Accounting, Organizations and Society 72 (2019) 74–84

Contents lists available at ScienceDirect

Accounting, Organizations and Society

journal homepage: www.elsevier.com/locate/aos

The effects of measurement basis and slack benefits on honesty in budget reporting☆

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ARTICLE INFO

Article history:
Received 20 September 2016
Received in revised form
10 April 2018
Accepted 4 May 2018
Available online 18 May 2018

Keywords:
Managerial reporting
Honesty
Budgetary slack
Financial measures
Nonfinancial measures

ABSTRACT

In this study, we experimentally investigate how managers' budget reporting behavior is influenced by two important features of the budgeting system: the measurement basis used in budget preparation (i.e., whether managers make budget reports in financial or nonfinancial measures) and managers' slack benefits in budget execution (i.e., whether managers benefit from budgetary slack directly or through an intermediate activity). While prior research suggests that moral self-regulation helps promote honest behavior, we predict that a financial measurement basis undermines moral self-regulation by strengthening the manager's desire to advance self-interest and that the absence of direct slack benefits undermines moral self-regulation by making misreporting more justifiable. We also predict that the effects of these two budgetary features on honesty are non-additive, due to the manager's diminishing marginal net utility from misreporting. Experimental results are consistent with our predictions. The implications of our findings for management accounting theory and practice are discussed.

1. Introduction

Firms use budgets to allocate resources among subunits (Braun & Tietz, 2014). The budgeting process involves two important mechanisms: budget preparation and budget execution (Bunce, Fraser, & Woodcock, 1995; Hackbart & Ramsey, 1999; Joyce, 2005). In budget preparation, subunit managers make budget proposals in financial (e.g., dollars) or nonfinancial (e.g., physical units) measures, referred to as the *measurement basis* of budget reports. In budget execution, headquarters allocates different types of resources (e.g., financial, physical, or human capital) to subunits, and managers may derive personal benefits from budgetary slack. In some organizational settings, managers directly use slack resources to increase their perquisites or remuneration, referred to as *direct slack benefits*. In other settings, managers use slack resources to support projects or activities that potentially advance their self-interest, referred to as *indirect slack benefits* (e.g., increase productive capacity to boost near-term output, which in turn increases managers' bonuses).[1] The purpose of this paper is to investigate the effects of measurement basis and the type of slack benefits on managers' honesty in budget reporting.

When making budget proposals, subunit managers have an incentive to inflate their resource needs (Baiman & Demski, 1980; Cyert & March 1963; Merchant, 1998; Williamson, 1969). Social cognitive theory suggests that individuals use generally accepted moral norms to self-regulate their behavior (Bandura, 1991, 2001), and prior accounting research provides evidence in support of the theory (Brown et al., 2009). We posit that the use of a financial measurement basis and the absence of direct slack benefits negatively affect honesty by deactivating managers' moral self-regulation. Specifically, a financial measurement basis reinforces the concept of money, which directs managers to focus on self-

☆ We thank Michael Williamson (editor), two anonymous reviewers, Kristina Demek, Agata Gasiorowska, Joseph Johnson, Michael Majerczyk, Adam Presslee, and participants at the SABE/IAREP/ICABEEP annual conference, the ABO midyear conference, and workshops at Georgia State University, University of Central Florida, and University of Tennessee for helpful comments. We appreciate research assistance provided by Melissa Carlisle, Joseph Johnson, and Lori Shefchik Bhaskar. We dedicate this paper to Bryan Church's family.

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[1] Note that, in this study, the distinction between direct and indirect slack benefits is not the magnitude of the benefit (which we hold constant in our experiment), but rather the way in which slack resources translate into managers' personal benefits (i.e., whether slack resources benefit managers immediately or through an intermediate activity).

https://doi.org/10.1016/j.aos.2018.05.005
0361-3682/

interest (Vohs, Mead, & Goode, 2008). The absence of direct slack benefits makes misreporting more justifiable and, thus, reduces managers' moral concerns (Mazar, Amir, & Ariely, 2008). Further, we predict that the effects of measurement basis and slack benefits on honesty are non-additive. That is, the negative effect of financial measurement basis on honesty will be weaker when managers receive indirect slack benefits than when they receive direct slack benefits. This is because, in deciding how to make budget reports, managers tradeoff between the utility from personal wealth and the disutility from lying (Mittendorf, 2006). As the level of honesty declines, managers' marginal *net* utility from misreporting diminishes because, on one hand, their marginal utility from wealth decreases and, on the other hand, their marginal disutility from lying increases (Bruggen & Luft, 2011; Hannan, Rankin, & Towry, 2010). Therefore, when managers receive indirect slack benefits, which already lower managers' honesty level, the ability of financial measurement basis to further decrease honesty will be weaker than when managers receive direct slack benefits. By the same logic, we predict that the negative effect of indirect slack benefits on honesty will be weaker when managers make budget reports in financial measures than when they make budget reports in nonfinancial measures.

To test our predictions, we conduct an experiment in which participants assume the role of a divisional manager and submit budget reports to hypothetical headquarters requesting funding to cover production costs. Participants know the actual cost but have an economic incentive to inflate the budget request. The experiment employs a 2×2 between-participant design, in which we manipulate the measurement basis of budget reports (financial versus nonfinancial) and whether participants receive a monetary payoff from budgetary slack directly or after an intermediate step (direct versus indirect). Consistent with our predictions, we find that a financial measurement basis leads to significantly lower honesty than a nonfinancial measurement basis when participants receive direct slack benefits, but this effect is attenuated when participants receive indirect slack benefits. We also find that a strengthened desire to advance self-interest mediates the effect of financial measurement basis on honesty. Similarly, indirect slack benefits lead to significantly lower honesty than direct slack benefits when a nonfinancial measurement basis is used, but not when a financial measurement basis is used. The effect of indirect slack benefits on honesty is mediated by a lessened moral concern in the decision-making process.

Our study contributes to theory and practice in several important ways. We extend the management accounting literature that explores how honesty in budget reporting is affected by situational factors independent of managers' economic incentives (Salterio & Webb, 2006). Specifically, prior accounting studies have examined honesty in settings where managers make budget reports in financial measures and directly benefit from budgetary slack (e.g., Rankin, Schwartz, & Young, 2003, 2008; Brown, Fisher, Sooy, & Sprinkle, 2014). A general finding is that managers tend to build slack in budget reports, although the average level of slack is lower than the wealth-maximizing level. Our study suggests that, in such settings, managerial honesty can be improved if budget reports are made in economically equivalent nonfinancial measures. Our findings have important implications for the design of management control systems in practice. While the choice of measurement basis may be endogenously influenced by other organizational factors, firm management needs to consider the potential costs and benefits of different alternatives so as to maximize the overall effectiveness of the control system.

The budgeting process consists of multiple stages, including budget preparation and budget review and execution (Merchant & Van der Stede, 2007). Prior honesty research examined the effects of noneconomic situational factors in each stage in isolation – for instance, owners' nonbinding announcements of the intended maximum funding level in the budget preparation stage (Rankin et al., 2003), and whether budgetary slack is shared by the reporting manager and other employees in the budget execution stage (Church, Hannan, & Kuang, 2012). Our study holistically investigates how important contextual features of different stages interact to influence managers' reporting decisions. This is important because managers' honesty "can be increased or decreased by the way in which the budgeting system is designed or complemented" (Riahi-Belkaoui, 1994, 12). Our findings highlight the need for researchers to carefully consider the specific decision contexts in future studies that investigate the effect of management accounting variables on managers' behavior.

Moreover, our study extends the literature on rewards and compensation. Accounting research investigates the psychological effects of different reward-scheme features on employees' effort and performance (Bonner & Sprinkle, 2002; Sprinkle & Williamson, 2007). Prior studies find that the framing of rewards (e.g., bonus versus penalty; cash versus noncash) has pronounced effects on employees' behavior (Christ, Sedatole, & Towry, 2012; Hannan, Hoffman, & Moser, 2005; Luft, 1994; Presslee, Vance, & Webb, 2013). While our study mainly focuses on budgeting settings, our findings suggest that the way in which managers are compensated can change their moral reasoning and, in turn, influence their decisions, even when the economic magnitude of compensation is held constant. Therefore, our study provides useful insight for understanding how noneconomic facets of organizational arrangements involving rewards and compensation may affect the cognitive processes underlying managers' behavior and decision making.

The remainder of this paper is organized as follows. In Section 2, we provide theoretical background and develop hypotheses. We report the research method in Section 3 and experimental results in Section 4. We offer concluding remarks in Section 5.

2. Theory and hypotheses

A core purpose of management control is using information and accountability systems to direct employees to act in line with the firm's strategic objectives (Langfield-Smith, 1997; Otley, 2003; Simons, 1990; Sprinkle & Williamson, 2007). For this purpose, management control system is tailored to fit the firm's operating environment and, therefore, the configuration of the control system varies across firms (Chenhall, 2003; Fisher, 1995). Prior accounting research has discussed the key characteristics of management control system in different environments (e.g., Chenhall, 2003; Davila, 2000; Ferreira & Otley, 2009; Malmi & Brown, 2008). In this paper we focus on the budgeting system, an integral part of management control system (Libby & Lindsay, 2010). The design of the budgeting system is contingent on specific organizational contexts (Merchant, 1981). The endogenous design choices, in turn, determine various functional attributes of the budgeting system, including the accounting metrics used and managers' discretion in resource utilization. We investigate how these functional attributes influence honesty in managers' budget reporting.

2.1. Budgeting practices and moral self-regulation

Budgets are widely used as a planning tool because they provide a useful basis for resource allocation decisions (Anthony & Govindarajan, 2004; Atkinson, Kaplan, Matsumura, & Young, 2007). To effectively allocate resources within the organization, top management often relies on bottom-up communication to

acquire information about subunits' resource needs (Penno, 1984; Waller & Bishop, 1990). In budget reporting, managers have an incentive to overstate their needs in order to attain slack resources, either for personal consumption or to ensure that production goals are satisfied (McAfee & McMillan, 1995; Merchant, 1985).[2] Thus, managers often make tradeoffs between advancing self-interest and reporting truthfully (Luft, 1997; Mittendorf, 2006). When making these tradeoffs, managers face temptation to increase personal wealth by misreporting (Chen, Tang, & Tang, 2014; Mittendorf, 2006). Social cognitive theory suggests that indivdiuals use generally accepted moral norms (e.g., honesty) to self-regulate their behavior (Bandura, 1991, 2001). Consistent with the social cognitive theory, experimental accounting research has found that, in budget reporting, managers often act in a manner that deviates from standard economic predictions, giving up wealth-maximizing opportunities to make honest or partially honest budget requests (Brown, Evans, & Moser, 2009).

However, social cognitive theory also suggests that the effectiveness of individuals' moral self-regulation in restraining misconduct is not invariant (Bandura, Caprara, Barbaranelli, Pastorelli, & Regalia, 2001; Zimmerman, 2000). Rather, self-regulation may be deactivated due to the influences of situational factors and, as a result, misconduct may arise (Baumeister & Heatherton, 1996; Heatherton & Baumeister, 1996; Bandura, 1999, 2002). For example, higher economic gains from misconduct can subject individuals to stronger temptation that overpowers their moral self-control (Tenbrunsel, 1998). Alternatively, if misconduct can be self-justified (e.g., misinterpreting the consequences, diffusion of responsibility), individuals may perceive it as more acceptable and, thus, feel less of a need to exert self-control (Bandura, 1999). In the accounting literature, researchers have devoted much attention to identifying factors that contribute to the deactivation of managers' moral self-regulation in budget reporting, including the opportunity cost of being honest (Hannan, Rankin, & Towry, 2006), superiors' authority (Rankin, Schwartz, & Young, 2008), sharing of budgetary slack among employees (Church et al., 2012), and social comparison of personal earnings (Brown et al., 2014). We extend this literature by examining the effects of important functional attributes of the budgeting system on moral self-regulation and, in turn, honest reporting.

Specifically, the functioning of the budgeting system involves two managerial processes (Hilton, Maher, & Selto, 2008). First, managers supply to the system relevant accounting information such as estimated costs and expenditures (i.e., the budget preparation process) (Parker & Kyj, 2006). Second, resources are allocated to managers to support their production or administrative work (i.e., the budget execution process) (Anthony & Govindarajan, 2004). We focus, respectively, on two prominent features of the budget preparation and execution processes: whether managers make budget reports in financial or nonfinancial measures, and whether managers directly benefit from budgetary slack. We contend that the use of a financial measurement basis for budget reporting and the absence of direct slack benefits undermine managers' moral self-regulation and, consequently, lead to lower honesty. Next, we explain the effects of these two budgetary features, and then discuss how they interact to affect managers' reporting behavior.

[2] Despite subordinates' incentive to misreport, a participative budget "may be more efficient than the best one achievable without the subordinate's participation" (Baiman & Evans, 1983, p. 372; Berg, Daley, Gigler, & Kanodia, 1990).

2.2. Measurement basis in budget preparation

When subunits report their resource needs to headquarters, the measurement basis of the report may vary depending on the firm's procurement policy: that is, based on whether procurement is decentralized or centralized (e.g., Johnson, Leenders, & Fearon, 1998; Rozemeijer, van Weele, & Weggeman, 2003). If procurement is decentralized, the user division is responsible for purchasing the productive items it needs (Joyce, 2006; Van Weele, 2010). So the user division can directly obtain pricing information from suppliers and submit budget requests in financial terms. By comparison, if procurement is centralized, the user division communicates its needs/requests in technical metrics, based on which the purchasing division collects pricing information and estimates the costs (Cooper & Kaplan, 1999; Ericson & Gross, 1980; Lilien & Wong, 1984; Thomas, 1989).[3]

When managers make budget reports in financial measures, the financial measure activates the concept of money (Vohs, Meade, & Goode, 2006, 2008). Because money denominates economic transactions, reminders of money can trigger a market-based decision frame (Heyman & Ariely, 2004; Kouchaki, Smith-Crowe, Brief, & Sousa, 2013). As a result, in making reporting decisions, managers consider a cost-benefit calculus, where the primary aim is to improve one's economic well-being (Kouchaki et al., 2013). Reminders of money bring managers' own financial interests to the forefront, making such interests dominant in decision making (Fiske, 1992; Kouchaki et al., 2013; Vohs, Meade, & Goode, 2008). This heightened desire to advance financial self-interest may outweigh managers' moral self-control (Kish-Gephart, Detert, Treviño, Baker, & Martin, 2014; Rajeev, 2011), inducing them to incorporate excess slack in their budget requests to increase personal wealth (Brandt, 1972; Ferrell, Fraedrich, & Ferrell, 2000; Forsyth, 1980). We expect that using financial measures in budget reporting, as opposed to nonfinancial measures, promotes behavior that is more in line with economic self-interest. However, as elaborated below, we expect that the effect of financial measurement basis on managers' behavior will be moderated by the way in which managers benefit from budgetary slack.

2.3. Managers' benefits from budgetary slack

To the extent that budget reports impact top-level decision making, managers gain power in resource acquisition and usage (Covaleski, Dirsmith, & Samuel, 1996; Markus & Pfeffer, 1983). Managers have an incentive to build slack in their budget reports, attaining resources in excess of their actual needs (Christensen, 1982; Dunk & Nouri, 1998). Contingent on the firm's internal and external operating environments, budgetary slack exists in different types of resources, including financial, physical, and human capital (Barney, 1991; Ruiz-Moreno, Garcia-Morales, & Llorens-Montes, 2008).

Depending on the specific type of slack resources and managers' authoritative power, managers may have different levels of

[3] Whether procurement is centralized or decentralized is influenced by a variety of organizational factors, such as the firm's product strategy (David, Hwang, & Pei, 2002), the type of items purchased (Ericson & Gross, 1980; Laios & Xideas, 1994), and information asymmetry (Vagastad, 2000). Some firms adopt a hybrid system such that small orders and rush orders are handled by the user division, whereas high-volume, high-priced orders are handled by a centralized purchasing division (Joyce, 2006). Moreover, while procurement policy is an important determinant of the measurement basis, the choice of measures could be influenced by other factors, including the cost of measurement and the quality of the measure (Merchant & Van der Stede, 2007). We preclude the effects of these factors in our study to avoid potential confounds.

discretion in the deployment of these resources (Mishina, Pollock, & Porac, 2004; Sharfman, Wolf, Chase, & Tansik, 1988). Accordingly, managers derive personal benefits from slack resources in different ways. At some firms, managers can directly extract economic benefits from slack resources. For example, when discretionary funding is granted, managers may enjoy more perquisites (Bourgeois, 1981; Bowen, 2002; Mishina et al., 2004). At other firms, slack resources do not directly translate into the manager's personal gain (Liu, Lin, & Cheng, 2011). Instead, these resources are used for other organizational activities, which potentially bring benefits to the manager. For example, slack resources in the form of increased productive capacity help improve current-period operational results, which ultimately leads to higher output-based compensation for the manager.[4] In such cases, the manager's personal benefits from budgetary slack are relatively indirect and may not be immediately realizable (Shahzad, Mousa, & Sharfman, 2016).

We posit that whether managers reap direct slack benefits will influence their reporting behavior. As discussed earlier, individuals' moral self-regulation against unethical behavior may be deactivated by self-serving justification of such behavior (Bandura, 1990). An important technique used to justify unethical behavior is to recategorize its consequences (Bandura, 1986, 1996). Mazar et al. (2008) suggest that, when the consequences of unethical behavior are reinterpreted in more liberal terms, it helps reconcile the psychological conflict between pursuing self-interest and maintaining a positive self-concept, and, thereby, increases the likelihood of people engaging in such behavior.

In our setting, if managers do not directly benefit from slack creation, they may be less concerned about misreporting and, thus, feel less need to exert self-control. Such effects can occur for two reasons. First, the indirectness of personal benefits from slack increases the psychological distance between self and immoral conduct because it diminishes the perceived personal attachment or involvement in such conduct (Naquin, Kurtzberg, & Belkin, 2010). Increased psychological distance, in turn, reduces individuals' moral concerns (Paharia, Kassam, Greene, & Bazerman, 2009; Zyglidopoulos & Fleming, 2008). Second, people tend to assess the acceptability of lying based on the consequences of the lie (Grover, 2005; Jones, 1991). Therefore, the absence of immediate financial gain makes lying appear less condemnable. Along these lines, Mazar et al. (2008) find that individuals who receive an intermediary medium of reward (tokens) from lying are less honest than those who directly earn cash from lying. We expect that the absence of direct slack benefits will increase the level of misreporting.

While we focus on managers' personal gain from budgetary slack, the above arguments are applicable to other forms of managerial compensation. The accounting literature has examined how the framing of reward schemes influences the incentive effect (i.e., the motivating effect) of rewards in non-moral contexts. For example, prior studies find that a compensation contract framed as a bonus is perceived to be fairer and more trusting than the same contract framed as a penalty, and that the bonus contract elicits higher (lower) effort than the penalty contract in incomplete (complete) contract settings (Christ et al., 2012; Hannan et al., 2005; Luft, 1994). Noncash compensation leads to employees' choices of easier performance goals, but greater commitment to the goal, than cash compensation (Presslee et al., 2013). We extend this line of research to moral contexts. We investigate how the way in which managers are compensated affects the perceived morality of self-serving acts and, in turn, the likelihood of engaging in such acts, even when the underlying economic incentive is held constant.

[4] Such use of resources, while benefiting the manager, may be suboptimal for the firm in the long term (Riahi-Belkaoui, 1994; Williamson, 1963, 1964).

2.4. Interactive effect between measurement basis and slack benefits

As suggested above, a financial measurement basis for budget reporting and the absence of direct slack benefits can each serve as a "deactivator" of moral self-regulation and, thereby, leads to lower honesty. An intriguing research issue is the joint effect of these two deactivators when they are both present, as compared to when only one of them is present. Studying this interactive effect is important because, in practice, the measurement basis used for budget reporting might influence the type of ensuing slack benefits. For example, as discussed earlier, in firms with a decentralized procurement policy, subunit managers often make budget requests in financial terms (e.g., dollars). Accordingly, top management may approve the budget by allocating requested funds to the subunit. To the extent that funds can be used in a more flexible manner than other types of slack resources, they are likely to generate immediate personal gain for the manager (Bowen, 2002; Mishina et al., 2004; Shahzad et al., 2016). On the other hand, in firms with a centralized procurement policy, managers may submit budget requests in nonfinancial terms (e.g., physical units of productive items) and receive nonpecuniary resources, which lead to indirect slack benefits. Our study provides insight for understanding how managers' honesty is affected by these different combinations of budgetary features. We further discuss the implications of our study for management control practices in the final section of the paper.

To facilitate our discussion, we illustrate our theoretical predictions in Fig. 1. We mainly discuss how the effect of financial measurement basis on honesty differs between settings where managers receive direct slack benefits and settings where managers receive indirect slack benefits. Referring to Fig. 1, we compare the difference between A and B with the difference between C and D. After this discussion, we apply a similar logic to developing predictions about how the effect of indirect slack benefits on honesty differs between a financial measurement basis and a nonfinancial measurement basis (i.e., compare the difference between A and C with the difference between B and D in Fig. 1).

First, consider the effect of financial measurement basis in a setting where managers receive direct slack benefits (i.e., B versus A in Fig. 1). Our theory suggests that a financial measurement basis, relative to a nonfinancial measurement basis, has a negative effect on honesty because it strengthens managers' desire to advance self-interest (i.e., $B < A$ in Fig. 1). Then, we predict that the negative effect of financial measurement basis on honesty will be weaker when managers receive indirect slack benefits than when managers receive direct slack benefits. Referring to Fig. 1, we use A and C as a baseline honesty level, and compare the extent to which honesty drops from the baseline level under direct slack benefits (i.e., $A - B$) versus under indirect slack benefits (i.e., $C - D$). We predict $C - D < A - B$ because, when making reporting decisions, managers tradeoff between the utility from wealth and the disutility from lying (Brickley, Smith, & Zimmerman, 1997). The marginal utility from wealth decreases with the level of wealth (Hannan et al., 2010), whereas the marginal disutility from lying tends to increase with the degree of lying (Bruggen & Luft, 2011; Mittendorf, 2006). Therefore, as the honesty level declines, the marginal *net* utility from misreporting diminishes. Applying this principle to Fig. 1, for our purpose, the lower the baseline honesty level, the less marginal net utility managers will derive from misreporting

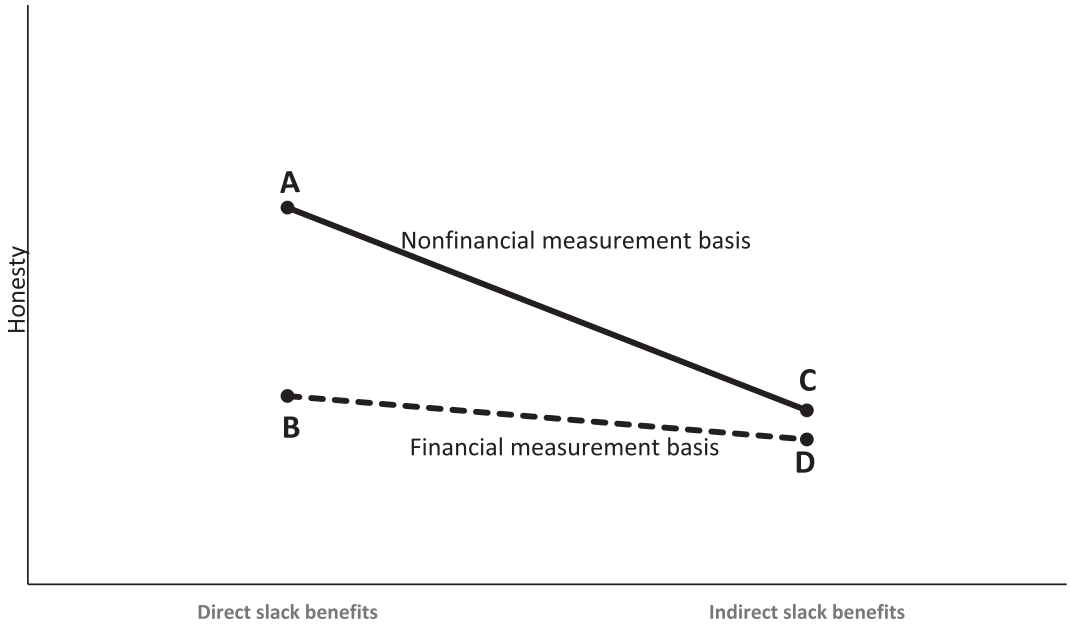

Fig. 1. Theoretical predictions.
This figure illustrates the hypothesized effects of measurement basis (financial versus nonfinancial) and slack benefits (direct versus indirect) on honesty.
H1 posits that using a financial measurement basis for budget reporting, relative to a nonfinancial measurement basis, will decrease managers' honesty level to a greater extent when managers receive direct slack benefits than when they do not receive such benefits (i.e., A − B > C − D).
H2 posits that the absence of direct slack benefits, relative to the presence of such benefits, will decrease managers' honesty level to a greater extent when managers make budget reports in nonfinancial units than when they make budget reports in financial units (i.e., A − C > B − D).

beyond the baseline level. Thus, because the baseline honesty level is lower at C than at A (as a result of indirect slack benefits making misreporting more justifiable), financial measurement basis will be less able to incrementally reduce honesty from C to D than from A to B, due to managers' diminishing marginal net utility from misreporting. That is, we expect that the difference in the honesty level between financial and nonfinancial measurement bases will be smaller under indirect slack benefits (i.e., C − D) than under direct slack benefits (i.e., A − B). We formally state this prediction as our first hypothesis.

H1. Using a financial measurement basis for budget reporting, relative to a nonfinancial measurement basis, will decrease managers' honesty level to a greater extent when managers directly benefit from budgetary slack than when they do not directly benefit from budgetary slack.

Applying a similar logic, we posit that the absence of direct slack benefits has a negative effect on honesty when budget reports are made on a nonfinancial measurement basis. We also posit that this negative effect will be weaker when budget reports are made on a financial measurement basis because of the diminishing marginal net utility from further lying. Referring to Fig. 1, we predict the following relationship for the honesty level: B − D < A − C. We formally state this prediction as our second hypothesis:

H2. The absence of direct slack benefits, relative to the presence of such benefits, will decrease managers' honesty level to a greater extent when managers make budget reports in nonfinancial units than when they make budget reports in financial units.

3. Method

3.1. Experimental setting and design

We conduct a laboratory experiment to test our hypotheses. In our experiment, participants act as a divisional manager of a corporation. The division manufactures flanges and the manager submits a budget to (hypothetical) corporate headquarters, requesting funding to cover the material needed for production (i.e., bar steel stock). The actual material needed is private information held by the manager. The headquarters always approves the budget and provides funding as requested by the manager. The manager keeps a portion of the difference between the funding provided by the headquarters and the actual material cost (i.e., budgetary slack).[5]

We use a "trust contract" (Evans, Hannan, Krishnan, & Moser, 2001), rather than mechanisms such as hurdles (Antle & Eppen, 1985) or audits (Chow, Hirst, & Shields, 1995), to provide a clean test of honesty in budget reporting. The trust contract allows us to investigate the effects of behavioral factors when individuals have unambiguous economic incentives to act opportunistically (see also Brown et al., 2014; Church et al., 2012; Evans et al., 2001; Hannan et al., 2006).

We manipulate two factors between participants. The first between-participant factor is the measurement basis of the budget report. In one condition, participants report the material cost *in dollars*, referred to as the FINANCIAL condition. In the other condition, participants report the material needed for production *in pounds*, referred to as the NONFINANCIAL condition. Importantly, in the NONFINANCIAL condition, participants are explicitly told that

[5] Our experimental context is adopted from Evans et al. (2001). Other like-studies in the budgeting literature have used a similar context (e.g., Brown et al., 2014; Church et al., 2012; Hannan et al., 2006; Rankin et al., 2008). The manager-reporting context helps maintain comparability of our study to other studies in the management accounting literature and facilitates the operationalization of measurement basis in a way that mimics budget reporting in practice. We chose not to include another person serving as corporate headquarters, because doing so introduces concerns about equity and fairness in participants' reporting decision (Rankin et al., 2008).

corporate headquarters knows that the material's purchasing price is $1 per pound and, therefore, will provide funding that equals $1 multiplied by the number of pounds budgeted.[6]

The second between-participant factor is whether participants receive direct or indirect slack benefits. As discussed earlier, the key difference between these two types of slack benefits is whether budgetary slack directly translates into personal gain or does so through an intervening step. Accordingly, we manipulate this factor using Mazar et al. (2008) method. In one condition, participants receive their share of the slack directly in cash, referred to as the DIRECT condition. In the other condition, participants receive their share of the slack in tokens, which are later converted to cash, referred to as the INDIRECT condition.[7] In all four experimental conditions, participants have the same economic incentives and are given the same information about their incentives. Therefore, the standard economic perspective suggests that their reporting behavior should be identical in these two conditions. We repeat the experiment for six independent periods.

3.2. Participants and procedures

Eighty-one undergraduate students enrolled in various majors at a public university in the U.S. are recruited to participate in our experiment. The experiment is conducted in a behavioral research laboratory, where instructions are distributed and read aloud. Each period, participants are paid a base salary of $5, and they submit a budget to corporate headquarters. For ease of exposition, we first describe the experimental procedures for the two DIRECT conditions (i.e., FINANCIAL_DIRECT and NONFINANCIAL_DIRECT). Then we do the same for the two INDIRECT conditions (i.e., FINANCIAL_INDIRECT and NONFINANCIAL_INDIRECT).

In the FINANCIAL_DIRECT condition, participants request funding to cover the material cost of production. Participants know the actual material cost, whereas corporate headquarters only knows that the material cost is uniformly distributed between $1000 and $1500 (in increments of $1). Corporate headquarters provides funding equal to the amount budgeted, and participants keep 10 percent of the difference between the budgeted and actual material cost.[8] Participants are given a numerical example about how their payoffs are determined and told that all decisions they make in the experiment are anonymous. After reading the instructions, participants complete a quiz to ensure that they understand the experimental task.

In the NONFINANCIAL_DIRECT condition, the procedures are the same as those in the FINANCIAL_DIRECT condition except for the variations necessitated by our experimental manipulation. Participants request resources to cover the material inputs of production. Participants know the actual material usage, whereas corporate headquarters only knows that the material usage is uniformly distributed between 1000 and 1500 pounds (in increments of 1 pound). Corporate headquarters provides resources in the amount budgeted, and participants keep 10 percent of the difference between the budgeted and actual amounts, converted to dollars (i.e., multiplying the difference by $1 per pound). As before, participants are given a numerical example that shows how their payoffs are determined.

Logistically, in both FINANCIAL_DIRECT and NONFINANCIAL_DIRECT conditions, each period proceeds as follows. Participants are given a report sheet. The top section of the sheet shows the actual material cost or usage for the period and the bottom section is for participants to enter a budgeted amount (in dollars or pounds). After participants enter their budgets, the report sheets are collected and the period ends. Then, the next period begins and the same procedures are repeated. After the six periods are finished, one period is randomly selected as the payment period. Participants complete a post-experiment questionnaire and are paid privately in cash based on their budget reports in the payment period.

Experimental procedures in the FINANCIAL_INDIRECT condition and the NONFINANCIAL_INDIRECT condition are, respectively, the same as those in the FINANCIAL_DIRECT condition and NONFINANCIAL_DIRECT condition, except for the following difference. Participants' reporting behavior determines the number of tokens earned. At the end of the experiment, participants are given tokens based on their budget reports in the payment period. Then, they go to another room, where a research assistant who has no knowledge of the experiment exchanges their tokens for dollars at a rate of 1 token equals $1.

4. Results

4.1. Descriptive statistics

We use a measure adopted from Evans et al. (2001) to assess participants' honesty in budget reporting. The measure, referred to as *HONESTY*, is computed as 1 − (reported amount− actual amount)/(1500 − actual amount). *HONESTY* takes a value from zero to one and represents the extent to which participants report opportunistically. If a participant reports the maximum possible amount of 1500 (dollars or pounds), the value is zero. If a participant reports the actual amount, the value is one. Values between zero and one represent participants who report an amount above the actual amount but less than the maximum amount possible. The means of *HONESTY* for the four experimental conditions are presented in Panel A of Table 1 and depicted in Fig. 2.

4.2. Hypotheses tests

To test our hypotheses, we conduct an ANOVA. The dependent variable is the participant's mean *HONESTY* across six periods. The independent variables include the measurement basis of budget reports (FINANCIAL vs. NONFINANCIAL), slack benefit (DIRECT vs. INDIRECT), and the interaction between the two. As reported in Panel B of Table 1, the result reveals a significant interaction effect ($p = 0.043$) of measurement basis and slack

[6] We set the material price at $1 per pound in order to hold constant the magnitude of the numerical scale between reports in dollars and reports in pounds, thereby precluding a potential confound caused by the "scale" effect (Holt & Laury, 2002; Kuhberger, Schulte-Mecklenbeck, & Perner, 1999).

[7] At the operational level, the FINANCIAL/NONFINANCIAL manipulation varies the *method of reporting*, where we predict that reporting in dollars leads to self-interested behavior by reinforcing the concept of money. By comparison, the DIRECT/INDIRECT manipulation varies the *method of payment*, where we predict that using an intermediary medium of payment leads to self-serving behavior by increasing the psychological distance between money and misreporting.

[8] Other related studies allow participants to keep 100 percent of the budgetary slack; however, in those studies an experimental numeraire (e.g., Lira) is used to convert experimental earnings to dollars (e.g., Church et al., 2012; Evans et al., 2001; Hannan et al., 2006). Our approach (i.e., allowing participants to keep 10 percent of the budgetary slack) is economically analogous. In the current study, we cannot use an experimental numeraire because our manipulation of measurement basis requires the use of dollars in one condition. We let participants keep 10 percent of the slack to increase the mundane realism of our budget reporting setting (e.g., material cost ranges from $1000 to $1,500, rather than smaller amounts) while maintaining payment to participants at a reasonable level.

Table 1
Results of hypotheses tests.
Panel A: Descriptive statistics: The mean [s.d.] of HONESTY.

		Slack benefits	
		DIRECT	INDIRECT
Measurement basis of budget reporting	NONFINANCIAL	0.26	0.12
		[0.35]	[0.22]
		N = 19	N = 24
	FINANCIAL	0.07	0.12
		[0.11]	[0.25]
		N = 21	N = 17

Panel B: ANOVA (Dependent variable = the mean HONESTY across six periods)

	Partial SS	*df*	*MS*	*F-statistic*	*p value*
Measurement_basis	0.19	1	0.19	3.32	0.072
Slack_benefit	0.05	1	0.05	0.88	0.350
Measurement_basis × Slack_benefit	0.18	1	0.18	3.04	0.043*
Residual	4.48	77	0.06		

Panel C: Simple effects (Dependent variable = the mean HONESTY across six periods)

	F-statistic	*p value*
In the DIRECT condition: FINANCIAL vs. NONFINANCIAL	6.37	0.007*
In the INDIRECT condition: FINANCIAL vs. NONFINANCIAL	<0.01	0.955
In the NONFINANCIAL condition: DIRECT vs. INDIRECT	3.83	0.027*
In the FINANCIAL condition: DIRECT vs. INDIRECT	0.30	0.583

HONESTY = 1 − (reported cost − actual cost)/(1500 − actual cost).
In the NONFINANCIAL condition, participants make budget reports in pounds.
In the FINANCIAL condition, participants make budget reports in dollars.
In the DIRECT condition, participants are directly paid in cash based on their budget report in the payment period.
In the INDIRECT condition, participants are given tokens based on their budget report in the payment period and later exchange tokens for cash at a rate of 1 token equals $1.
Measurement_basis = zero for the NONFINANCIAL condition and one for the FINANCIAL condition.
Slack_benefit = zero for the DIRECT condition and one for the INDIRECT condition.
An asterisk indicates a one-tailed p value for testing a directional prediction.

benefit on the honesty of participants' reports.[9]

To understand the nature of this interaction effect, we use contrast analyses to examine simple effects. Consistent with our theory, when participants directly receive cash from budgetary slack, financial measurement basis leads to significantly lower (p = 0.007) honesty than nonfinancial measurement basis. By comparison, when participants receive tokens from budgetary slack, financial versus nonfinancial measurement basis does not significantly affect (p = 0.955) their honesty. Also consistent with our theory, when participants make budget reports in nonfinancial measures, their honesty level is significantly lower (p = 0.027) when they are paid in tokens than in cash. However, when participants make budget reports in financial measures, whether they are paid in tokens or in cash does not significantly influence (p = 0.583) their honesty. These results provide support for our hypotheses.

4.3. Additional analyses

We conduct additional analyses to shed light on the psychological processes underlying participants' decision making. Our theory suggests that financial measurement basis generates a heightened focus on self-interest, which overpowers participants' moral self-control and leads to more budgetary slack. To measure participants' desire to advance self-interest, in the post-experimental questionnaire we ask participants to rate how desirable/attractive it was for them to obtain resources in excess of the actual level, on an 11-point scale where 1 = "not at all" and 11 = "very much" (labeled *DESIRE*). Our theory also suggests that the absence of direct slack benefits reduces participants' moral concerns. In the post-experimental questionnaire, we ask participants to rate the extent to which they were concerned about being honest, on an 11-point scale where 1 = "not at all" and 11 = "very much" (labeled *HONESTY_CONCERN*).

We conduct structural equations-based path analyses to simultaneously test the relationships among our main variables. We first test whether *DESIRE* mediates the effect of measurement basis on honesty, controlling for *HONESTY_CONCERN*. Model results are shown in Fig. 3, with goodness-of-fit measures indicating a good model fit: the result of the chi-squared Likelihood Ratio test is non-significant (p = 0.118), the Comparative Fix Index (CFI) is 0.951, and the Standardized Root Mean Square Residual (SRMR) is 0.068.[10] Consistent with our theory, there is a significantly positive relationship (p = 0.053, Link 1) between financial measurement basis and *DESIRE* when participants are paid in cash for budgetary slack. By comparison, the path between measurement basis and *DESIRE* is not significant (p = 0.207, Link 1) when participants are paid in tokens for budgetary slack. These results suggest that the desire to advance self-interest mediates the effect of financial measurement basis on honesty, but only when participants do not receive direct slack benefits. When participants do receive direct slack benefits, the mediation effect does not exist. Further, under both direct and indirect slack benefits, there is a significantly negative relationship

[9] We repeat the hypothesis test using a repeated-measure ANCOVA, with the participant's HONESTY in each period as the dependent variable, measurement basis, slack benefit, and the interaction between measurement basis and slack benefit as between-participant factors, period as the within-participant factor, and the actual cost as the covariate. The covariate is non-significant, and period is marginally significant (p = 0.081). Importantly, controlling for period, the interaction effect remains statistically significant (p = 0.044).

[10] The struactrual equations model is considered a good fit if CFI is equal to or higher than 0.95 and SRMR is equal to or lower than 0.08 (Hu & Bentler, 1999; Kline, 2016).

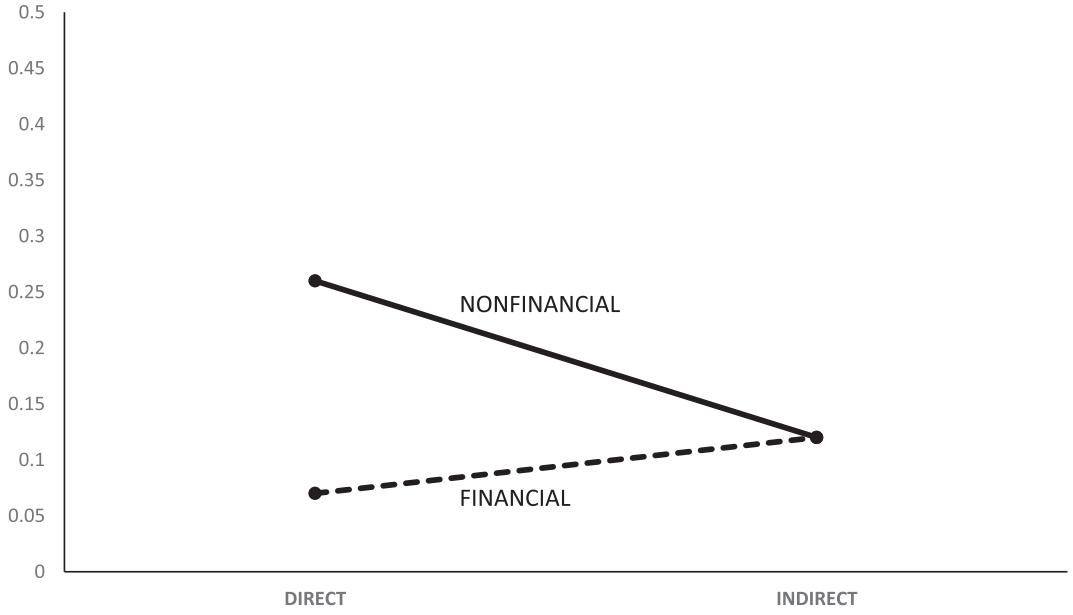

Fig. 2. The mean HONESTY in the four experimental conditions.
This figure depicts the mean honesty level in the four experimental conditions.
HONESTY = 1 − (reported cost − actual cost)/(1500 − actual cost).
In the NONFINANCIAL condition, participants make budget reports in pounds.
In the FINANCIAL condition, participants make budget reports in dollars.
In the DIRECT condition, participants are directly paid in cash based on their budget report in the payment period.
In the INDIRECT condition, participants are given tokens based on their budget report in the payment period and later exchange tokens for cash at a rate of 1 token equals $1.

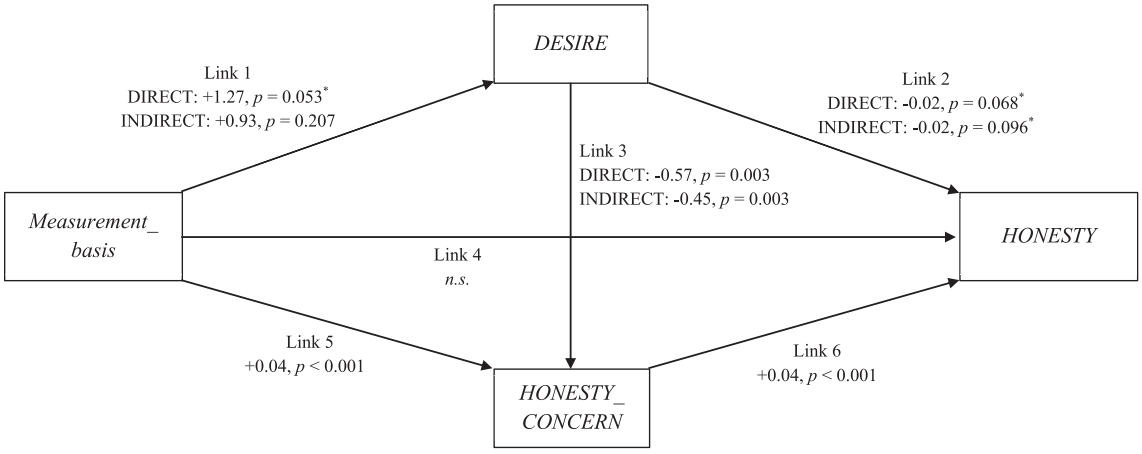

Fig. 3. SEM analysis for mediation effects: Desire to advance self-interest.
This model provides a path analysis that simultaneously tests the relationships among *Measurement_basis*, *HONESTY*, and *DESIRE*, controlling for *HONESTY_CONCERN*. The number of observations is 81. We show, next to each path, the path coefficient and corresponding p-value (an asterisk indicates a one-tailed test). The model provides a good fit for the data, as evidenced by a non-significant chi-squared Likelihood Ratio test (p = 0.118), a Comparative Fix Index (CFI) of 0.951, and a Standardized Root Mean Squared Residual (SRMR) of 0.068.
DESIRE = participants' rating of how desirable/attractive it was for them to obtain resources in excess of the actual level, on an 11-point scale where 1 = "not at all" and 11 = "very much."
HONESTY_CONCERN = participants' rating of the extent to which they were concerned about being honest, on an 11-point scale where 1 = "not at all" and 11 = "very much."
See Table 1 for definitions of other variables.

between *DESIRE* and *HONESTY* (Link 2), providing reassurance that our *DESIRE* measure captures participants' thought processes.

Then we conduct a path analysis to examine whether *HONESTY_CONCERN* mediates the effect of slack benefits on honesty, controlling for *DESIRE*. The results are presented in Fig. 4. Goodness-of-fit measures indicate a good model fit, with a non-significant chi-squared test (p = 0.135), an CFI of 0.958 and an SRMR of 0.049. We find a significantly negative relationship (p = 0.005, Link 1) between slack benefits and *HONESTY_CONCERN* when participants make budget reports in nonfinancial measures, but not when they make budget reports in financial measures (p = 0.434, Link 1). These results suggest that, consistent with our theory, a lessened concern about honesty mediates the effect of indirect slack benefits on honesty, but only when participants report in nonfinancial units. When participants report in financial units, this mediation effect does not exist. We also find that *HONESTY_CONCERN* is significantly positively related to *HONESTY* (Link 2), again suggesting that our *HONESTY_CONCERN* measure is

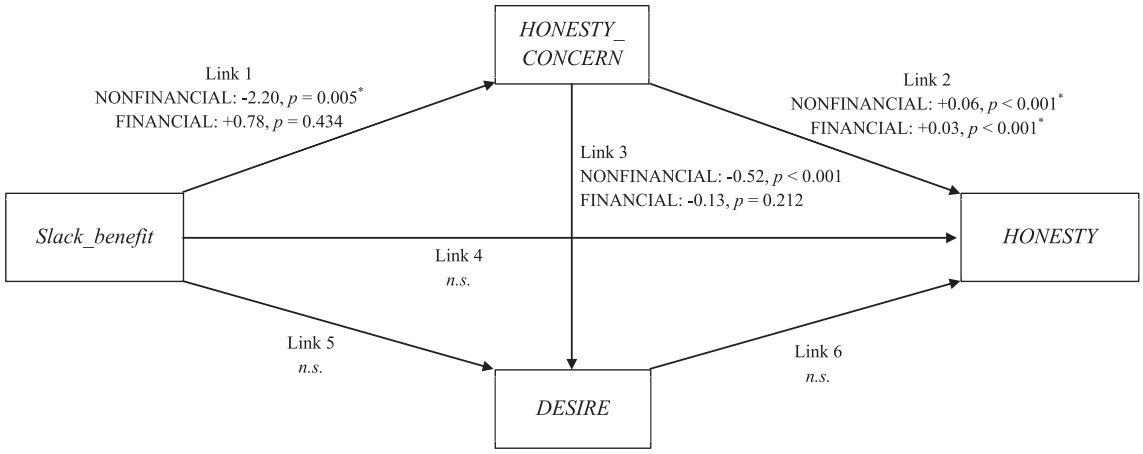

Fig. 4. SEM analysis for mediation effects: Honesty concern.
This model provides a path analysis that simultaneously tests the relationships among *Slack_benefit*, *HONESTY*, and *HONESTY_CONCERN*, controlling for *DESIRE*. The number of observations is 81. We show, next to each path, the path coefficient and corresponding p-value (an asterisk indicates a one-tailed test). The model provides a good fit for the data, as evidenced by a non-significant chi-squared Likelihood Ratio test (p = 0.135), a Comparative Fix Index (CFI) of 0.958, and a Standardized Root Mean Squared Residual (SRMR) of 0.049.
DESIRE = participants' rating of how desirable/attractive it was for them to obtain resources in excess of the actual level, on an 11-point scale where 1 = "not at all" and 11 = "very much."
HONESTY_CONCERN = participants' rating of the extent to which they were concerned about being honest, on an 11-point scale where 1 = "not at all" and 11 = "very much."
See Table 1 for definitions of other variables.

reflective of participants' psychological processes.

Overall, the results of path analyses show that financial measurement basis increases misreporting by strengthening the desire to pursue self-interest and the absence of direct slack benefits increases misreporting by attenuating individuals' moral concerns. Our analyses also suggest that these two effects are non-additive. These findings provide further support for our theory.

5. Conclusion and discussion

In this paper, we report the results of an experiment designed to investigate the effects of measurement basis and slack benefits on managers' behavior in budget reporting. The standard economic perspective suggests that, in our setting, the choice of measurement basis and the type of slack benefits should not impact behavior. However, based on psychological theory, we predict that a measurement basis of financial units reinforces the concept of money, thereby enhancing managers' desire to pursue self-interest. The absence of direct economic benefits from slack decreases the perceived personal attachment to misreporting and, thus, makes such behavior more justifiable. As a result, these two contextual factors deactivate managers' moral self-regulation and, in turn, negatively affect honesty in budget reporting. We also predict that the negative effect of one factor on honesty is stronger when the other factor is absent than when the other factor is present, because of diminishing marginal net utility from misreporting. Consistent with our predictions, we find an interactive effect of measurement basis and slack benefits on honesty: reporting in financial units, relative to nonfinancial units, decreases participants' honesty level, but only when they receive a direct financial payoff from budgetary slack. Moreover, the absence of a direct financial payoff from slack, relative to the presence of such a payoff, decreases participants' honesty level, but only when they make budget reports in nonfinancial units.

Our findings contribute to the accounting literature investigating the effects of noneconomic social factors on employees' behavior and have important implications for improving the effectiveness of management control systems in practice. As discussed earlier, managers in firms that adopt a decentralized procurement policy are likely to make budget reports in financial measures and directly benefit from budgetary slack. Our study suggests that, in these settings, an effective control device for promoting honesty is to mandate the use of nonfinancial measures in budget reporting. On the other hand, in firms with a centralized procurement policy, where managers by default may submit budget requests in nonfinancial measures and receive indirect slack benefits, giving managers more discretion in resource deployment (i.e., allow for direct slack benefits within a reasonable limit) can actually lead to more honest budget reports. This finding is consistent with prior accounting literature, which suggests that sometimes managerial perquisites can be used as an incentive device (Arya, Fellingham, Glover, & Sivaramakrishnan, 2000; Kaplan & Atkinson, 1998). Firm management needs to carefully consider these effects in light of extant environment, and adjust control systems accordingly to maximize the likelihood of achieving organizational goals.

Our experimental findings are subject to several limitations, which provide a basis for future study. Our experiments are conducted in the laboratory within a relatively short time span, so it is not clear whether the results will persist when individuals are exposed to financial measures for an extended period of time. It is possible that, after repeated exposure, the concept of money gradually becomes the "default" mindset, and therefore, its stimulating effect on behavior weakens. Now that we have documented the results in a baseline setting, the natural next step is to examine the sustainability of these results over a longer time frame.

Our experimental manipulation of slack benefits is subtle: in the INDIRECT condition participants receive tokens from budgetary slack, which are converted to cash after a short delay. This design choice provides a conservative test of our hypotheses. On the other hand, in our experiment budgetary slack solely benefits the manager who makes the budget report, whereas in naturally occurring settings slack resources may also improve the division's productive or administrative efficiency, which could change the perceived justifiability of slack creation. It would be interesting to explore whether such changes in justifiability affect managers' honesty.

As discussed in the theory and hypotheses section, in this paper we investigate how managers' honesty is influenced by important contextual factors inherent in the budget preparation and execution processes. To the extent that other elements of the budgeting system or, more broadly, the management control system differ fundamentally from the two settings we chose to examine, the effects of the types of accounting measures and personal benefits on managers' behavior could differ from those documented in the paper. Future research could systematically investigate other management control contexts to gain a more comprehensive understanding of such effects.

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