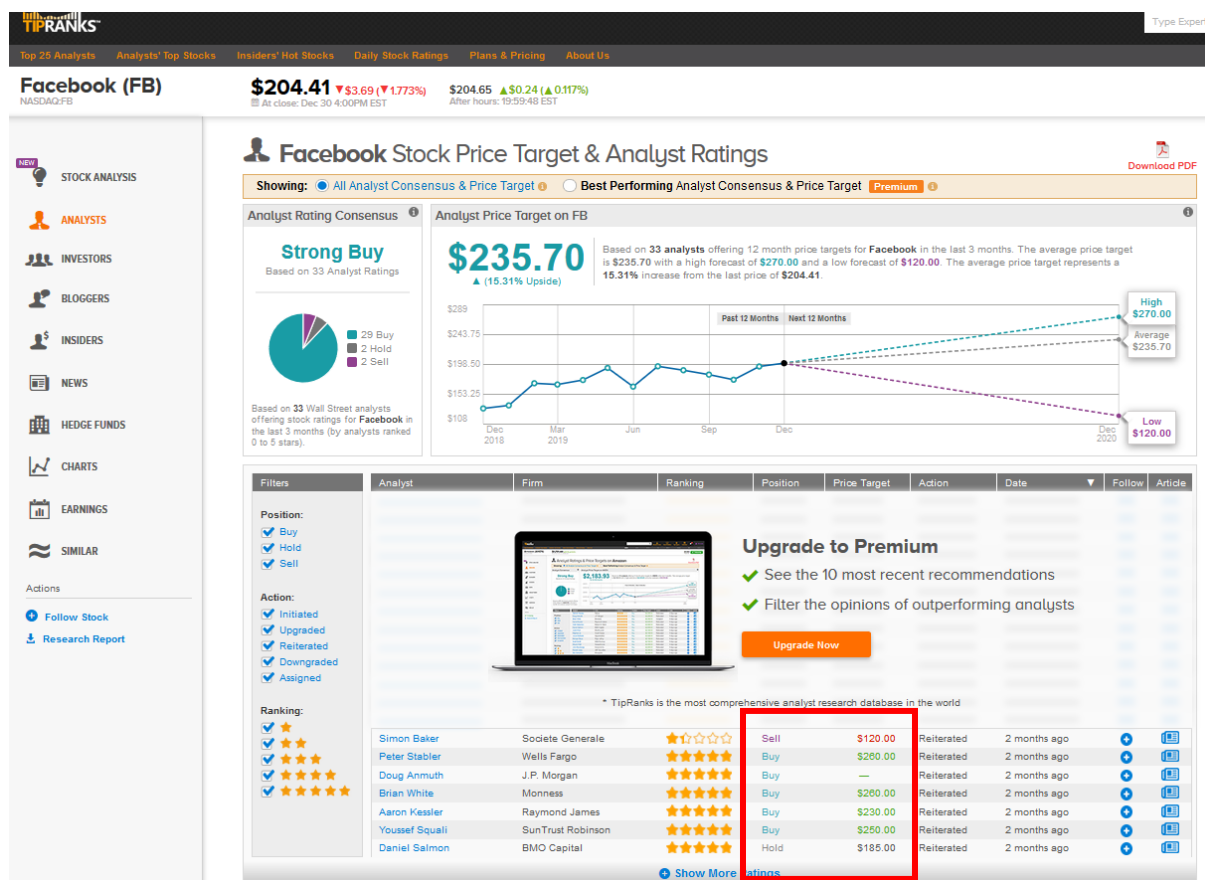
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Appendix 1: Examples of real word information sets

Panel A

Example of information sets where investors conduct *JOINT evaluation* due to presentation format.

Stock investment website (Tipranks; www.tipranks.com)



Panel B

Example of information sets where investors conduct separate evaluation (i.e., only one analyst is listed on the page) due to presentation format.

News article on Apple (Seeking Alpha)

Retrieved from: <https://seekingalpha.com/news/3350799-analyst-initiates-apple-buy-and-33-upside>

Tech | On the Move

Analyst initiates Apple at Buy and 33% upside

May 1, 2018 9:57 AM ET | About: [Apple Inc. \(AAPL\)](#) | By: [Brandy Betz](#), SA News Editor 

- D.A. Davidson [initiates](#) Apple (NASDAQ:[AAPL](#)) with a Buy rating and a \$220 price target, a 33% upside to yesterday's close.

Appendix 2: Experimental Manipulations

Panel A

Experiment 1 and Experiment 2 Information set: No earnings estimates

Analyst: George Anderson

Stock Recommendation	Stock Price Target
BUY	\$370 (+48.0% Upside)

Analyst: Lucas Nelson

Stock Recommendation	Stock Price Target
BUY	\$350 (+40.0% Upside)

Analyst: Bradley Clark

Stock Recommendation	Stock Price Target
BUY	\$300 (+20.0% Upside)

Analyst: Ethan Davis

Stock Recommendation	Stock Price Target
BUY	\$280 (+12.0% Upside)

Analyst: Clive Roberts

Stock Recommendation	Stock Price Target
BUY	\$290 (+16.0% Upside)

Analyst: Aaron Martin

Stock Recommendation	Stock Price Target
BUY	\$260 (+4.0% Upside)

Note: The order of appearance of the analysts is randomized.

Panel B

Experiment 1 Information set: Earnings estimates available

Analyst: George Anderson

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$370 (+48.0% Upside)	\$14.90 (+24.7% Upside)

Analyst: Lucas Nelson

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$350 (+40.0% Upside)	\$14.70 (+23.0% Upside)

Analyst: Bradley Clark

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$300 (+20.0% Upside)	\$14.10 (+18.0% Upside)

Analyst: Ethan Davis

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$280 (+12.0% Upside)	\$13.60 (+13.8% Upside)

Analyst: Clive Roberts

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$290 (+16.0% Upside)	\$13.80 (+15.5% Upside)

Analyst: Aaron Martin

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$260 (+4.0% Upside)	\$13.10 (+9.6% Upside)

Note: The order of appearance of the analysts is randomized.

Panel C

Experiment 2 Information set: Earnings estimates available

Analyst: George Anderson

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$370 (+48.0% Upside)	\$14.00 (+17.2% Upside)

Analyst: Lucas Nelson

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$350 (+40.0% Upside)	\$13.70 (+14.6% Upside)

Analyst: Bradley Clark

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$300 (+20.0% Upside)	\$14.10 (+18.0% Upside)

Analyst: Ethan Davis

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$280 (+12.0% Upside)	\$13.60 (+13.8% Upside)

Analyst: Clive Roberts

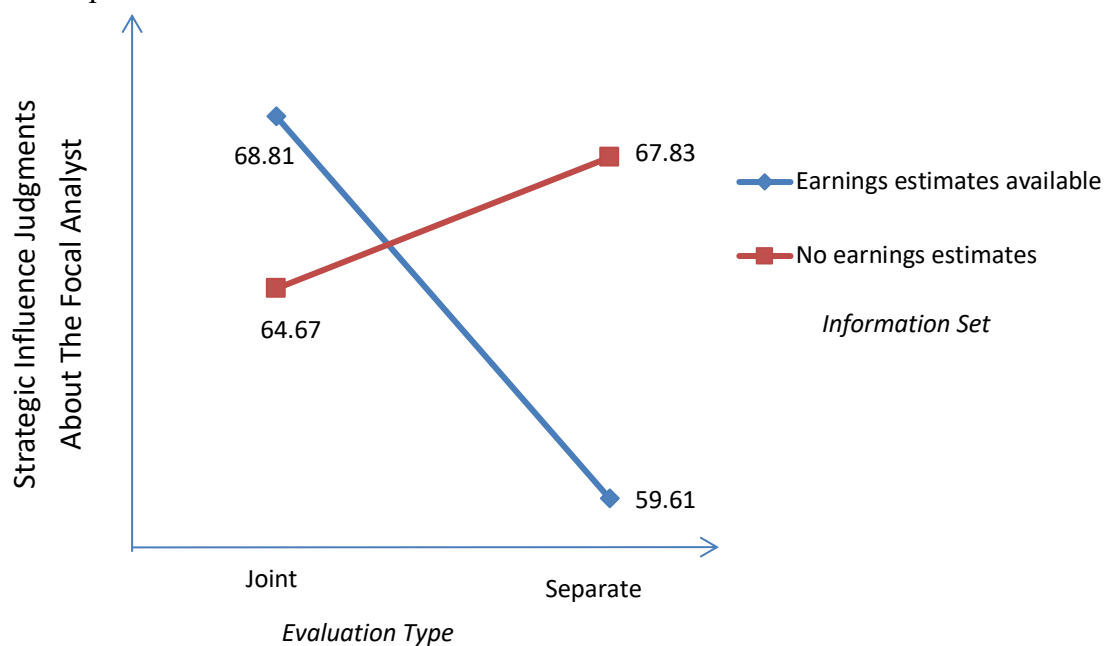
Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$290 (+16.0% Upside)	\$13.80 (+15.5% Upside)

Analyst: Aaron Martin

Stock Recommendation	Stock Price Target	2019 Annual EPS Forecast
BUY	\$260 (+4.0% Upside)	\$13.10 (+9.6% Upside)

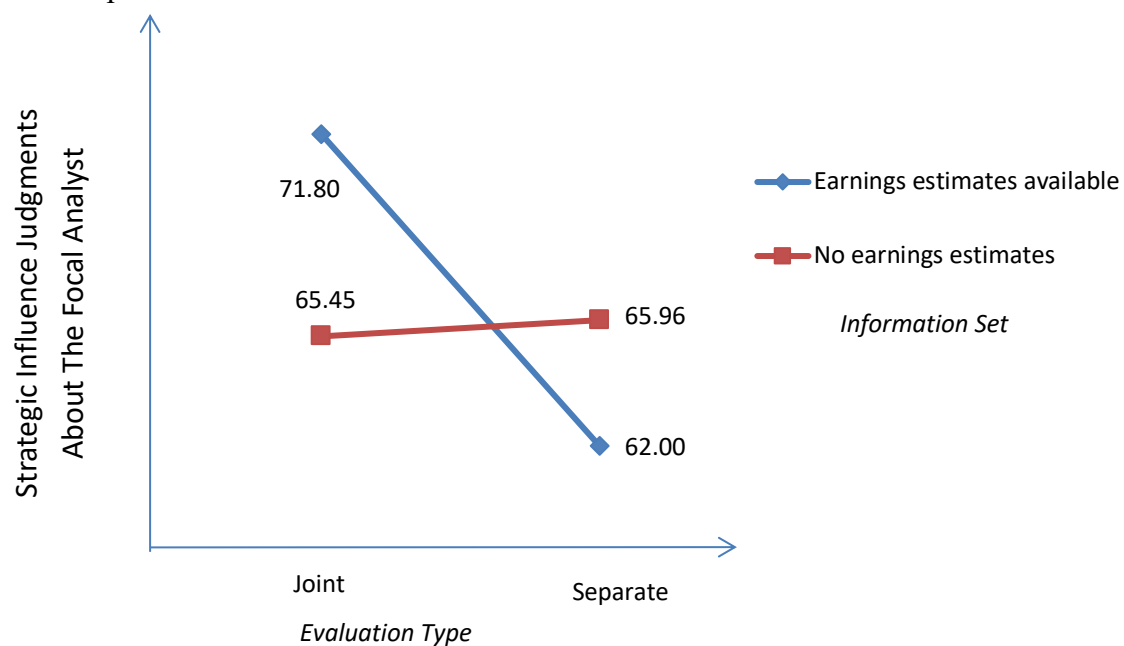
Note: The order of appearance of the analysts is randomized.

Figure 1
Graphical results for Experiment 1



Notes: Figure 1 graphically depicts the observed strategic influence judgment means for the experimental conditions in Experiment 1. The only difference between the two experiments pertains to the earnings estimate for the focal aggressive analyst, i.e., whether the earnings estimate is aggressive (Experiment 1) or not aggressive (Experiment 2) relative to the earnings estimates issued by the other analysts. Please refer to Table 1 for the description of the dependent and independent variables.

Figure 2
Graphical results for Experiment 2



Notes: Figure 2 graphically depicts the observed strategic influence judgment means for the experimental conditions in Experiment 2. The only difference between the two experiments pertains to the earnings estimate for the focal aggressive analyst, i.e., whether the earnings estimate is aggressive (Experiment 1) or not aggressive (Experiment 2) relative to the earnings estimates issued by the other analysts. Please refer to Table 1 for the description of the dependent and independent variables.

Table 1

Experiment 1 results

Panel A: Mean and [Standard Deviation]

<i>Information Set</i>	<i>Evaluation Type</i>	
	Separate	Joint
Earnings estimates available	59.61 [24.98] n=51	68.81 [17.83] n=42
No earnings estimates	67.83 [21.39] n=46	64.67 [19.14] n=45

Panel B: ANOVA

Source of Variation	SS	df	MS	F-Stat	p-value
<i>Evaluation Type</i>	417.82	1	417.82	0.93	0.336
<i>Information Set</i>	190.08	1	190.08	0.42	0.516
<i>Interaction</i>	1748.67	1	1748.67	3.89	0.025 ^a
Residual	80935.24	180	449.64		

Panel C: Tests of hypothesis

	t-statistic	p-value
Mean of joint/no earnings estimates = Mean of separate/no earnings estimates	-0.71	0.478
Mean of joint/earnings estimates > Mean of separate/earnings estimates	2.08	0.019 ^a

^a one-tailed (or equivalent), given our directional predictions

Notes: For each analyst, we ask participants the following question: 0 (Strongly Disagree) - 100 (Strongly Agree) "Do you agree that this analyst is trying to strategically influence investors' judgments?" Our dependent variable is the strategic influence judgment pertaining to our focal analyst of interest. We conduct an Analysis of Variance (ANOVA) with the *strategic influence judgment* (focal) as the dependent variable and *evaluation type* ("joint" =1, "separate" =0) and *information set* (coded "earnings estimates" =1, "no earnings estimates" =0), and their interactions as independent variables. For the joint evaluation condition, we present participants with information provided by all analysts on a single screen. For the separate evaluation condition, we present participants with all information from each analyst one analyst at a time on different screens. Each individual analyst's EPS forecast is provided for the earnings estimates condition but not for the no earnings estimates condition.

Table 2

Experiment 2 results

Panel A: Mean and [Standard Deviation]

<i>Information Set</i>	<i>Evaluation Type</i>	
	Separate	Joint
Earnings estimates available	62.00 [23.70] n=45	71.80 [20.77] n=50
No earnings estimates	65.96 [19.83] n=52	65.45 [23.56] n=55

Panel B: ANOVA

Source of Variation	SS	df	MS	F-Stat	p-value
<i>Evaluation Type</i>	1084.45	1	1084.45	2.24	0.136
<i>Information Set</i>	71.36	1	71.36	0.15	0.702
<i>Interaction</i>	1334.02	1	1334.02	2.76	0.049 ^a
Residual	95873.56	198	484.21		

Panel C: Tests of hypothesis

	t-statistic	p-value
Mean of joint/no earnings estimates = Mean of separate/no earnings estimates	-0.12	0.905
Mean of joint/earnings estimates > Mean of separate/earnings estimates	2.17	0.016 ^a

^a one-tailed (or equivalent), given our directional predictions

Notes: We conduct an Analysis of Variance (ANOVA) with the *strategic influence judgment* (focal) as the dependent variable and *evaluation type* ("joint" =1, "separate" =0) and *information set* (coded "earnings estimates" =1, "no earnings estimates" =0), and their interactions as independent variables. Please refer to Table 1 for the description of the dependent and independent variables.

Table 3

Comparison of the results of Experiment 1 and Experiment 2

	Experiment 1	Experiment 2
Mean (Standard Deviation)		
Joint evaluation – Earnings estimates available	68.81 (17.83)	71.80 (20.77)
Separate evaluation – Earnings estimates available	59.61 (24.98)	62.00 (23.70)
Joint evaluation – No earnings estimates available	64.67 (19.14)	65.45 (23.56)
Separate evaluation – No earnings estimates available	67.83 (21.39)	65.96 (19.83)
ANOVA		
<i>Evaluation Type</i>	p=0.336	p=0.136
<i>Information Set</i>	p=0.516	p=0.702
<i>Interaction</i>	p=0.025 ^a	p=0.049 ^a
Comparisons		
Joint evaluation – No earnings estimates available = Separate evaluation – No earnings estimates available	p=0.478	p=0.905
Joint evaluation – Earnings estimates available > Separate evaluation – Earnings estimates available	p=0.019 ^a	p=0.016 ^a

^a one-tailed (or equivalent), given our directional predictions