

**The Effect of Endogenous Contract Selection on Budgetary Slack:
An Experimental Examination of Trust, Distrust, and Trustworthiness**

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Abstract: We examine the effect of endogenous contract selection on budgetary slack using two slack-inducing contracts found in the literature: a trust contract where the superior must accept the subordinate's budget and a discretion contract where the superior can accept or reject the budget. Because neither contract incorporates a formal control for budgetary slack, we apply insights from both agency theory and social norm theory to develop our theoretical expectations. We hypothesize and find that budgetary slack is lower for both contracts when they are endogenously selected by the superior than when they are exogenously assigned. Consistent with our theoretical expectations, exit questionnaire responses suggest that selecting a trust contract signals trust and expectations of trustworthiness whereas selecting a discretion contract signals distrust and an increased willingness to enforce trustworthiness by rejecting unreasonable budgets. Signaling distrust, however, appears optimal for superiors in our budgeting setting. In particular, far more superiors select the discretion contract under endogenous contract selection and doing so yields the efficiency of the optimal hurdle contract prescribed under traditional agency assumptions.

Keywords: *endogenous contract selection; trust; distrust; trustworthiness*

Data Availability: *Experiment data are available from the authors upon request.*

JEL: C91; D83; M40

1. Introduction

Participative budgeting, wherein superiors involve subordinates in the formulation of budgets, improves efficiency to the extent that it allows superiors to incorporate their subordinates' private information in operating and financing decisions. This improvement in efficiency is supported by standard agency models, which reveal that optimal contracts make non-trivial use of the subordinate's budget communication (Antle and Eppen 1985; Antle and Fellingham 1997; Lambert 2001).¹ Due to the subordinate's incentive to build slack in the budget, and the high cost of reducing this incentive through formal contracting, a large experimental literature in participative budgeting examines informal controls for budgetary slack (Brown, Evans, and Moser 2009). This literature commonly uses two slack-inducing contracts that are exogenously assigned to participants: a trust contract where the superior must accept the subordinate's budget and a discretion contract where the superior can accept or reject the budget. We hypothesize and find that budgetary slack is lower for both contracts when they are endogenously selected by the superior than when they are exogenously assigned. Thus, we provide theory and evidence suggesting that endogenous contract selection increases the efficiency of participative budgeting.

Although it has received little attention, we argue that endogenous contract selection is an important next step in the literature. First, participative budgeting is typically found in large, decentralized firms with high information asymmetry (Shields and Shields 1998), and the budgeting process in these firms is likely to be subject to locally chosen

¹ It should be noted that the purpose of the budget communication in these agency models is only to determine how much to compensate the subordinate and whether production should occur. Further, these models assume that the subordinate always acts so as to maximize budgetary slack.

procedures (Mookherjee and Reichelstein 1997). Second, many firms are moving towards flatter organizational structures in lieu of more hierarchical structures (Fraser and Dutta 2008), which leads to the delegation of decision rights and more local control over budgeting procedures. Third, at some hierarchical level the contractual form is endogenous, and research is needed to generate better insight into this feature of the budgeting process (Cardinaels and Yin 2015). Finally, endogenous contract selection by superiors can influence subordinate behavior by conveying behavioral expectations, and the role of contract selection in conveying such expectations has not been previously examined.

Consistent with the experimental literature in participative budgeting, we focus on contracts that rely on informal controls for budgetary slack. Formal controls have been criticized for substituting for trust rather than encouraging trust (Cook, Hardin, and Levi 2005) and for eliminating the opportunity to make inferences about an agent's trustworthiness (Yamagishi and Yamagishi 1994). Further, formal controls have been found to signal distrust and reduce intrinsic motivation for trustworthiness (Tenbrunsel and Messick 1999), particularly when endogenously selected (Fehr and Rockenbach 2003). Finally, there is growing evidence that informal controls play an important role in participative budgeting. A recent study of participative budgeting at a large European bank finds that informal agreements commonly arise and generate mutual trust and trustworthy behavior (Bol and Lill 2015). In addition, experimental researchers have documented the ability of social norms to reduce budgetary slack apart from formal controls (e.g., Rankin, Schwartz, and Young 2008; Hannan, Rankin, and Towry 2010; Douthit and Stevens 2015).

Experimental researchers commonly use one of two contracts to examine informal controls for budgetary slack. One is a contract where the superior must accept any feasible

budget proposal submitted by the subordinate (Evans, Hannan, Krishnan, and Moser 2001; Stevens 2002). This contract has been called the “trust contract,” although researchers have not previously examined the effect of this contract when it is endogenously selected by the superior as a signal of trust. The other is a contract where the superior can accept or reject the budget proposal *ex post* without making an *ex ante* commitment to a decision rule (Rankin et al. 2008; Douthit and Stevens 2015). We call this contract the “discretion contract.” Prior research has found both contracts to be less efficient than the optimal contract prescribed under traditional agency assumptions, but far more efficient than standard agency theory would predict. While budgetary slack is consistently lower under the discretion contract (Rankin et al. 2008), social norms such as honesty, fairness, and reciprocity have been found to reduce budgetary slack under both contracts (e.g., Zhang 2008; Hannan, Rankin, and Towry 2010; Douthit and Stevens 2015).

We utilize a highly controlled budgeting experiment based on the agency model in Antle and Eppen (1985). This setting allows us to examine the effect of endogenous contract selection on budgetary slack using the two contracts commonly found in the literature, and compare the efficiency of such contracts to the optimal contract prescribed under traditional agency assumptions. We first conduct two benchmark conditions where participants are randomly assigned to either the trust contract or the discretion contract, as in prior experimental studies. Then we conduct a condition where the superior chooses between these two contracts and the subordinate is aware that the superior is making this choice. We hypothesize and find that budgetary slack is lower for both contracts when they are endogenously selected by the superior than when they are exogenously assigned. Consistent with our theoretical expectations, exit questionnaire responses suggest that

selecting a trust contract signals trust and expectations of trustworthiness whereas selecting a discretion contract signals distrust and an increased willingness to enforce trustworthiness by rejecting unreasonable budgets. Signaling distrust, however, appears optimal for superiors in our budgeting setting. In particular, far more superiors select the discretion contract under endogenous contract selection and doing so yields the efficiency of the optimal hurdle contract prescribed under traditional agency assumptions.

In a related experimental study, Cardinaels and Yin (2015) examine the effect of the superior's choice between a fixed wage contract and an incentive contract on budgetary slack. They find that choosing the incentive contract incentivizes truthful reporting but also leaks information regarding the truthfulness of other subordinates. The later effect increases budgetary slack by reducing *empirical* expectations for truthful reporting, consistent with the economic model in Sliwka (2007). Our study differs from theirs in that we focus on the potential for endogenous contract selection to reduce budgetary slack by communicating both *empirical* and *normative* expectations for truthful reporting, consistent with Bicchieri's (2006) model of social norm activation. In another related study, Kuang and Moser (2009) examine the effect of the superior's choice between the optimal agency contract and a gift-exchange contract on effort. They find that workers punish superiors who choose the optimal agency contract by reducing effort (or rejecting the contract) and reward superiors who choose the gift-exchange contract by increasing effort. Our study differs from theirs in that we examine the ability of endogenous contract selection to signal trust or distrust in a budgeting setting and thereby reduce budgetary slack by activating a trustworthiness norm.

Our study has important implications for both theory and practice. Our results conflict with prior research suggesting that controls reduce intrinsic motivation for trustworthy behavior (Tenbrunsel and Messick 1999) or “crowd-out” pro-social behavior by changing the context of the situation to one where opportunism is the behavioral norm (Frey and Jegen 2001). Our theory and evidence suggests that social norm activation holds the key to predicting when a given control will “crowd-out” or “crowd-in” pro-social behavior. In particular, our study suggests that crowding-in behavior is more likely with informal controls that maintain flexibility but support behavioral expectations for pro-social norms. Thus, our study should help firms design more efficient control systems. Our results also suggest that firms may benefit from making it obvious to subordinates that local superiors (rather than central headquarters) have selected the budgeting contract.

The remainder of this paper is organized as follows: In Section 2 we present our theoretical foundation and develop our hypotheses. In Section 3 we describe our experimental design. In Section 4 we present our results and in Section 5 we conclude.

2. Theoretical Foundation and Hypothesis Development

Theoretical Foundation

We utilize the agency model in Antle and Eppen (1985) as a framework for our experimental budgeting setting.² In the model, a project is being considered by the firm and there is asymmetric information between a subordinate and a superior regarding the project’s cost. The project revenue and the probability distribution of the project cost are

² Brown et al. (2009) advocate using well-structured settings within which one can compute an economic equilibrium under standard assumptions of narrow self-interest. This generates a strong test of alternative theories of behavior such as the social norm theory used in this study.

common knowledge. Prior to project implementation, the subordinate privately learns the actual project cost and submits a cost budget to the superior. If the project is funded, the superior receives the profit above the budget and the subordinate receives the difference between the budget and actual cost (i.e., the budgetary slack). Thus, the subordinate is motivated to maximize budgetary slack. Under traditional agency assumptions, the subordinate is expected to report a cost at the top of the distribution and the superior is expected to accept any feasible budget with a positive profit, no matter how small.

Antle and Eppen (1985) demonstrate that the optimal contract solution in this setting, given traditional agency assumptions, is for the superior to commit to fund all budgets less than or equal to a budget hurdle at the hurdle amount and to turn down all budgets exceeding the hurdle. This hurdle contract is “truth-inducing” in that reporting honestly maximizes the pay of the subordinate, but it comes at a significant cost in the form of both budgetary slack and capital rationing (Evans et al. 2001). In addition to the inefficiencies of the hurdle contract, the model assumes that the superior can costlessly commit to a hurdle even though it would be in both parties’ best interest to renegotiate the arrangement whenever the cost exceeds the hurdle. Given these inefficiencies, and to explain why hurdle contracts are rare in practice, researchers have examined alternative contracts involving informal controls for budgetary slack (Brown et al. 2009).

Given the emphasis on informal controls and social norms in the participative budgeting literature, we incorporate insights from Bicchieri’s (2006) model of social norm activation to develop our hypotheses.³ According to her model, a social norm is a

³ Bicchieri’s (2006) model has previously been shown to have predictive power in experimental budgeting settings (Douthit and Stevens 2015). Bicchieri’s formal model is presented in detail in

conditional preference that can arise and affect behavior due to cues and information signals present in a given social setting. Bicchieri identifies four necessary and sufficient conditions for a social norm to be activated: *contingency*, *empirical expectations*, *normative expectations*, and *conditional preferences*. The *contingency* condition states that actors are aware that a behavioral rule exists and applies to a given setting. The *empirical expectations* condition states that actors expect a sufficient proportion of a given population to follow the rule in similar settings. The *normative expectations* condition states that actors believe this referent group expects conformance with the rule and, if possible, may sanction behavior inconsistent with the rule. The *conditional preferences* condition states that actors will derive positive utility from conforming to the rule if the previous conditions are met.

We use Bicchieri's model to develop hypotheses regarding the effect of endogenous contract selection by the superior on budgetary slack. For our purposes, we use a general "trustworthiness" norm in place of other, more specific, social norms that have been shown to affect budgetary slack. Researchers in accounting have used a trustworthiness norm to capture preferences for general norm behavior consistent with honesty, fairness, cooperation, commitment, reciprocity, and accountability (Coletti, Sedatole, and Towry 2005). Further, researchers have used the theoretical constructs of trust and trustworthiness to generate new insights in economics and finance (e.g. Chami and Fullenkamp 2002). However, the theoretical constructs of trust, distrust, and trustworthiness have not yet been applied in participative budgeting research. Thus, we begin our hypothesis development by defining these theoretical constructs.

Davidson and Stevens (2013) and the empirical implications of the model are discussed in Blay, Gooden, Mellon, and Stevens (2016).

Hypothesis Development

Consistent with the literature in trust and trustworthiness, *trust* is conveyed if Party A takes an action that causes a vulnerability to Party B in that there is potential for A to be made worse off by the actions of B (Hardin 2002; Ben-Ner and Halldorsson 2010). *Trustworthiness* is the extent to which B is motivated to “fulfill the trust” or not take full advantage of the vulnerability of A.⁴ In contrast to trust, *distrust* is conveyed if Party A takes an action that reduces the vulnerability of A to the actions of Party B (Hardin 2002; Ben-Ner and Halldorsson 2010). Researchers maintain that trust and distrust are distinct constructs and not just opposite ends of a continuum (Cho 2006). For example, brain research confirms that the two constructs are distinct in that trust deals with positive expectations about the trustee’s beneficial conduct whereas distrust deals with negative expectations about the trustee’s harmful conduct (Dimoka 2010).⁵ Hardin (2002, 89-90) emphasizes that distrust is a rational and expected behavior in some social settings. Of particular relevance to our study, he notes that the presence of sanctions, while a signal of distrust, can create the grounds for trust by providing an incentive to be trustworthy. Similarly, Bicchieri’s (2006) model suggests that potential sanctions can encourage trustworthy behavior by communicating strong normative expectations for such behavior.

⁴ In his analysis of trust and trustworthiness, Hardin (2002) characterizes trusting behavior as strategic in that it must take into account the trustworthiness of the trusted party. Further, he argues that a person is motivated to be trustworthy only by the benefits of an ongoing trusting relationship. In contrast, Bicchieri’s (2006) model suggests that conveying trust in a single-period setting can motivate a person to be trustworthy by activating a trustworthiness norm.

⁵ Dimoka (2010) examines brain behavior during a purchasing task with seller feedback profiles manipulated to create substantial variation in the level of trust and distrust. Using fMRI, she finds that trust is associated with areas of the brain linked to anticipating rewards, predicting the behavior of others, and calculating uncertainty, whereas distrust is associated with areas linked to intense negative emotions and fear of loss.

We argue that trust, distrust, and trustworthiness are important theoretical constructs for participative budgeting settings. Involving the subordinate in the formulation of the budget conveys trust by making the superior vulnerable to the trustworthiness of the subordinate. Thus, we expect the contingency condition in Bicchieri's model to be present in a participative budgeting setting. In particular, we expect the subordinate and the superior in a participative budgeting setting to view trustworthiness as a behavioral rule that would apply. The superior can therefore motivate the subordinate to fulfill a trustworthiness norm in their budget by increasing empirical and normative expectations for such a norm. Below, we argue that the superior can do this by endogenously choosing a contract that conveys either trust or distrust. Again, endogenous contract selection as we define it requires that the subordinate regards the contract as something that was chosen or designed by the superior rather than a third party.

In summary, there are valid reasons to expect that endogenous contract selection will activate a trustworthiness norm in a participative budgeting setting. This is related to the trusting relationship implicit in this setting and the ability of the superior to increase empirical and normative expectations for a trustworthiness norm by signaling trust or distrust. We now apply the literature in trust and trustworthiness to Bicchieri's model of social norm activation to formally develop the two hypotheses we test.

Endogenous Selection of a Trust Contract

We first consider the effect of the endogenous selection of a *trust contract* on budgetary slack. Under a trust contract, the superior is completely vulnerable to the subordinate because any feasible budget must be accepted. Given the superior's choice between a trust and a discretion contract, therefore, we expect the selection of the trust

contract to signal trust and increase empirical and normative expectations for trustworthiness. Due to the importance of expectations in Bicchieri's model, we expect this to generate a conditional preference for trustworthiness in the subordinate that will reduce budgetary slack relative to the exogenous assignment of the trust contract.

In support of our theoretical expectation, Fehr and Rockenbach (2003) and Fehr and List (2004) find that choosing not to impose a control leads to more trustworthiness than not having the option to impose a control. Both studies use the two-person trust game (Berg, Dickhaut, and McCabe 1995) whereby Player 1 (P1) is paired with Player 2 (P2) and each is endowed with M_1 and M_2 , respectively. In the first stage of the game, P1 can send any amount X of M_1 to P2 and it is multiplied by a growth rate, r . In the second stage, P2 can return any of the rX amount to P1. The amount sent by P1 captures trust and the amount returned by P2 captures trustworthiness. In addition to the benchmark trust game, the authors include a manipulation where the sender has the option to fine the receiver if the receiver does not return an amount specified by the sender. In this manipulation the trustor can also commit to not impose a fine. The receiver knows the sender's choice with respect to the fine when he makes his return decision. Both studies find that trustworthiness is higher when the sender commits not to impose the fine than when she chooses to or when no fine is available at all. They label this the "hidden reward of incentives."

In summary, insights from the literature in trust and trustworthiness and Bicchieri's model of social norm activation suggest that given the choice between a trust contract and a discretion contract, the selection by the superior of the trust contract will signal trust and thereby increase empirical and normative expectations for trustworthiness. This is expected to focus the subordinate on a trustworthiness norm in a way that is not possible with the

exogenous assignment of the trust contract. Experimental studies of the hidden reward of incentives support this expectation. Thus, we predict that budgetary slack will be lower when superiors endogenously select a trust contract than when a trust contract is exogenously assigned. This is stated formally in Hypothesis 1.

H1: Budgetary slack will be lower when superiors endogenously select a trust contract than when a trust contract is exogenously assigned.

Endogenous Selection of a Discretion Contract

We next consider the effect of the endogenous selection of a *discretion contract* on budgetary slack. Under a discretion contract, the superior is much less vulnerable to the opportunism of the subordinate because of the ability to reject the budget. This form of informal control is highly effective in constraining budgetary slack (Rankin et al. 2008; Hannan et al. 2010; Douthit and Stevens 2015). Given the choice between a trust and a discretion contract, therefore, we expect the selection by the superior of the discretion contract to signal distrust. However, we also expect this signal of distrust to generate empirical and normative expectations for trustworthiness. In Bicchieri's model, the strongest mechanism for communicating a normative expectation for a social norm is a sanction for non-compliance. Because of the important role of expectations in Bicchieri's model of social norm activation, we expect this signal of distrust to generate a conditional preference for trustworthiness in the subordinate that will reduce budgetary slack relative to the exogenous assignment of the discretion contract.

Because the discretion contract closely resembles an ultimatum game, we apply Bicchieri's extension of her model to strategic behavior in ultimatum games to more formally support our expectation (Bicchieri 2006, 115-117). Bicchieri extends the utility

function of the Proposer so that it depends on expectations regarding the Responder's rejection behavior. The Responder's behavior is a function of their beliefs on fair sharing, N_2 , and the extent to which they care about enforcing the social norm of fair sharing, k_2 . The Proposer's behavior is a function of their beliefs on fair sharing, N_1 , the extent to which they care about receiving their fair share, k_1 , and second order beliefs on N_2 and k_2 . To simplify the intuition from her model, Bicchieri focuses on k_2 and second-order beliefs on k_2 . She finds that, all else constant, offers are increasing in the Proposer's second-order beliefs on k_2 . When choosing between the trust and discretion contract, we find it reasonable to assume that those superiors who choose the discretion contract will have a higher preference for enforcing the trustworthiness norm, k_2 , than the general population of superiors. Further, we expect subordinates to anticipate this effect. Thus, we expect the superior's endogenous selection of the discretion contract to signal their willingness to enforce a trustworthiness norm by rejecting unreasonable budgets.

Motivational crowding theory suggests that rewards and punishments may change the context of the social setting from one where pro-social behavior is the norm to one where opportunism is the norm. Evidence of this "crowding-out" effect is considered one of the most important anomalies in economics (Frey and Jegen 2001). However, there is also evidence that controls can strengthen or "crowd in" intrinsic motivation (Frey 1994; Coletti et al. 2005; Garrett, Livingston, and Tayler 2015). The evidence suggests that crowding-out occurs mainly when the subordinate's choice or autonomy is restricted by the control (Fehr and Rochenbach 2003; Fehr and List 2004; Falk and Kosfeld 2006). Further, crowding-in occurs mainly with informal controls in the form of potential sanctions or rewards (Fehr and Rochenback 2003; Rigdon 2009). Fehr and Rochenback

(2003) argue that this crowding-in effect may occur because individuals view informal controls as acceptable in some social settings. Similarly, it is reasonable to assume that subordinates will find it acceptable for superiors to retain some authority over the budget. Given the above, we expect the endogenous selection of the discretion contract to crowd-in or support a trustworthiness norm.

In summary, insights from the literature in trust and trustworthiness and Bicchieri's model of social norm activation suggest that given the choice between a trust contract and a discretion contract, the selection by the superior of the discretion contract will signal distrust and increase empirical and normative expectations for trustworthiness. This is expected to focus the subordinate on the social norm of trustworthiness in a way that is not possible with the exogenous assignment of the discretion contract. Studies of informal controls and "crowding-in" behavior support our expectation. Thus, we predict that budgetary slack will be lower when superiors endogenously select a discretion contract than when a discretion contract is exogenously assigned. This prediction is stated formally in Hypothesis 2.

H2: Budgetary slack will be lower when superiors endogenously select a discretion contract than when a discretion contract is exogenously assigned.

3. Experimental Setting

The budgeting setting we employ resembles other experimental studies based on Antle and Eppen's (1985) agency model (Evans et al. 2001; Rankin et al. 2008; Douthitt and Stevens 2015). Participants were recruited from a pool of student volunteers for experimental economics studies at a large southeast U.S. university. Upon arrival at the laboratory, participants gave their informed consent to participate, were seated at a private

computer terminal, and were given the instructions for the experiment.⁶ The instructions were then read aloud and any questions regarding the instructions were answered by the experimenter. The experiment was conducted using the z-tree software package for experimental economics (Fischbacher 2007).

At the beginning of the experiment, participants were randomly assigned to the role of either a superior or a subordinate.⁷ The experimental task was as follows. The superior paid the subordinate a salary of 1,000 Lira to implement a project that yielded 1,000 units that sold for 7.00 Lira each. It was common knowledge that the unit cost was uniformly distributed between 4.00 and 6.00 Lira in increments of .05 Lira. Before the project was undertaken, the subordinate privately learned the actual cost of the project; the actual cost was never revealed to the superior. After learning the actual cost, the subordinate issued a budget request to the superior. The budget request could be any amount between the actual cost and the maximum cost of 6.00 Lira per unit.

Per period earnings were computed as follows. If the project was implemented, the superior earned the project profit, which equaled total revenue (7.00 Lira per unit x 1,000 units) less the total budget request (budget per unit x 1,000 units) less the subordinate's salary (1,000 Lira). The subordinate kept any slack in his budget, which equaled the budget request less actual cost, plus his salary of 1,000 Lira. If the project was rejected, the subordinate earned his salary of 1,000 Lira and the superior earned 0 Lira. After each period, participants were randomly re-matched with another participant in the opposite

⁶ This study was IRB approved. Instructions for all treatments are presented in the Appendix.

⁷ The experimental instructions used the labels "corporate headquarters" and "divisional manager" in lieu of superior and subordinate. For expositional ease, we use "superior" and "subordinate" throughout the paper.

role. There were 20 periods in total. Participant pay was determined by randomly drawing from one of the 20 periods and using a conversion rate of 50 Lira = \$1.00.⁸

There are several features of this experimental setting that make it particularly useful for our study. First, it mirrors key aspects of Antle and Eppen's (1985) model and creates a stark economic prediction against which to test our predictions based on social norm theory. Second, by using a setting where subordinates observe the cost with certainty prior to making their budget request, we control for risk preferences. Third, participants are randomly re-matched without identifiers to control for reputation or other multi-period effects. This re-matching, coupled with earnings based on one randomly-selected period, generated a repeated, single-period setting. This gave participants an opportunity to learn their economic incentives while maintaining the single-period setting in Antle and Eppen.

The nested research design we implemented is presented in Figure 1. Participants were randomly assigned to either the *No Choice* or *Superior Choice* treatment. Within the *No Choice* treatment, participants were also randomly assigned to either (1) a *Trust Contract*, or (2) a *Discretion Contract*. In the *Superior Choice* treatment, the superior endogenously chose one of the two contract forms each period. This research design yielded four cells of data: (1) *No Choice/Trust Contract*, (2) *No Choice/ Discretion Contract*, (3) *Superior Choice/Trust Contract*, and (4) *Superior Choice/Discretion Contract*. The comparisons we test in our two hypotheses are presented in Figure 2.

[INSERT FIGURES 1 AND 2 ABOUT HERE]

⁸ To ensure that noise in the actual cost draws did not affect our results, we drew 30 independent cost sequences of 20 costs each and used each of these cost sequences for exactly one subordinate in each treatment. Thus, the sample of actual costs was identical between treatments in total and in each period.

The *Discretion Contract* differed from the *Trust Contract* in the following way. After the subordinate submitted his budget request, the superior was presented with two options: (1) accept the budget request, or (2) reject the budget request and outsource production to another division. If the superior accepted the budget, production occurred as normal and the payoffs were the same as in the basic setting. If the superior rejected the budget, then production was outsourced to another division and the superior earned 1,000 Lira from production. However, the superior still paid the subordinate the salary of 1,000 Lira. Thus, a rejection decision yielded a net payoff of 0 Lira to the superior and 1,000 Lira to the subordinate.

In the *Superior Choice* treatment, superiors selected either the *Trust Contract* or the *Discretion Contract* at the start of each period prior to the subordinate learning the actual cost of production or making their budget request. In this treatment subordinates were told that superiors were choosing between the two contract forms. Prior to learning their superior's choice of contract, subordinates submitted two budget requests using the strategy method (Brandts and Charness 2000). One of these budgets was the cost they wished to request assuming their superior had selected the *Discretion Contract* and the other was the cost they wished to request assuming their superior had selected the *Trust Contract*.⁹ Superiors then received only the budget request that corresponded to the contract they had selected. If the superior had selected the *Trust Contract*, the budget was

⁹ This design allows us to observe reports that would have occurred if the superior had chosen a different contract and provides us with an equal number of budget report observations across conditions.

automatically accepted. If the superior had selected the *Discretion Contract*, she decided between accepting the budget or rejecting the budget and outsourcing production.

Each experimental session included 20 participants (10 superiors and 10 subordinates) and lasted approximately 50 minutes. There were three sessions for each experimental treatment and a given individual could only participate in one of these nine sessions. Earnings ranged from \$0 to \$58 and the average earnings per participant was \$19.38 plus a \$7 show-up fee. Participants received their cash earnings in private at the end of the experiment.

4. Results

Manipulation Checks and Descriptive Statistics

At the end of each session, participants completed an exit questionnaire designed to gather demographic information and test whether our manipulations were successful. Manipulation check questions were answered on a 7-point Likert scale (1 = Strongly Disagree, 4 = neutral, 7 = Strongly Agree). Responses were tested against the neutral response of 4. Simple *t*-tests indicate that participants identified key aspects of the setting, including that they were re-matched with a different participant each period, that the subordinate could request any feasible cost above the actual cost, and that the subordinate always received their salary (all *p*-values < 0.05). Participants also correctly responded to items regarding the identifying features of their experimental treatment, including whether or not the superior was able to select the contract or reject the budget (*p*-values < 0.05). These tests suggest that the key aspects of our experimental setting were salient and our manipulations were successful.

Descriptive statistics in the four experimental cells are presented in Table 1. Consistent with prior studies using discretion contracts (Rankin et al. 2008; Hannan et al. 2010; Douthit and Stevens 2015), descriptive statistics and analyses of slack are pro forma; that is, they include both accepted and rejected cost reports. Budgetary slack is measured as a percentage of the available slack: $(\text{cost report} - \text{actual cost}) / (6.00 - \text{actual cost})$. Mean budgetary slack by condition is presented in Figure 3. Similar to prior studies, slack is the lowest in the *Discretion Contract* treatment. Across the two *Discretion Contract* conditions, nearly a quarter of budgets are rejected and rejection rates are similar between *No Choice* and *Superior Choice*. In the *Superior Choice* treatment, 92.5% of the superiors selected the *Discretion Contract*. This appears rational, as superior earnings are much greater under the *Discretion Contract* than under the *Trust Contract* (497.12 vs. 277.58).

[INSERT TABLE 1 AND FIGURE 3 ABOUT HERE]

Mean budgetary slack by period and experimental treatment is presented in Figure 4. This figure reveals that the relations in Table 1 are consistent across periods. The *Discretion Contract* conditions exhibit consistently lower budgetary slack than the *Trust Contract* conditions. Further, *Superior Choice* reduces budgetary slack under both the *Discretion Contract* and the *Trust Contract*. Finally, there is not a significant time trend in the data; tests for period effects do not yield significant within-subject main effects or interactions between our manipulations and period. Thus, our results are robust across time.

[INSERT FIGURE 4 ABOUT HERE]

Tests of Hypotheses

Table 2 presents the results of a series of comparisons designed to test the effect of our manipulations on the level of budgetary slack created by subordinates. To control

for the lack of independence caused by having subordinates make multiple decisions, we average the responses for each individual for all twenty periods and treat it as a single observation.

Our first hypothesis predicts that budgetary slack will be lower with an endogenously selected *Trust Contract* relative to an exogenously assigned *Trust Contract*. The results presented in Table 2 support this prediction. Budgetary slack in the *Superior Choice/Trust Contract* condition (72.5%) is significantly lower than in the *No Choice/Trust Contract* condition (82.6%) using a t-test ($t = 1.47$, $p = 0.07$, one-sided). Because a Shapiro-Wilk test suggests that this data is not normally distributed ($p < 0.01$), we also present a Mann-Whitney U test. Results are a bit stronger using this non-parametric test ($z = 1.60$, $p = 0.055$, one-sided). Thus, we find consistent support for our first hypothesis.

Our second hypothesis predicts that budgetary slack will be lower with an endogenously selected *Discretion Contract* relative to an exogenously assigned *Discretion Contract*. The results presented in Table 2 support this prediction as well. Budgetary slack in the *Superior Choice/Discretion Contract* condition (43.8%) is significantly lower than in the *No Choice/Discretion Contract* condition (52.2%) using a t-test ($t = 1.80$, $p = 0.04$, one-sided). Again, as this data is not normally distributed, we also present a Mann-Whitney U test and find stronger results ($z = 2.11$, $p = 0.017$, one-sided). Thus, we also find consistent support for our second hypothesis.

[INSERT TABLE 2 ABOUT HERE]

To provide direct evidence regarding our underlying theory, we examine responses to exit questionnaire items. To test the theory behind H1, we examine subordinates' perceptions regarding the expectations of their superior under the *Superior Choice*

conditions. We expect that selecting a *Trust Contract* focuses the subordinate on a trustworthiness norm by conveying trust and expectations for trustworthiness. To test this expectation, we examine subordinate responses to the statement, “I felt obligated to report lower costs when the owner gave up their ability to reject projects” (again on a 7-point Likert scale). Because 20% of subordinates in the *Superior Choice* conditions never experienced an owner giving up their rejection authority, we only consider the responses of the remaining 80% of subordinates to this item. In untabulated results, we find that budgetary slack under the *Trust Contract* is negatively related to this item ($t = -1.81$, $p = 0.04$, one-sided), consistent with the theory behind H1.

To further test the theory behind H1, we conduct a mediation analysis of the subordinate’s motivation to behave trustworthy. Specifically, we test if responses to the statement, “I wanted to treat the owner fairly,” mediate the effect of the endogenous selection of a *Trust Contract* using the Baron and Kenny (1986) three-step mediation analysis. Results of this mediation analysis are presented in Figure 5. We find that slack is lower with *Superior Choice* ($t = -1.51$, $p = 0.07$, one-sided). Second, the subordinate’s *Trustworthy Motive* is higher with *Superior Choice* ($t = 2.51$, $p < 0.01$, one-sided). Finally, when both factors are included, *Trustworthy Motive* reduces slack ($t = -2.11$, $p = 0.04$, two-sided) but *Superior Choice* no longer affects slack ($t = -0.81$, $p = 0.42$, two-sided). This mediation analysis suggests that the subordinate’s motivation to behave trustworthy mediates approximately 45% of the effect of *Superior Choice* of a *Trust Contract*, consistent with our theoretical expectation that the endogenous selection of a trust contract reduces budgetary slack by activating a trustworthiness norm.

[INSERT FIGURE 5 ABOUT HERE]

To test the theory behind H2, we examine subordinates' perceptions of their superior's expectations under the *Discretion Contract*. We expect that the endogenous selection of a discretion contract focuses the subordinate on a trustworthiness norm by signaling the superior's willingness to enforce trustworthiness by rejecting unreasonable budgets. Consistent with this expectation, subordinates agreed significantly more with the statement "I was concerned the owner would reject my offer" when the superior chose the *Discretion Contract* than when it was exogenously assigned (5.80 vs. 4.90; $p < 0.02$, one-sided).^{10,11} This supports our theoretical expectation behind H2.

Despite subordinates' perception that the endogenous selection of the *Discretion Contract* signaled the superior's increased willingness to reject unreasonable budgets, exit questionnaire responses indicate that the highest cost superiors were willing to accept was not significantly different between the *No Choice/Discretion Contract* and the *Superior Choice/Discretion Contract* conditions (5.69 v. 5.79; $p = 0.14$, two-sided).¹² Comparing actual rejection behavior to these stated upper limits, however, we find that superiors in the *No Choice* condition funded projects above their stated upper limit more frequently than superiors in the *Superior Choice* condition (45% over-fund rate vs. 28% over-fund rate; $t = 1.98$, $p = 0.05$, two-sided). Nevertheless, controlling for the cost reported in the budget, rejection rates were not significantly different between the *No Choice* and *Superior Choice*

¹⁰ This result is robust to controlling for the number of times a subordinate was under a discretion contract.

¹¹ There are potential concerns with using an ex post measure of rejection concerns. Subordinates with higher slack were more likely to be rejected and feel greater concerns about their budgets being rejected. While slack is related to rejection concerns ($p = 0.02$), this result persists when controlling for slack ($p < 0.01$).

¹² Ten of 30 superiors with *Superior Choice* never chose to use a *Trust* contract. The highest cost the superior would accept for this group is not significantly different from the superiors in the *No Choice* condition.

conditions ($t = 0.63$, $p = 0.53$, two-sided). Thus, selecting the *Discretion Contract* increased the salience of potential sanctions without increasing the cost of foregone productivity to superiors. This analysis suggests that the endogenous selection of a discretion contract reduced budgetary slack by changing *expectations* regarding the superior's willingness to enforce a trustworthiness norm, consistent with our theory.

Similar to prior research (Schatzberg and Stevens 2008; Rankin et al. 2008), budgetary slack is significantly lower in the *No Choice/Discretion Contract* condition (52.2%) than in the *No Choice/Trust Contract* condition (82.6%; $p < 0.01$ for the parametric t-test or Mann-Whitney U). This effect persists in our new setting with *Superior Choice*: budgetary slack is significantly lower in the *Superior Choice/Discretion Contract* condition (43.8%) than in *Superior Choice/Trust Contract* condition (72.5%; $p < 0.01$ for the parametric t-test or Mann-Whitney U). Further, subordinates with an endogenously selected *Discretion Contract* claimed less than half of the surplus (43.8%; $t = -1.86$, $p = 0.036$, one-sided). This result is surprising in light of prior research that documents a tendency of subordinates to fixate on an even split of the available surplus (Hannan et al. 2006; Salterio and Webb 2006; Douthit and Stevens 2015). This further supports the value of strategic rejection concerns as a control for budgetary slack.

Supplemental Analysis of Superior Earnings

A primary concern of agency theory is to reduce agency costs to the firm. Thus, we also examine the effect of our manipulations on superior earnings. Under the *No Choice* conditions (*No Choice/Trust Contract* and *No Choice/Discretion Contract*) superior earnings are straightforward. Under the *Superior Choice* conditions, however, subordinates chose one budget that applied if their superior selected the *Trust Contract* and another that

applied if their superior selected the *Discretion Contract*. In these conditions, therefore, if a superior selected a *Discretion Contract* we calculate superior earning under both the *Discretion Contract* and what they *would have been* under the *Trust Contract*. If a superior selected the *Trust Contract*, however, their earnings were only calculated for the *Trust Contract*. The reason for this is we do not know what outcome would have resulted if the superior had selected the *Discretion Contract*, because we do not know whether she would have accepted or rejected the subordinate's budget.

Superior earnings by condition are presented in Table 1. Superior earnings are the lowest under the *Trust Contract* (176.00 and 277.58 for *No Choice* and *Superior Choice*, respectively) and the highest under the *Discretion Contract* (407.75 and 497.12 for *No Choice* and *Superior Choice*, respectively). Independent pairwise t-tests indicate that these earnings are significantly different from one another (all p-values < 0.01).¹³ Predictions under traditional agency assumptions are as follows. Under the *Trust Contract* the subordinate will always request the maximum cost (6) and extract the entire surplus as the superior must accept all budgets. Thus, the superior will receive 0 Lira each period. Under the *Discretion Contract* the subordinate will always request a budget close to the maximum cost as a utility-maximizing superior will accept any budget below 6. Thus, the subordinate will report a cost close to 6 here as well. These stark predictions are unaffected by the endogenous choice of contract. Therefore, both the *Trust Contract* and the *Discretion Contract* yield an equilibrium pay prediction of 0 Lira for the superior each period.¹⁴

¹³ This data is normally-distributed, making parametric t-tests appropriate.

¹⁴ Technically, the subordinate may report a cost just below 6 (5.95) in equilibrium, which yields a payoff of 50 to the superior. Inferences are unchanged by changing the assumption of the equilibrium report.

It is also useful to compare realized earnings across the experimental conditions to the optimal hurdle contract prescribed under traditional agency assumptions. In Antle and Eppen's (1985) agency model, the superior can costlessly commit to a budget hurdle above which she would reject the budget. The optimal solution in their model is for the superior to commit to: (1) fund any cost report below or equal to the budget hurdle and pay the hurdle regardless of the cost report, and (2) reject any cost report above the budget hurdle regardless of how much profit it would provide. The optimal hurdle in our setting is 5 Lira per unit. Given the uniform distribution of costs, this means that, in expectation, 50% of the costs will be above the hurdle and will be rejected. The remaining 50% of the budgets will be approved at a cost of 5 Lira per unit. This yields an expected payoff of 500 Lira for the superior each period.¹⁵

We test whether superior earnings in each experimental condition are statistically different from what they would be *in equilibrium* under the following two benchmarks:

- Benchmark (1): Superiors cannot commit to a hurdle, as in our setting, and earnings are 0
- Benchmark (2): Superiors can commit to a hurdle, as in Antle and Eppen's (1985) setting, and earnings are 500

The results of these *t*-tests are presented in Table 3.

[INSERT TABLE 3 ABOUT HERE]

As in prior studies, superior earnings in all conditions are greater than the equilibrium earnings in Benchmark (1) (all *p*-values < 0.01). Also, in the *Trust Contract*

¹⁵ Rankin et al. (2003) suggests that participants are unlikely to set the binding hurdle at an ideal spot. However, we compare superior earnings to the economically-derived optimal contract instead of an internally generated benchmark that may be affected by shortcomings in the superior's decision-making.

conditions superior earnings are significantly lower than Benchmark (2) (both p-values < 0.01). Thus, signaling trust and expected trustworthiness by endogenously choosing a trust contract improved the efficiency of the contract, but not enough to yield the efficiency of the optimal hurdle contract. Finally, we compare earnings in the *Discretion Contract* conditions to Benchmark (2). Prior research suggests that superiors are not adept at using rejection authority in a manner where they trade-off the slack-reducing fear of rejection with the cost of actual rejections. In particular, studies where superiors have rejection authority have yielded profit levels lower than those of the optimal hurdle contract (e.g. Rankin et al. 2003, 2008; Hannan et al. 2010). Likewise, we find that superiors who are exogenously assigned the discretion contract do worse than Benchmark (2) ($t = -5.81$, $p < 0.01$). When the *Discretion Contract* is endogenously selected, however, superior earnings are not significantly different than the optimal hurdle contract (497.12 vs. 500, $p = 0.843$). Thus, we find that the endogenous choice of a *Discretion Contract* increases the efficiency of the contract to the point of yielding the efficiency of optimal hurdle contract.

5. Conclusion

We examine the effect of endogenous contract selection by the superior on budgetary slack. We find that budgetary slack is lower when the superior selects a trust contract and purposefully gives up the ability to reject the budget than when the same contract is randomly assigned. We also find that budgetary slack is lower when the superior selects a discretion contract and purposefully maintains the ability to reject the budget than when the same contract is randomly assigned. Exit questionnaire responses suggest that selecting a trust contract signals trust and expectations of trustworthiness whereas selecting a discretion contract signals distrust and an increased willingness to enforce trustworthiness

by rejecting unreasonable budgets. Signaling distrust, however, appears optimal for superiors in our budgeting setting. In particular, far more superiors select the discretion contract under endogenous contract selection and doing so yields the efficiency of the optimal hurdle contract prescribed under traditional agency assumptions.

Our study contributes to the literature in participative budgeting by introducing the theoretical constructs of trust, distrust, and trustworthiness. As such, our theory and experimental findings also contribute to research in economics and finance suggesting that trust and trustworthiness contributes to the efficiency of the firm (Chami and Fullenkamp 2002; Chami, Cosimano, and Fullenkamp 2002; Sliwka 2007). The importance of trust and trustworthiness to the efficiency of the firm has not been fully appreciated in the budgeting literature. A recent study by Cox, Kerschbamer, and Heururer (2015) extends traditional definitions of trust and trustworthiness in economics by isolating various motivations for returning a positive amount in the trust game. They find that trustworthiness is driven by unconditional other-regarding preferences and a response to being trusted by increasing one's vulnerability. We extend this literature by demonstrating that trustworthiness can also be driven by a response to being distrusted.

Consistent with Bicchieri, Xiao, and Muldoon (2011), subordinates and superiors in our study behave as if trust is not a social norm. In particular, trusting behavior by superiors is relatively low and subordinates do not appear to react negatively to distrust conveyed by the superior. This supports arguments in Hardin (2002) that distrust is a rational and expected behavior in some social settings. Our evidence that the endogenous selection of a discretion contract yields the efficiency of the optimal hurdle contract suggests that distrust can be a rational and expected behavior in a participative budgeting

setting. In particular, low trustworthiness was the dominant expectation and subordinates generally expected superiors to retain some control over the budget. Our evidence also supports Hardin's (2002, 89-90) assertion that the presence of sanctions, while a signal of distrust, can create the grounds for trust by providing an incentive to be trustworthy.

This study also contributes to the ongoing debate regarding the effect of controls on intrinsic motivation. Some research in management suggests that strong controls are dysfunctional in that they reduce trust and trustworthiness within the firm (e.g., Tenbrunsel and Messick 1999). This is consistent with research in economics suggesting that strong controls "crowd-out" pro-social norms by changing the context of the situation from one where pro-social behavior is the norm to one where opportunistic behavior is the norm (Frey 1994). While Cardinaels and Yin's (2015) study of the endogenous selection of formal controls in a participative budgeting setting supports a crowding-out effect (Christ, Sedatole, and Towry 2012; Christ 2013), our study of the endogenous selection of informal controls supports a crowding-in effect (Coletti et al. 2005; Garrett et al. 2015). We contribute to this debate by providing potential explanations for these disparate results. In particular, our study suggests that choosing strong informal controls that do not reduce decision rights are able to crowd-in intrinsic motivations by activating a trustworthiness norm. Future research appears warranted to more fully understand the effects of formal and informal controls on intrinsic motivations.

This study also has potential implications for participative budgeting in practice. For example, our theory and experimental findings suggest that the superior is more likely to choose strong informal controls as the risk to trusting the subordinate increases. This trade-off between risk and trusting behavior is intuitive but has not been previously

addressed in the literature. Thus, our study has the potential to improve our understanding of contracting behavior in practice and help firms design better contracts and management control systems. Further, our results suggest that pushing the contract choice down to managers lower in the hierarchical structure enhances the contract's efficiency as subordinates will view this contract choice as a signal of behavioral expectations. Thus, our study reveals a potential control benefit of delegating decision rights further down the organizational chart. Future research should consider this dynamic.

The results and implications of this study are subject to the normal caveats associated with much experimental research. In particular, this study contains a stark setting that is designed to provide a strong test of relevant theory. Although this setting incorporates an important feature of organizational budgeting settings by granting the superior a choice among contracts, it still abstracts significantly from budgeting settings in practice. To the extent that our experimental design captures important aspects of these settings, however, we believe that our results provide useful insights that may generalize to such settings. Given our results, future research appears warranted regarding the effect of superior choices and behavior on subordinate reporting, and the ability of informal controls to activate social norms that increase the efficiency of the firm.

APPENDIX

Experiment Instructions

Note: [Bracketed underlined] is disclosed only in Superior Choice treatments.
[Bracketed italics] is disclosed only in Discretion treatments.
[Bracketed text] is disclosed only in Trust treatments.

General Instructions

Welcome and thank you for participating in this experiment. This experiment involves decision making in an organizational setting. Please read the instructions carefully because the amount of money you earn will depend upon the decisions you make. It is important that you keep your decisions private. Please feel free to ask questions while we are going over the instructions. During the experiment we will use an experimental currency called "Lira." The Lira you earn will be converted into dollars and you will be paid in cash at the end of the experiment.

Before the first production period, you will be assigned to the role of either a divisional manager or of corporate headquarters. Half of you will be assigned the role of a divisional manager and half of you will be assigned the role of corporate headquarters. Each production period you will be randomly paired with one participant in the opposite role. At the beginning of each production period you will be randomly paired with a different participant.

Specific instructions: Divisional Managers

You are the manager of a manufacturing division in a corporation. You receive a salary of 1,000 Lira per period. Your division manufactures a product for which there is demand of 1,000 units at a fixed selling price of 7.00 Lira per unit. The actual production cost per unit will fall within the range of 4.00 Lira to 6.00 Lira. The actual cost per unit has been determined by randomly drawing a cost from the following set of equally likely costs $\{4.00, 4.05, 4.10, \dots, 6.00\}$. Thus, each cost within the range of 4.00 Lira to 6.00 Lira at .05 intervals is equally likely to be your randomly determined actual cost per unit. You are responsible for submitting a production budget.

When you were hired, both you and your employer knew that your division's production cost was uncertain and you agreed on the probability distribution of possible production costs. Later, as you have worked on the job, you have set up your own private forecasting system that reliably determines in advance exactly what your production cost will be in the coming period. That is, before you submit your budget, you will know for certain what your actual cost of production will be. Because you alone are responsible for submitting your budget, you can then decide whether to submit a budget request that is equal to or greater than your actual cost. Corporate headquarters will know the total budget that you received, but they will never be able to distinguish how much of that total budget was spent on actual production versus how much (if any) you kept for yourself. That is,

corporate headquarters will never be able to determine whether your budget request was equal to your actual cost.

At the start of each production period, [corporate headquarters decides if they will **1) retain the authority to approve or reject each production project on an individual basis or 2) give up this authority and approve each production project you submit.** After corporate headquarters makes this decision,] you will submit a [pair of budgets] budget to corporate headquarters for your division's production cost in the coming period [one assuming that corporate headquarters retained authority over the project and one assuming that corporate headquarters gave up the authority to approve each project and agreed to approve any budget submitted.]. [Corporate headquarters will then provide you with funds equal to the amount you have requested for the period. You will get to keep for yourself any difference between the amount you receive from corporate headquarters and your division's actual production cost.] [*Corporate headquarters will then decide to either 1) approve the production project and provide you with funds equal to the amount you have requested for the period or 2) reject and outsource the production project and provide you with no funds. If corporate headquarters approves the production project, you will get to keep for yourself any difference between the amount you receive from corporate headquarters and your division's actual production cost.*]

[If corporate headquarters retained the authority to approve or reject the project, they will then decide to either **1) approve the production project and provide you with funds equal to the amount you have requested for the period or 2) reject and outsource the production project and provide you with no funds.** If corporate headquarters gives up the authority over the project, the project is automatically approved. If corporate headquarters approves the production project, you will get to keep for yourself any difference between the amount you receive from corporate headquarters and your division's actual production cost.]

Your division's contribution to corporate profit (before overhead and other costs) is equal to sales revenue of 7,000 Lira (1,000 units sold x 7.00 Lira per unit selling price) minus the funds provided to you for production [*if corporate headquarters approves the project. If corporate headquarters rejects the project, your division makes no contribution to corporate profit. Regardless of whether or not the project is approved,*] You will receive your salary of 1,000 Lira each production period.

Specific instructions: Corporate Headquarters

You are a member of the corporate headquarters in charge of a manufacturing division of your corporation. You pay the divisional manager that you supervise a salary of 1,000 Lira per period. [Each production period, you decide if you would like to 1) retain the authority to accept or reject the production project or 2) give up this authority.] You then receive a budget request for the divisional manager's division's production cost in the coming period. [You only see the budgeted cost reported by the divisional manager for the decision you made (to retain or give up authority over the project). If you decide to retain

authority over the project, you then decide whether to 1) approve the budget and provide the division manager with funds equal to the amount they have requested for the period or 2) reject the project and outsource production to another division. If you give up the authority to reject the project, you always approve the project. [You then provide the division manager with funds equal to the amount they have requested for the period.] [If you approve the budget,] You earn a profit of 7.00 Lira per unit less the budgeted cost reported by the divisional manager for each of the 1,000 units you produce. [If you reject the project, you outsource production to another division and earn 1,000 Lira from production.] Again, [regardless of whether or not you approve the project,] you will pay the divisional manager a salary of 1,000 Lira each production period.

Examples

Each of the two examples below assumes that the randomly determined actual production cost was 4.50 Lira per unit. This means that when the divisional manager submits their budget request, they know for certain that their actual cost will be 4.50 Lira per unit, but corporate headquarters knows only that the actual cost per unit is somewhere within the range of 4.00 Lira to 6.00 Lira.

Example 1

Assume the divisional manager submits a budget request of 4.50 Lira per unit. **[Also assume that corporate headquarters has chosen to retain the authority to approve/reject the project. If corporate headquarters decides to approve the project,]** Corporate headquarters must then provide the divisional manager with 4,500 Lira (4.50 Lira x 1,000 units). The divisional manager's actual production cost would be 4,500 Lira (4.50 Lira x 1,000 units).

[If corporate headquarters approves the project,] The divisional manager's total personal earnings is 1,000 Lira, calculated as the 4,500 Lira provided by corporate headquarters plus the divisional manager's salary of 1,000 Lira minus the 4,500 Lira of actual production cost. [If corporate headquarters rejects the project, the divisional manager's total personal earnings would be their salary of 1,000 Lira.]

[If corporate headquarters approves the project,] The division's contribution to corporate profit is 1,500 Lira, calculated as 7,000 Lira of revenue (1,000 units @ 7.00 Lira per unit) minus 4,500 Lira provided for production and the divisional manager's salary of 1,000 Lira. [If corporate headquarters rejects the project, corporate profit would be 0 Lira, calculated as the 1,000 Lira gained from outsourcing production less the 1,000 Lira paid to the divisional manager's salary.]

Example 2

Assume the divisional manager submits a budget request of 5.00 Lira per unit. **[Also assume that corporate headquarters has chosen to give up authority to**

approve/reject the project and therefore it will be approved. *[If corporate headquarters decides to approve the project,]* Corporate headquarters must then provide the divisional manager with 5,000 Lira (5.00 Lira x 1,000 units). The divisional manager's actual production cost would be 4,500 Lira (4.50 Lira x 1,000 units).

[If corporate headquarters approves the project,] The divisional manager's total personal earnings is 1,500 Lira, calculated as the 5,000 Lira provided by corporate headquarters plus the divisional manager's salary of 1,000 Lira minus the 4,500 Lira of actual production cost. *[If corporate headquarters rejects the project, the divisional manager's total personal earnings would be their salary of 1,000 Lira.]*

[If corporate headquarters approves the project,] The division's contribution to corporate profit is 1,000 Lira, calculated as 7,000 Lira of revenue (1,000 units @ 7.00 Lira per unit) minus 5,000 Lira provided for production and the divisional manager's salary of 1,000 Lira. *[If corporate headquarters rejects the project, corporate profit would be 0 Lira, calculated as the 1,000 Lira gained from outsourcing production less the 1,000 Lira paid to the divisional manager's salary.]*

Earnings Spreadsheet: You should now check the examples above on your Earnings Spreadsheet. Notice that the spreadsheet covers the entire range of combinations of actual costs and budgeted costs. Please take a few minutes to review the Earnings Spreadsheet and ask any questions that you may have.

Experimental Procedures:

In this experiment the divisional managers will submit a separate budget request to corporate headquarters **[and corporate headquarters will make a decision to approve or reject the budget request]** in twenty production periods. Each of the twenty periods will be independent of all other periods. That is, the decisions made in one period will not affect **anything** in any other period. In particular, neither the divisional manager's earnings for a period, nor the corporate headquarters' earnings for that period, will have any effect on earnings in any subsequent period. This is a coordinated experiment, the production period will not end and the next production period will not begin until all divisional managers have submitted their budget requests. As previously mentioned, at the beginning of each period, you will be randomly paired with a different participant in the opposite role.

Each period, the divisional manager learns their actual cost per unit for that period. Each period the actual costs per unit is randomly drawn (with replacement) from the following set of equally likely costs {4.00, 4.05, 4.10, ..., 6.00}. Because each division's actual costs per unit were determined independently of other division's costs, the actual cost per unit in any period may or may not be the same as that of other divisions. The corporate headquarters will observe the cost reported by the divisional managers but will NEVER LEARN THE ACTUAL COST.

Payment for the experiment will be based on **one** randomly selected period. The payment period will be randomly determined at the end of the experiment by the computer

program. Because each period is equally likely to be the one selected for payment, divisional managers should make their budget request decision [*and corporate headquarters should make their budget approval decision*] each period as if that period were the one for which they will be paid.

Your earnings in Lira for the one randomly selected period will be converted to dollars at the rate of 50 Lira = \$1.00, and you will be paid in private and in cash. Recall that your earnings for any period depend directly on the budget request [*and approval decisions*] for that period, but do not depend on the decisions for any other period.

Your decisions will remain completely anonymous. We will not be able to relate your responses to you individually. You will be called for payment paid based on a unique identification number.

Please ask any questions now. After the experiment begins, you should not talk to any other participants.

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Figure 1: Experimental Design

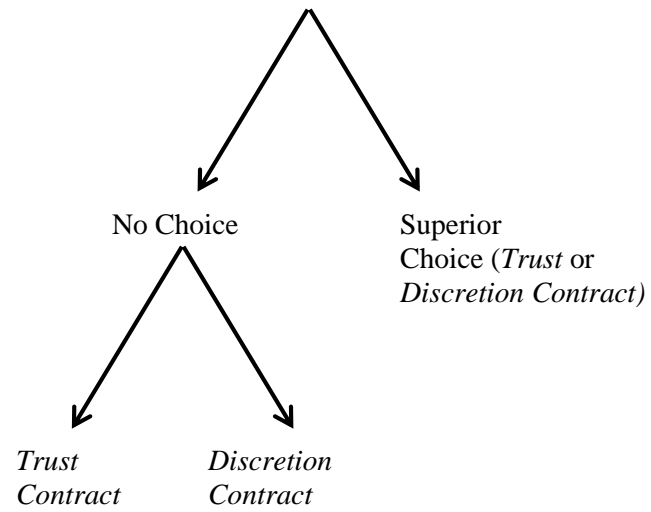


Figure 2: Hypotheses

Exogenous Trust Contract (EX-T)	Endogenous Trust Contract (EN-T)
Exogenous Discretion Contract (EX-D)	Endogenous Discretion Contract (EN-D)

H1: $Slack_{EN-T} < Slack_{EX-T}$

H2: $Slack_{EN-D} < Slack_{EX-D}$

Figure 3: Mean Budgetary Slack by Treatment

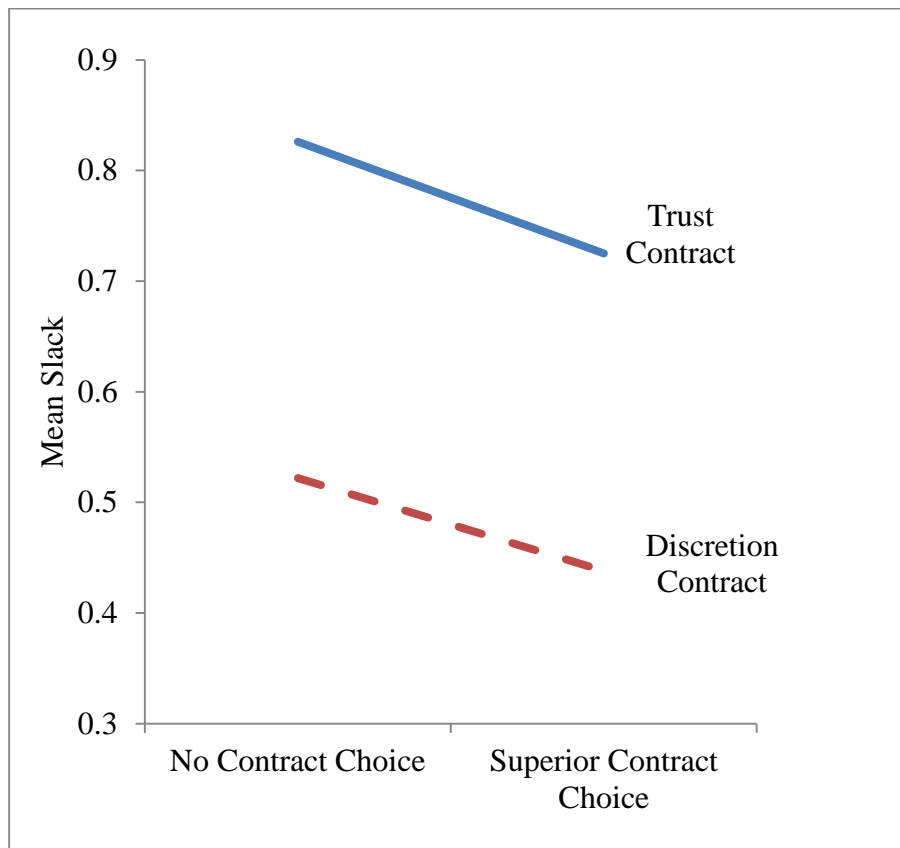


Figure 4: Mean Budgetary Slack by Period and Treatment

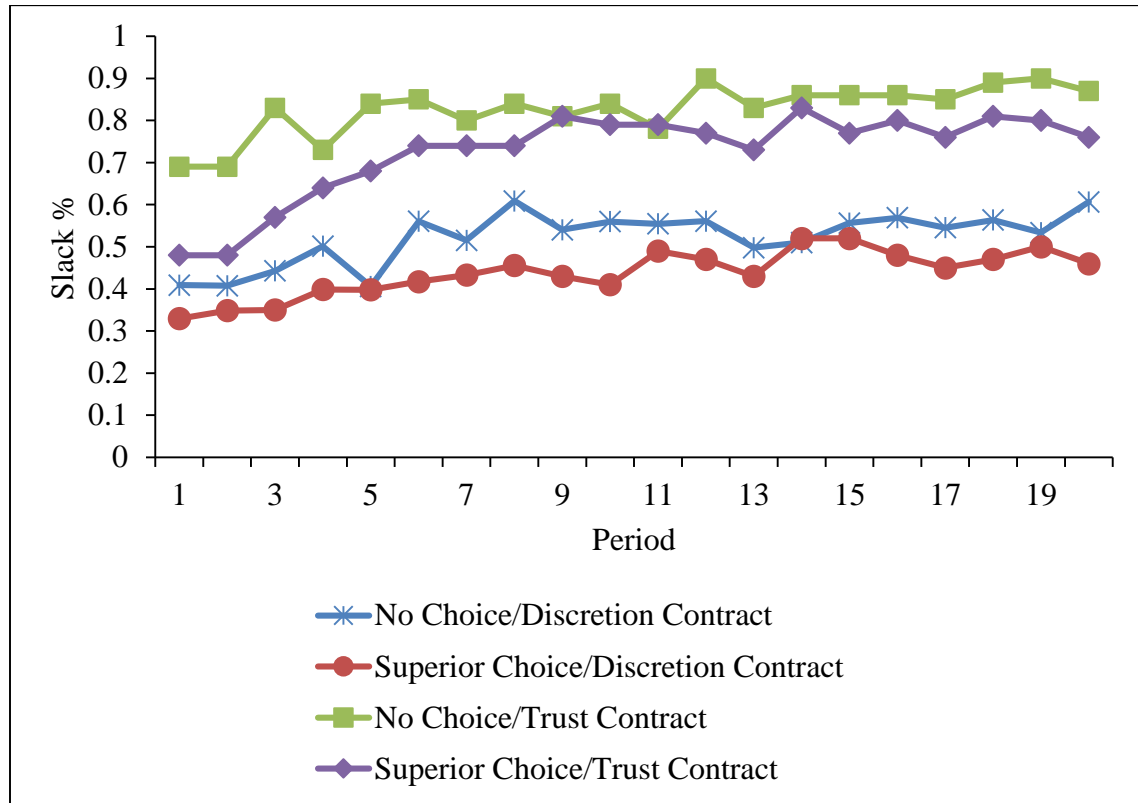
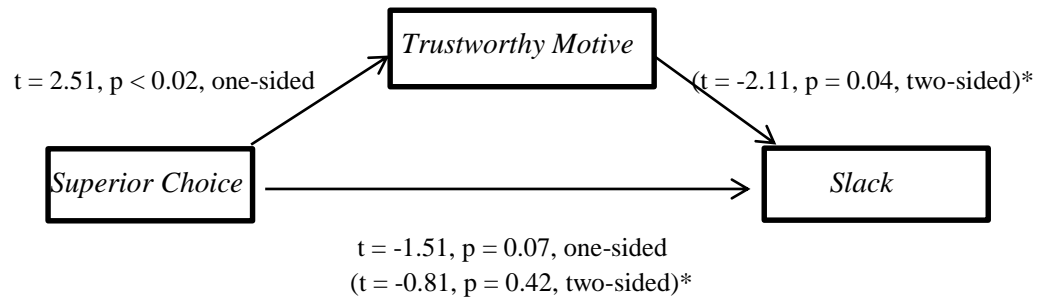


Figure 5: Mediation Analysis of the Endogenous Selection of a Trust Contract: The Mediating Effect of the Subordinate's Motivation to Behave Trustworthy.



Superior Choice is equal to 1 if the superior selected between the discretion and trust contract prior to the subordinate's budget report and 0 otherwise (Only Trust Contract Choices Included).

Trustworthy Motive is the subordinate's response to the exit questionnaire item "I wanted to treat the owner fairly," on a 7-point Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree) with 4 being "Neutral."

Slack is defined as the ratio of slack claimed to slack available, or $(\text{Report}-\text{Cost})/(\text{6}-\text{Cost})$.

*Result when both factors *Superior Choice* and *Trustworthy Motive* are jointly included.

TABLE 1
Descriptive Statistics

	<i>Trust Contract</i>		<i>Discretion Contract</i>	
<i>No Choice</i>	Mean Slack.....	0.826	Mean Slack.....	0.522
	St. Dev.....	0.307	St. Dev.....	0.292
	Superior Earnings	176.00	Superior Earnings	407.75
	Subordinate Earnings	1810.92	Subordinate Earnings	1419.25
	Rejection %	N/A	Rejection %	24%
	N.....	30	N.....	30
<i>Superior Choice</i>	Mean Slack.....	0.725	Mean Slack.....	0.438
	St. Dev.....	0.359	St. Dev.....	0.290
	Superior Earnings....	277.58	Superior Earnings.....	497.12
	Subordinate Earnings	1709.33	Subordinate Earnings	1353.51
	Rejection %	N/A	Rejection %	21%
	Choice %	7.5%	Choice %	92.5%
	N.....	30	N.....	30

Trust Contract is a slack-inducing pay scheme where the superior must accept any feasible budget submitted by the subordinate.

Discretion Contract is a slack-inducing pay scheme where the superior can accept or reject the budget submitted by the subordinate.

No Choice is the experimental treatment where the superior cannot choose between the two contract forms (the contract form is randomly assigned by the experimenter).

Superior Choice is the experimental treatment where the superior has a choice as to which contract form to implement.

Slack is defined as the ratio of slack claimed to slack available, or $(\text{Report}-\text{Cost})/(\text{6}-\text{Cost})$. This is calculated for every period, including those where the superior chose to reject the project. Observations where the cost was 6 were removed since slack available is zero in these instances.

Superior Earnings is the average earnings of the superior. In the *Superior Choice* treatment, subordinates submitted a budget request for each contract form using the strategy method (superiors received only the budget request that corresponded to the contract they selected). In this treatment, therefore, earnings are calculated under both contract forms when the superior selected the Discretion Contract. When the superior selected the Trust Contract, however, we only use earnings data from the Trust Contract budget request since it is impossible to know if the Discretion Contract budget request would have been accepted.

Rejection % is the proportion of periods where the superior rejected the subordinate's budget (relevant only under the *Discretion Contract*).

Choice % is the proportion of periods where the superior chose a given contract form (relevant only under *Superior Choice*).

TABLE 2

The Effect of Contract and Endogenous Contract Selection on Budgetary Slack

Comparison	Tests of Differences			
	t-test		Mann-Whitney U	
	t-stat	p-value	z-stat	p-value
<i>Within No Choice</i>				
Trust Contract (82.6%) versus Discretion Contract (52.2%)	5.57	<0.001	4.46	<0.001
<i>Within Superior Choice</i>				
Trust Contract (72.5%) versus Discretion Contract (43.8%)	5.95	<0.001	3.80	<0.001
<i>Within Trust Contract (H1)</i>				
No Choice (82.6%) versus Superior Choice (72.5%)	1.47	0.073*	1.60	0.055*
<i>Within Discretion Contract (H2)</i>				
No Choice (52.2%) versus Superior Choice (43.8%)	1.80	0.039*	2.11	0.017*

* One-sided p-value

Slack is the dependent variable and is calculated as the ratio of slack claimed to slack available, or (Report-Cost)/(6-Cost).

There were 30 observations for each condition.

TABLE 3
Analysis of Superior Earnings*

Comparison	Mean	t-stat	p-value (two-sided)
Economic benchmark without commitment to a hurdle	0.00		
No Choice/Trust Contract	176.00	9.91	<0.001
No Choice/Discretion Contract	407.75	25.69	<0.001
Superior Choice/Trust Contract	277.58	12.52	<0.001
Superior Choice/Discretion Contract	497.12	36.80	<0.001
Economic benchmark with commitment to a hurdle	500.00		
No Choice/Trust Contract	176.00	-18.24	<0.001
No Choice/Discretion Contract	407.75	-5.81	<0.001
Superior Choice/Trust Contract	277.58	-10.03	<0.001
Superior Choice/Discretion Contract	497.12	-0.20	0.843

* *Superior Earnings* is the dependent variable in this analysis, and is as defined in the text. The economic benchmark without commitment to a hurdle is 0 based on traditional economic assumptions. The economic benchmark with commitment to a hurdle is that the superior commits to accept any project with a cost less than or equal to 5 and pays 5.

There were 30 observations for each condition.