An Experimental Investigation of the Effects of Financial Incentives and Mutual Shared Interest on Honesty

Charles Boster
University of South Carolina

Michael Majerczyk
Georgia State University

Yu Tian
University of Central Florida

July 2014

Please do not distribute or cite without approval of the authors.

We gratefully acknowledge helpful comments and suggestions from Melayne McInnes, Andrew Newman, Bernhard Reichert, Bryan Stikeleather, Brad Tuttle, Kathleen Whitcomb, Alex Woods, and workshop participants at the University of South Carolina and 2013 ABO conference. We thank Dixon School of Accounting at the University of Central Florida for the financial support.
An Experimental Investigation of the Effects of Financial Incentives and Mutual Shared Interest on Honesty

Abstract

This study examines the effects of financial incentives and mutual shared interest among agents on honesty in managerial reporting. Given an observed disutility from dishonesty, there remains a need for understanding how control systems, including financial incentives, affect honesty in managerial reporting. In a laboratory experiment manipulating profit-sharing conditions (none, individual, or pooled), individuals with private cost information submit budget requests. Consistent with our prediction based on motivation crowding theory, our findings suggest that honesty is reduced in the presence of an individual profit-sharing plan. When the profit-sharing plan is expanded to a pooled profit-sharing plan to create a mutual shared interest, the adverse effects of the financial incentive are mitigated. However, honesty is not restored fully to the baseline level where no profit-sharing is available. The findings of this study speak to the adverse effects of financial incentives and potential beneficial effects of shared interest as a means of control.

Keywords: profit-sharing, mutual shared interest, managerial reporting, honesty, motivation crowding

Data Availability: Data are available upon request.
I. Introduction

The benefits from participative budgeting are dependent on the honesty of managerial reporting. While managing agents appear to exhibit disutility from dishonesty, and therefore report more honestly than predicted by conventional agency models (Evans et al. 2001; Rankin et al. 2008), organizations often still implement control systems which may include financial incentives in compensation contracts in order to further induce honesty from managing agents. However, motivation crowding theory suggests that financial incentives do not always have the desired effect when an intrinsic motivation already exists (Frey and Jegen 2001; Gneezy et al. 2011). In the participative budgeting literature, it is still unknown how the presence of a financial incentive influences this observed intrinsic motivation related to the disutility from dishonesty.

In practice, one commonly used financial incentive is profit-sharing. In the United States, it is estimated that 69 percent of large organizations have profit-sharing plans (Lawler et al. 1998). Profit-sharing plans can be based on either an individual’s performance or the pooled performance of several members or the organization in its entirety. We use a multi-divisional setting because of its greater parallel to the natural setting of profit-sharing plans in organizations. In the common practice of pooled profit-sharing plans, the welfare of organizational members can be partially dependent on the decisions of others agents. Under a pooled profit-sharing plan, all eligible members of the organization share in the distribution from the aggregate organizational profits. Therefore, managerial decisions that can affect profitability, including misrepresentation of private information, directly impact the welfare of members of other divisions, creating a shared interest amongst members of the organization. Church et al. (2012) examines a setting of shared interest in which the reporting behavior of an agent in a hierarchical organization has a direct impact on the welfare of that agent’s subordinates. While
Church et al. (2013) examine a one-way dependency within a division, in this study we use a pooled profit-sharing plan across multiple divisions of an organization creating a two-way dependency we label as “mutual shared interest”. Specifically, this study examines how financial incentives and a mutual shared interest, created by profit-sharing plans, influence the honesty of managerial reporting.

We contend that pooled profit-sharing has two potential mechanisms for influencing behavior. First, profit-sharing offers a direct financial incentive, and second, it creates a mutual shared interest. Because our central research question focuses on the influence of the financial incentive, we first examine the effect of a profit-sharing plan independent of any mutual shared interest (i.e., in individual performance based profit-sharing plan). We predict, based on motivation crowding theory, that managing agents will actually decrease the level of honesty in reporting when financially incentivized through the individual performance based profit-sharing plan. We theorize that the presence of the financial incentive acts to crowd out the intrinsic motivation to refrain from maximizing personal wealth caused by the disutility from dishonesty.

In addition to the direct financial incentive, pooled profit-sharing introduces a mutual shared interest. Results from Church et al. (2012) suggest that shared interest within decentralized organizations can influence the honesty of managerial reporting. Specifically, they find that a known preference by the subordinate for honesty reduces the amount of misrepresentation suggesting that managers can be influenced by the preferences of those that have a shared interest in the reporting decision. Under pooled-profit sharing everyone benefits when other employees make decisions which maximize organizational profits as opposed to individual wealth (i.e., act opportunistically or out of self-interest), creating a preference for
honesty in others. This suggests that managing agents with a mutual shared interest will report more honestly under financial incentives than managing agents with no shared interest.

We conducted an experiment assigning participants to organizations consisting of three managers and a single employer. Managers in the organization are responsible for preparing a budget request based on a private, accurate cost projection, consistent with the trust game used in Evans et al. (2001). Any misrepresentation of that cost projection results in inefficient resource allocation that reduces organizational profitability. The absence of uncertainty surrounding the budget allows for any misrepresentation to be classified as dishonesty consistent with prior studies (Rankin et al. 2008; Douthit et al. 2012).

Each three-manager organization was assigned to one of three conditions (no profit-sharing, individual profit-sharing, pooled profit-sharing) to manipulate the absence or presence of a financial incentive and shared interest in the reporting decision. In the no profit-sharing condition, the participants were told to assume as managers of divisions who do not participate in a profit-sharing plan. The no profit-sharing condition serves as a baseline for testing purpose. In the individual profit-sharing plan condition, participants assumed the role of division managers who receive a percentage of any profits from their division regardless of overall organizational profitability. In the pooled profit-sharing plan condition, participants assumed the role of division managers who receive a percentage of the profits reported by each of the three divisions within the organization.

As predicted, we find that, consistent with motivation crowding theory, the individual profit-sharing plan leads to less honesty in budget reporting when compared to a baseline condition. Also as predicted, when the profit-sharing plan is pooled, honesty increases compared to when the profit-sharing plan has no mutual shared interest. However, the pooled profit-sharing
does not restore the honesty level observed when there is no financial incentive. These results provide experimental evidence that incentive programs can at times lead to less honest reporting by managers, regardless of the potential effects on other members of the organization.

This study makes several contributions to the management accounting literature. Broadly speaking this is a study on managerial reporting, but it returns that literature to an earlier discussion of financial incentives, looking at an existing control (profit-sharing) used in practice as opposed to a proposed control (truth-inducing contracts).¹ The benefit of this is two-fold. First, we examine a prevalent form of compensation used in organizations and its influences on managerial reporting. This has direct practical implications on the design of control systems for organizations. Second, it makes a theoretical contribution by adding to our understanding of the role of financial incentives in managerial reporting. This is among the first papers in the accounting literature to demonstrate a motivation crowding effect in a non-effort based task. This could have implications beyond the managerial accounting literature into areas such as auditing and financial reporting.

We also extend the management accounting literatures in the area of shared interest. Given the structure of organizations and the growing evidence of social norms to serve as controls, the shared interest construct is an important one for management accountants to explore. In the current study, we examine how the presence of managers of other divisions with their own reporting responsibilities influences managers’ reporting decisions through establishing a mutual shared interest. We find that a preference for honesty by other members of

¹ Prior literature on participative budgeting looked at so-called “truth-inducing” contracts (Chow et al. 1988; Waller & Bishop 1990; Chow et al. 1994). While these contracts were compensation based, they have two distinct differences from profit-sharing plans. First, “truth-inducing” contracts never became prevalent in practice unlike profit-sharing plans. Second, by nature of the contract, “truth-inducing” contracts served as much stronger controls rather than financial incentives. In addition, this stream of research predates the honesty stream of literature that emerged following Evans et al. (2001).
the organization resulted in more honest reporting by agents, consistent with Church et al. (2012). However, our setting demonstrates that shared interest is not sufficient in overcoming self-interested wealth maximization behaviors under the presence of financial incentives.

Finally, the study furthers our basic knowledge related to multi-agent settings in participative budgeting. While substantially expanding our knowledge of budgeting and behavior by both agents and principals, simple dyad relationships of a single principal and a single agent cannot provide answers for many organizational related questions. We extend this simple dyad relationship by examining a more generalizable setting that consists of multiple agents acting within an organization of multiple divisions. This establishes a foundation to assess implications of shared interest and mutual dependence in more complicated, diverse business models prevalent in the market.

The remainder of this paper is outlined as follows. In the next section we present background related to participative budgeting and profit-sharing and develop two specific hypotheses. Section III outlines the experimental design used to test our hypotheses. Section IV provides an analysis of our data and Section V concludes the paper.

II. Background and Hypotheses Development

Managerial Reporting and Participative Budgeting

Participative budgeting has received a great deal of attention in the management accounting literature (for reviews see Shields and Shields 1998; Brown et al. 2009). Participative budgeting is relevant to both academics and practitioners because of the role that budgeting plays in both planning and control for most organizations (Hannan et al. 2010). Organizations often involve lower level managers in the budgeting process because they have superior information
about their subunit’s conditions and capabilities (Hannan et al. 2006). This involvement produces a moral hazard problem in which the managers can act opportunistically by misrepresentation (distorting actual forecasts of costs and revenues). Dunk and Nouri (1998) identify slack as any intentional underestimation of production capabilities or overestimation of costs. This concept of intentional misstatement led to later studies identifying slack as opportunistic and ignores more legitimate forms of slack including guarding against uncertainty (e.g., Evans et al. 2001; Hannan et al. 2006; Rankin et al. 2008; Zhang 2008; Hannan et al. 2010; Matuszewski 2010; Church et al. 2012).²

**Profit-Sharing**

Companies use financial incentives as part of their control systems to align employees’ behavior with the goals of the organization. Amongst the different types of controls, financial incentives have received limited attention in the participative budgeting literature. One of the most common forms of financial incentives offered by organizations are profit-sharing plans. Prior research suggests that profit sharing plans served as an alternative to direct monitoring (Magnan et al. 2005). Using longitudinal data from 141 employees, Coyle-Shapiro et al. (2002) find evidence to support the importance of employee perceptions of profit sharing in achieving higher levels of trust and organizational commitment. Kruse (1992) defines profit-sharing as any system in which a direct link is established between the profits of the company and the compensation of the employees. It is estimated that 69 percent of large organizations in the United States have profit-sharing plans and two-thirds of the U.S. Fortune 1,000 firms have some sort of profit sharing plan (Lawler et al. 1995, 1998). The Bureau of Labor Statistics reports that 11% of all workers in goods-producing industries took part in a cash profit-sharing bonus plan.

² Prior literature has built on the identification of slack as opportunistic to establish the construct of honesty in managerial reporting. Rankin et al. (2008) specifically use the construct of honesty to define the tendency of individuals to avoid accurate reporting.
(Bureau of Labor Statistics 2012). Kruse (1996) finds that 40.7% of organizations sampled have a profit-sharing plan with employees outside of top management positions. Consistent with Magnam et al. (2005), Kruse (1996) suggests that profit-sharing plans can mitigate agency problems and reduce the need for supervision.

**Individual Profit-Sharing**

Brown et al. (2009) maintain that agency theory should still act as the foundation in the examination of participative budgeting. Agency theory assumes that agents are self-interested and thus will act opportunistically, maximizing the amount of slack in budgets (Baiman 1990). A wide variety of behavioral studies in economics have found individuals do not act consistently with pure economic predictions (Camerer 2003). Evidence from a multitude of experimental studies of participative budgeting has also found that participants do not act consistently with agency predictions. The findings in Evans et al. (2001) suggest that agents incur disutility from misrepresentation or have increased utility from honesty. This preference for honesty produces an intrinsic motivation for agents in a participative budgeting context. Recent analytical studies have attempted to incorporate preferences for honesty into agency models (see Mittendorf 2006; Stevens and Thevaranjan 2010). These adapted agency models have maintained the self-interested behavior of agents but suggest that behavior is driven by preferences for both personal wealth-maximization and preferences for honesty (or disutility from dishonesty). This establishes two basic terms in the model: $\beta_w$ representing preferences for personal wealth-maximization and $\beta_h$ representing preferences for honesty. We argue that $\beta_h$ is a measure of the intrinsic motivation of the individual to conform to social norms of honesty.

Frey and Jegen (2001) formalize a theory of motivation crowding and they argue that financial incentives can crowd out intrinsic motivation to perform a task. By explicitly
incentivizing the task, the motivation gets obscured. Gneezy et al. (2011) are among those that have proposed that when financial incentives are present people may be concerned that their actions indicate greediness rather than a person’s pro-social or norm-based preferences. The presence of financial incentives can thereby change the framing of the interaction from social to monetary (Messick 1999; Gneezy et al. 2011). A classic example of the crowding out phenomenon relates to the behavior of individuals in charitable situations. Mellström and Johannesson (2008), testing earlier work by Titmuss (1970), find that when monetary incentives were offered charitable donations deceased by almost half.

Motivation crowding theory can also be used to predict profit-sharing will not have the intended effect of motivating higher performance. As observed in prior literature, agents demonstrate a tendency to build less than the wealth-maximizing amount of slack in budgets suggesting a preference for honesty (Evans et al. 2001; Rankin et al. 2008; Zhang 2008). This suggests some intrinsic motivation associated with social norms of honesty. Rankin et al. (2008) explicitly test and find support for the proposition that control systems, not comprised of financial incentives, can crowd out this intrinsic motivation further establishing that a preference for honesty exists but can be influenced by organizational conditions. Remember that a primary objective of profit-sharing contracts is to serve as an organizational control. Thus, under certain contracts, the agent becomes more interested in wealth-maximizing behavior (i.e., shifting greater weight to $\beta_w$ and minimizing the weight placed on $\beta_h$).

As a result, we predict a simple profit-sharing incentive based solely on divisional profits for which the agent is responsible will act to increase the level of opportunistic behavior by the agent in accordance with motivation crowding predictions (Frey and Jegen 2001; Gneezy et al. 2011). Specifically, we predict the agent will report with less honesty in the budget by building
higher levels of slack into the budget when the financial incentive, which operates as a control, is in place. Formally, our first hypothesis states:

\[ H1: \text{Honesty levels will be lower in the presence of a profit-sharing plan based solely on the profitability of the specific agents’ division as compared to agents without a profit-sharing plan.} \]

**Pooled Profit-Sharing**

Despite an abundance of experimental studies, it is recently that research has been conducted related to multi-agent settings thus limiting our knowledge of the relationship between the participative budgeting process and the greater organization practices and structure. In the standard agency-model, one agent manages the operations of one principal with the principal providing the capital. Therefore, all repercussions from agents’ actions are absorbed by the principal. All behaviors by the agent are therefore framed by considerations towards the principal. While substantially increasing our knowledge of budgeting and behavior by both agents and principals, simple dyad relationships of a single principal and a single agent cannot provide answers for all organizational questions.

To answer some of these organizational questions, recent experimental studies have expanded the scope of the organization (Zhang 2008; Hannan et al. 2010; Matuszewski 2010; Bruggen and Luft 2011; Church et al. 2012). Most related to the current study is Church et al. (2012), where participants assume the role of agents responsible for allocation of resources to departments that include subordinates. Church et al. (2012) find that honesty decreases when agents can share the benefits from slack with the subordinates, consistent with moral disengagement theory. Additionally, they find in a second experiment that a known preference for honesty by subordinates increases the honesty of managerial reporting.
Profit-sharing represents some manner of distribution from employers over an allocation base of selected recipients. While returns to an agent from their own division’s contribution to organization profits constitute a profit-sharing plan, profit-sharing is often viewed in terms of allocation across divisions from pooled profits (Kruse 1996). In the event that the organization uses a pooled profit-sharing plan, misrepresentation decreases the pool of profits to be allocated throughout the organization. Misrepresentation leads to the inefficient allocation of resources that increases costs for business divisions and processes. Ultimately, the increase in the cost of operation from inefficiencies in resource allocation decreases the profitability of the organization and thereby the pool of distributable profits. Thus, any potential for misrepresentation under pooled profit-sharing plans, forces a consideration of shared interest, as depicted in Figure 1.

Under pooled profit plans, there is still a direct reward for honesty in the budget because some fraction of the division’s profits is returned to the responsible agent, but there also exists a mutual shared interest. In addition to the effects of simple profit-sharing plans as in H1, we examine how pooled profit-sharing plans, which inherently assume a mutual shared interest, affect honesty in managerial reporting within a participative budgeting setting.

[Inset Figure 1 here]

A pooled profit-sharing setting is similar to public goods games in the behavioral economics literature. As Nalbantian and Schotter (1997) note, there is an obvious analogy between public goods games and the examination of group incentives that would include profit-sharing. The public goods game is an analogous setting because agents within a greater organization have a decision between self-interested behavior (in a participative budgeting setting - slack) and cooperative behavior (in a participative budgeting setting - honesty) that helps the greater organization. A key difference between the public goods game and the profit-
sharing environment is in the size of the return from cooperation. As discussed earlier, profit-sharing returns only a fraction of the agent’s contribution to the organization allowing misrepresentation to produce a much larger return to the agent. Therefore, while in a public goods game, cooperation among participants maximizes overall payoffs, under a pooled profit-sharing plan, agents still maximize overall personal payoffs by maximizing slack due to the lack of a multiplier as present in a standard public goods game. As a result, economic theory would maintain that pooled profit-sharing plans would have no effect on honesty, and that misrepresentation would not decrease under such a plan.

Despite the predictions of economic theory, there is reason to believe that pooled profit-sharing plans will affect agents’ behavior in the budgeting process. Similar to the discrepancies between experimental evidence and agency theory in the literature on honesty and participative budgeting, research in public goods games has found that contribution levels in experimental studies are higher than predicted by economic theory. The public goods literature has identified three classifications of participants: free-riders, unconditional cooperators and conditional cooperators. In a review of the literature Chaudhuri (2011) reports that generally more than half of participants in any public goods games are conditional cooperators.

Viewed within an adapted agency model, conditional cooperators are effectively looking for justification or a signal to place more weight on $\beta_h$ relative to $\beta_w$. In the event that no justification for cooperation is found, conditional cooperators are more likely to behave as free-riders acting to maximize personal wealth. However, given a justification or signal to cooperate, conditional cooperates will act in a cooperative manner. The findings of Church et al. (2012) provide a potential justification for conditional cooperators to be more likely to cooperate with the desired norms of the organization (i.e., honesty) under a profit-sharing plan based on overall

---

3 In a public goods game the economic prediction is for no-cooperation.
profitability. Their results suggest the mere presence of a shared interest can shift behavior in the direction that benefits the shared interest. Church et al. (2012) further find that agents report more honestly when subordinates have a known preference for honesty regardless of the direction of the benefit. In our study, the shared interest arises from agents of other divisions that prefer the agent reports with honesty as opposed to with self-interest. Thus, based on the findings of Church et al. (2012) a mutual shared interest resulting from a pooled profit-sharing plan should motivate agents to report honestly.

Hypothesis 1 specifically provides insight into the significance of an individual division profit-sharing plan on honesty. While in the individual division profit-sharing plan we anticipate crowding out of the preference for honesty (H1), in the pooled profit-sharing plan we anticipate that the shared interest will strengthen the preference for honesty and help to mitigate the crowding effect of the financial incentive. It does so by two means. First, it creates a dependency that increases the cost (or potential disutility) to the individuals of self-interested behavior. Second, it implies a norm of cooperation within the organization. Therefore, we predict:

**H2:** When multiple agents within an organization are responsible for reporting, honesty levels will increase with the introduction of a pooled profit-sharing plan compared to a profit-sharing plan based solely on the profitability of the specific agents’ division.

### III. Method

**Design**

To test our hypotheses, we conducted a laboratory experiment using the trust game adapted from Evans et al. (2001). The experiment was programmed and conducted with the z-Tree software (Fischbacher, 2007) in a multi-period setting. In the experiment, three managers were randomly assigned to one employer under one of three conditions: no profit-sharing
(baseline), profit-sharing plan based on profits reported for a specific division (individual) and a pooled profit-sharing plan based on the profits reported for all three divisions (pooled).\(^4\)

Each session consisted of a single experimental condition with twelve periods. All participants in a session stayed in the same condition and were paired with same employer and managers for all twelve periods. Managers were responsible for submitting budgets to the employer for which the employer knew only the range of possible costs and the manager knew the actual cost. Each employer had a specific actual cost and all employers had equivalent revenues.\(^5\) Employers were present while managers performed the task, but employers did not perform any task and could not see managers’ budget reporting decisions.

**Independent Variable**

The independent variable in our experiment is the profit-sharing plan of the manager. As discussed earlier, the profit-sharing plan is manipulated at three levels: 1) baseline, 2) individual and 3) pooled. In the baseline condition, the task is fundamentally the same as in the trust game used in Evans et al. (2001). The distinguishing feature of our baseline condition is that managers are informed that they are part of a multi-divisional organization. Specifically, there are three managers in each organization with one employer. This basic structure of the organization is the same across all experimental conditions.

In the profit-sharing conditions, managers’ earnings are based on three possible components: salary, slack and profit-sharing. In the individual condition, profit-sharing distributions are determined based on the profits of the individual manager’s division and

\(^4\) A fourth condition was also run for the purposes of exploring a potential alternative explanation related to the results of the pooled profit-sharing condition. As such, it is not discussed here. In this condition, participants performed an identical task to the pooled profit sharing condition but this was preceded by a team building task to establish a group identity. Discussion of this condition is reserved for the supplemental analysis of Section IV.

\(^5\) In order to avoid any order effects, all managers saw the same costs but in different orders. The cost was specific to an employer so managers assigned to the same employer had all the same costs.
distributions are made to that specific manager. Managers receive 15% of any divisional profits in addition to their base compensation and any earnings received through misrepresentation of the actual cost. In the pooled condition, the managers also have a profit-sharing component to compensation in addition to salary and slack. Unlike in the individual condition, profit-sharing distributions in the pooled condition are determined based on the profits of all divisions in the organization. Managers receive 5% of any profits which are reported to the employer from each division in the organization in addition to their base salary and any compensation received through misrepresentation of the actual cost. In the baseline condition, managers’ earnings are based only on salary and slack consistent with prior studies.

**Dependent Measure**

The dependent measure used in this study is the honesty measure first used in Evans et al. (2001). Rankin et al. (2008) argue that the use of a factual assertion, as done in the current study, allows for the interpretation of any slack as dishonest. The honesty measure inversely measures how opportunistic managers were. Honesty is calculated with the following equation:

\[
1 - \frac{\text{slack taken}}{\text{slack available}}
\]

The slack taken is the amount of slack in the budget, calculated as the difference between the amount reported in the budget and the actual cost. The slack available is calculated by taking the difference between the highest possible cost and the actual cost.

**Procedures and Task**

Participants were provided with identification numbers and randomly assigned to the role of manager or employer upon arriving for the session. In addition to a salary, managers were able to increase their earnings based on their decisions regarding the actual cost and budget. Managers were explicitly told that the employer’s only earnings came from the decisions made by the three managers in the organization. Employers were present to make the organization
more salient to the participants serving as managers. All participants maintained anonymity for the duration of the session.

After reading the instructions and explaining the budget examples in the instructions, the study administrator read from a script reiterating the main points of the task, including the employer’s dependence on the manager to receive any earnings and the fact that employers never found out the actual cost. Next, participants completed a quiz to verify their understanding of the instructions and the experimental condition to which they were assigned. Then the study administrator checked the answers to the quiz for each participant individually and explained in detail the question(s) they missed. These forced manipulation checks ensured that participants understood the task and the assigned condition before completing the budget task. All managers completed twelve reporting periods via a budget form in z-Tree software. The only difference between periods for managers was that each budget request form presented had a different actual cost. Employers were randomly assigned to one organization for the duration of the session and as previously discussed did not perform any task and were completely dependent on managers for any compensation.6

The manager was informed that all organizations had a possible range of costs between 4,000 Lira and 5,500 Lira in 50 Lira increments.7 The manager received a wage of 500 Lira and the revenue from the project was known to be 6,000 Lira.8 In each period the manager received a budget request form identifying the actual cost. Managers then completed the budget request form by indicating the budget and calculating the profits of the firm and their own earnings. In the individual and pooled conditions managers also included any profit-sharing in the calculation

---

6 Not giving the employer the ability to review the task made managers’ reporting decisions easier to attribute to honesty preferences because there was no potential for fear of rejection by employers.
7 Lira is the experimental currency of the study. The payout rate for participants was 100 Lira to $1.
8 The 500 Lira salary was not part of the project cost. Therefore, if the manager created the maximum slack available the division earned zero profits.
of their earnings. After completing the last period’s budget request form, managers filled out a post-experimental survey that included demographic information.

**Participants**

Participants were recruited from upper-level accounting courses at a large public university and had at least completed an introduction to managerial accounting. Participants consisted of 72 students in the role of division manager and 58.6% of them were female. Participants in the role of manager had a mean age of 22.93 years. Participants who served as managers received extra course credit and an average cash payment of $8.25. Given the simplified nature of the budget task, upper-level accounting students possess sufficient capabilities to perform the task. The use of this participant pool is consistent with the pool used in previous studies in participative budgeting (e.g., Fisher et al. 2006; Rankin et al. 2008; Hannan et al. 2010; Douthit and Stevens 2012).

**IV. Results**

**Summary Analysis**

The results of the three treatment conditions are summarized in Table 1. Table 1 demonstrates a noticeable difference across conditions related to the number of participant-periods reporting with 100% dishonesty (i.e., taking all slack available). The increase in the number of participant-periods reporting dishonestly from the baseline to the individual profit-sharing condition is apparent. There are 49 participant-periods in the individual profit-sharing condition reporting 100% dishonestly while only 26 of participant-periods in the baseline condition report 100% dishonestly. We conduct a Wald Chi-Square test for the count data and

---

A total of 96 students participated in the study. Twenty-four of these students served in the role of employer and made no decisions in the study. For this reason, they were not included in further analysis, but they did receive both extra credit and cash payments.
find that this difference is significant (Wald Chi-square = 6.82, p-value = 0.009, not tabulated).

In the pooled profit-sharing condition, there are 42 participant-periods reporting 100% dishonestly, which is also significantly different from the baseline condition (Wald Chi-square = 3.69, p-value = 0.05, not tabulated). We do not find any significant difference about the frequency of 100% dishonesty between the individual profit-sharing and pooled profit-sharing conditions (Wald Chi-square = 0.54, p-value = 0.46).

[Insert Table 1 here]

Similar to the difference in the number of dishonest responses between conditions, the primary dependent measure, honesty, varies across conditions. Please be reminded that the honesty measure is calculated with the following equation: \[1 - \frac{\text{slack taken}}{\text{slack available}}\]. Therefore, a greater honesty measure indicates a higher honesty level. As shown in Table 1, the honesty measure is 72.7% in the baseline condition, 59.5% in the individual profit-sharing condition, and 67% in the pooled profit-sharing condition. Participants in the baseline profit-sharing condition created the least amount of slack per budget request of the three conditions. The pattern suggests participants in the pooled profit-sharing condition as a group are reporting less overall slack in each budget request compared to individual profit-sharing condition.

Tests of Hypotheses

For all hypotheses tests, we use repeated measure ANOVA to control for within subjects variation over the multiple periods.\(^{10}\) Figure 2 presents a visual demonstration of mean condition results. Our first hypothesis predicts, in a multi-agent setting, honesty will decrease when each agent is subject to an individual profit-sharing plan versus only a standard fixed wage as in our baseline condition. Support for this hypothesis would provide evidence of less honest budget

\(^{10}\) Models including period as a variable showed no significance associated with the period.
reporting when individual profit-sharing plans are present. We find strong evidence consistent with H1, in which we predict that honesty in an individual profit-sharing condition will be less than in the baseline condition. Specifically, Panel A of Table 2 shows that the honesty level for participants in individual profit-sharing condition is about 13% less than the honesty level in the baseline condition ($t = 3.56, p = 0.005$, one-tailed). This suggests that individual profit-sharing plans have an adverse influence on honesty in reporting, supporting motivation crowding theory.

[Insert Figure 2 here]

[Insert Table 2 here]

Our second hypothesis predicts, in a multi-agent setting, pooled-profit sharing will help to mitigate the motivation crowding effect observed in H1. Support for this hypothesis would provide evidence of more honest budget reporting when pooled profit-sharing plans are present, consistent with alignment of goals from shared interest. We also find support for H2. Specifically, as shown in Panel B of Table 2, participants in pooled profit-sharing condition significantly show more honesty in reporting than in individual profit-sharing condition ($t = -1.92, p = 0.031$, one-tailed). This suggests that the mutual shared interest of pooled-profit sharing does undo some of the motivation crowding effect observed from the financial incentive of the individual profit-sharing plan.

**Supplemental Analysis**

We conduct a supplemental analysis to test the difference in reporting honesty between the baseline and pooled profit-sharing plan condition. We predict that individual profit-sharing financial incentive will crowd out agents’ intrinsic motivation of being honesty and thus decrease the honesty level (H1). Hypothesis 2 suggests that shared interest will help to mitigate the

---

11 Unless otherwise noted, all p-values reported in this study are one tailed test because we have directional hypotheses.
crowding effect of financial incentives, and that pooled profit-sharing plans will increase agents’ reporting honesty, compared to the individual profit-sharing plan, up to the honesty level in the baseline condition. As observed in Table 1, both profit-sharing plans result in a decrease in honesty compared to the baseline condition. To test the significance between the baseline and pooled profit sharing plan, we again use repeated measure ANOVA to control for within subjects variation over the multiple periods. As shown in Table 3 Panel A, results indicate a marginal significant difference between participants in the baseline and participants in the group profit-sharing plan (t = 1.55, p = 0.065, one-tailed).\textsuperscript{12} This suggests that the mutual shared interest does not fully mitigate the motivation crowding effect of financial incentives. An introduction of a profit-sharing plan leads to less honest reporting regardless of the presence of a mutual shared interest. This provides evidence that motivation crowding can outweigh the effects of a shared interest in pooled profit-sharing plans.

[Insert Table 3 here]

We argue that mutual shared interest from the pooled profit-sharing plan reduces self-interested behavior compared to an individual profit-sharing. We suggest that this result occurs by creating a dependency that increases the cost (or potential disutility) of self-interested behavior to the managers. Our results above show that the mutual shared interest in the pooled profit-sharing plan fails to fully mitigate the motivation crowding effect. One possible alternative explanation is that participants in the pooled profit-sharing plan did not feel that the group dynamic was salient enough. In order to rule out this alternative explanation, therefore, we conducted a fourth experimental condition.

\textsuperscript{12} The p-value reported here is one-tailed test because of the ceiling effect predicted to occur in baseline condition. By ceiling effect we mean to say that the baseline condition, devoid of financial incentive, should reflect the strongest preference for honesty.
In the fourth condition, all tasks and procedures are identical to the group condition, with the added manipulation that participants completed an eight-minute team building exercise prior to participating in the reporting task. In this team exercise, participants interacted directly with the other two managers in their organization. This is designed in order to increase the salience of the team dynamic and create a perception of social identity among the participants within the same organization, and thus lead to greater cooperation and other-regarding behavior. As shown in Panel B of Table 3, we find that the reporting honesty in this fourth condition is marginally lower than the honesty in pooled profit-sharing plan condition ($t = -1.63$, $p = 0.944$, one tailed). That is, the results from this condition do not support the alternative explanation that stronger greater familiarity with the group members will increase honesty.

V. Conclusion

Our findings expand our knowledge related to the motivational effects of profit-sharing, for both pooled and individual profit-sharing plans. We find individuals report less honestly when offered a profit-sharing plan than when not. These results support literature on the theory of motivation crowding by demonstrating that an introduction of an external incentive of financial rewards crowds out an internal preference for honesty (Frey and Jegen 2001). We do find support for our prediction that introducing mutual shared interest, through a pooled profit-sharing plan, increases honesty compared to a profit-sharing plan based solely on individual performance. However, the effect of mutual shared interest does not fully mitigate the crowding effect, and honesty is still lower under pool profit-sharing than in the absence of a profit-sharing plan.

Our main contribution is the expansion of our understanding of the effects of financial incentives on managerial reporting behavior. Relatedly, we expand the participative budgeting
literature in the area of shared interest on honesty in managerial accounting by introduction of the construct of mutual shared interest. Prior literature has shown that, when others could share in the benefit of misrepresentation, but those others have a preference for honesty, individuals report more honestly (Church et al. 2012). However, in our study, despite the presence of a preference for honesty by other agents based on potential benefits from honesty, reporting agents report marginally less honestly when mutual-shared interest is present compared to the baseline. These findings suggest the effect of shared interest is context specific.

Experimental design choices lead to potential limitations of the findings. The use of an experimental design limits the generalizability of results beyond the task-participant-decision setting. While generalizability is an inherent weakness of experimental studies, the use of a controlled experiment allows greater validity related to the relationship of the constructs of interest. The task is similar to a task from prior literature, and the decisions involved are related to decisions faced in the participative budget process. The use of a task from prior literature allows for a better contextual understanding of the results and adds validity to the findings.

The implications of our findings related to motivational crowding are important throughout the accounting literature. To this point in accounting, crowding out has been primarily reserved for discussion of effort based tasks. The results of the current study demonstrate that the theory likely applies to many other domains in the accounting literature including behavior related to financial reporting and auditing. Future research could examine how crowding out could lead to inefficiencies in such domains.
References


Figure 1:

Creation of Shared Interest through Misrepresentation in a Pooled Profit-Sharing Plan

- Misrepresentation of Divisional Cost by Agent $i^*$
- Inefficient Allocation of Resources
- Increase in Cost of Business Division
- Decrease in Divisional Profitability
- Decrease in Distributable Profits for all Agents

* These relationships hold for each agent $i$ where $i = 1, 2 \ldots, n$ where $n$ is the total number of agents in the organization.
Figure 2: Honesty Measure* Percentage by Condition

\[
\text{Honesty Percentage} = 1 - \frac{\text{slack taken}}{\text{slack available}}.
\]

*: Honesty measure is calculated as: \(1 - \frac{\text{slack taken}}{\text{slack available}}\).
### Table 1: Summary Results

<table>
<thead>
<tr>
<th>Condition</th>
<th>Baseline</th>
<th>Individual</th>
<th>Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Honesty Measure * (std. dev.)</strong></td>
<td>72.7% <em>(0.36)</em></td>
<td>59.5% <em>(0.40)</em></td>
<td>67.0% <em>(0.40)</em></td>
<td>66.4% <em>(0.39)</em></td>
</tr>
<tr>
<td><strong>Honest (Dishonest) Responses</strong></td>
<td>100 (26)</td>
<td>81 (49)</td>
<td>95 (42)</td>
<td>276 (117)</td>
</tr>
</tbody>
</table>

*: Honesty measure is calculated as: \( 1 - \frac{\text{slack taken}}{\text{slack available}} \).

**: Honest means 100% honesty (i.e., not taking any slack when submitting budget), and dishonesty means 100% dishonesty (i.e., taking all available slack when submitting budget).
Table 2: Test of Hypotheses

Panel A: Test of H1 (Baseline vs. Individual Profit-sharing Plan)

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimate</th>
<th>DF</th>
<th>t Value</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline vs. Individual profit-sharing plan</td>
<td>0.1315</td>
<td>34</td>
<td>3.56</td>
<td>0.0005</td>
</tr>
</tbody>
</table>

Panel B: Test of H2 (Individual Profit-sharing vs. Pooled Profit-sharing Plan)

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimate</th>
<th>DF</th>
<th>t Value</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual vs. Pooled profit-sharing plan</td>
<td>-0.0747</td>
<td>34</td>
<td>-1.92</td>
<td>0.0313</td>
</tr>
</tbody>
</table>

*: This reported p-value is one-tailed test because of the directional hypotheses.
Table 3: Supplemental Analysis

Panel A: Baseline vs. Pooled Profit-sharing Plan

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimate</th>
<th>DF</th>
<th>t Value</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline vs. Pooled profit-sharing plan</td>
<td>0.05681</td>
<td>34</td>
<td>1.55</td>
<td>0.065</td>
</tr>
</tbody>
</table>

Panel B: Pooled Profit-sharing Plan vs. Pool Profit-Sharing Plan with Social Interaction

<table>
<thead>
<tr>
<th>Description</th>
<th>Estimate</th>
<th>DF</th>
<th>t Value</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pooled profit-sharing vs. Pooled profit-sharing with social interaction</td>
<td>0.06242</td>
<td>34</td>
<td>1.63</td>
<td>0.056</td>
</tr>
</tbody>
</table>

*: This reported p-value is one-tailed test because of the directional predictions.