The Joint Effect of Justification and Uncertainty on Real Earnings Management

Abstract

The recent growth in real earnings management (REM) is of significant concern because REM is intended to mislead stakeholders and is not easily detected or curbed. It is reasonable to expect REM to decline when managers are asked to justify their decisions to stakeholders, but the prevalence of uncertainty may render justification ineffective. We report the results of an experiment examining the interactive effect of justification and uncertainty on the operating decisions of managers, including decisions that may mislead owners. The opportunity to justify an operating decision has the effect of *increasing* REM-type decisions when heightened uncertainty surrounds future project outcomes. Some managers use uncertainty to strategically justify decisions by communicating reasons that make them appear accountable to the owners. This behavior is consistent with moral licensing, in which managers are more likely to choose actions that benefit themselves because disclosure gives them a license to act in self-interest. We also find that many of our managers show concern for the owners and are not the self-interested profit maximizers of economic theory.

Keywords: Real earnings management, uncertainty, justification, experiment, moral licensing, accountability

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INTRODUCTION

Real earnings management (REM) is "departures from normal operational practices, motivated by managers' desire to mislead at least some stakeholders into believing certain financial reporting goals have been met in the normal course of operations" (Roychowdhury 2006, 337). Research indicates a marked increase in REM, and corresponding decrease in accruals-based earnings management (AEM), after the implementation of the Sarbanes-Oxley Act (SOX 2002; Cohen, Dey, and Lys 2008). This shift in managerial behavior is attributed to auditors' strict scrutiny of AEM, with much less auditor attention to REM. REM is intended to mislead stakeholders and, thus, is of significant concern in the corporate governance arena. Because REM is difficult to detect, it is unclear how it might be constrained (Graham, Harvey, and Rajgopal 2005; Commerford, Hermanson, Houston, and Peters 2016).

Prior research in accounting suggests that asking managers to justify their operating decisions to the firm's owners could reduce REM. Bentley speculates (2019, 45), "…managers who anticipate providing external narrative reports (e.g., conference calls, MD&A, management commentary) or non-GAAP earnings will be less likely to engage in real earnings management." Asking managers to justify their choices may compel them to choose actions that improve owners' welfare. However, uncertainty is present in multiple managerial decisions, such as decisions to invest in projects, increase/decrease research and development (R&D) spending, etc. As such, uncertainty is an integral component of a company's operations. Thus, outcome uncertainty surrounds operating decisions and REM, and it is unclear whether asking managers to justify operating decisions will curb REM in presence of uncertainty. Further, Carcello (2009) describes the importance of financial reporting in promoting the common good and notes the

potential for experimental research to provide insight into effective oversight through corporate governance. Our paper adopts an experimental method to study how justifying operating decisions impacts REM when there is uncertainty about future operating outcomes.

We study managerial behavior in a stylized, incentivized experimental environment. In natural settings, managers have considerable discretion in directing the operating activities of the firm. Similarly, our experimental participants, acting as managers, are asked to decide whether to continue a project under uncertainty. If the manager decides to proceed with the project and the outcome of the project is good, the owners of the firm experience their best possible payoff. However, if the project outcome is bad, the owners would have been better off if the manager had decided to drop the project. Dropping the project maximizes the manager's earnings with both possible outcomes. In our setting, the likelihood of a good outcome is high so that the owners' expected payoff is higher if the project is kept, while the manager's payoff is strictly higher when the project is dropped. Managerial conflicts of interest are pervasive in natural settings and central in our experimental environment. A selfish manager has the incentive to change the firm's course and drop the project, thereby increasing the manager's own payoff. The self-interested alteration of transactions by managers to deceive consumers of financial statement information, such as owners, is the substance of REM. As a real-world parallel, managers may cut R&D projects to meet earnings targets with the goal of locking in bonuses tied to targets.

In our experimental setting, we vary uncertainty about project outcomes and whether managers are asked to justify their project decisions. We examine the role of uncertainty from the *manager's* perspective by varying the information provided about the likelihood of a good outcome. The outcome of the project is determined randomly following the same distribution in all experimental conditions. In our Unknown condition, participants are not informed of the

precise likelihood of a good outcome, whereas in our Known condition participants are informed of this likelihood. In the Justification condition, the participants, acting as managers, are asked to justify their drop or keep decision to the owners, while in the No Justification condition, they are not given the opportunity to do so. Such justification opportunities are analogous to management providing disclosures about possible REM activities in the MD&A section of the financial statements, answering questions on an analyst call, or addressing issues in a shareholder meeting.

Our central result is a significant interaction between uncertainty and justification regarding the operating decisions of managers. The effect of justification depends on uncertainty about the project outcome. Specifically, when more uncertainty surrounds future project outcomes and managers have the opportunity to justify their decisions to owners, managers are most likely to engage in REM-type behavior and drop the project. Some participants appear to use justification strategically to support their decisions when uncertainty is high. To provide further insight into managers' behavior, we compare managers' justification (i.e., written explanations of their project decisions that are directed to the owners) with their corresponding written explanations for their project decisions in the post-experimental questionnaire (PEQ). This analysis provides evidence of strategic justification. Some participants explicitly say in the PEQ that they chose to drop the project to maximize their own payoff, but in their justification to the owners they provide a different reason. Beyond the interaction result, we also find that many managers act in the owners' interest, sacrificing their own payoffs, which contradicts standard economic theory.

Our study contributes to the literature in accounting by providing evidence of the interaction between justification and uncertainty. Prior research shows that justifying an action has potential positive impacts, such as improving the quality of auditing judgments (Johnson and

Kaplan 1991) and reducing managerial bias (Bentley 2019). However, the prior literature has not considered the role of uncertainty in justification effects. We show that the effect of justifying an action on operating decisions depends on uncertainty. Specifically, justification can have a negative effect by increasing managers' opportunistic behavior when uncertainty is high. In practice, when a manager makes an operating decision designed to manage earnings, uncertainty is very likely to be a factor. Thus, considering the joint effect of justification and uncertainty has useful practical implications.

Our study also contributes to the disclosure literature. The written communication from managers detailing the reasons behind their operating decisions is a form of disclosure to the owners. Prior research suggests that disclosure can benefit the owners by reducing information asymmetry (Healy and Palepu 2001). However, we find that there is an unintended effect of disclosure on operating decisions made by the managers when there is high uncertainty. With managerial disclosure aimed at the justification of operating decisions, managers are more likely to act selfishly. Uncertainty gives them "wiggle room" to spin a story so that a selfish act will appear accountable to the owners. Such strategic disclosure can have unintended consequences by changing the operating decisions rather than simply reducing information asymmetry. Disclosure is not simply revealing information about firm values, but also can influence real decisions such as operating or investing decisions that can change firm value (Kanodia 2007; Kanodia and Sapra 2016). We add to the real effects of accounting disclosure literature by recognizing a psychological factor that can lead to real effects of disclosure.

We posit that the psychological factor that leads to unintended effects of justification in our setting is moral licensing. With moral licensing, managers engage in questionable behavior when a prior "good deed" gives them a "license" to behave in self-interest, rather than making

the choice that is best for the owners (Merritt, Effron, and Monin 2010; Miller and Effron 2010).[1] For example, when conflicts of interest are publicly disclosed, managers do not feel guilt when misleading investors because such behavior seems "like fair play" (Cain, Loewenstein, and Moore 2005, 2011). Rose, Rose, Norman, and Mazza (2014) provide another example related to managerial disclosure of conflicts of interest. With disclosure of a friendship tie to managers (a good deed), a board of directors is granted a license to approve a managerial proposal to make deeper cuts in R&D in an effort to meet managers' bonus targets. The content of disclosure in our study is different from this prior work, which was an objective fact about the presence or absence of a conflict of interest. In our setting, managers strategically provide subjective arguments in supporting their justification. Our analysis of the content of strategic disclosures generates additional insight beyond the moral licensing literature.

An important implication of our main result is that regulators and investors should be cautious about the potential effect of justification when uncertainty is high. Under the cover of uncertainty, justification can be used strategically by managers to promote selfish decisions. While the literature typically focuses on the role of justification in promoting accountability to others (Ashton 1990; Bentley 2019), justification can yield adverse effects in some settings, especially when uncertainty is high. Uncertainty and justification together may lead managers to disclose opportunistically and act selfishly to the detriment of the owners. Regulators have pushed for more disclosure to compel managerial accountability. We caution policymakers and urge them to consider the role of uncertainty, especially for disclosures that have low verifiability, including managerial justifications.

[1] Psychologists document the adverse consequences that can result from moral licensing for a diverse and large set of behaviors (see a review by Blanken, van de Ven, and Zeelenberg (2015)).

Another important implication of this study is that investors should be skeptical about strategic justifications. We find evidence of strategic disclosure in that some managers attempt to provide a legitimate story to convince the owners that an REM-type decision is the best choice for the owners, even when managers' true intention is to serve self-interest. The reasons are hard to verify, especially when uncertainty is high. The lack of verifiability allows managers to appear accountable to the owners, which gives them moral licenses to act selfishly. Miller (2009) notes that there is significant evidence in the accounting literature to support the view that managers sometimes disclose opportunistically to influence investors' judgment and decisions. Our results suggest that strategic disclosure also can affect managers' own judgments and decisions to the detriment of owners. Along with our results, we warn stakeholders to be skeptical of both what managers say (e.g., management disclosure) and what managers do (e.g., motives behind operating decisions), particularly in settings in which there is a high degree of uncertainty.

Finally, our evidence also suggests we should be cautious about being overly skeptical of managerial disclosures. Despite the strategic use of justification by some managers in our study, we also find considerable concern for the owners. Some managers do not engage in strategic justification even when they have the opportunity. This difference in behavior is a factor that auditors or investors are encouraged to consider when scrutinizing managerial disclosure. In naturally occurring markets, a manager's true intention is not observable, and managerial actions are used to infer intent. For example, auditors form negative impressions of the ethical tone set by top management when earnings management is used aggressively to meet goals (Commerford et al. 2016, 2019; Commerford, Hatfield, and Houston 2018). Prior research finds that when managers appear to use REM to meet earnings targets, auditors are more rigorous in other areas of the audit because the auditors perceive that the managers set a weaker ethical tone

(Commerford et al. 2018). Our results indicate that it is dangerous to assume that a manager who appears to use REM and meets a target intends to deceive financial statement users, including the firm's owners, because the true intention is unobservable. While some managers engage in strategic disclosure, others do not. Neither words nor actions perfectly signal intentions.

BACKGROUND AND HYPOTHESIS

Selected REM Literature

The accounting literature surrounding earnings management has advanced markedly in recent years. Of greatest relevance to this study is work addressing managers' REM behavior, which is reported to be frequent and elusive to stakeholders. Graham et al. (2005) find that CFOs believe that REM is common and that it decreases firm value. Further, Dichev, Graham, Harvey, and Rajgopal (2013) find that CFOs believe it is difficult for analysts to differentiate managers' REM from business decisions. Zang (2012) finds that managers use REM and AEM as substitute methods of managing earnings. Ahearne, Boichuk, Chapman, and Steenburgh (2016) identify factors that are associated with increased REM through the sales function, while Cheng, Lee, and Shevlin (2016) link reductions in REM to subordinate executives' greater influence and longer time horizon. Jarvinen and Myllymaki (2016) document a positive relation between REM and material weaknesses in internal control.[2]

A few recent studies report on experiments designed to examine managers' REM behavior or the role of uncertainty in REM. First, Asay (2018) manipulates the time between initial earnings management behavior (AEM in one experiment and REM in the other) and the reversal of the earnings management. He finds that AEM and REM are higher when the reversal period is farther away, and that managerial optimism mediates the relation between the time

[2] See a review of selected REM studies by Hermanson, Ackert, Popova, and Qu (2021).

period manipulation and earnings management. Second, Guggenmos (2020) examines the effect of an innovative company culture on REM, finding greater REM in more innovative settings. He further examines the effects of different ways of attempting to mitigate REM and finds the impact varies across cultures. Third, Hales, Koka, and Venkataraman (2018) show that accountability in the form of a strong board can reduce earnings management (both accrual and real). Fourth, Brink, Gouldman, Rose, and Rotaru (2020) find evidence that superiors' compensation structures can reduce subordinates' REM behavior. Finally, Commerford et al. (2019) address uncertainty in the REM arena, focusing on *auditors'* response to REM, rather than *managers'* REM behavior. Commerford et al. (2019) find that auditors facing possible REM look to other cues, such as whether the client beat or missed its earnings target, when evaluating management behaviors that could be REM or could be business decisions.

As we describe in the following section, people's behavior often changes when they are given the opportunity to justify a decision. To date, the literature has not examined whether justifying operating decisions to owners affects managers' REM behavior under varying levels of uncertainty. This is the gap our paper attempts to fill.

Effect of Justifying an Action

When people know they must justify their decision to an outside party, decision-making accuracy and consistency increase, while the impact of information processing biases decreases (Ashton 1990). In addition, when asked to justify in front of an audience, people may have knowledge of the audience preferences. People typically seek the approval of their audience, regardless of whether they know the views of the audience. Often when the viewpoint of the audience is known, people conform to the audience's perspective (Lerner and Tetlock 1999). In other words, when people know the preferences of their audience, they are more likely to

"target" their justification to that audience by seeking the most acceptable position (Tan, Jubb and Houghton 1997). Thus, justification should reduce managers' opportunistic behavior (Lundholm 1999, 2003; Bentley 2019).

In our study, although all managers are informed that the owners' goal is to maximize their project payoffs in the second period, only a subset of managers is given the opportunity to justify their decisions to the owners. Traditionally, managers are expected to act in the best interest of the owners and often provide narrative disclosures to explain their choices to stakeholders. Therefore, it seems natural to expect that justification will reduce self-serving behavior (in this case REM).

A recent experiment by Bentley (2019) suggests that owners can benefit when managers explain the reasons behind their actions. In Bentley's design, participants were asked to write narrative, open-ended explanations of their decisions to their "boss" who determined their performance payments. In the narrative disclosure treatment, agents were told that their boss would see their explanation. Bentley (2019) finds that agents are less likely to distort decisions to their personal benefit when they know an explanation will be expected, even when the narrative is unverifiable.

As in Bentley's design, some of the managers in our study have the opportunity to write open-ended explanations of their decisions to the owners. A key difference in our study from Bentley (2019) is our manipulation of uncertainty. Because uncertainty is prevalent when managers make operating decisions, an examination of the joint impact of uncertainty and justification is warranted.

Uncertainty and Opportunistic Behavior

People are not strictly selfish and often make decisions that are consistent with other-regarding preferences (Cooper and Kagel 2016). However, when people are faced with uncertainty about the best course of action, they tend to exercise discretion in ways that benefit themselves (Kunda 1990). Uncertainty creates an avenue for managers' opportunistic behavior. For example, Schweitzer and Hsee (2002) find that when there is uncertainty about project outcomes, there is more room to justify (to oneself) selfish behavior by reducing negative self-perceptions. Haisley and Weber (2010) show that subjective beliefs about outcomes are distorted by incentives to behave selfishly when there is high uncertainty. Furthermore, the preference for fairness to others is diminished when there is uncertainty about the consequence of selfish actions on others (Dana, Weber, and Kuang 2007). While the literature has provided insights into the impact of uncertainty on behavior, this literature has not included a justification manipulation.

The observed recent increase in REM has stimulated the search for measures to constrain REM (Commerford et al. 2016), with more accountability, such as justification, being a natural candidate. However, uncertainty is prevalent in situations where REM is attempted. Thus, it is important to examine the joint effect of justification and uncertainty. An important characteristic of our design is that an action that is selfish can appear to be beneficial to others. This feature is commonly observed in situations involving REM. For example, cutting a particular R&D project could be an optimal operating decision, rather than a decision that serves managers' own interests.

Hypothesis Development

In our experiment, the manager is asked to make a decision regarding the continuation of a project in an uncertain environment that captures the underlying structure of REM. In our environment, the choice that maximizes the owners' payoffs depends on the future outcomes of the project. When the outcome is good, the owners are better off if the manager chooses to keep the project. In contrast, when the outcome is bad, the manager and the owners all are better off if the manager drops the project. Keeping the project gives higher expected payoffs to the owners because the likelihood of good outcomes is high, while dropping the project gives higher payoffs to the manager.

This stylized environment is analogous to the implementation of REM using cuts to discretionary expenses. For example, managers may engage in REM to lock in bonuses tied to earnings targets by cutting investments, such as those in R&D. In practice, the future profitability of R&D projects is not observable to researchers. Therefore, it is unknown whether cutting investment is truly the optimal decision for the owners or simply used to achieve a target and lock in a manager's bonus (i.e., REM). In an experimental setting, we can control the distribution of future project outcomes. The likelihood of the good outcome is high, so keeping the project generates higher expected payoffs for the owners. Dropping the project represents REM.

We manipulate the uncertainty surrounding the future outcome of the project. The manager is informed of the precise likelihood of a good project outcome in the Known condition but not in the Unknown condition, so that uncertainty is higher in the Unknown condition. The distribution of project outcomes across treatments is held constant. Our second manipulation is whether the manager is asked to justify the project choice.

In our study, the opportunity to justify a project decision could influence the manager's behavior in two disparate ways. First, an accountability effect emanates from the manager's fiduciary duty to the owner. The act of explaining the reasoning behind a project decision to the owners increases the manager's accountability for the action chosen on behalf of the owners. The second influence of justification on managers is a disclosure effect. By justifying the project decision, the manager discloses more information to the owners, including why the chosen action is best for the owners. The consequences of accountability and disclosure vary depending on the degree of uncertainty surrounding project outcomes.

The accountability effect is likely to decrease REM in the Known condition, but not in the Unknown condition. Justifying one's actions to an audience may compel people to anticipate potential counter arguments and impose greater discipline on their arguments (Crowley and Zentall 2013). Justification creates scrutiny that can reduce self-serving behavior (Lerner and Tetlock 1999) and allow the manager to maintain a desirable image to the owners (an audience with a known preference). In our setting, from the owners' perspective, the best action is to keep the project if the likelihood of a good outcome is high, but to drop the project if the likelihood of a good outcome is low. In our Known condition, the best choice from the owners' point of view is to keep the project because the probability of a good outcome is high. Thus, an accountability effect is likely to discipline the manager to choose what is best for the owners and reduce REM. In our Unknown condition, uncertainty about the project outcome is high, which gives the manager wiggle room to appear accountable through justification when the manager wants to pursue self-interest. For example, a manager may lean toward a pessimistic view of the future outcome and drop the project, as both the manager and owners are better off dropping the project when future outcomes are bad. The accountability effect may not reduce the propensity of a

manager to drop the project in the Unknown condition because of the possibility that justification gives the manager opportunities to appear accountable.

A second influence of allowing the manager to justify a decision to the owners arises from a disclosure effect. As described previously, prior research suggests that disclosure can lead to moral licensing (Cain et al. 2005, 2011; Ackert, Church, Venkataraman, and Zhang 2019). With disclosure of a conflict of interest, a manager feels morally licensed to act in self-interest because conflicts of interest are transparent to the owners. Similarly, justifying project decisions in our experiment makes the reasons for managers' actions transparent to the owners. Therefore, managers can feel morally licensed to choose self-serving actions that also appear accountable to the owners. This moral licensing effect due to strategic justification may increase REM in our Unknown condition. For example, managers can disclose a pessimistic outlook for the project outcomes or emphasize the downside risk of a bad outcome. If so, dropping the project appears to be a good choice from the owners' perspective, even when the true intention of the manager is to maximize own payoffs. This type of disclosure allows managers to appear accountable. Such a "good" deed creates moral credit, which can lead to more selfish behavior (Merritt et al. 2010; Miller and Effron 2010) and make the managers feel morally licensed to engage in REM. In the Known condition, it is more challenging for a manager to advance a story that supports REM behavior that appears accountable to the owners. Thus, the disclosure effect through moral licensing is unlikely to occur.

Combining the two effects above, we predict that the impact of justification on REM depends on uncertainty. In Unknown condition, we expect that REM will increase with justification. There is more wiggle room for the manager to justify dropping the project by leveraging uncertainty and pointing to the possibility of a bad outcome. This strategic disclosure

allows managers to appear accountable to the owners, which gives them moral license to drop the project to serve their own self-interest and diminish the accountability effect. Overall, the disclosure effect is expected to dominate so that REM increases with justification in the Unknown condition. By contrast, in the Known condition, the accountability effect is expected to dominate, which is likely to reduce REM. In this case, the odds are unambiguously high for a good outcome, and the owners are likely to be worse off if the project is dropped. There is less wiggle room to justify self-interested behavior, and justification will correspond with the audience preference, which is to continue with the project.

Based on the above discussion, we predict an interaction between uncertainty and justification. Formally stated:

H1: Justification increases REM when outcome uncertainty is elevated.

In addition to the prediction about managers' project decisions, our discussion above suggests that justification is likely to be strategic in the Unknown condition. We expect that deliberate managers seek to appear accountable to the owners in their justification when the probability of a bad outcome is unknown by emphasizing the potential for loss if the bad outcome is later observed. However, their true intention is to maximize own payoffs. Such strategic behavior cannot be detected in archival data because the true intention is unobservable. In our experiment, we ask all participants to explain their project decisions in the PEQ. Comparing the PEQ explanations with justifications to the owners allows us to detect strategic disclosure in their justification.

METHOD

Overview

In our experimental setting, the subject takes the role of a manager whose task is to make a decision regarding the investment in a project on behalf of the firm's owners. A time dimension is an important feature for earnings management to occur. We adopt the simple case with two periods. In the first period, the manager decides whether to drop or keep a project. The project outcome, which can be either good or bad, realizes in the second period. Managers face uncertainty about the project outcome in the second period when making their decisions in the first period. We adopt a 2 × 2 experimental design, manipulating the information available to the manager regarding the probability of a good outcome (Known or Unknown) and the manager's ability to justify the drop/keep decision (Justification or No Justification).[3]

Participants

In Fall 2020, we recruited student participants from introductory managerial accounting classes at a large university. We invited participants through an online link sent to more than 300 students enrolled in five course sections. Potential participants were informed that their participation would require 10-20 minutes of time, and they would receive compensation through an electronic gift card. The average age of the 135 participants is 20.64 years. Students earned, on average, $12.61 for their participation.

[3] To refine parameters and ensure clarity, we ran a pilot session with Master of Accounting students in March 2020. The data collected from the pilot session are not reported here, as significant changes were made to the experimental instrument, including modification of the payoff table and addition of instruction repetition to promote subject comprehension.

Procedures

The experiment was conducted online using Qualtrics.[4] Each subject completed one round, comprised of two periods. Participants are informed that they manage multiple two-period projects on behalf of a firm's owners. The goal of the owners is to maximize the payoffs from the projects in the second period. In the first period, managers decide whether to drop or keep a particular project. This drop/keep decision in period one impacts their earnings in both periods.

Table 1, Panel A provides information about the manager's and owners' payoffs in the experimental currency, francs. The first period earnings are greater for the manager by dropping the project (100 francs) than by keeping the project (50 francs). This captures the short-term benefit of REM to the manager, such as getting a bonus by beating an earnings target. If the manager keeps the project, the second period earnings are contingent on the project outcome, which are 70 when the outcome is good and 30 when the outcome is bad. If the manager drops the project, the second period earnings are 50. The manager's total earnings from both periods are strictly higher if the project is dropped (150 francs) no matter what the project outcome is. However, the owners may be better off if the firm continues with the project. If the manager keeps the project, the owners earn 520 francs when the outcome is good and 400 francs when the outcome is bad. In comparison, the owner payoff is 450 if the manager drops the project. Before making a project decision, participants complete a quiz to assess their understanding of the payoffs.

[Insert Table 1 here]

The outcome of the project is determined by (electronically) drawing a chip from a transparent glass jar that includes chips of two colors. In all sessions, the manager observes a

[4] The complete instructions are included in the Appendix. The study is IRB approved.

picture of the jar, which allows an estimation of the ratio of chip colors. The jar contains 75 chips that represent a good outcome and 25 chips representing a bad outcome. Whether or not the percentage of a good outcome (75%) is disclosed to the managers is our manipulation of uncertainty. In the Unknown condition, the likelihood of a good outcome is unknown to both the manager and the owners. In the Known condition, managers know the likelihood of a good outcome, but the owners are not aware of this information.

Before making their drop/keep decision, all managers are asked to report a prediction of whether the outcome will be good or bad. At the end of a session, participants who correctly (incorrectly) predict the outcome earn additional compensation of $1 ($0). For each participant, the outcome subsequently observed is randomly determined within the Qualtrics program, with the probability of a good outcome of 75%. In the Unknown condition, we also asked participants to predict the number of chips that represent good outcomes. There is no compensation for this prediction.

Our second experimental manipulation surrounds managers' ability to explain the reasoning behind their investment decisions. In the Justification condition, participants are given the opportunity to justify the drop/keep decision. These participants are given a prompt of, "The Owners ask that you explain the reasoning behind your decision to DROP or KEEP. Please type in your response to the Owners here", and a text box in which they could explain their decision.[5] In the No Justification condition, participants are not given the opportunity to justify their decision. Panel B of Table 1 summarizes our 2x2 design.

[5] This is analogous to the SEC's (2008, 9110.1.a) focus on the MD&A section of the 10-K as providing "…a narrative explanation of a company's financial statements that enables investors to see the company through the eyes of management."

Next, the participants learn the outcome of the chip draw and their total earnings. They are asked to report some demographic information, including year of study, gender, age, and major in the PEQ. Participants are asked, "How important was the Owners' payoff to you when you make your decision to DROP or KEEP?", using a scale from 1 = not at all important to 7 = extremely important (*OwnerImportance*).[6] This question captures the manager's concern for the owners. Similarly, the variable *RiskTaking* is based on the PEQ question, "In general, how willing are you to take higher financial risk in order to realize higher returns?", on a scale from 1 = very unlikely to 7 = very likely.

When asked to evaluate how interesting they found the experiment on a 7-point scale, the average response was 5.27 or "interesting." When asked how they would characterize the money they earned for participation, the average response was 4.98 or a "somewhat large amount."[7] Finally, participants are asked to explain to the researchers how they chose the more likely outcome and their decision to drop or keep the project. The answers to the PEQ questions are useful for us to glean the true intention behind the participants' decisions. The contrast between the PEQ questions and the corresponding written explanations for the decisions in the Justification condition allows us to detect strategic justification.

EXPERIMENTAL RESULTS

This section has two parts. First, we analyze the project decisions. Second, we analyze the content of managers' written explanations supporting their project decisions. Of the 135

[6] After the experiment was run, we noted a typo in this question (a repeated "the"). We have no reason to believe that this error affects the results.
[7] The means for "interesting" and "money earned" are both greater than the scale midpoint ($p < 0.001$).

participants, 31 participants are excluded from our analysis because they made at least one mistake on the quiz.[8]

Analysis of Project Decisions

Our main dependent variable is the project decision, that is, whether to keep or drop the project. Dropping the project is analogous to REM, for the manager is altering a transaction to maximize own payoff. Thus, we analyze the frequency that participants choose to drop the project. Our main independent variables are the two manipulations: whether participants are asked to justify their project decisions (Justification or No Justification) and whether they know the probability of good project outcome (Known or Unknown).

Table 2 summarizes the proportion of dropped projects for each treatment. Figure 1 plots the proportion of dropped projects by condition. Although participants are strictly better off by choosing to drop the project, we observe in all four treatments that a large proportion of participants chooses to keep the project. Thus, we clearly reject the prediction of standard economic theory, which assumes agents only care about and maximize their own monetary payoffs.

[Insert Table 2 here]

[Insert Figure 1 here]

Consistent with our prediction, we find that the effect of justification on REM differs depending on uncertainty. Justification increases REM in the Unknown condition, but not in the Known condition as seen in Table 2. In the Unknown condition, justification significantly

[8] The highest rate of missing a quiz question is in the Unknown/Justification cell (n = 12). However, 5 of these 12 participants missed only one question. If we include all 135 participants in the full model in Table 3, the interaction term has p = 0.162, two-tailed (the interaction has p = 0.216, two-tailed, in the base model with n = 135). If we exclude from the sample only those who missed more than one question (leaving n = 114), the interaction term is significant in the full model (p = 0.043, two-tailed).

increases the likelihood of dropping the project. Specifically, the proportion of participants who drop the project is 0.32 without justification, while this proportion increases to 0.58 with justification. The difference is marginally significant ($p = 0.080$) using a Pearson Chi-Square Test. In the Known condition, justification does not have a significant effect on managers' project decisions. Specifically, the proportion of participants who drop the project is 0.25 with justification, while this proportion is 0.38 without justification. The difference is not significant ($p = 0.294$) using a Pearson Chi-Square Test. Overall, the effect of justification is not significant pooling over the Known and Unknown conditions. The proportion of participants who drop the project is 0.38 in the Justification condition and 0.35 in the No Justification condition, giving a difference that is not significantly different from zero ($p = 0.735$) using a Pearson Chi-Square Test.

When justification is available, whether the probability of project outcome is known has a significant effect on the likelihood of dropping the project. In the Justification/Known treatment, the proportion of participants who drop the project is 0.25, while this proportion is 0.58 in the Justification/Unknown treatment. The difference is significant ($p = 0.023$) using a Pearson Chi-Square Test. When managers are given the opportunity to justify, participants are more likely to drop the project when the probability of project outcome is unknown. When there is no justification, whether the probability of project outcome is known or not does not significantly impact project decisions ($p = 0.647$). The main effect of whether the probability of project outcomes is known or not is not significant. The proportion of participants who drop the project is 0.32 in the Known condition and 0.43 in the Unknown condition, which indicates no significant difference ($p = 0.247$).

To examine the factors that influence project decisions, we run probit regressions. The results are shown in Table 3. The dependent variable is the project decision, which is 1 if a participant drops the project and 0 if a participant keeps the project. The explanatory variables include our two manipulations, their interaction, and other control variables. The dummy variable *Unknown* is 1 in the treatment in which the probability of project outcomes is unknown and 0 otherwise. The dummy variable *Justification* is 1 in the treatment in which participants are asked to justify their project decisions and 0 otherwise. In the base model results reported in Table 3, the main effects of our two manipulations are not significant, and the overall model is not significant ($p = 0.137$). The interaction effect between our two manipulated variables is significantly positive ($p = 0.046$), suggesting that REM increases when justification is available and the probability of project outcomes is unknown. All p-values are two-tailed.

[Insert Table 3 here]

The control variables are *OwnerImportance*, *RiskTaking*, and *BusinessMajor* (coded 1 for business majors, else 0).[9] The full model results presented in Table 3 include all control variables. As with the base model, the main effects of our two manipulated variables are not significant, whereas the interaction between the two manipulated variables is significantly positive ($p = 0.019$).[10] That is, REM increases when justification is available *and* the probability of project outcomes is unknown. The coefficient on *OwnerImportance* is -0.29, which is significant ($p < 0.001$). This suggests that participants who care more about the owners' welfare

[9] The mean of *OwnerImportance* is 4.33 (moderately important), and the mean of *RiskTaking* is 5.13 (slightly likely). *BusinessMajor* is coded 1 for 93 business majors and 0 for 11 non-business majors.

[10] When added one at a time to the full model in Table 3, the following variables are not significant ($p \geq 0.24$ in all cases): time taken to complete the experiment, year in university, gender, age, accounting major versus others, participants' assessment of the interest of the case, participants' assessment of the money earned in the case, and whether the participants guessed correctly about the good or bad outcome. The interaction term is significant at $p \leq 0.029$ in all of these models.

are less likely to engage in REM. The coefficient on *RiskTaking* is not significant (p = 0.151).[11] The coefficient on *BusinessMajor* is 1.21 (p = 0.053), indicating that business majors are more likely to drop the project than non-business majors.[12]

Evidence of Strategic Justification

As we discussed in the development of our hypothesis, we expect strategic justification in the Unknown condition. That is, managers who drop the project may emphasize the potential losses in the bad outcome or the probability of a bad outcome in their justification to the owners. This justification makes them appear accountable to the owners when their true intention is to maximize own payoffs. In our experiment, we ask all participants to disclose the reasons for their project decisions in the PEQ. We measure true intention using the explanation in the PEQ. Comparing participants' justification to owners with their PEQ explanations allows us to detect strategic justification, although we recognize that this method may serve to understate the degree of strategic justification. Specifically, some participants may not reveal their true intentions in the PEQ, instead continuing with the explanation provided to the owners. This is a limitation of our approach.

We examine and compare the content of justifications to owners and PEQ explanations to shed light on strategic justifications. For participants who drop the project, there are two common types of narratives: one is to explicitly say that their decision serves their self-interest; the other is to emphasize the risk and loss in the case of a bad outcome. We classify the first type as "Self-interest" and the second as "Pessimistic tone." If a manager's justification to the owners

[11] If we remove *RiskTaking* from the full model in Table 3, the interaction term is significant (p = 0.018).
[12] Only 18 percent of the non-business majors dropped the project, versus 39 percent of the business majors. Rather than controlling for *BusinessMajor* in the full model, if we delete the 11 non-business majors from the sample (leaving n = 93), the interaction term remains significant (p = 0.036).

is classified as having "Pessimistic tone" but the PEQ explanation is classified as "Self-interest," strategic justification is indicated.

For participants who decide to keep the project, we also observe two common narratives. One is to explicitly say that they serve the best interest of owners; the other is to emphasize the potential gain and likelihood of a good outcome. We classify the first as "Owner interest" and the second as "Optimistic tone."

We classify all justifications to owners following the above classification criteria, but participants' explanations for project choice in the PEQ are noisy and do not always fall into one of the four categories. For example, some participants' explanations for their decision to keep the project indicate that they simply do not want to give up on the project. We label this explanation as "Quit-averse." We also observe that some explanations in the PEQ simply do not convey meaningful information. We label this category of explanation "No information."[13] Examples of no clear reason responses in the No Justification/Unknown treatment include, "I just guessed," "Keep will be smarter," and "I decided to keep it."

[Insert Table 4 here]

Table 4, Panel A summarizes frequencies for the classifications of the justification to owners. Table 4, Panel B summarizes frequencies the PEQ explanations. Comparing the justifications in Panel A with explanations in Panel B, we observe evidence of strategic justification for some participants who drop the project in the Unknown/Justification treatment. As we see in Panel A for the Unknown condition, among the 11 participants who drop the project in the justification condition, 7 of them are classified as "Pessimistic tone" in their justification to the owners. In their PEQ explanations, 3 of the 7 participants explicitly

[13] Two independent coders were used to code the narratives. The intercoder agreement was high (Cohen's (1960) kappa > 0.9), and any remaining disagreements were resolved between the coders.

acknowledge that their project decision is driven by "Self-interest" and 1 has shifted to "No information." Although the sample sizes are small, the difference between 7 Pessimistic Tone explanations in Panel A versus 3 in Panel B has p = 0.086 (Pearson Chi-Square Test).[14] The 3 participants who later cited "Self-interest" in the PEQ did not disclose their true intention to the owners, and instead attempted to justify their decision to the owner by referring either to the risk of the project or losses from bad outcomes. They strategically justified to the owners by using a pessimistic tone, even though their true intention is to maximize own payoffs. In archival data, true intent is not observable. Researchers cannot separate good intent versus bad intent with respect to REM-type decisions. Our experimental evidence suggests that disclosure through justification can allow managers to mask their true intent strategically. In the No Justification condition, such opportunities for strategic justification are absent.

Our analysis suggests that justification allows participants to strategically justify their decisions to drop when uncertainty surrounding project outcomes give them wiggle room to appear accountable to the owners. Without justification, we notice that there is an abnormally high number of participants who give no clear information in their PEQ explanations in the Unknown condition. Table 4, Panel B shows that in the No Justification/Unknown treatment, 7 participants who keep the project give no clear reasons in their PEQ. In the Justification/Unknown treatment, all participants who keep the project provide reasons for their choice. The difference in providing clear reasons between the two conditions is statistically significant (p = 0.046 Pearson Chi-Square Test). This difference in explanations suggests that justification has a significant impact on participants' motivation to keep the project. Without justification, more participants choose to keep the project without a clear reason for their choices.

[14] Specifically, we test a 2x2 table with rows of Justification to Owners versus PEQ and columns of Pessimistic Tone versus other response. We use a similar 2x2 approach in the other Chi-Square tests in this section.

The uncertainty about the project outcomes itself does not lead managers to drop the project. However, justification heightens awareness of the opportunity for strategic justification and leads to more managers dropping the project.

We also found that justification has a different impact among participants who keep the project. In the Known condition, good outcomes are more likely, and their payoffs do not decrease that much if they keep the project versus drop the project (150 vs. 120). Participants use an optimistic tone more often in the Known condition. As shown in Table 4, Panel A, in the justification to owners, 20 participants in the Justification/Known treatment use an "Optimistic tone" when they know that outcomes are likely to be good, but only 4 participants in the Justification/Unknown condition use an "Optimistic tone." The likelihood of using an "Optimistic tone" is significantly greater in the Known than in the Unknown condition ($p = 0.004$ Pearson Chi-Square Test). Similar results hold for the explanations in the PEQ when justification is available (17 vs. 3, $p = 0.024$). However, such a difference is not noticeable when there is no justification (12 vs. 9, $p = 0.236$). This indicates that justification makes the difference between the Known and Unknown condition more salient to participants who keep the project.

DISCUSSION AND CONCLUSION

Managers who engage in REM intend to mislead stakeholders about the goals that underlie their operating decisions. Because REM is designed to mislead and difficult to detect, its increase in recent years is of significant concern. This paper reports an experiment designed to study how uncertainty and justification of operating decisions impact REM. As in natural settings where managers have discretion in directing the firm's operating activities, managers in our experiment choose whether to drop a project to benefit themselves. We vary uncertainty about project outcomes and whether managers are asked to justify their project decisions. This

design allows us to study the joint effects of uncertainty and justification on managers' propensity to engage in REM.

Though prior research suggests that asking managers to justify their operating decisions to the firm's owners might reduce REM, we find that with justification managers are more likely to engage in REM-type behavior under high uncertainty. Some managers appear to use justification strategically to support their decisions when uncertainty is high. Managers can spin a story so that a selfish act will appear accountable to the owners using managerial disclosure. This behavior is consistent with moral licensing, in which managers are more likely to choose actions that benefit themselves when their incentives are transparent to the owners. This strategic disclosure is new to the moral licensing literature.

The result that justification can have a negative effect by increasing managers' opportunistic behavior when uncertainty is high is novel and has practical implications. In practice, when a manager makes an operating decision aimed to manage earnings, uncertainty is very likely to be a factor. We urge caution among stakeholders about the potential effect of justification when uncertainty is high. Justification can be used strategically by managers to promote selfish decisions in uncertain situations. While the literature typically focuses on the role of justification in promoting accountability to others, in some settings, justification can yield adverse effects. We also caution stakeholders to reflect on their reliance on managerial disclosures. Information disclosures may not transparently reflect true intentions and must be evaluated on a case-by-case basis. Though some managers engage in strategic disclosure, others do not. In fact, some of our managers show considerable concern for the owners in our experiment. They do not simply maximize their own payoff, as economic theory would predict.

Our study has limitations that can be addressed by future studies. First, our setting only captures the underlying economics of REM in situations where managers decide to cut or continue future potentially profitable projects. In practice, however, there are multiple ways to implement REM, in addition to the reduction of a discretionary expense. For example, REM may involve cutting expenditures on maintenance projects that could cause future risks (e.g., Guggenmos 2020). In contrast, our setting involves cutting projects that miss good future outcomes. It is possible that failing to prevent future risks has a different psychological effect from failing to capture future profits. Future studies can examine whether our main result of an interaction effect of justification and uncertainty remains in other REM settings. Second, we have not examined the reaction of owners to justification in our study. Our evidence suggests that some proportion of people justify strategically, while others do not. An interesting question is whether the owners can correctly adjust for strategic justification. Third, our study exogenously manipulates justification (i.e., mandatory disclosure). Future studies can let participants decide whether to voluntarily provide justification. It is possible that a strategic-type person is more likely to justify.

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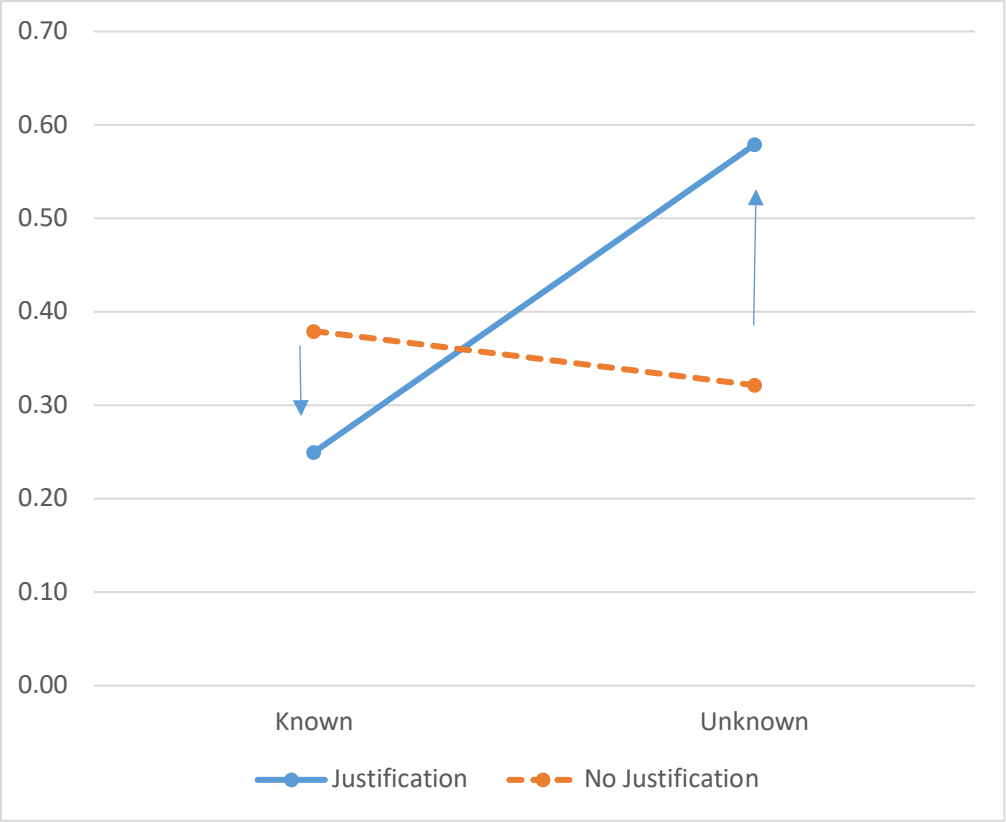
Figure 1
Proportion of Dropped Projects by Treatment



This figure reports the proportion of managers who choose to drop the project. Participants make project decisions in the role of a manager by choosing to keep or drop a project. The outcome of the project is determined by (electronically) drawing a chip from a transparent glass jar that includes chips of two colors. In all treatments, participants observe a picture of the jar which allows estimation of the ratio of chip colors. In the Unknown condition, they are told only that the probability of a good outcome is unknown to both the manager and the owners. In the Known condition, they are told the true probability of a good outcome (75%) and instructed that the owners are not aware of this information. In the Justification condition, participants are asked to explain their project decisions to the owners by typing in a text box, which is absent in the No Justification condition.

Table 1
Experimental Design

Panel A: Payoff Table

	Drop	**Keep (Good)**	**Keep (Bad)**
Your earnings in period 1	100	50	50
Your earnings in period 2	50	70	30
Your total earnings for both periods	150	120	80
Owners' payoff in period 2	450	520	400

Panel B: Treatments

Treatment	**Information Availability**	**Opportunity to Justify Decision**	**Number of Participants**
Known / No Justification	Probability known	No	29
Known / Justification	Probability known	Yes	28
Unknown / No Justification	Probability unknown	No	28
Unknown / Justification	Probability unknown	Yes	19

Table 2
Proportion of Dropped Projects by Treatment

	Known	**Unknown**	Difference	Total
Justification	0.25 n = 28	0.58 n = 19	-0.33 *p = 0.023*	0.38 n = 47
No Justification	0.38 n = 29	0.32 n = 28	0.06 *p = 0.647*	0.35 n = 57
Difference	-0.13 *p = 0.294*	0.26 *p = 0.080*		0.03 *p = 0.735*
Total	0.32 n = 57	0.43 n = 47	-0.11 *p = 0.247*	

This table reports the proportion of managers who choose to drop the project. Participants make project decisions in the role of a manager by choosing either to keep or drop a project. The outcome of the project is determined by (electronically) drawing a chip from a transparent glass jar that includes chips of two colors. In all treatments, participants observe a picture of the jar which allows estimation of the ratio of chip colors. In the Unknown condition, they are told only that the probability of a good outcome is unknown to both the manager and the owners. In the Known condition, they are told the true probability of a good outcome (75%) and instructed that the owners are not aware of this information. In the Justification condition, participants are asked to explain their project decisions to the owners by typing in a text box, which is absent in the No Justification condition.

Table 3
Probit Regression on Decision to Drop

	Base Model			**Full Model**		
Explanatory Variables	**Coef.**	**Std. Err.**	**P>z**	**Coef.**	**Std. Err.**	**P>z**
Unknown	-0.16	0.34	0.647	-0.40	0.37	0.280
Justification	-0.37	0.35	0.294	-0.37	0.38	0.327
*Unknown*Justification*	1.03	0.52	**0.046**	1.39	0.59	**0.019**
OwnerImportance				-0.29	0.08	**<0.001**
RiskTaking				-0.16	0.11	0.151
BusinessMajor				1.21	0.62	**0.053**
Intercept	-0.31	0.24	0.194	0.69	0.83	0.406
MODEL P>Chi-Square			0.137			**<0.001**

This table reports results of a probit regression with the project decision as the dependent variable, which is 1 if a participant drops the project and 0 if a participant keeps the project. The dummy variable *Unknown* is 1 in the treatment in which the probability of project outcomes is unknown and 0 otherwise. The dummy variable *Justification* is 1 in the treatment in which participants are asked to justify their project decisions and 0 otherwise. In the post experimental questionnaire (PEQ), participants are asked, "How important was the Owners' payoff to you when you make your decision to DROP or KEEP?" using a seven-point Likert scale that ranges from 1 = not at all important to 7 = extremely important (*OwnerImportance*). Similarly, the variable *RiskTaking* is based on the PEQ question "In general, how willing are you to take higher financial risk in order to realize higher returns?" using a seven-point Likert scale that ranges from 1 = very unlikely to 7 = very likely. *BusinessMajor* is 1 for business majors, else 0. P-values of ≤ 0.05, two-tailed, appear in bold.

Table 4
Content Analysis of Justification and Post-Experimental Explanations

Panel A: Justification to Owners									
		DROP			**KEEP**				**Grand Total**
		Self-interest	**Pessimistic tone**	**No info.**	**Owner interest**	**Optimistic tone**	**No Info.**	**Quit-averse**	
Justification	**Known**	3	4	0	1	20	0	0	28
	Unknown	4	7	0	4	4	0	0	19
Panel B: PEQ Explanations									
Justification	**Known**	3	3	1	2	17	1	1	28
	Unknown	7	3	1	3	3	0	2	19
No Justification	**Known**	8	2	1	3	12	2	1	29
	Unknown	6	3	0	2	9	7	1	28

Panel A reports classification of the justification to owners (only for participants in the Justification condition). Panel B reports the classification of explanations for project decisions in the PEQ (for all participants). For participants who drop the project, some of them mention they want to maximize their own payoffs (Self-interest), while others justify the decision to drop by emphasizing the downside risk from potential bad outcomes (Pessimistic tone). For participants who keep the project, some of them just mention that they work for the best interest of the owners (Owner interest). Some justify the decision to keep by highlighting that the good outcome is more likely (Optimistic tone). Some participants in their PEQ explanations reveal no information (No information). A few of them simply choose to keep because they do not want to give up (Quit-averse).

Appendix

Experimental Instructions

Following are complete experimental instructions for the treatment in which participants are aware of the probability of a good outcome and given the opportunity to justify their choices. Changes in the instructions for other treatments are detailed in italics and brackets. The experiment is conducted using the Qualtrics interface. Participants proceed to the next screen by clicking an arrow key. Here we indicate the paging by noting ***[Next screen]****.*

[*Introductory screen*]

Welcome to the research study!

This experiment is being conducted as part of a research project that examines the economics of decision-making. You will be asked to make a few financial decisions and complete a short questionnaire. You will be paid based on your decisions. Later you will receive an email from Reward Genius by Tango Card with a link to choose a gift card for the amount you earned. Many options of gift cards are offered by Reward Genius including Amazon, GrubHub, Target, Walmart, Apple, Best Buy, and Starbucks.

This experiment will require approximately 10-20 minutes and will not present you with any risks. Your participation in the experiment is entirely voluntary. Please note that minors are prohibited from participating in this research project. If you are under 18 years of age, please do not complete the experiment.

Only the experimenters and research assistants will have access to the experimental data, and you may be assured that any responses you provide during the course of the experiment will be held in strict confidence. Your records will be stored in password-protected files, and only study staff will be allowed to look at them. In addition, we will separate your email and name from your responses, so that you cannot be personally identified from the experimental materials. You may be assured that participation in this experiment will not affect your standing in any course or at the University.

If you have any questions about this research subsequent to your participation, you are free to contact [contact information deleted].

[*Next screen*]

By clicking the button below, you acknowledge that your participation in the study is voluntary, you are at least 18 years of age, and you are aware that you may choose to terminate your participation in the study at any time and for any reason.

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.

I consent. I am 18 years old or more. Begin the study. _____

I do not consent, or I am under 18 years old. Do not begin the study. _____

[*Next screen*]

In the experiment today you will be asked to make decisions under uncertainty. The compensation you receive for your participation will depend on the decisions you make. Payoffs are shown in francs, the experimental currency. For each 10 francs earned, you will receive $1.

Please be assured that all decisions are confidential. After all participants complete this study, you will receive an email from Reward Genius with a link to choose a gift card for the amount you earned.

[*Next screen*]

In the experiment today, you take the role of a manager. Assume that you manage multiple projects on behalf of the Owners of the firm. There are two periods. In the first period, you make a project investment decision. Specifically, you decide whether to DROP or KEEP one particular project, which we will refer to as Project A. In the second period, you make no decision. The project outcomes and payoffs are realized.

The Owners' goal is to maximize the project payoffs in the second period. You receive earnings in both the first and the second period. Your decision regarding Project A in the first period affects your earnings in both periods.

[*Next screen*]

Your earnings
Period 1: If you drop Project A, your earnings are 100 francs. If you keep Project A, your earnings fall to 50 francs because the project is costly to implement.
Period 2: If you drop Project A, your earnings are 50. If you keep Project A, your earnings depend on the outcome of Project A. Project A's outcome can be either GOOD or BAD. If it is GOOD, your earnings are 70. If it is BAD, your earnings are 30.

Owners' payoff
If you drop Project A, the Owners' payoff is 450. If you keep Project A, the Owners' payoff depends on the outcome of Project A. If the outcome is GOOD, the Owners' payoff is 520. If the outcome is BAD, the Owners' payoff is 400.

See a summary of payoffs below.

	Drop	**Keep (Good)**	**Keep (Bad)**
Your earnings in period 1	100	50	50
Your earnings in period 2	50	70	30
Your total earnings for both periods	150	120	80
Owners' payoff in period 2	450	520	400

[*Next screen*]

Your earnings
Period 1: If you drop Project A, your earnings are 100 francs. If you keep Project A, your earnings fall to 50 francs because the project is costly to implement.
Period 2: If you drop Project A, your earnings are 50. If you keep Project A, your earnings depend on the outcome of Project A. Project A's outcome can be either GOOD or BAD. If it is GOOD, your earnings are 70. If it is BAD, your earnings are 30.

Owners' payoff
If you drop Project A, the Owners' payoff is 450. If you keep Project A, the Owners' payoff depends on the outcome of Project A. If the outcome is GOOD, the Owners' payoff is 520. If the outcome is BAD, the Owners' payoff is 400.

See a summary of payoffs below.

	Drop	Keep (Good)	Keep (Bad)
Your earnings in period 1	100	50	50
Your earnings in period 2	50	70	30
Your total earnings for both periods	150	120	80
Owners' payoff in period 2	450	520	400

[*Next screen*]

Whether the outcome is GOOD or BAD will be determined by drawing a chip from a jar containing blue and white chips.

If a BLUE chip is drawn from the jar, the outcome is GOOD, and if a WHITE chip is drawn, the outcome is BAD.

The Owners do not know the number of blue or white chips in the jar, but you know that there are 75 BLUE chips and 25 WHITE chips in the jar.

[*In the treatment in which the probability of a good outcome is unknown, participants are instructed as follows: The Owners do not know the number of blue or white chips in the jar. You do not know, either.*]

[*Next screen*]

Please answer the following questions based on the payoff table below

	Drop	Keep (Good)	Keep (Bad)
Your earnings in period 1	100	50	50
Your earnings in period 2	50	70	30
Your total earnings for both periods	**150**	**120**	**80**
Owners' payoff in period 2	**450**	**520**	**400**

Suppose you decided to DROP Project A. Your total earnings for both periods are_____.

Suppose you decided to DROP Project A. Owners' payoff in period 2 is _____.

Suppose you decided to KEEP Project A and the outcome was GOOD. Your total earnings for both periods are _____.

Suppose you decided to KEEP Project A and the outcome was GOOD. Owners' payoff in period 2 is _____.

Suppose you decided to KEEP Project A and the outcome was BAD. Your total earnings for both periods are _____.

Suppose you decided to KEEP Project A and the outcome was BAD. Owners' payoff in period 2 is _____.

[*Next screen*]

	Drop	**Keep (Good)**	**Keep (Bad)**
Your earnings in period 1	100	50	50
Your earnings in period 2	50	70	30
Your total earnings for both periods	150	120	80
Owners' payoff in period 2	450	520	400

If a BLUE chip is drawn from the jar, the outcome is GOOD, and if a WHITE chip is drawn, the outcome is BAD.

The Owners do not know the number of blue or white chips in the jar, but you know that there are 75 BLUE chips and 25 WHITE chips in the jar.

[*In the treatment in which the probability of a good outcome is unknown, participants are instructed as follows: The Owners do not know the number of blue or white chips in the jar. You do not know, either.*]

Below is a picture of the jar.

Please enter your prediction for the outcome of Project A. You receive $1 if your prediction is correct. You predict the outcome is likely to be:

GOOD (Blue chip is likely to be drawn) _____.
BAD (White chip is likely to be drawn) _____.

Please enter your decision for Project A here:
KEEP _____.
DROP _____.

The Owners ask that you explain the reasoning behind your decision to DROP or KEEP. Please type in your response to the Owners here.

Dear Owners:

[*Participants are given a text box in which they respond to the prompt. They must enter a response to move to the next page but the length is not constrained.*]

[*For the treatment in which participants are not given the opportunity to justify their choices, the participants are not asked by the Owners to explain.*]

[*Next screen*]

The chip drawn is : [*The randomly drawn color is reported.*]
The outcome of Project A is : [*The outcome for the color drawn is reported.*]
You predicted the outcome to be: [*The subject's prior prediction is reported.*]
You get $[*0 or 1*] for predicting the outcome [*inaccurately, accurately*].
You choose to [*KEEP or DROP*] Project A.
Your total cash compensation is $[*Reported to student based on the chip prediction, chip drawn, and the Payoff Table.*]

[*Next screen*]

What year are you in university? [*1, 2, 3, 4*]

Your gender is: [*Response is open-ended.*]

Your age is: [*Response is open-ended.*]

Your major is: [*Response is open-ended.*]

In general, how willing are you to take higher financial risk in order to realize higher returns?

	Very unlikely	Moderately unlikely	Slightly unlikely	Neither likely nor unlikely	Slightly likely	Moderately likely	Very likely
Take financial risk							

How important was the Owners' payoff to you when you make your decision to DROP or KEEP?

	Not at all important	Slightly important	Somewhat important	Moderately important	Important	Very important	Extremely important
Payoff to the Owners							

How interesting did you find this experiment?

	Not interesting at all	Slightly interesting	Somewhat interesting	Moderately interesting	Interesting	Very interesting	Extremely interesting
You find this experiment							

For the time spent, how would you characterize the amount of money earned for participating in this experiment?

	Very small amount	Moderately small amount	Somewhat small amount	Neither too much nor too little	Somewhat large amount	Moderately large amount	Large amount
Money earned							

[*Next screen*]

Today you were asked to predict the most likely outcome for Project A (GOOD or BAD). Please briefly explain how you made this choice.

[*Participants are given a text box in which they respond to the prompt. They must enter a response to move to the next page but the length is not constrained.*]

You are asked to make decisions on whether to DROP or KEEP a project. Please briefly explain how you made this decision.

[*Participants are given a text box in which they respond to the prompt. They must enter a response to move to the next page but the length is not constrained.*]

[*Next screen*]

Thank you for your participation. You will receive an email later from Reward Genius by Tango Card to choose a gift card for the amount you earned. The day after this study expires, you will receive an email from Tango Card to claim your gift card. To initiate payments, Tango Card needs to know your email and first name.

Please type your [university] email here: _____.
Please type your first name here: _____.

Again, your decisions are confidential. The above information is collected only for the payment purpose. Researchers do not keep records of any personal identification information.

Confidentiality is important for this study. Please do not communicate any information related to the study to others. Thank you!

[*Next screen*]

We thank you for your time spent taking this survey.

Your response has been recorded.