An Investigation of Monitoring Frequency and Slack Allowance on Reporting Honesty

ABSTRACT

Businesses that use participative budgeting commonly face the problem of subordinates introducing budgetary slack into the planning process in a manner that harms the organization. This study examines budgetary reporting behavior in response to two key features of a monitoring system, the frequency of monitoring (increasing versus decreasing) and thresholds in a monitoring system that determine an allowable level of budgetary slack (low versus high slack allowance). Based on prior theory and literature, we develop hypotheses and research questions regarding the effects of these monitoring features on subordinates' slack creation. We test our predictions in a multiple-round experimental setting that uses economic incentives. Participants' actions are consistent with the strategic creation of slack to maximize wealth (to the extent permitted given the constraints of the monitoring system) rather than preferences for honesty. Of the monitoring systems imposed, a low slack allowance combined with high monitoring frequency that decreases over time is most effective in reducing slack creation.

Keywords: honesty, budgetary slack, participative budgeting, controls, monitoring.

I. INTRODUCTION

This study examines how monitoring strategies affect managerial honesty in a participative budgeting setting. Many organizations use participative budgeting to efficiently coordinate cost communications between subordinates and the organization (Brown, Evans, and Moser 2009). Subordinate managers often have private information that can benefit the organization. Organizations expect subordinates to efficiently utilize resources in a manner that is most beneficial to the organization; this, however, may be counter to the interests of local management. It is possible that subordinate management may take advantage of information asymmetry in order to benefit themselves through the self-interested creation of budgetary slack.

Prior literature finds that introducing information systems that reduce information asymmetry, such as formal controls and monitoring, can have mixed success in influencing subordinate behavior (e.g., Abdel-Rahim and Stevens 2018; Hannan, Rankin, and Towry, 2006; Rankin, Schwartz, and Young 2003; Schatzberg and Stevens 2008). While such features can reduce slack creation, they can also cause subordinates to focus less on individual preferences for honesty and more on self-interests. Further, the way in which controls are implemented can effect subordinates' perceptions of organizational intent. Negative reciprocity effects can then potentially motivate subordinates to engage in dysfunctional behavior (Christ 2013). Thus, care must be taken when implementing controls to ensure that subordinates' responses are consistent with organizational objectives.

The availability and variety of monitoring practices have increased in response to advances in technology and access to data. Companies may take advantage of such advances to implement automated formal controls, which present the possibility of increased monitoring frequency and/or rigor. However, organizational resources are often constrained, which limits the

time and money that can be devoted to variance investigations associated with the increased prevalence and magnitude of data that may emerge from automated monitoring practices. Thus, determinations must be made about many features of these systems, such as the frequency with which monitoring is imposed and rules underlying which variances will be investigated. This study examines how slack creation may be affected by two key elements that may occur in automated monitoring systems: changes in the frequency of monitoring and, if a review is conducted, the strictness of the threshold that determines whether slack creation will be penalized (i.e., the level of budgetary slack allowed by the system).

We test subordinates' responses to changes in monitoring frequency and differing levels of slack allowance in an experimental setting. Participants assume the role of manager in a company and possess private information about the company's actual costs. Any costs reported to the organization in excess of actual costs (i.e., budgetary slack) are initially retained by the manager. However, the manager's report may be subject to a review, in which any slack created may be eliminated. The monitoring frequency (increased vs. decreased) and the slack allowance (high vs. low) are manipulated between participants. For the increased monitoring frequency treatment, participants experience 12 decision-making rounds where reviews occur with a low frequency (25 percent of rounds audited), followed by 12 decision-making rounds where reviews occur with high frequency (75 percent of rounds audited). Participants in the decreased frequency treatment experience the 12 high audit frequency rounds prior to the 12 low audit frequency rounds. If an audit occurs, participants in the high slack allowance condition are penalized by having their slack withdrawn if the slack exceeds 75 percent of the available slack in that round. Participants in the low slack allowance condition are penalized by having their slack withdrawn if the slack exceeds 25 percent of the available slack in that round.

Results indicate that a low slack allowance combined with high monitoring frequency is most effective in reducing slack in the first 12 rounds. This effectiveness in slack reduction persists throughout the experiment, even when monitoring frequency decreases. Subordinates in the high slack allowance treatments significantly increase slack creation in the second set of rounds, regardless of whether monitoring frequency increases or decreases. However, subordinates in the low slack allowance treatments exhibit no significant change in the levels of slack created across the two sets of rounds. Overall, this pattern of results is consistent with the imposition of controls causing participants to create slack strategically rather than focus on preferences for honesty.

This study has implications for organizations and internal auditors as they consider the most effective ways to implement auditing procedures with increased automation while balancing the costs and benefits of these procedures. With increasing information and affordable technologies available to organizations, many have begun to utilize automated auditing practices. Research indicates many potential benefits to the effective use of these practices. However, implementing automated auditing practices involves high costs of entry and ongoing costs (Kuhn and Sutton 2010). In addition, internal auditors may become overwhelmed by both the quantity and granularity of data available (Alles, Brennan, and Kogan 2006). Our results suggest that frequent, strict monitoring in early periods effectively reduces slack in early periods, and this behavior persists once monitoring decreases. Thus, it may be that implementing monitoring in a similar manner may be the most efficient and cost-effective way to achieve desired compliance results.

II. BACKGROUND AND HYPOTHESES

Budgetary Slack, Monitoring, and Controls

Subordinate managers in a company often possess information about aspects of their local environment that is not known by their superiors. Involving subordinates in the budgeting and planning process enables them to use this information to benefit the company. However, subordinates may also use the private information to benefit themselves at the company's expense. This agency conflict and factors that influence decision-making in participative budgeting settings have received much attention in the accounting literature (see Brown et al. 2009 and Brink, Coats, and Rankin 2018 for reviews of the participative budgeting literature).

Evans, Hannan, Krishnan, and Moser (2001) examine subordinates' tendency to engage in self-interested wealth maximization through the creation of budgetary slack. Despite unambiguous incentives to create slack, Evans et al. (2001) find that subordinates exhibit preferences for honesty in that they do not always act in a purely self-interested manner by creating the maximum amount of budgetary slack. Mittendorf (2006) suggests that subordinates experience disutility from not reporting honestly; this disutility causes subordinates to limit their consumption of budgetary slack. The participative budgeting literature has built upon the straightforward setting used in Evans et al. (2001) to investigate the incremental impact on slack creation and managerial honesty of various features that may be present in the participative budgeting setting, such as the presence of information systems or monitoring controls.

Prior literature indicates that monitoring and controls may have unanticipated negative consequences on managerial behaviors. Hannan, Rankin, and Towry (2006) examine the effects of information system presence and information system precision on subordinate honesty. They compare a system that delivers more precise information about subordinates' honesty to a system

that delivers less precise information, which makes it more difficult for superiors to detect dishonesty. Even though the information system provides superiors with increased information about subordinate dishonesty, they must accept all cost reports. Thus, the information system affects subordinates' ability to appear honest, while still permitting them to engage in slack creation. Hannan et al. (2006) find that subordinates choose to appear honest under a coarse (less precise) information system more often than they choose to report honestly under a fine (more precise) information system. Hannan et al. (2006) posit that precise information systems may lead to lower levels of honesty because subordinates' marginal cost of appearing honest is higher under precise systems. Thus, it appears that strengthening an information system's ability to reduce information asymmetry may not have the desired result of increasing honesty when the information system does not directly impact subordinates' ability to create slack.

Christ (2013) builds upon research that investigates the potential for formal controls to lead to dysfunctional behaviors. Specifically, she investigates the impact of controls on employees' beliefs about management intentions. Christ draws on reciprocity theory to hypothesize that participants will be influenced by the intentionality of the control. Reciprocity is essentially a behavioral response to the perceived intent of an action (Christ 2013; Falk and Fischbacher 2006). If one party perceives another's actions as having positive intent, then the first party reciprocates with positive behaviors. Conversely, actions perceived to have negative intent lead to negative reciprocity (Falk and Fischbacher 2006). Christ (2013) finds, in her setting, that formal controls cause participants to negatively influence firm profit by exerting low effort when they interpret the intent of the control to be a signal of distrust. However, the formal control does not lead to negative consequences when participants are uncertain of the intentions underlying the control, or if they do not view the control as a signal of distrust.

Overall, the literature suggests that features designed to reduce the negative consequences of information asymmetry in participative budgeting settings should be designed with caution. Imposing controls or other forms of monitoring can have unintended adverse consequences on subordinates' actions. Controls may reframe the reporting decision from that of a moral question to one of strategic interaction where subordinates' incentives to act honestly are crowded out by incentives to act in a self-interested manner.

Monitoring Frequency

In the wake of the vastly publicized fraud case of WorldCom, as well as major frauds such as the Enron and HealthSouth management scandals, organizations increased their focus on more effective means of monitoring, such as automated auditing systems (Kuhn and Sutton 2006; Alles, Kogan, and Vasarhelyi 2008). Improved technologies and increased access to data allow new approaches to measurement and reduce what would otherwise be manual work during the audit process (Vasarhelyi 2013). Companies may take advantage of such systems to increase the precision and frequency of monitoring through the use of real-time information, such as transactional data, inventory tracking, and video and image data. These practices have the potential to provide benefits to organizations.

However, questions remain about the best ways to implement these practices and make use of available data and technology. Implementing automated auditing practices implies a change in monitoring frequency and/or intensity. When applied to the participative budgeting setting, increases in monitoring frequency may lead to reductions in budgetary slack and more accurate budgets. Webb (2002) finds that the presence of variance investigations decreases slack creation. Consistent with this, we posit that subordinates experiencing an increase in monitoring frequency will respond by decreasing slack.

H1: Subordinates who experience an increase in monitoring frequency will respond by creating less slack than when monitoring frequency was lower.

As companies continue to learn how to best take advantage of the increased ability to implement monitoring related to the prevalence of data, we may expect them to engage in a calibration process in which they explore various levels of monitoring frequency or monitoring strength. The question arises, therefore, regarding how subordinates will respond to increases and decreases in monitoring frequency. Prior literature highlights that the imposition of controls may be perceived as a signal of distrust from the organization, causing subordinates to reciprocate with adverse behaviors when possible (Frey 1993; Christ 2013). A decrease in monitoring frequency will naturally follow a period of higher monitoring frequency. The heightened salience of controls under a high monitoring frequency may deemphasize moral motivations, such as preferences for honesty. As a result, subordinates may strategically view a decrease in monitoring frequency as an opportunity to maximize wealth through greater slack creation. However, it is also possible that subordinates may interpret decreases in monitoring frequency as a signal of trust from the organization or a reward for previous good behavior. If so, they may reciprocate by reporting more honestly. This leads us to the following set of competing hypotheses:

H2a: Subordinates who experience a decrease in monitoring frequency will respond opportunistically and create more slack than when monitoring frequency was high.

H2b: Subordinates who experience a decrease in monitoring frequency will reciprocate by creating less slack than when monitoring frequency was high.

Slack Allowance

The question arises as to whether, if possible, it would be in a company's best interests to eliminate all budgetary slack. In practice, allowing some level of budgetary slack is useful for organizations. Slack provides management the flexibility to effectively cope with uncertainties, such as inflation or unanticipated adverse events (Merchant and Manzoni 1989; Lillis 2002; Davila and Wouters 2005). Slack can also facilitate innovation and experimentation (Van der Stede 2000). Davila and Wouters (2005) document an organization that successfully permitted budgetary slack to facilitate subordinates' motivation and ability to achieve organizational goals. The organization purposefully implemented a control system that facilitated an acceptable level of slack. Specifically, in regard to certain budgets, small variances did not trigger intervention, although larger unexplained variances were investigated. This literature illustrates that organizations may find that some levels of budgetary slack are acceptable in practice.

Further, costs associated with eliminating all slack may be prohibitive. As such, decisions must be made regarding how the organization will use information. One concern regarding the implementation of monitoring practices is the relation between the implementation strategy and investigation efficiency. For example, an organization may implement a new automated procedure which significantly increases the quantity of discrepancies internal auditors will have to investigate. This may result in the internal audit staff being overwhelmed with more potential incidents of misreporting than they can effectively manage (Alles et al. 2006). In addition, the increased rigor of testing may reduce efficiencies by requiring internal auditors to investigate situations that are essentially false positives – items the system flags that do not reflect error or misstatement. Similar to the organization in Davila and Wouters (2005), one potential strategy to manage inefficiency is to set materiality thresholds that establish cutoffs for items discovered in

the monitoring process that will result in further action. In a budgeting setting, this may translate to setting a level of slack the organization will allow.

Slack Allowance and Hurdle Rates

The notion of setting an acceptable level of slack is related to the concept of hurdle rates. Antle and Eppen (1985) describe the use of hurdle rates in contracts to manage budgetary slack. In the typical hurdle rate contract, the subordinates' cost report is accepted if the reported cost is less than or equal to the hurdle. However, if the subordinate's cost report exceeds the hurdle, the project is rejected. Antle and Eppen's (1985) proposed hurdle contract depends on the assumption that the superior can credibly commit, *ex ante*, to upholding the hurdle contract (Brink et al. 2018). It may be difficult to expect a superior to uphold a hurdle contract without implementing automated processes, because the superior must commit to an irrational action (i.e., the hurdle contract essentially requires the superior to reject profitable budgets). One method to impose commitment to a hurdle would be use of slack allowance thresholds implemented through a monitoring system.

Limited research has investigated the use of hurdle contracts. Evans et al. (2001) examine a hurdle rate contract enforced by the experiment's software, which they label a Modified Trust Contract (MTC). They find that MTC use results in lower levels of honesty compared to a trust contract, but superiors achieve higher profits. Rankin, Schwartz, and Young (2003) compare an automated hurdle contract to a non-binding hurdle contract that allows superiors discretion over acceptance or rejection of cost reports. Similar to Evans et al. (2001), they find that firm profit is greater under a hurdle rate contract. However, increased profit comes at the cost of subordinate honesty. Subordinates tend to report the maximum slack allowed by the hurdle rate rather than reporting honestly. This research suggests that hurdle rates reframe the budgeting setting so it

decreases emphasis on subordinate motivations such as honesty and increases emphasis in conforming to the mandated level of slack permitted by the hurdle rate.

We extend this literature by examining the use of materiality thresholds imposed automatically via a monitoring system. Such thresholds essentially create hurdle rates for slack creation if a review of the subordinate's cost report occurs. However, our setting deviates from prior literature in that there is uncertainty in each period as to whether an audit will occur, and uncertainty regarding the exact threshold imposed by the system (i.e., the slack allowance). Rather than providing an exact level of slack permitted by the threshold, the system communicates to the participant that the threshold will be more or less strict. As such, subordinates have some information about the potential presence of a threshold but must learn the exact nature of this threshold as is the case in prior literature, where the superior has rejection authority.

Taking prior literature into account, we predict that subordinates will adjust their budget reports in response to the presence of the slack allowed by the system. Specifically, we expect the potential for review combined with the presence of a limit to slack allowed will shift subordinates' focus from honesty concerns to fear of rejection, leading them to strategically determine what slack they will be allowed to report. In general, this would suggest that slack creation should decrease as the level of slack allowed by the system decreases. However, uncertainty regarding whether or not a control will be imposed and uncertainty regarding the exact level of the slack that will be allowed may interfere with subordinates' conformance with this prediction. Further, as discussed earlier, the imposition of controls can lead to negative reciprocity which may cause subordinates to respond negatively to slack allowances perceived to be overly strict. Finally, prior literature demonstrates that increases in control precision do not

always lead to corresponding increases in honesty (Hannan et al. 2006; Newman 2014). Thus, there is the potential for subordinates' preference for honesty to play a larger role when slack allowances are less strict. Given this tension from prior literature, we pose the following research questions:

> **RQ1:** Will subordinates subject to low levels of slack allowance engage in less slack creation than will subordinates subject to high levels of slack allowance?
>
> **RQ2:** Will subordinates' reactions to changes in monitoring frequency (increased vs. decreased) differ when the level of slack allowance is high as compared to when the level of slack allowance is low?

III. METHOD

Task

To test our hypotheses and research questions, we conducted a laboratory experiment utilizing economic incentives. The experiment was programmed in z-Tree (Fischbacher 2007) and conducted at the Experimental Laboratory for Economics and Business Research at Virginia Commonwealth University. Participants were assigned the role of manager of a hypothetical company. In this role, they reported costs to the corporate headquarters for two sets of 12 decision rounds (24 decision rounds total). In each round, participants received private information about their actual costs, which ranged from $5 to $25. Costs for each period were randomly preselected to control for differences in costs across treatment groups. Participants were allowed to report any cost equal to or greater than their actual costs up to the maximum of $25. Any costs reported in excess of their actual costs constitute budgetary slack. Specifically, participants received the following information:

> You will now assume the role of a regional production manager for Banner's Widget Company. As manager you will receive private information about your actual costs for the period. Actual costs will range between $5 and $25. Headquarters knows that costs range between $5 and $25, but headquarters will not know your actual costs.

> Therefore, you must report your costs to Headquarters. Headquarters will transfer the amount reported to you. If you report costs higher than your actual costs, this will result in excess money being sent to you from Headquarters.

For each round's initial earnings calculations, participants received a $4 base salary plus any budgetary slack created. Therefore, as with many prior studies (e.g., Brink, Coats, and Rankin 2017; Douthit and Stevens 2015; Evans et al. 2001; Newman 2014; Rankin, Schwartz, and Young 2008), subordinates have monetary incentives to create budgetary slack. The base salary ensured that participants would have positive earnings for the period even if they elected not to create budgetary slack.

Conditional upon the treatment, some costs reports were selected for review. If a review occurred, any costs reported in excess of actual costs (i.e., slack) were compared to the level of slack deemed acceptable by the company (i.e., slack allowance). If the slack exceeds the slack allowance, then any earnings from slack were withdrawn from the participant's earnings for the decision round. However, participants retained their $4 base salary for the round. The frequency of monitoring and slack allowance were manipulated independent variables (details provided in the next section). Participants' range of possible earnings in each decision round ranged from a minimum of $4 (base salary only) to $24 (actual costs of $5 with maximum slack created by reporting costs of $25). Participants were paid for one randomly selected round from each of the two sets of 12 decision rounds. Participants also received a fixed show-up fee of $5.

Independent Variables

There are five experimental conditions resulting from a 2x2+1 design. The change in monitoring frequency (increase vs. decreased) and slack allowance (high vs. low) were manipulated between participants. In addition, observations were collected for a control cell where there was no review of cost reports.

Change in Monitoring Frequency

The change in monitoring frequency (increased vs. decreased) was manipulated between participants. For the increased frequency treatment, reviews occurred with low frequency (25 percent of rounds reviewed) in the first set of 12 decision rounds and with high frequency (75 percent of rounds reviewed) in the second set of 12 decision rounds. Participants in the decreased frequency treatment experienced 12 high monitoring frequency rounds before the 12 low monitoring frequency rounds.

To introduce the monitoring frequency manipulation, participants were provided the following information before the first set of 12 decision rounds:

> Recently, Headquarters has implemented a new system that randomly selects some costs reports for review. Not all periods will be reviewed.

Following this statement, the instructions provided information about the slack allowance (described in the next section). To introduce the change in frequency, participants received the following information before the second set of 12 decision rounds:

> Headquarters has decided to make an adjustment to the review process. Specifically, the frequency of random reviews will be **decreased** {**increased**}. Therefore, you will experience **less** {**more**} periods where your cost report is reviewed. All other features of your reporting process will remain the same.

Slack Allowance

The slack allowance was manipulated between participants at two levels: low (25 percent of the slack available in a round allowed) and high (75 percent of the slack available in a round allowed). Slack allowance was held constant across all decision rounds in an experimental session. To introduce the slack allowance, manipulation participants were provided the following information before the first set of 12 decision rounds:

> Headquarters is willing to accept a **relatively low** {**relatively high**} level of excess cost reporting. Therefore, Headquarters has set a maximum level that it deems as acceptable

> for excess cost reports. You do not know Headquarters' maximum level of acceptable excess costs.
>
> For each period in which a review is conducted, the system checks your reported costs against your actual costs for the period. If you reported higher costs than your actual costs, the system will provide a red flag if the excess costs reported are higher than the maximum level Headquarters is willing to tolerate. If a red flag is triggered, any excess costs you reported will be removed from your earnings for the period.

The exact calculation of slack allowance was not provided to prevent participants from simply calculating an amount they could report that would always be accepted.

Dependent Variables

The primary dependent variable of interest, Average % Slack, is the slack created by participants scaled by the slack available. Specifically, we calculate Average % Slack as follows: (Cost Reported – Actual Costs) / ($25-Actual Costs).

Following each set of decision rounds, we gathered participants' perceptions of the monitoring system by asking for their level of agreement with the following statements: (1) I feel that Headquarters trusts me as an employee; (2) I feel that the budgetary review function is in the best interests of the company; (3) I think the review process put in place by Headquarters is fair; and (4) The chance of a review impacted my willingness to report costs that were higher than my actual costs. Participants responded to each statement on a seven-point scale where one = Strongly Disagree, and seven = Strongly Agree.

Understanding Checks, Manipulation Checks, Post-Experimental Questionnaire

Participants responded to understanding checks throughout the experimental instructions to ascertain whether they understood key elements of the instructions. Specifically, we tested participants' understanding of how the creation of slack impacted their earnings in each period, how Headquarters described the slack allowance, and whether the number of reviews would increase or decrease in the second set of decision rounds. Any misunderstandings about these

key features of the experiment were corrected before participants were allowed to continue to the decision rounds. At the conclusion of the experiment, participants completed a post-experimental questionnaire that included additional questions testing participants' perceptions of the experiment and a series of demographic questions.

IV. RESULTS

Descriptive Statistics

Using the university's Online Recruitment System for Economic Experiments (ORSEE), we recruited 123 student participants; 63 percent were female. To test that our instructions were clear and that manipulations were successful, we asked several understanding check questions during the experiment and did not proceed until all participants demonstrated an understanding of the key information underlying the experimental manipulations and how their earnings were calculated.

Table 1 presents the descriptive statistics for our variables of interest. Across all participants and all rounds, the mean Average % Slack was 55.7 percent (standard deviation = 0.221), indicating that participants only attempted to take a little more than half the slack available on average. For the control cell, where there was no slack monitoring, the mean Average % Slack was 61.7 percent (standard deviation = 0.337). An untabulated test indicates that the Average % Slack created for all rounds was marginally higher ($t = 1.368$, $p = 0.087$, one-tailed) for the control than for the treatment cells, which had a mean Average % Slack of 54.47% (standard deviation = 0.189).

[Insert Table 1 about here]

Monitoring Frequency Change and Slack Allowance

Table 2 presents the results of a repeated measures analysis of the effect of Frequency Change and Slack Allowance on the Average % Slack created in each of the two sets of decision rounds. The repeated dependent measure, Decision Set, is the Average % Slack for the first set of 12 decision rounds and the second set of 12 decision rounds. Panel A reports the tests of within-subjects effects. The significance of Decision Set ($F = 7.302$, $p = 0.008$) indicates that the Average % Slack for rounds 1-12 and rounds 13-24 is significantly different across treatments. Further, Decision Set interacts significantly with Frequency Change ($F = 4.155$, $p = 0.044$) and Slack Allowance ($F = 4.481$, $p = 0.037$). Panel B of Table 2 reports the tests of between-subjects effects. The analysis indicates that Slack Allowance ($F = 11.773$, $p = 0.001$) and the interaction between Frequency Change and Slack Allowance ($F = 5.744$, $p = 0.018$) significantly affect Average % Slack created. However, the main effect for Frequency Change is not significant ($F = 0.109$, $p = 0.742$). Figure 1 and Figure 2 illustrate the patterns underlying the observed interaction effects, and Table 3 presents the underlying cell means and simple effects.

[Insert Table 2 about here]

Figure 1 illustrates the treatment effects on Average % Slack across the two decision sets. When Slack Allowance is low, participants' slack creation does not change significantly between Rounds 1-12 and Rounds 13-24 for either Frequency Change treatment. Specifically, Table 3, Panel A reports that the mean Average % Slack did not differ significantly between rounds 1-12 and rounds 13-24 under the Low Slack Allowance treatment when frequency increased ($t = -0.895$, $p = 0.380$) or when frequency decreased ($t = -1.26$, $p = 0.218$). However, when Slack Allowance is high, participants' slack creation increases between rounds 1-12 and rounds 13-24. This increase occurs whether monitoring frequency increases or decreases. Specifically, Table 3

Panel B reports that the mean Average % Slack is significantly higher in rounds 13-24 than in rounds 1-12 under the High Slack Allowance treatment when frequency increased ($t = -2.263$, $p = 0.003$) and when frequency decreased ($t = -2.756$, $p = 0.011$).

This pattern of results allows us to address our hypotheses. First, H1 predicts that subordinates who experience an increase in monitoring frequency will respond by creating less slack than when monitoring frequency was lower. We do not find support for this hypothesis. Rather, we find no significant change in slack creation in the Low Slack Allowance treatment and an increase in slack creation for the High Slack Allowance treatment. Next, we present competing hypotheses for H2. Our results are consistent with H2a, which predicts that subordinates who experience a decrease in monitoring frequency will respond opportunistically and create more slack than when monitoring frequency was high. Consistent with H2a, we observe a significant increase in slack creation for both the Low and High Slack Allowance treatments.

[Insert Figure 1 and Table 3 about here]

RQ1 asks whether subordinates subject to low levels of slack allowance will engage in less slack creation than subordinates subject to high levels of slack allowance, and RQ2 asks whether the change in monitoring frequency will interact with slack allowance. While Table 2 indicates a significant main effect of Slack Allowance, it must be interpreted in light of the significant interaction effects. Additional details underlying these interactions are demonstrated in Figure 2, which illustrates the treatment effects for each of the decision sets separately.

Consistent with Table 2, Figure 2 illustrates that there is a significant interaction between Frequency Change and Slack Allowance in each Decision Set with the nature of the interaction differing between the two Decision Sets. In rounds 1-12, the Average % Slack in the High

Frequency, Low Slack Allowance treatment is significantly lower than all other treatments (p-values < 0.05, untabulated). In rounds 13-24, the Average % Slack for the Low Slack Allowance treatment is consistently lower slack than for the High Slack Allowance treatment (p-values < 0.10, untabulated). The Average % Slack for the High Slack Allowance treatment is significantly lower when the monitoring frequency is high than when it is low ($t = 2.593$, $p = 0.013$, untabulated). Overall, this pattern of results reveals that in response to RQ1, subordinates subject to low levels of slack allowance engage in less slack creation than do subordinates subject to high levels of slack allowance in all cases except in the first 12 rounds when monitoring frequency is low.

[Insert Figure 2 about here]

Analysis of Round Effects

Table 4 presents the results of repeated measures analysis investigating the trends over each set of decision rounds. For both decisions sets, the within-subjects tests indicate that there is a significant round effect ($p < 0.001$) and an interaction between Frequency Change and Round ($p < 0.10$). However, the between-subjects tests for both decision sets are consistent with the results reported in Panel B of Table 2. Specifically, the between-subjects results indicate that Slack Allowance and the interaction between Frequency Change and Slack Allowance (F = significantly affect Average % Slack ($p < 0.05$), while the main effect for Frequency Change is not significant ($p > 0.10$). Figure 3 and Figure 4 illustrate the Average % Slack by Round for each treatment group and indicate the rounds reviewed throughout the experiment.

[Insert Table 4, Figure 3, and Figure 4 about here]

V. DISCUSSION

We tested subordinates' responses to changes in monitoring frequency and differing levels of slack allowance in an experimental setting. Results indicate an overall pattern consistent with the imposition of controls, causing participants to create slack strategically.

In the first 12 rounds, slack creation is statistically different only for participants in the low slack allowance, high monitoring frequency treatment. Participants in this cell appeared to learn to reduce slack in response to the first two reviews (see Figure 3). This lower level of slack persisted for the remainder of the experiment, even when monitoring frequency decreased in rounds 13-24 (see Figure 4). This suggests that by imposing sufficiently strict monitoring penalties frequently in early periods, companies may be able to set a pattern of conservative subordinate behavior that persists even if the company subsequently reduces monitoring.

Participants who experienced low slack allowance with increased monitoring frequency created an equivalent amount of slack as participants who had a high slack allowance in the first 12 rounds. However, the increase in monitoring frequency in rounds 13-24 prevented them from increasing their slack creation.

A different pattern of results occurs when slack allowance is high. Specifically, subordinates in the high slack allowance treatments significantly increase slack creation between rounds 1-12 and rounds 13-24 even when monitoring frequency increases. For participants in the increased monitoring frequency treatment, the higher level of monitoring frequency in rounds 13-24 dampens, but does not halt, this increase in slack creation. It appears that participants in the high allowance treatments were slowly learning the exact nature of the cut-off for acceptable slack. Consistent with research on hurdle rates (Evans et al. 2001; Rankin et al. 2003), it appears that the slack allowance reframes the budgeting setting so it decreases emphasis on subordinate

motivations such as honesty and increases emphasis in conforming to the mandated level of slack permitted.

Further, we find no evidence that participants will positively reciprocate by reducing slack in return for decreased monitoring frequency. Rather, participants in the high allowance, decreased monitoring frequency treatment exhibited the highest slack creation of all conditions in rounds 13-24. These participants may have been exhibiting negative reciprocity in response to the high monitoring frequency of the first 12 rounds, or they may simply have been strategically focused on maximizing their personal wealth. In either scenario, honesty preferences appear to have been crowded out by other concerns.

REFERENCES

Abdel-Rahim, H. Y., and D. E. Stevens. 2018. Information system precision and honesty in managerial reporting: A re-examination of information asymmetry effects. *Accounting, Organizations and Society* 64: 31-43.

Alles, M. G., G. Brennan, and A. Kogan. 2006. Continuous monitoring of business controls: A pilot implementation of a continuous auditing system and Siemens. *International Journal of Accounting Information systems* 7 (2): 137-161.

Alles, M. G., A. Kogan, and M. A. Vasarhelyi. 2008. Putting continuous auditing theory into practice: Lessons from two pilot implementations. *Journal of Information Systems* 22 (2): 195-214.

Antle, R., and G. Eppen. 1985. Capital rationing and organizational slack in capital budgeting. *Management Science* 31*:* 163-174.

Brink, A. G., J. C. Coats, and F. W. Rankin. 2018. Who's the boss? The economic and behavioral implications of various characterizations of the superior in participative budgeting experiments. *Journal of Accounting Literature.* Forthcoming.

Brink, A. G., J. C. Coats, and F. W. Rankin. 2017. Deceptive superiors and budgetary reporting: An experimental investigation. *Journal of Management Accounting Research* 29 (3): 79-91.

Brown, J. L., J. H. Evans III, and D. V. Moser. 2009. Agency theory and participative budgeting experiments. *Journal of Management Accounting Research* 21: 317-345.

Christ, M. H. 2013. An experimental investigation of the interactions among intentions, reciprocity, and control. *Journal of Management Accounting Research* 25 (1): 169-197.

Davila, T., and M. Wouters. 2005. Managing budget emphasis through the explicit design of conditional budgetary slack. *Accounting, Organizations and Society* 30 (7-8): 587–608.

Douthit, J. D., and D. E. Stevens. 2015. The robustness of honesty effects on budget proposals when the superior has rejection authority. *The Accounting Review* 90 (2): 467-493.

Evans III, J. H., R. L. Hannan, R. Krishnan, and D. V. Moser. 2001. Honesty in managerial reporting. *The Accounting Review* 76 (4): 537-559.

Falk, A., and U. Fischbacher. 2006. A theory of reciprocity. *Games and Economic Behavior* 54 (2): 293-315.

Fischbacher, U. 2007. z-Tree: Zurich toolbox for ready-made economic experiments. *Experimental Economics* 10 (2): 171-178.

Frey, B. S. 1993. Does monitoring increase work effort? The rivalry with trust and loyalty. *Economic Inquiry* 31 (4): 663-670.

Hannan, R. L., F. W. Rankin, and K. L. Towry. 2006. The effect of information systems on honesty in managerial reporting: A behavioral perspective. *Contemporary Accounting Research* 23 (4): 885-918.

Kuhn, J. R., and S. G. Sutton. 2006. Learning from WorldCom: Implications for fraud detection through continuous assurance. *Journal of Emerging Technologies in Accounting* 3 (1): 61-80.

Kuhn, J. R., and S. G. Sutton. 2010. Continuous auditing in ERP system environments: The current state and future directions. *Journal of Information Systems* 24 (1): 91-112.

Lillis, A. M. 2002. Managing multiple dimensions of manufacturing performance—An exploratory study. *Accounting, Organizations and Society* 27: 497–529.

Merchant, K. A., and J. F. Manzoni. 1989. The achievability of budget targets in profit centers: A field study. *The Accounting Review* 64: 539–558.

Mittendorf, B. 2006. Capital budgeting when managers value both honesty and perquisites. *Journal of Management Accounting Research* 18 (1): 77-95.

Newman, A. H. 2014. An investigation of how the informal communication of organization preferences influences managerial honesty. *Accounting, Organizations and Society* 39 (3): 195-207.

Rankin, F., S. Schwartz, and R. Young. 2003. Management control using non-binding budgetary announcements. *Journal of Management Accounting Research* 15: 75-93.

Rankin, F. W., S. T. Schwartz, and R. A. Young. 2008. The effect of honesty and superior authority on budget proposals. *The Accounting Review* 83 (4): 1083-1099.

Schatzberg, J. W., and D. E. Stevens. 2008. Public and private forms of opportunism within the organization: A joint examination of budget and effort behavior. *Journal of Management Accounting Research* 20 (1): 59-81.

Van der Stede, W. A. 2000. The relationship between two consequences of budgetary controls: Budgetary slack creation and managerial short-term orientation. *Accounting, Organizations and Society* 25: 483–496.

Vasarhelyi, M. A. 2013. Formalization of standards, automation, robots, and IT governance. *Journal of Information Systems* 27 (1): 1-11.

Webb, R. A. 2002. The impact of reputation and variance investigations on the creation of budget slack. *Accounting, Organizations and Society* 27: 361-378.

Figure 1. Average % Slack by Treatment

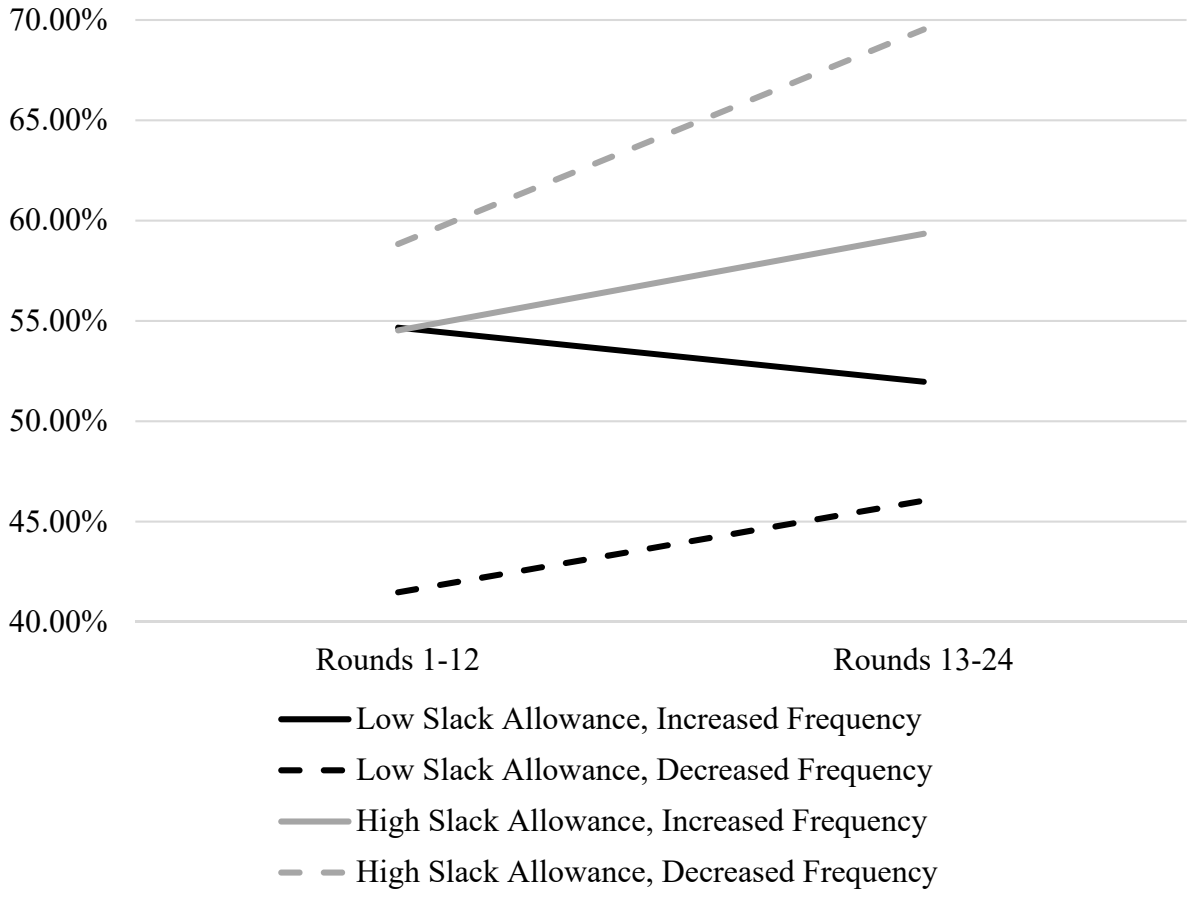

Figure 2. Average % Slack across Decision Sets

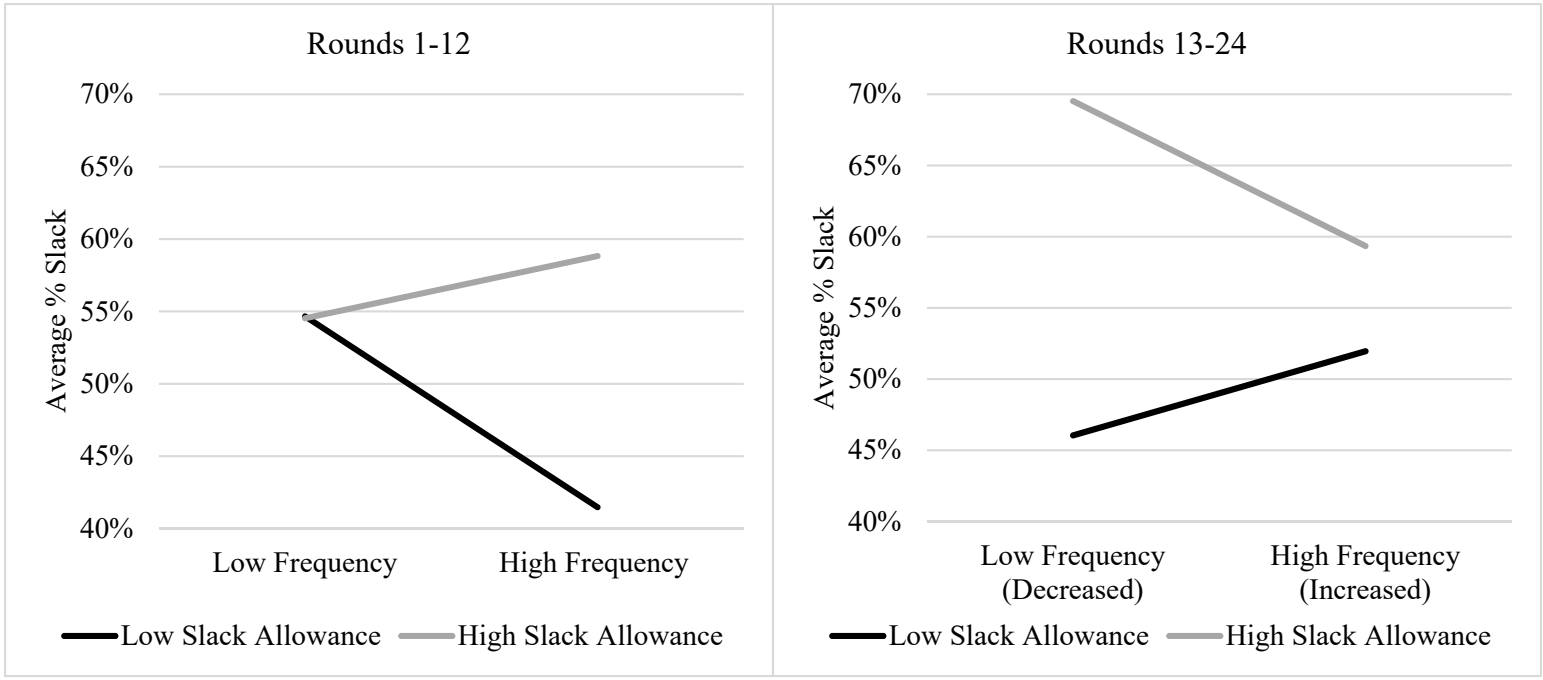

Figure 3. Average % Slack for Rounds 1-12

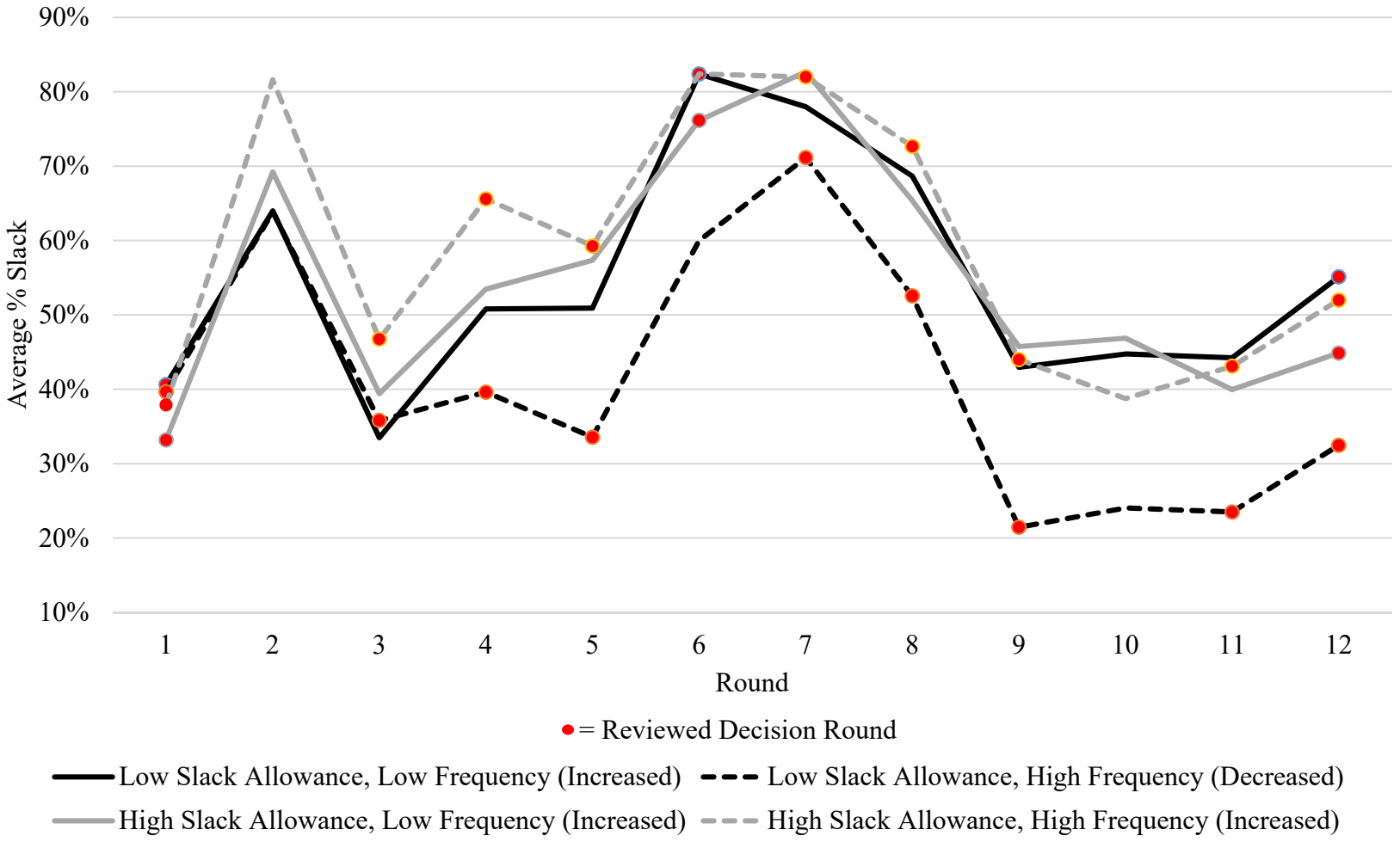

Figure 4. Average % Slack for Rounds 13-24

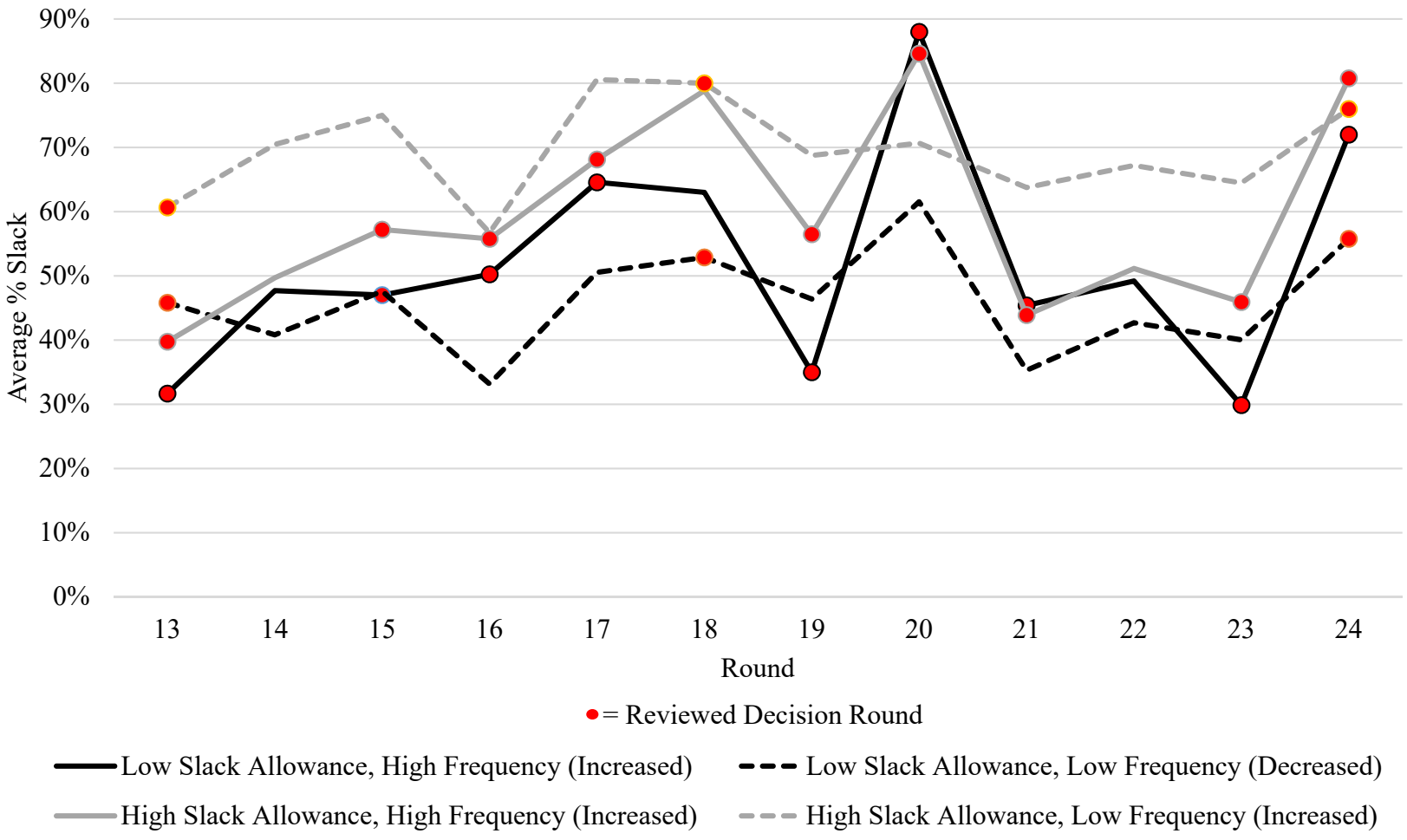

TABLE 1
Descriptive Statistics

		All Participants	Control
	n	123	21
	Average % Slack (Std. Dev)	55.70% (0.221)	61.70% (0.337)
	Average Net Earnings per Round (Std. Dev)	$8.21 (2.354)	$10.53 (3.898)
	Average Total Payment (Std. Dev)	$21.46 (6.609)	$27.33 (9.609)
		Low Slack Allowance	**High Slack Allowance**
		Cell 1	Cell 2
	n	25	26
Increased Frequency Change	Average % Slack (Std. Dev)	53.32% (0.171)	56.94% (0.118)
	Average Net Earnings per Round (Std. Dev)	$6.91 (1.094)	$8.33 (0.825)
	Average Total Payment (Std. Dev)	$19.48 (5.417)	$21.96 (4.142)
		Cell 3	Cell 4
	n	26	25
Decreased Frequency Change	Average % Slack (Std. Dev)	43.76% (0.245)	64.18% (0.146)
	Average Net Earnings per Round (Std. Dev)	$6.58 (1.495)	$9.16 (0.989)
	Average Total Payment (Std. Dev)	$17.35 (4.308)	$22.28 (4.996)

Participants assumed the role of a manager who made a cost reporting decision to a hypothetical firm. Each participant made decisions in two sets of 12 decision rounds (24 total rounds).

Variable Definitions:

Average % Slack: The slack claimed/slack available, and ranges from 0 to 1.

Frequency Change: The change in monitoring frequency was manipulated between subjects. When Frequency Change increased, participants experienced a low frequency of reviews in the set of decision rounds (25% of rounds reviewed) followed by a high frequency of reviews in the second set of decision rounds (75% of rounds reviewed). When Frequency Change decreased, participants experienced a high frequency of reviews in the first set of decision rounds (75% of rounds reviewed) followed by a low frequency of reviews in the second set of decision rounds (25% of rounds reviewed).

Slack Allowance: Slack allowance was manipulated between participants at two levels: Low = 25% of the available slack was allowed if a round was reviewed, and High = 75% of the available slack was allowed if the round was reviewed.

Average Net Earnings per Round is the average earnings per round. This amount is post-review if a review occurred.

Average Total Payment is the average total payment each participant received. Participants were paid for one randomly selected period from each of the two sets of decision rounds. The lowest possible payment was $8 (no slack created), and the maximum possible payment was $48 (maximum slack created, no review penalty).

TABLE 2

Repeated Measures Test of Effects of Frequency Change and Slack Allowance on Average % Slack

Panel A: Test of Within-Subjects Effects (n = 102)[a]

Source of Variance	df	*F*	*p*-value, two-tailed
Decision Set	1	7.302	0.008
Decision Set × Frequency Change	1	4.155	0.044
Decision Set × Slack Allowance	1	4.481	0.037
Decision Set × Frequency Change × Slack Allowance	1	0.047	0.828
Error (Decision Set)	98		

Panel B: Test of Between-Subjects Effects (n = 102)

Source of variance	df	*F*	*p*-value, two-tailed
Intercept	1	969.756	<0.001
Frequency Change	1	0.109	0.742
Slack Allowance	1	11.773	0.001
Frequency Change × Slack Allowance	1	5.744	0.018
Error	98		

[a] The repeated dependent measure, Decision Set, is the Average % Slack for the first set of 12 decision rounds and for the second set of 12 decision rounds. Tests indicate that the assumption of sphericity is met (Epsilon lower-bound = 1.00).

Variable Definitions:

Average % Slack: The slack claimed/slack available, and ranges from 0 to 1.

Frequency Change: The change in monitoring frequency was manipulated between subjects. When Frequency Change increased, participants experienced a low frequency of reviews in the set of decision rounds (25% of rounds reviewed) followed by a high frequency of reviews in the second set of decision rounds (75% of rounds reviewed). When Frequency Change decreased, participants experienced a high frequency of reviews in the first set of decision rounds (75% of rounds reviewed) followed by a low frequency of reviews in the second set of decision rounds (25% of rounds reviewed).

Slack Allowance: Slack allowance was manipulated between participants at two levels: Low = 25% of the available slack was allowed if a round was reviewed, and High = 75% of the available slack was allowed if the round was reviewed.

TABLE 3

Tests of Simple Effects for Average % Slack across Decision Sets

Panel A: Low Slack Allowance Means (Standard Deviations)

	Rounds 1-12	Rounds 13-24	*t* (*p*-value, two-tailed)
Increased Frequency (n = 25)	Low (25% of periods reviewed) 54.67% (0.187)	High (75% of periods reviewed) 51.97% (0.187)	0.895 (0.380)
Decreased Frequency (n = 26)	High (75% of periods reviewed) 41.48% (0.221)	Low (25% of periods reviewed) 46.05% (0.298)	-1.26 (0.218)

Panel B: High Slack Allowance Means (Standard Deviations)

	Rounds 1-12	Rounds 13-24	*t* (*p*-value, two-tailed)
Increased Frequency (n = 26)	Low (25% of periods reviewed) 54.53% (0.147)	High (75% of periods reviewed) 59.35% (0.111)	-2.263 (0.033)
Decreased Frequency (n = 25)	High (75% of periods reviewed) 58.84% (0.184)	Low (25% of periods reviewed) 69.53% (0.165)	-2.756 (0.011)

Panel C: Control / No Monitoring Means (Standard Deviations)

	Rounds 1-12	Rounds 13-24	*t* (*p*-value, two-tailed)
Control (n = 21)	No Reviews 58.89% (0.335)	No reviews 64.51% (0.351)	-1.954 (0.065)

Variable Definitions:

Average % Slack: The slack claimed/slack available, and ranges from 0 to 1.

Frequency Change: The change in monitoring frequency was manipulated between subjects. When Frequency Change increased, participants experienced a low frequency of reviews in the set of decision rounds (25% of rounds reviewed) followed by a high frequency of reviews in the second set of decision rounds (75% of rounds reviewed). When Frequency Change decreased, participants experienced a high frequency of reviews in the first set of decision rounds (75% of rounds reviewed) followed by a low frequency of reviews in the second set of decision rounds (25% of rounds reviewed).

Slack Allowance: Slack allowance was manipulated between participants at two levels: Low = 25% of the available slack was allowed if a round was reviewed, and High = 75% of the available slack was allowed if the round was reviewed.

TABLE 4

Repeated Measures Analysis of Average % Slack by Round [a]

Panel A: Rounds 1-12

Source of Variance	df	*F*	*p*-value, two-tailed
Tests of Within-Subjects Effects			
Round	7.057	44.144	<0.001
Round × Frequency Change	7.057	1.913	0.064
Round × Slack Allowance	7.057	1.253	0.271
Round × Frequency Change × Slack Allowance	7.057	0.888	0.516
Between-Subjects Effects			
Frequency Change	1	1.442	0.233
Slack Allowance	1	5.431	0.022
Frequency Change × Slack Allowance	1	5.601	0.020

Panel B: Rounds 13-24

Source of variance	df	*F*	*p*-value, two-tailed
Tests of Within-Subjects Effects			
Round	5.484	18.988	<0.001
Round × Frequency Change	5.484	4.983	<0.001
Round × Slack Allowance	5.484	1.078	0.373
Round × Frequency Change × Slack Allowance	5.484	0.826	0.541
Tests of Between-Subjects Effects			
Frequency Change	1	0.281	0.597
Slack Allowance	1	14.813	<0.001
Frequency Change × Slack Allowance	1	4.029	0.047

[a] The repeated dependent measure, Round, is the Average % Slack for each decision round of the experiment. Tests indicate that the assumption of sphericity is not met (Rounds 1-12: Epsilon lower-bound = 0.091, Greenhouse-Geisser Epsilon = 0.642; Rounds 13-24: Epsilon lower-bound = 0.091, Greenhouse-Geisser Epsilon = 0.499). Accordingly, the Greenhouse-Geisser corrected results are presented for the within-subjects tests.

Variable Definitions:

Average % Slack: The slack claimed/slack available, and ranges from 0 to 1.

Frequency Change: The change in monitoring frequency was manipulated between subjects. When Frequency Change increased, participants experienced a low frequency of reviews in the set of decision rounds (25% of rounds reviewed) followed by a high frequency of reviews in the second set of decision rounds (75% of rounds reviewed). When Frequency Change decreased, participants experienced a high frequency of reviews in the first set of decision rounds (75% of rounds reviewed) followed by a low frequency of reviews in the second set of decision rounds (25% of rounds reviewed).

Slack Allowance: Slack allowance was manipulated between participants at two levels: Low = 25% of the available slack was allowed if a round was reviewed, and High = 75% of the available slack was allowed if the round was reviewed.