Norms and Derivative Use

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Abstract: Prior research indicates that a firm's use of derivatives to manage business risks is viewed favorably by investors. However, these studies do not consider a potentially key factor in how investors evaluate a firm's usage of derivatives—namely, the typical behavior (or norms) regarding derivatives by other firms in the industry or the firm itself. In this paper, we report the results of multiple experiments to test the idea that investors, evaluating firms that choose to use or not use derivatives in the current period, judge that behavior in light of industry and firm norms. Our results show that norms are influential in affecting investors' evaluations. Further, we find that industry and firm norms are not viewed similarly. Our study has implications for researchers, firm managers, and investors.

KEYWORDS: Derivatives, norms, experiment

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1. Introduction

Prior research indicates that a firm's use of derivatives to manage business risks is viewed favorably by investors. For example, Guay (1999) shows that market-based firm risk is lower for new users of derivatives, and Allayannis and Weston (2001) document a four percent increase in firm value for large firms that use foreign currency derivatives. More recent research reveals that investors believe that firm managers using derivatives to address risk exposures exhibit greater decision making care than those who do not use derivatives (Koonce, Lipe and McAnally, 2008). This result occurs even when holding constant the *ex ante* and *ex post* economic differences typically present when comparing derivative use versus non-use. Despite the general finding that derivatives are viewed positively by investors, these studies do not consider a potentially key factor in how investors evaluate a firm's derivatives choices—namely, the typical prior behavior (or norms) regarding derivatives by other firms in the industry or by the firm itself.

Understanding how industry and company norms influence investors' evaluations of derivative use is important for two reasons. First, there is known variation both in the norms regarding derivative use by industry and company *and* in whether firms behave consistent with those norms (Geczy, *et al.,* 1997; Mian, 1996; Tufano, 1997). For example, most firms in the banking industry use derivatives to manage interest rate risk, and banks such as Wells Fargo operate similarly to the industry norm by relying on derivatives. In contrast, in the last decade, most airlines did not rely on derivatives to hedge fuel prices, yet Southwest Airlines did enter into a number of such derivative contracts.

Second, the existing literature is unclear regarding whether norms will be influential. On the one hand, financial theory suggests that a firm's future cash flows are unaffected by what other

firms normally do regarding derivatives or even by what the company has historically done (Grinblatt and Titman, 2002). Presumably, the firm made the decision to enter into or not enter into derivatives based on an evaluation of their own business needs and assessment of current risks. In this sense, norms should *not* affect investors' evaluations of firms' derivative use. On the other hand, theory from psychology suggests individuals often view norms as an important signal. Thus, investors may evaluate a firm in light of whether their behavior is consistent or inconsistent with the norm. That is, the more consistent a firm's behavior is with that of the prior behavior of other firms in the industry (or its own prior behavior), the more justifiable and positively investors may perceive the firm's behavior to be. Here, norms are likely to affect investors' evaluations of firms' derivative use. In sum, it is unclear whether norms will influence investor reaction to firms' derivative use.

In this paper, we report the results of three experiments designed to identify how real-world investors react to a firm's use of derivatives in light of information about industry and company norms. In our first experiment, we rely on a 2 × 2 between-participants design in which we vary whether a firm enters into or does not enter into derivative contracts in the current period. We also vary whether the industry norm is to use or not use derivatives. In all conditions, the firm's decision regarding derivatives results in lower earnings (i.e., an unfavorable outcome) in the current period. We focus exclusively on unfavorable outcomes as they enable us the best opportunity to observe norm effects, should they exist.[1] Overall, the results strongly support the idea that norms influence investors' evaluations of firms' derivative decisions. When the industry norm is to use derivatives, investors assign a higher valuation to the firm when its current-period behavior is consistent with the norm. However, when the industry norm is to *not*

[1] Specifically, studying norms in the context of favorable outcomes could possibly lead to ceiling effects. That is, given that prior research indicates that using derivatives is viewed favorably, it may be that investors do not further bolster their favorable evaluations of firms following norms and using derivatives that lead to positive outcomes.

use derivatives, investors assess a higher firm valuation when the firm *does not use* (versus *does use*) derivatives. That is, investors' reaction completely reverses.

Our second study tests the generality of these findings by exploring whether similar results are obtained when the norm is based on the company's own historical behavior. Thus, rather than varying industry norm, we manipulate whether it was the historical norm for the company to use or not use derivatives. Similar to the first experiment, we observe that investors assign a higher valuation to the firm when their historical norm is to use derivatives and the firm uses derivatives in the current period. However, we unexpectedly find that when the company's norm is *not* to use derivatives, violating the norm (by using derivatives) does not cause investors to lower the firm's valuation. This interesting result stands in contrast to the analogous result from the first experiment, where using derivatives in light of an opposing industry norm reversed the favorable evaluations associated with derivative use.

Because of this unexpected finding, we conducted a third experiment. Our conjecture was that the different findings from experiments one and two resulted from industry norms being viewed as stronger signals than company norms. In this experiment, our 2 × 2 mixed-model design varied within-participants whether a norm was based on the industry or the company. The firm's decision to use or not use derivatives varied between-participants. In this experiment, we focused exclusively on a norm of not using derivatives, as that context is the one where the different results from our first two experiments occurred. Results support our conjecture that industry norms are viewed as stronger signals than firm norms. Specifically, in their evaluative judgments about the firm's behavior, participants were more strongly influenced by industry than firm norms. Thus, our third experiment not only provides an explanation for the differing results

in the first two experiments, but also reveals the insight that norms in business settings are not viewed similarly.

Experimentation affords us several advantages. First, through this method, we are able to examine an individual firm's choice to use or not use derivatives in light of different types of norms regarding derivatives. The necessary combinations for archival tests may not be found in sufficient frequency to allow for powerful tests (Libby, Bloomfield, and Nelson, 2002). Further, through experimentation, we are able to create the conditions that allow us to hold constant the economic outcome of the firm while manipulating norms and whether the firm's behavior is consistent or inconsistent with those norms. Second, experimentation allows us to measure participants' beliefs about factors such as the care that firm management used in deciding whether to use derivatives and the justifiability of those decisions. These measurements are desirable, as they allow us to investigate the inferences that investors draw from norms.

Our study has several implications. First, from a theoretical perspective, our study suggests that investors' reactions to firms' usage of derivatives are more complex than previously contemplated. The prior research in this area concludes that derivative use has a positive effect on firm valuation (e.g., Guay, 1999; Zhang, 2009). Our study extends these findings by showing that this positive relationship is influenced by industry norms, and that the relationship can actually *reverse* when a firm's choices regarding derivatives are not the same as the industry norm.

Second, from a practical perspective, our results provide insights for firm managers regarding how market participants view their use (or lack of use) of derivatives. That is, a firm's choices about derivative use are not evaluated in isolation. Specifically, investors consider industry norms (and, in some cases, company norms) when evaluating a firm's derivative choices in the

current period. To the extent that firm managers are already aware of this insight, our study adds another possible reason to the literature regarding why firms might use (or not use) derivatives (see Smith and Stulz, 1985)—that is, to be consistent with norms.

The next section reviews prior research on derivatives and norms and develops our competing predictions. Sections three, four, and five describe the specifics of our first, second, and third set of experiments, respectively, along with their results. Section six renders brief conclusions.

2. Prior research and hypotheses

2.1 Derivative use and norms

The prior research on derivatives generally falls into one of two categories: the *determinants* of derivative use and its *consequences.* Our focus in this study is on the consequences associated with derivative use. The research on consequences reports that derivative use adds value to firms.[2] For example, Allayannis and Weston (2001) document a four percent increase in firm value (that is, a 'hedging premia') for large firms that hedge their foreign currency exposure by using derivatives. Guay (1999) shows that market-based firm risk is lower for new users of derivatives (also see Zhang, 2009). Koonce, *et al.* (2008) reports that even after holding constant the economic outcome, investors are more satisfied when a company uses derivatives. Adam and Fernando (2006) documents that firms in the gold mining industry have consistently realized significant positive cash flows from their derivative transactions.

While these studies have proven valuable in furthering our understanding of the consequences of derivative use, it seems unlikely that those conclusions hold in all circumstances. In

[2] Due to data availability issues, research regarding the consequences of derivative use is more recent than the research on the determinants of derivative use. Derivative use data became more widely available after the passage of several accounting regulations and standards (FASB, 1991, 1998, 2003; SEC, 1997). Recent updates to these standards have improved the quality of the disclosed information (FASB, 2010).

particular, the studies do not consider a potentially key factor in how market participants evaluate a firm's usage of derivatives—that is, the typical behavior (or norms) regarding derivatives by other firms in the industry or by the firm itself.

Prior descriptive research shows that use of derivatives varies considerably across industries. In a survey with non-financial firms, Bodnar, *et al.* (1995) finds that commodity-based industries such as agriculture, refining, and mining, normally use derivatives. In contrast, other industries, such as wholesale and retail trade firms as well as service firms, less often use derivatives to manage risks. These authors also report that there is variation in whether firms consistently use derivatives across time, with some firms repeatedly entering into derivative contracts and others rarely or only occasionally using these instruments. Generally speaking, those firms with more exposure and economies of scale in hedging activities are more likely to use derivatives (Geczy, *et al.,* 1997).

2.2 Different perspectives on norms

A rich literature exists on norms and how they influence the behavior of individuals. While norms can fall into different categories (e.g., injunctive norms, cultural norms, subjective norms, etc.), we are most interested in what are commonly referred to as descriptive norms (Cialdini, *et al.,* 1991). Descriptive norms are derived from what other people do in any given situation. Watching the behavior of others provides information about what is the norm in an ambiguous situation (Gilbert, 1995). When the appropriate behavior is unclear, the behavior of others provides consensus information (Hilton, *et al*., 1988). That is, the greater the number of people who respond to the same situation in the same way, the more correct or justifiable individuals perceive the behavior to be. In contrast, when others do not follow norms, then outsiders are more likely to assign blame, particularly if the norm is one that is generally well understood to be applicable in the setting (Malle, *et al.,* 2012; Sunstein, 1996). Similarly, observing past behavior

provides consistency information when appropriate behavior is ambiguous (Kelley, 1967). When current actions are consistent with prior behavior, individuals are blamed less for bad outcomes than if the current action deviates from past action (Baron and Ritov, 1994).

Drawing on these ideas, it seems quite plausible that investors who are evaluating a firm's decision to use (or not use) derivatives in the current period might view industry or firm norms regarding derivative use as an important signal. That is, if it is the norm to use derivatives and a firm chooses to use derivatives in the current period, then the investor may view the firm's behavior as more justified than if the firm chooses not to use derivatives. In other words, an industry or firm norm provides a confirmation of the validity of the action. Accordingly, if it is *not* the norm to use derivatives, and a firm chooses to use them in the current period, then the investor may view the firm's behavior as less justified. In short, behavior that is congruent with the norms is viewed as more justifiable than behavior that is not congruent with norms. This idea is formally hypothesized below:

H1: Investors will more favorably evaluate firms who follow industry or company norms in their decision regarding derivative use in the current period.

On the other hand, investors may not consider norms when evaluating a firm's decision to use or not use derivatives in the current period. Several reasons exist for this possibility. First, firms often are evaluated on their own performance (Kasznik and McNichols, 2002). Thus, whether a firm follows the behavior of other firms in the industry (or its own normal behavior) arguably may not be important to investors and other outsiders evaluating that firm. Drawing on corporate finance theory, firms are evaluated on their own merits and not on whether a firm acted in a fashion that was consistent with other firms or their historical behavior. Second, Koonce, *et al.* (2008) show that firms that use derivatives are more highly valued than those who do not, even when the economic outcomes are held constant. They further document that this higher

valuation results from the perceived decision making care ascribed to firms that use derivatives. It is possible that this decision-making care effect is a stronger factor influencing investors' evaluations of firms than is the effect of industry or firm norms. These ideas are formally hypothesized below:

H2: Investors' evaluations will not be influenced by whether firms follow industry or company norms in their decision regarding derivative use in the current period.

3. Experiment one

3.1 Design and participants

Our first experiment examines whether investor reactions to a firm's choice to use or not use derivatives are affected by industry norms—that is, it provides evidence to discriminate between our two competing hypotheses. We employ a 2 × 2 between-participants design in which we vary whether the firm uses derivatives in the current period to manage their business commodities risk (*use* or *do not use*) and whether it is the norm for other companies in the firm's industry to use derivatives (*norm* or *not norm*). In all conditions, the company's decision to either use or not use derivatives results in an unfavorable financial impact on the company's current period reported earnings.[3] As explained previously, we focus on unfavorable outcomes as doing so provides the best chance of observing norm effects, should they exist.

Study participants are 119 individuals who completed the experiment using Amazon.com's Mechanical Turk platform.[4] Individuals were screened to ensure appropriate coursework in accounting and finance and prior experience with financial statements. Specifically, only those participants who had previously taken at least two accounting and/or finance classes *and*

[3] The unfavorable outcome resulted from a price decrease (increase) when the company decided to use (not to use) derivatives.

[4] See Rennekamp (2012) for a description of Mechanical Turk and for evidence of the effectiveness of this platform for conducting judgment and decision-making experiments. We paid each participant $2 for completing the experiment. Further, participation was limited to those individuals with U.S. based internet-protocol (IP) addresses.

experience in reading financial statements were allowed to participate. Demographic questions completed at the end of the experiment indicate that participants have a mean of 12.8 years of work experience. Additionally, 80 percent of participants have completed an undergraduate, masters, or PhD degree. Over 66 percent have invested in common stock or mutual funds, with the mean (median) investment number at 84.9 (10) times.

3.2 Materials and procedure

Participants are asked to assume the role of an investor who currently has a significant investment in a firm that operates in the snack food business. They are told that the firm purchases various commodities as inputs into their manufacturing process and, so, faces the risk of changes in those market prices. Next, participants are provided with the derivative use manipulation. Specifically, in the *use derivatives* condition, participants are told that in the current year, the firm decides to enter into derivative contracts to lock in the prices of its planned commodity purchases. In the *do not use derivatives* condition, participants are told that the firm decides not to enter into derivative contracts.

Next, participants are provided with the information for the norm manipulation. In the *norm* condition, participants are told that most companies in the firm's industry regularly enter into derivative contracts. In the *not norm* condition, they are told that other companies in the industry do not regularly enter into derivative contracts. All participants are informed that as a result of the firm's derivative decision in the current period and the subsequent change in commodity prices, net income is $2.5 million lower for the year.

3.3 Dependent measures

After reading the information described above, participants respond to the dependent measures. For all questions, we use 101-point response scales with appropriately labeled endpoints. The first three questions are the primary dependent measures—responsibility, blame,

and valuation. The responsibility question asks participants how responsible they view firm management for the $2.5 unfavorable effect on net income related to their derivatives' decision, with 0 (101) indicating not at all responsible (completely responsible). The blame question asks participants how much they blame management, with 0 (101) indicating no blame (substantial blame). For brevity, we combine responsibility and blame into one average measure (which we label "responsibility").

The valuation question asks participants how management's decision about derivatives affects their valuation of the company's stock. For this question, participants are told to assume that any potential value change is not already incorporated into the company's stock price. Responses to this question are made on a 101-point scale with 0 (100) indicating that management's decision does not decrease (greatly decreases) how much they value the firm.

The remaining questions capture measures for our second set of tests regarding *why* the investor participants react to norms and derivative use. Specifically, we ask participants to rate the justifiability of management's decision, the carefulness of their decision process, the normality of their actions, the degree management controlled the outcome, management's competence, and management's performance. For these questions, we use 101-point response scales with appropriately labeled endpoints, where 0 corresponds to low or weak and 100 corresponds to high or strong. After these, we ask manipulation check questions and demographic information.

3.4 Manipulation checks

Data collected in the post-experimental questionnaire reveal that our manipulations are successful. Ninety-five percent of participants correctly identify whether the company used or did not use derivatives, and these responses are significantly associated with derivative use condition ($\chi^2 = 45.67$, $p < 0.01$). Our industry norm manipulation also is successful. Ninety-

three percent of participants correctly verify whether it is the norm or not for other companies in the firm's industry to use derivatives. Such responses are significantly associated with industry norm condition ($\chi^2 = 50.12$, $p < 0.01$). For both manipulation check questions, no other main effects or interactions are significant (all p-values > 0.40), as expected.

3.5 Hypothesis test results

In experiment one, our tests are designed to discriminate between hypotheses 1 and 2. These two hypotheses differ regarding whether norms will influence investor reaction to a firm's choice regarding derivative use in the current period. Hypothesis 1 predicts that norms will be influential to investors, while hypothesis 2 indicates that norms will not matter. From a statistical point of view, an interaction between derivative use and industry norm suggests the validity of hypothesis 1, while a main effect of derivative use supports hypothesis 2.

The two left-most columns of Panel A of Table 1 present the descriptive statistics for the responsibility and valuation measures by condition, and the two left columns of Panels B and C show our statistical tests. As shown in Panel B, we observe a significant derivative use × industry norm interaction for assessments of responsibility ($F = 22.41$, $p < 0.01$) and for the valuation measure ($F = 24.91$, $p < 0.01$). Follow-up simple effect tests in Panel C show that the interaction is consistent with hypothesis 1. When it is the industry norm *to use* derivatives, participants assign less responsibility to management for the ensuing unfavorable outcome when the firm chooses to also use derivatives (mean = 68.52) than when it does not (mean = 82.67) ($t = -2.93$, $p = 0.01$). This relationship reverses in the not norm condition. When most companies in the industry *do not use* derivatives, participants assign *more* responsibility to management for the unfavorable outcome when the firm violates the norm by using derivatives (mean = 75.50) than when it does not violate the norm (mean reduction of 57.17) ($t = 3.76$, $p < 0.01$). These results are consistent with hypothesis 1.

A similar pattern is observed for the common stock valuation question. Specifically, when derivative use is the industry norm, investors reduce the stock valuation of the firm violating that norm by a greater amount (mean reduction of 66.27) as compared to when the firm's behavior is consistent with the industry norm (mean = 47.67) (t = -3.26, $p < 0.01$). This relationship reverses when the norm is not to use derivatives. There, investors reduce the firm value more when the company uses derivatives (mean reduction of 69.53) as compared to when it does not (47.69) (t = 3.80, $p < 0.01$). Again, these results support hypothesis 1. Investors rely on information about industry norms when evaluating a firm's use or non-use of derivatives.[5]

Insert Table 1 here

3.6 Mediation analysis

As noted earlier, we not only elicit investors' judgments about responsibility and valuation, but also their judgments about the firm's decision making process (i.e., its carefulness and justifiability). Because psychology theory cites these measures as relevant to understanding how norms might influence investor reaction to derivative use (hypothesis 1), we explore those associations through mediation analysis. As illustrated in Figure 1, we argue that norms and the

[5] Although our experiment one held constant the *absolute* economic outcome of the firm making the choice to use or not use derivatives in the current period, it is possible that study participants inferred something about the *relative* economic outcome of the firm when evaluating its performance. Using relative economic outcomes would imply that participants punished the firm violating the norm *presumably* because they inferred that other firms in the industry followed the norm and, thus, did not experience an unfavorable outcome. To rule out this possibility, the follow-on experiment replicated the results from the two conditions in experiment one where relative economics was a possibility—the norm/did not use and not norm/did use conditions. After responding to the same questions from experiment one, participants were then explicitly told to consider the possibility that other firms in the industry could have behaved consistent with the norm and, thus, experienced favorable outcomes. That is, we gave them the possible inference about relative economics. Participants then responded again to the same questions. Results suggest that relative economic outcomes do not appear to a possible explanation for our experiment one results. Specifically, once they knew the information about possible relative economics, they evaluated the firm as less careful, less justified, and less competent (all p-values < 0.01), suggesting that they had not spontaneously considered relative economics previously. Interestingly, though, participants did not assign lower valuation measure once they knew the relative economics information (p-value > 0.40), suggesting they were unwilling to punish the firm for the less careful, less justified, and less competent behavior.

firm's decision regarding derivative use in the current period will interact to influence judgments of the decision-making care taken by the firm (Koonce, *et al.,* 2008), with more perceived care in those cases where the firm followed the industry norm. In turn, perceived decision making care will be positively related to the perceived justifiability of the firm's decision regarding derivative use in the current period (Reb and Connolly, 2010). That is, the more care exercised by firm management, the greater the justifiability of their decision, even when the outcome is unfavorable (which we hold constant in all of our experimental conditions). These two mediators—decision-making care and justifiability—are posited to increase the explanatory power of the interactive relationship between our two independent variables and our main dependent measures—namely, responsibility and valuation.

Insert Figure 1 here

Figure 1 provides the results of our mediation analysis for experiment one, and Table 2 tabulates the descriptive and inferential statistics for the two mediators. Results of mediation analysis are consistent with our expectations.[6] As shown in Table 2, the relationship between derivative use and perceived decision making care (*Link 1*) depends on industry norm. When it is the norm for companies in the industry to use derivatives, this relationship is significantly positive (β = +0.66, p = 0.01). In contrast, when it is not the norm for the industry, using derivatives lowers perceived decision making care (β = -0.21, p = 0.05); that is, the relationship becomes negative. This pattern is consistent with our predictions. Perceived decision making care is higher when the norm is to use derivatives and the company chooses to use them in the current period (mean of 53.90) than not to use them (mean of 25.00). This relationship reverses

[6] Results are generated using a bootstrapping method with bias-corrected standard errors as recommended by Preacher *et al.* (2007). Results using traditional standard errors and without bootstrapping yield similar inferences to those reported.

when the norm is to not use derivatives; there, using derivatives causes investors to attribute less decision making care on the part of management (mean of 38.07) than when they behave similarly to the norm by not using derivatives (mean of 49.55) (significant interaction $F = 31.63$, $p < 0.01$).

Insert Table 2 here

As expected, decision making care is positively associated with decision justifiability (*Link 2;* $\beta = +1.09$, $p = 0.01$), and decision justifiability is negatively related to the responsibility assigned to firm management for the unfavorable derivative outcome (*Link 3:* $\beta = -0.45$, $p = 0.02$). Not surprisingly, responsibility for the unfavorable impact on net income (i.e., the $2.5 million decrease in income) is positively associated with the decrease in stock valuation assigned by our participants (*Link 5:* $\beta = +1.10$, $p < 0.01$).

Considering the mediation analysis as a whole, we find that a nested model test indicates that including the two mediators (i.e., *Links 1, 2* and 3) significantly improves the fit of the model ($\chi^2 = 85.49$, $p < 0.01$). The Tucker-Lewis Fit index shows a very good fit (101%). That is, the two mediators are important to our understanding of why investors react to industry norms.

4. Experiment two

4.1 Design, participants, materials, and procedures

For experiment two, we employ the same scenario from experiment one. Specifically, we describe a firm in the snack food industry facing the risk of volatile pricing for input commodities. Instead of manipulating industry norm, though, we manipulate company norm. That is, we vary whether or not it was the norm for the firm to use derivatives (*norm* or *not norm*). Similar to experiment one, we also manipulate whether the firm uses derivatives in the current period to manage their commodities risk (*use derivatives* or *do not use derivatives*). As

in the prior experiment, the company's decision regarding derivatives results in an unfavorable financial impact on the company's current period reported earnings in all conditions. We rely on the same dependent measures as in experiment one.

Participants were 186 individuals who complete the experiment using Amazon.com's Mechanical Turk platform. Experiment two was conducted at the same time as experiment one. No one who participated in experiment one was able to also participate in experiment two. We employed the same screening and payment procedures from experiment one. The demographic information for the experiment two participants is virtually identical to that for those participating in experiment one.

4.2 Manipulation checks

Data collected in the post-experimental questionnaire reveal that our two manipulations are successful. Results reveal that 99 percent of participants correctly identify whether or not the firm uses derivatives in the current period, and such responses are associated with derivative use condition ($\chi^2 = 75.45$, $p < 0.01$). For the norm manipulation, 92 percent of participants correctly identify whether or not the company historically uses derivatives. These responses are significantly associated with company norm condition ($\chi^2 = 174.24$, $p < 0.01$). For both manipulation check questions, no other main effects or interactions are significant (all p-values > 0.10), as expected.

4.3 Hypothesis test results

In Experiment 2, we ask the same primary dependent measures as in Experiment 1. Recall that hypothesis 1 predicts that investor reaction to a company's decision to use or not use derivatives will depend on norms. As such, a significant interaction between derivative use and company norm supports our first hypothesis. On the other hand, hypothesis 2 predicts that a

company using derivatives will be viewed more favorably than those not using derivatives. Thus, a main effect of derivative use will support hypothesis 2.

The two rightmost columns in Panel A of Table 1 show the descriptive statistics for the responsibility and common stock valuation measures by condition, and the two right columns of Panel B present our statistical tests. As seen in Panel B, we observe both a significant main effect for derivative use and a significant derivative use × company norm interaction for responsibility ($F = 6.36$, $p = 0.01$ and $F = 19.48$, $p < 0.01$, respectively) and the valuation measure ($F = 11.99$, $p < 0.01$ and $F = 9.31$, $p < 0.01$, respectively). The presence of a significant interaction provides support for hypothesis 2. As explained below, though, follow-up simple main effects tests indicate one difference between these experiment two results and those in experiment one.

The follow-up tests reveal that, consistent with experiment one, when the firm's norm is to use derivatives, participants assign less responsibility to management for a poor outcome when the company uses derivatives in the current period (mean = 57.00) than when it does not (mean = 76.45) ($t = -4.90$, $p < 0.01$). Similar results are obtained for the common stock valuation question (means of 44.00 and 64.66 ($t = -4.61$, $p < 0.01$). These results are similar to those from experiment one.

Turning to the situations where it is *not* the norm for the company to use derivatives, we do not observe the judgment reversal like we do in experiment one. That is, when it is the norm to not use derivatives, we observe no difference in participants' evaluations (i.e., either responsibility or valuation) depending on whether or not the company uses derivatives in the current period (both p-values > 0.10). Thus, unlike the results of the first experiment, firm norms

influence investor reaction to derivative use *only* when using derivatives is the norm. We return to this unexpected finding in our third experiment.

4.4 Mediation analysis

Similar to experiment one, we conduct a mediation analysis to test the model previously described with that experiment. Instead of testing the effect of industry norm, though, we test firm norm in our mediation analysis for the second experiment. All other measures are the same.

In general, the results are very similar to those for experiment one. Figure 2 summarizes the results of the mediation analysis and Table 2 (two right columns) summarizes the descriptive and inferential statistics for the two mediators. We again see an interaction between our two independent variables and perceived decision making care (*Link 1*). Consistent with results in Table 2, perceived decision making care is higher when the norm is to use derivatives and the company chooses to use them in the current period (mean of 58.80) than not to use them (mean of 34.47). Unexpectedly, though, this relationship does not reverse when the norm is to not use derivatives. Although we observe a significant interaction (F =7.10, $p < 0.01$), it is not in the disordinal pattern predicted and documented in our first experiment. However, it is consistent with the pattern of our primary dependent measures for experiment two.

Insert Figure 2 here

The remaining components of the model are consistent with our predictions. That is, perceived decision making care is positively associated with decision justifiability (*Link 2;* β = +1.26, $p < 0.01$), and decision justifiability is negatively related to the responsibility assigned to firm management for the unfavorable derivative outcome (*Link 3:* β = -0.44, $p < 0.01$). As expected, responsibility for the unfavorable impact on net income (i.e., the $2.5 million decrease in income) is positively associated with the decrease in stock valuation assigned by our

participants (*Link 5:* $\beta = +1.14$, $p = 0.03$). For the mediation analysis as a whole, we find that a nested model test indicates that including the two mediators (i.e., *Links 1, 2* and *3*) significantly improves the fit of the model ($\chi^2 = 93.96$, $p < 0.01$), and the Tucker-Lewis Fit index shows a reasonable fit (93%). In sum, the analysis reveals that the two mediators are important to our understanding of why investors react to industry norms.

5. Experiment three

5.1 Overview

The results of experiments one and two demonstrate that industry and company norms related to the use of derivatives influence investors' reactions to a firm's decision to use derivatives; that is, our results support hypothesis one. Specifically, we observe that when industry and firm behavior indicate the use of derivatives is the norm, investors respond more *favorably* to firm managers who use (versus do not use) derivatives. However, when industry and firm behavior indicates that using derivatives are not the norm, we unexpectedly observe that investors' reactions differ depending on whether the norm is industry or company related. When the industry (company) norm is to not use derivatives, investors respond more (no more) *unfavorably* to managers who use derivatives than to those who do not use derivatives.[7]

Experiment three is designed to further probe this unexpected result. Our intuition is that study participants view the company norm as less powerful than the industry norm. As a result, they may find it less compelling as a cue in those situations where the norm is to not use derivatives. That is, given the prior research on the favorable viewpoints regarding derivative

[7] To test that the behavior statistically differs between experiment one and experiment 2, we combine the relevant not-norm conditions from experiment one with those from experiment two and conduct a 2 × 2 between-participants analysis of variance with norm at two levels (industry versus company norm) and the firm's decision regarding derivatives at two levels (use versus not use). This analysis indicates a statistically significant interaction for both the responsibility and value questions (both p-values < 0.05); follow-up tests confirm that the choice to use derivatives is a significant variable in the industry norm conditions (both p-values < 0.01) but not in the firm norm conditions (both p-values > 0.10).

use and perceived decision making care (Koonce, *et al.* 2008), the violation of the norm not to use derivatives might be perceived as less problematic because the firm chooses to do something that is viewed as favorable (i.e., use derivatives) even though they violate the norm. The effect is not symmetric, though, as not using a derivative (which, from prior research, is viewed unfavorably) when the norm is to use derivatives is more obviously a norm violation.

5.2 Design, participants, materials, and procedures

Because the differing results in the first two experiments occur in the *not norm* conditions, we focus exclusively on that condition in experiment 3. The experimental materials are based on those used in the first two experiments. Further, we rely on a 2 × 2 mixed design. The within-participants independent variable is whether the source of the norm is industry or firm (*industry norm* or *firm norm*). The between-participants variable is whether the firm uses or does not use derivatives in the current period (*use* or *no use*).

The materials are set up so each participant is told to consider two possible scenarios that the firm might face. These two scenarios represent the within-participants manipulation of *industry norm* (scenario 1) or *firm norm* (scenario 2). Scenario 1 indicates that most firms in the *industry* historically have not entered into derivative contracts. Scenario 2 indicates that the *firm* has historically not entered into derivative contracts. Participants are told to assume that the firm can only be in one of the two scenarios and cannot be in both scenarios at the same time. Further, they are told that the firm either chose to use or not to use derivatives in the current period. Consistent with the first two experiments, the firm's derivative decision results in a $2.5 million unfavorable impact on reported net income.

After reading the two scenarios, participants answer four questions designed to assess their judgments about the firm's decision to not use derivatives in the current period. For each

question, participants are asked to respond assuming the firm was in Scenario 1 (industry norm) and then to respond again to the same question assuming the firm was in Scenario 2 (firm norm). The questions ask participants to judge whether the company had good reasons for their derivative decision, is justified in their derivatives decision, exhibits decision making care, and is likely to be viewed favorably by outside investors. Responses to all questions are made on a 101-point response scale, with 0 indicating low or weak and 100 indicating high or strong.

Eighty-three participants completed experiment three. The experiment was administered using Amazon.com's Mechanical Turk platform, with the same screening and payment procedures as used in the first two experiments. Those participating in experiments one or two are not allowed to participate in this third study. Participants have a mean of 14.2 years of work experience, with over 78% of participants having completed an undergraduate, masters, or PhD degree. Additionally, 53.7 percent of participants have invested in common stock or mutual funds, with the mean (median) number of times investing at 88.2 (7) times.

5.3 Results

The results are consistent with our conjecture that industry norms are viewed as stronger than firm norms. That is, with one exception, we observe that participants react more strongly to industry norms than to firm norms when evaluating the firm's derivative choice in the current period. As shown in Table 3, participants judge the firm following the industry norm (to not use derivatives) to have a greater number of reasons to not use derivatives (mean of 68.45) than the firm not following the industry norm (mean of 48.40) ($t = 3.88$, $p < 0.01$). In contrast, the firm following their own norm (to not use derivatives) is judged as having the same number of reasons (mean of 53.35) as the firm not following their own norm (mean of 50.86) ($t = 0.48$, $p = 0.63$). This different reaction to norms is statistically significant, as evidenced by the interaction

between norms and firm action ($F = 7.78$, $p < 0.01$). With the exception of the decision-making care question which does not show significant results, similar results are obtained for the justifiability of management's actions and the favorability of investors' views regarding the firm. Overall, these results provide support for the idea that investors view an industry norm of not using derivatives to be a more powerful justification than an analogous company norm, and thus, it exerts greater influence on investor judgments (cf. Goldstein, *et al.,* 2008).

Insert Table 3 here

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6. Conclusions

Prior research indicates that a firm's use of derivatives to manage business risks is viewed favorably by investors. However, these studies do not consider a potentially key factor in how investors evaluate a firm's usage of derivatives—namely, the typical behavior (or norms) regarding derivatives by other firms in the industry or the firm itself. In this paper, we report the results of three experiments to test the idea that investors, evaluating firms that choose to use or not use derivatives in the current period, evaluate that behavior in light of industry and firm norms. Our results show that norms are influential in affecting investors' evaluations. Further, in a third experiment, we find that industry and firm norms are not viewed similarly. We find that industry norms exert a more powerful influence on investors.

Our results also reveal that when evaluating a firm's derivative choices in light of norms, investors make inferences about the decision making care used by the firm and, in turn, the justifiability of the firm's derivatives decision. These inferences are causally linked to investors' judgments about the firm's responsibility for the outcome and valuation. Identifying and measuring these mediating variables is important as it provides a more-complete understanding of how investors reason when evaluating a firm's use (or non-use) of derivatives.

Our study has possible limitations, all of which suggest additional directions for future research. For example, we only studied situations where derivative use (or non-use) led to unfavorable outcomes. That is, the firm was worse off (in mean outcome sense) from having used (or not used) derivatives as compared to a situation where it did not use (did use) these instruments. Future research should explore the implications of norms when outcomes are favorable. That is, if a firm achieves a favorable outcome from using derivatives—when the norm is not to use them—will this lead to greater reward than the same outcome from not using derivatives? From a theoretical perspective, this reaction appears possible, albeit the effect may be smaller than when the outcome is negative. Future research should explore the boundary conditions on our findings herein.

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Table 1 – Experiment one and two hypotheses test results

Panel A: Means (standard deviations)

	Experiment One Results						Experiment Two Results					
	Judged decrease in common stock valuation			Judged management responsibility			Judged decrease in common stock valuation			Judged management responsibility		
Use / Norm	Used Deriva-tives	Did Not Use Deriva-tives	Row Means	Used Deriva-tives	Did Not Use Deriva-tives	Row Means	Used Deriva-tives	Did Not Use Deriva-tives	Row Means	Used Deriva-tives	Did Not Use Deriva-tives	Row Means
Norm	47.67 (26.52) n=30	66.27 (19.23) n=30	56.97 (24.81)	68.52 (18.10) n=30	82.67 (18.43) n=30	75.59 (19.47)	44.00 (25.71) n=46	64.66 (18.20) n=47	54.44 (24.43)	57.00 (20.56) n=46	76.45 (15.38) n=47	66.83 (20.51)
Not Norm	69.53 (13.37) n=30	47.69 (26.63) n=29	58.80 (23.52)	75.50 (17.97) n=30	57.17 (20.29) n=29	66.49 (21.11)	56.00 (21.87) n=47	57.30 (20.07) n=46	56.65 (20.90)	67.49 (18.36) n=47	62.18 (21.66) n=46	64.87 (20.12)
Column Means	58.60 (23.56)	57.14 (24.80)		72.01 (18.22)	70.14 (23.11)		50.07 (24.47)	61.02 (19.40)		62.30 (20.08)	69.39 (19.98)	

Panel B: Analysis of variance statistical results

	Experiment One Results		Experiment Two Results	
	Common Stock Valuation	Management Responsibility	Common Stock Valuation	Management Responsibility
Company Use	$F = 0.16$, $p = 0.69$	$F = 0.37$, $p = 0.54$	$F = 11.99$, $p < 0.01$	$F = 6.36$, $p = 0.01$
Norm	$F = 0.16$, $p = 0.69$	$F = 7.28$, $p < 0.01$	$F = 0.54$, $p = 0.47$	$F = 0.45$, $p = 0.50$
Company Use × Norm	$F = 24.91$, $p < 0.01$	$F = 22.41$, $p < 0.01$	$F = 9.31$, $p < 0.01$	$F = 19.48$, $p < 0.01$

Panel C: Follow-up simple main effects

	Experiment One Results		Experiment Two Results	
	Common Stock Valuation	Management Responsibility	Common Stock Valuation	Management Responsibility
Norm to Use: Used vs. Did Not	$t = -3.26$, $p < 0.01$	$t = -2.93$, $p < 0.01$	$t = -4.61$, $p < 0.01$	$t = -4.90$, $p < 0.01$
Norm Not to Use: Used vs. Did Not	$t = 3.80$, $p < 0.01$	$t = 3.76$, $p < 0.01$	$t = -0.28$, $p = 0.77$	$t = 1.36$, $p = 0.18$

Panel A shows the means and standard deviations for the responses to the primary dependent variables used in Experiments 1 and 2. The common stock valuation question was: *To what extent does management's decision regarding the derivative contracts decrease the value you would place on the company's common stock (assume that any potential value change is not already incorporated into the company's stock price)?* The response scale was 0 to 100 with higher scores representing a greater decline in value. The responsibility question was an average of two correlated questions. They are: *How much blame do you place on the management of the company for the $2.5 million effect on net income*

related to their derivatives decision? The response scale was 0 to 100 with higher scores representing more blame. *How responsible do you think the company is for the $2.5 million effect on net income related to their derivatives decisions?* The response scale was from 0 to 100 with higher scores representing more responsibility. In each experiment, we employed a 2 × 2 between-participants design, with company derivative use and norm for independent variables (i.e., industry norm for experiment one and company norm for experiment two).

Table 2 – Results for experiments one and two: mediators

Panel A: Means (standard deviations)

	Experiment One Results						Experiment Two Results					
	Judged decision making care			Judged management justification			Judged decision making care			Judged management justification		
Use / Norm	Used Deriva-tives	Did Not Use Deriva-tives	Row Means	Used Deriva-tives	Did Not Use Deriva-tives	Row Means	Used Deriva-tives	Did Not Use Deriva-tives	Row Means	Used Deriva-tives	Did Not Use Deriva-tives	Row Means
Norm	53.90 (19.94) n=30	25.00 (13.12) n=30	39.45 (22.19)	70.73 (19.84) n=30	31.23 (18.72) n=30	50.98 (27.61)	58.80 (21.73) n=46	34.47 (19.78) n=47	46.51 (24.00)	71.52 (23.06) n=46	34.02 (24.17) n=47	52.57 (28.97)
Not Norm	38.07 (19.70) n=30	49.55 (24.14) n=29	43.71 (22.56)	48.63 (21.57) n=30	59.83 (27.77) n=29	54.14 (25.24)	48.98 (20.74) n=47	40.87 (20.79) n=46	44.97 (21.05)	57.13 (20.10) n=47	52.41 (24.04) n=46	54.80 (22.14)
Column Means	45.98 (21.21)	37.07 (22.82)		59.68 (23.37)	45.28 (27.48)		53.84 (21.69)	37.63 (20.43)		64.25 (22.68)	43.12 (24.33)	

Panel B: Analysis of variance statistical results

	Experiment One Results		Experiment Two Results	
	Decision Making Care	Management Justification	Decision Making Care	Management Justification
Company Use	$F = 5.88$, $p = 0.02$	$F = 12.09$, $p < 0.01$	$F = 28.38$, $p < 0.01$	$F = 42.31$, $p < 0.01$
Norm	$F = 1.47$, $p = 0.23$	$F = 0.64$, $p = 0.43$	$F = 0.32$, $p = 0.58$	$F = 0.38$, $p = 0.54$
Company Use × Norm	$F = 31.63$, $p < 0.01$	$F = 38.78$, $p < 0.01$	$F = 7.10$, $p < 0.01$	$F = 25.52$, $p < 0.01$

Panel C: Follow-up simple main effects

	Experiment One Results		Experiment Two Results	
	Decision Making Care	Management Justification	Decision Making Care	Management Justification
Norm to Use: Used vs. Did Not	$t = 5.72$, $p < 0.01$	$t = 6.89$, $p < 0.01$	$t = 5.65$, $p < 0.01$	$t = 8.17$, $p < 0.01$
Norm Not to Use: Used vs. Did Not	$t = -2.25$, $p = 0.03$	$t = -1.94$, $p = 0.06$	$t = 1.88$, $p = 0.06$	$t = 1.03$, $p = 0.31$

Panel A shows the means and standard deviations for the responses to the mediating measures used in Experiments 1 and 2. The decision making care question was: *To what extent did management use a careful decision making process regarding the derivatives*? The response scale was 0 to 100 with higher scores indicating more decision care. The justification question was: *How justified was management's decision regarding the derivative contracts?* The response scale was 0 to 100 with higher scores representing more justification. See Table 1 for a description of the independent variables.

Table 3 – Results for experiment three

Panel A: Means (standard deviations)

	Judgments regarding good reasons for derivative choice			**Judgments about justifiability of derivative choice**			**Judgments about perceived decision making care**			**Judgments about extent to which outsiders would view derivative choice favorably**		
Use / Source of Norm	Used Deriva-tives	Did Not Use Deriva-tives	Row Means	Used Deriva-tives	Did Not Use Deriva-tives	Row Means	Used Deriva-tives	Did Not Use Deriva-tives	Row Means	Used Deriva-tives	Did Not Use Deriva-tives	Row Means
Industry Norm	48.40 (21.63) n=43	68.45 (22.80) n=40	58.06 (24.26)	44.67 (23.10) n=43	63.20 (23.84) n=40	53.60 (25.11)	54.56 (26.36) n=43	55.38 (26.73) n=40	54.95 (26.38)	25.09 (21.74) n=43	43.50 (27.50) n=40	33.96 (26.22)
Firm Norm	50.86 (22.95) n=43	53.35 (26.58.) n=40	52.06 (24.26)	48.14 (24.29) n=43	48.38 (25.01) n=40	48.25 (24.49)	55.28 (25.73) n=43	46.08 (28.91) n=40	50.84 (27.53)	31.14 (24.91) n=43	25.58 (19.74) n=40	28.46 (22.60)
Column Means	49.63 (22.20)	60.90 (25.75)		46.41 (23.63)	55.79 (25.41)		54.92 (25.89)	50.73 (28.05)		28.12 (23.44)	34.54 (25.44)	

Panel B: Mixed model statistical results

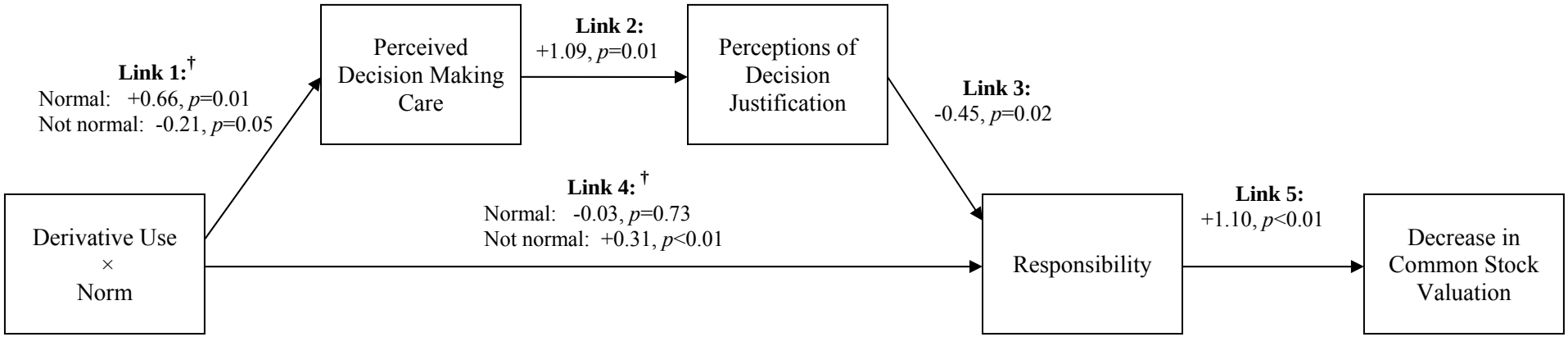
	Reasons	**Justifiability**	**Decision Care**	**Favorability**
Company Use	$F = 7.57$, $p < 0.01$	$F = 4.37$, $p = 0.04$	$F = 0.64$, $p = 0.42$	$F = 1.87$, $p = 0.18$
Source of Norm	$F = 4.03$, $p = 0.05$	$F = 4.15$, $p = 0.05$	$F = 2.39$, $p = 0.13$	$F = 7.19$, $p < 0.01$
Firm Use × Source of Norm	$F = 7.78$, $p < 0.01$	$F = 10.76$, $p < 0.01$	$F = 3.26$, $p = 0.08$	$F = 29.27$, $p < 0.01$

Panel C: Follow-up simple main effects

	Reasons	**Justifiability**	**Decision Care**	**Favorability**
Industry Norm: Used vs. Did Not	$t = 3.88$, $p < 0.01$	$t = 3.51$, $p < 0.01$	$t = 0.14$, $p = 0.89$	$t = 3.54$, $p < 0.01$
Firm Norm: Used vs. Did Not	$t = 0.48$, $p = 0.63$	$t = 0.04$, $p = 0.96$	$t = -1.56$, $p = 0.12$	$t = -1.07$, $p = 0.29$

Panel A shows the means and standard deviations for the responses to the questions in experiment three. These questions are: *To what extent do you think the company had good reason(s) for their derivative decision in the current period? To what extent do you think the company was justified in their derivatives decision in the current period? To what extent do you think the company used a careful decision process in their derivatives decision? To what extent do you think the company's derivatives decision in the current period will be viewed favorably by its investors?* The response scale for all questions was 0 to 100, with more favorable responses indicated by higher scores. In the experiment, we employed a 2 × 2 mixed design, with company derivative use (*used* versus *did not use*) and source of norm (*industry* versus *firm)* as independent variables. The derivative use variable was manipulated between-participants and the source of norm was varied within-participants.

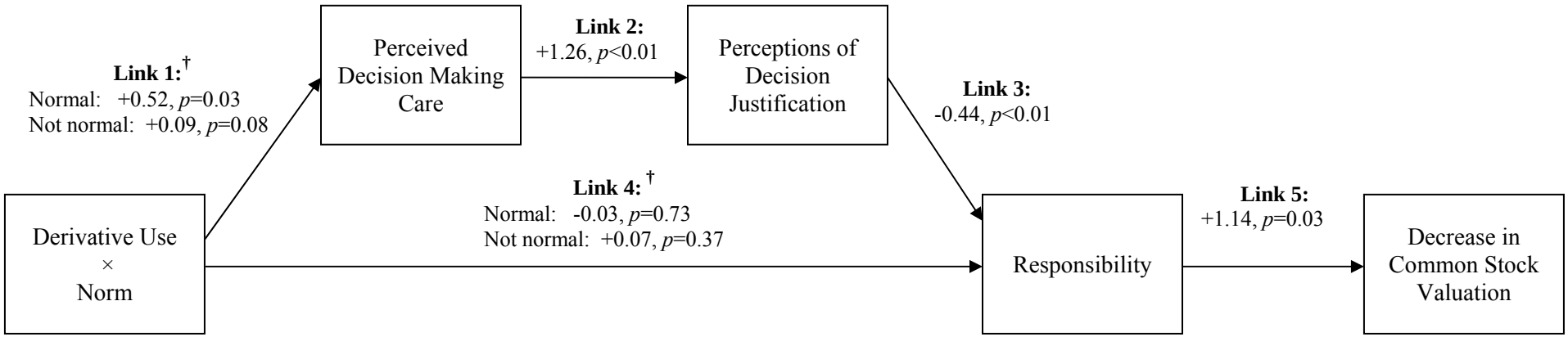
Figure 1 – Mediation analysis for experiment one



This figure presents the results of a mediation analysis designed to simultaneously test the relationships among our variables. Derivative use is an indicator variable coded 1 when the company uses derivatives and 0 when it does not use derivatives, and Norm is an indicator that is coded 1 when it is the norm to use derivatives in the industry and 0 otherwise. See Table 2 for a description of all other variables. Shown next to each link are the standardized coefficients generated by a bootstrapping method and corresponding bias-corrected *p*-values (all are one-tailed, except for *Link 4* where a directional relation is not expected) as recommended by Preacher *et al.* (2007). Overall goodness of fit is measured through the Tucker-Lewis Index (101 percent) and is confirmed with a χ^2 test ($\chi^2 = 7.58$, $p=0.57$) and the Root Mean Square Error of Approximation (RMSEA < 0.01).

† The strength of *Links 1 and 4* are expected to be moderated by the company's decision to use or not use derivatives and the industry norm (i.e., whether it is the norm for other companies to use derivatives). Nested models confirm that these links indeed differ by industry norm condition (($\chi^2 = 36.62$, $p<0.01$).

Figure 2 – Mediation analysis for experiment two



This figure presents the results of a mediation analysis designed to simultaneously test the relationships among our variables. Derivative use is an indicator variable coded 1 when the company uses derivatives and 0 when it does not use derivatives, and Norm is an indicator that is coded 1 when it is the norm to use derivatives in the industry and 0 otherwise. See Table 2 for a description of all other variables. Shown next to each link are the standardized coefficients generated by a bootstrapping method and corresponding bias-corrected *p*-values (all are one-tailed, except for *Link 4* where a directional relation is not expected) as recommended by Preacher *et al.* (2007). Overall goodness of fit is measured through the Tucker-Lewis Index (93 percent). A conventional χ^2 test ($\chi^2 = 19.54$, $p=0.03$) and the Root Mean Square Error of Approximation (RMSEA = 0.08) indicate a moderate fit to the data.

† The strength of *Links 1 and 4* are expected to be moderated by the company's decision to use or not use derivatives and the industry norm (i.e., whether it is the norm for other companies to use derivatives). Nested models confirm that these links indeed differ by industry norm condition (($\chi^2 = 23.11$, $p<0.01$).