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Do Changes in Budget Targets from Tight to Loose Demotivate Subordinates' Effort? An Experimental Study

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ABSTRACT:- This study investigates whether a superior change in budgets from tight to loose budgets will demotivate subordinates' effort, yet this issue has not been explored in a budgeting context. The experiment consisted of two treatments: (1) loose-to-tight treatment and (2) tight-to-loose treatment. Results indicate when a superior change in budgets from loose to tight budgets, subordinates' effort is significantly higher than their earlier effort in a loose budget condition. However, when a superior change in budgets from tight to loose budgets, subordinates' effort is not significantly lower than their earlier effort in a tight budget condition. The findings are useful to management in understanding that superiors set budgets from tight to loose budgets, which may not undermine subordinates' motivation and suggest if superiors believe that subordinates will be motivated by reciprocity, then superiors may change budgets from tight to loose budgets to achieve win/win results for both superiors and subordinates.

Keywords: Budget Targets, Changes, Tight to Loose, Effort, Reciprocity.

I. INTRODUCTION

Budgeting is one of the most important planning and control mechanisms for any business firm (Merchant & Van der Stede, 2017). Without a budget, companies cannot track processes or improve performance. Participative budgeting is helpful for management to communicate with subordinates to plan the budget because subordinates often have insights into business trends, and their knowledge and experience can add value to the budget. However, in the participative budgeting setting, creating budgetary slack is a public opportunistic behavior that is observable to the superior (Onsi, 1973; Merchant, 1989), while providing low effort is a private opportunistic behavior that is unobservable to the superior (Schatzberg & Stevens, 2008).

Several studies have examined the effect of a budget goal on subordinates' effort and reported that a loose budget goal is less effective in increasing subordinates' effort, whereas a tight budget goal can influence subordinates to change from being selfish to becoming willing to exert effort. However, in a tight budget target, if subordinates fail to fulfill their targets, they may engage in a variety of undesirable behavior, such boost short-term results but destroying the firm's long-term competitiveness (Bedford, Speklé, & Widener, 2022;

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Matějka, 2018; Merchant & Manzoni, 1989; Webb, Williamson, & Zhang, 2013). Especially, in early 2020, the Covid-19 crisis has affected every part of the world. Many firms face this crisis to tighten their budget controls, and these controls increase employees' emotional exhaustion (Bedford, et al., 2022). Moreover, there will be complaints or arguments and there may even be a few people who quit. Prior research indicates when firms are greatly concerned about subordinates' retention, they prefer easy-to-achieve targets (Matějka & Ray, 2017). Schatzberg and Stevens (2008) point out that in a participative budgeting setting, it may not be optimal for organizations to tightly control budgets, and suggest superiors who allow more budgetary slack expect to receive higher effort from their subordinates. The effects of goal setting on effort levels are well documented (e.g., Amold & Artz 2015; Locke & Latham, 2002; Sprinkle, Williamson, & Upton, 2008; Van der Stede, 2000). Of greater interest for this study is whether budget targets from tight to loose undermine subordinates' motivation or can be useful for incentives, yet this issue has not been explored in a budgeting context. My research question is: do changes in budget targets from tight to loose demotivate subordinates' effort?

I use a participative budgeting experiment to examine whether superior changes in budgets from tight to loose budgets will demotivate subordinates' effort. Participants were business students in a private university and the role of a superior in each treatment was played by one teacher. The setting is subordinates begin the process by submitting a sales budget proposal for the upcoming period to a superior and negotiating a budget target with the superior. The experiment consisted of two treatments: (1) loose-to-tight treatment and (2) tight-to-loose treatment. Throughout this paper, the term "loose budget" refers to a budget that is agreed upon by a superior at low and easily attained levels, and the term "tight budget" refers to a budget that is agreed upon by a superior at high but attainable levels.

My study extends previous research (eg., Bonner & Sprinkle, 2002; Fisher, Peffer, Sprinkle, & Williamson, 2015; Schatzberg & Stevens, 2008) by examining whether a superior change in budgets from tight to loose budgets will demotivate subordinates' effort. Results indicate that subordinates tend to propose low budget targets to earn a large bonus. When a superior change in budgets from loose to tight budgets, salespeople's effort is significantly higher than their earlier effort in a loose budget condition. However, when a superior change in budgets from tight to loose budgets, salespeople's effort is not significantly lower than their earlier effort in a tight budget condition. The finding of this study is useful to management in understanding that organizations set budgets from tight to loose budgets, which may not undermine subordinates' motivation.

II. HYPOTHESIS DEVELOPMENT

2.1. Budget targets and Effort

In participative budgeting settings, subordinates have the opportunity and the incentive to influence budget targets through negotiating with their superiors, and much research has found that budgetary slack is common in such settings (e.g., Fisher, et al., 2000; Brown, Evans III, & Moser, 2009; Brown, Fisher, Peffer, & Sprinkle, 2017). Budgetary slack is the difference between the budget amount and the best estimates, and slack creation may be associated with fewer costs of effort or more bonuses. A selfish and rational subordinate would propose a low budget to create as much slack as feasible (Bonner & Sprinkle, 2002).

In my experiment, a loose budget condition allows subordinates to have a higher probability to

obtain low or easily attainable budgets than those in a tight budget condition. Much research (e.g., Bonner & Sprinkle, 2002; Locke & Latham, 2002; Van der Stede, 2000) finds that a low level of effort occurred when the budget target is easy, and a high level of effort occurred when the budget target is challenging but achievable because people must exert more effort to attain the goal. Thus, this leads to my first hypothesis as follows.

H1: Subordinates in a tight budget condition will exert higher effort than those in a loose budget condition.

2.2. Changes in Budget Targets and Effort

From a monetary incentive perceptive, subordinates believe that effort will lead to attaining the rewards, and reward incentives lead them to exert a high level of effort. A loose budget target allows subordinates to achieve the target and obtain a bonus with less effort than would be necessary with a tight budget target. When a superior sets budget targets from loose to tight, subordinates learn they need to work harder than they would in the loose budget condition to receive the desired bonus (Sprinkle, et al., 2008). Therefore, I expect when a superior change in budgets from loose to tight budgets, subordinates' effort will be higher than their earlier effort in a loose budget condition. Thus, I propose my second hypothesis as follows.

H2: When a superior change in budgets from loose to tight budgets, subordinates' effort is significantly higher than their earlier effort in a loose budget condition.

Prior research suggests that individuals are motivated by not only monetary incentives but also by reciprocity, and finds that reciprocity is more likely to arise when work relationships interact over multiple periods (Fisher, et al., 2015; Hannan, 2005; Schatzberg & Stevens, 2008). Gift exchange is considered a kind of reciprocity in the workplace, such as workers who are paid higher wages reciprocated with higher effort (Akerlof, 1982; Hannan, 2005). Schatzberg and Stevens (2008) examine budget and effort in a participative budgeting setting and find reciprocity increases when managers who allow more budgetary slack receive higher effort from their producers. In addition, Fisher, et al. (2015) examine how reciprocity affects the relation between performance targets and effort, and find that, in a repeated-interaction setting, superiors set low targets, and employees generally respond to low targets with high effort, and reciprocal behaviors appear for more strategic concerns to attempt to maximize utilities.

In my study, subordinates have higher benefits from providing high effort in a loose budget condition than in a tight budget condition. When a superior change in budgets from tight to loose budgets, subordinates may view this loose budget as a gift exchange whereby more slack is granted in exchange for higher effort. Therefore, I expect when a superior change in budgets from tight to loose budgets, subordinates negotiate a low budget target and respond to the low budget target with high effort as usual in the earlier tight budget condition. Thus, this leads to my third hypothesis as follows.

H3: When a superior change in budgets from tight to loose budgets, subordinates' effort is not significantly lower than their earlier effort in a tight budget condition.

III. EXPERIMENTAL METHOD

3.1. Participants and Design

A total of 104 undergraduate students who were enrolled in a managerial accounting course

participated in the laboratory experiment. Participants were randomly assigned to one of two treatments and received written instructions. Each participant played the role of a subordinate throughout the treatment. The role of the superior was played by two teachers. One was in the loose to tight treatment and the other was in the tight to loose treatment. The superior and subordinates were separated using a room partition.

The setting used in this experiment is a modification of the participative budgeting setting developed by Fisher, Frederickson, and Peffer (2000) and Schatzberg and Stevens (2008). Subordinates begin the process by submitting a sales budget proposal for the upcoming period to a superior. The sales budget was within the range of 100~200 units, with a uniform distribution of (100, 105, 110, …, 200) units. I manipulated the probabilities of the superior's budget agreement under two conditions (1) a loose budget condition and (2) a tight budget condition. In a loose budget condition, subordinates have a higher probability to obtain easily attainable budgets than in a tight budget condition. Table 1 presents the proposed budget and the probability of agreement in the loose and tight budget conditions, respectively.

Table 1: Proposed Budgets and the Probability of Agreement in Loose and Tight Budget Conditions

Loose budget condition		**Tight budget condition**	
Proposed budgets	Agreement probability	Proposed budgets	Agreement probability
>= 145 units	100%	>= 185 units	100%
130~140 units	90%	170~180 units	60%
110~125 units	60%	150~165 units	30%
<= 105 units	30%	<= 145 units	0%

My experiment consisted of two treatments: (1) loose-to-tight treatment and (2) tight-to-loose treatment. In the loose-to-tight treatment, the same N participants played the first 12 periods in the loose budget condition and the last 12 periods in the tight budget condition. Similarly, in the tight-to-loose treatment, the same N participants played the first 12 periods in the tight budget condition and the last 12 periods in the loose budget condition. This provided the advantage to make within-subject comparisons of the effort level.

3.2. Procedures

Before the experiment started, a researcher read the instructions aloud and briefly described the experimental setting. Three true or false questions were used to ensure that the participants understood the experiment: (1) "In the budget negotiation process, your superior's budget target was tight." (2) "Your expected sales depended on the effort you provided." (3) "In the budget negotiation process, your superior knew the effort you provided in each period (reversed question)." The experiment started only after all the participants had answered all quiz items correctly. Before the experiment began, the participants had two practice rounds to help them understand experimental tasks and procedures. The actual experiment started thereafter.

A timeline of events in each period appears in Figure 1 and Appendix presents 2 examples of the experiment. At the beginning of each period, the subordinates who made the initial proposal wrote a budget on the

negotiation form and submitted the form to a superior. To control for the effects on reputation and image management, the superior drew a ball from a probability of balls in boxes to decide whether they should agree on the proposed budget. If the negotiation failed to reach an agreement within four rounds, the superior had the final authority to set the budget.

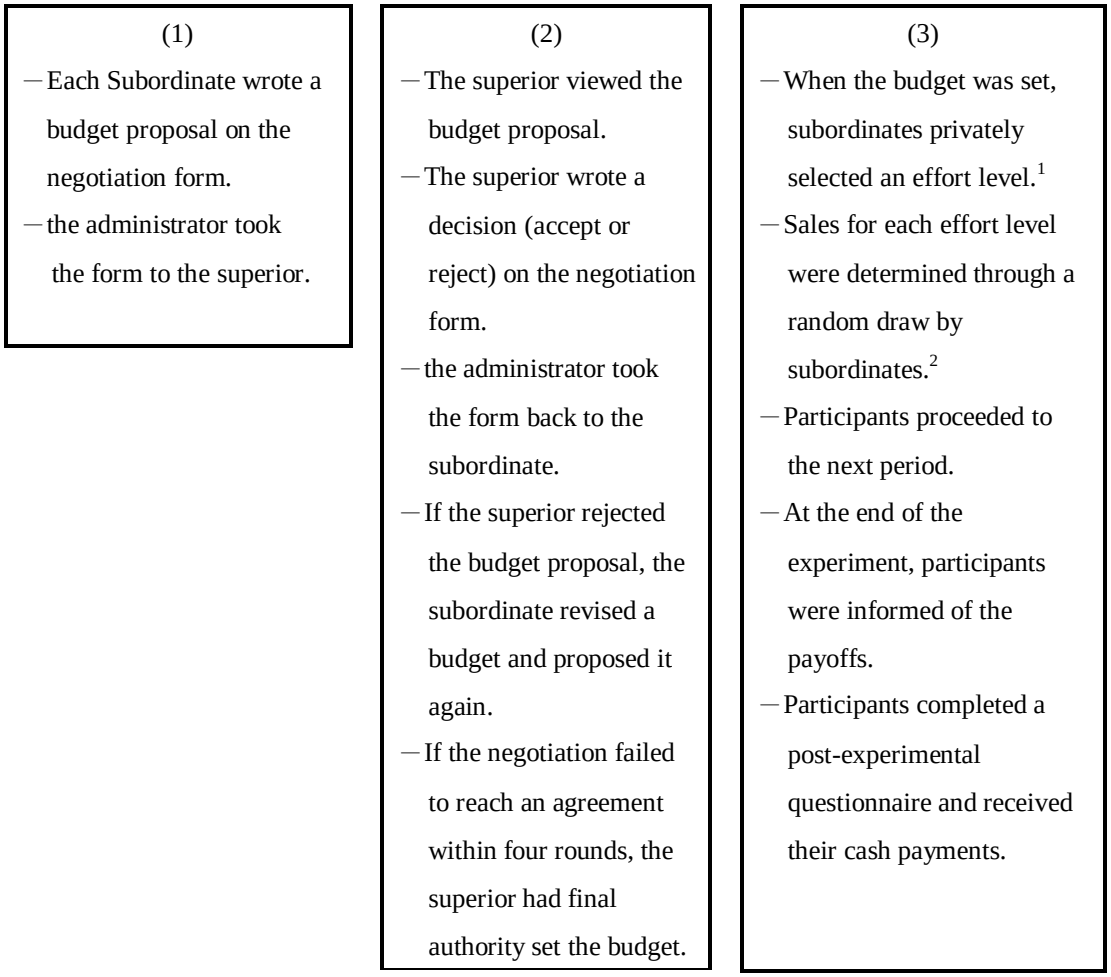


Figure 1 Timeline of Events in Each Period

When the budget was set, the subordinates privately selected an effort level from 1 to 10 levels; the cost of effort level is associated with a convex cost function and has been used in numerous recent experimental studies (Hannan, 2005). The expected sales for each effort level are uncertain, with an 80% probability of sales units and a 20% probability of sales units. Table 2 shows that each effort level imposed an economic cost on the subordinate and high effort levels cost more and generate high expected sales than low effort levels. To keep the effort decisions of the subordinate private within a given decision series, the expected sales units are not disclosed to the superior.

[1] *Participants are presented with a menu of effort choices, the cost of each effort choice, and sales of each effort choice with probability.*

[2] *There are 10 boxes with an 80 percent probability of sales units and 10 boxes with a 20 percent probability of sales units for each effort level.*

Table 2 Effort Level, Cost of Effort, and Expected Sales

Effort level	Cost of effort (NT$)	Expected sales	
		80% probability of sales units	20% probability of sales units
1	0	100	110~120
2	10	100~120	130~150
3	20	110~130	140~160
4	40	120~140	150~170
5	60	130~150	160~180
6	80	140~160	170~190
7	100	150~170	180~200
8	120	160~180	190~200
9	150	170~190	200
10	180	180~200	200

3.3. Monetary incentives

Subordinates are compensated in each period according to the following budget-based contract that is commonly employed in practice and research (Fisher, et al., 2002; Fisher, et al., 2006):

$$P = S + (A)(X - B) \quad \text{if } X > B$$
$$= S \quad \text{if } X \leq B$$

Where P is compensation (pay), S is the subordinate's salary compensation (base pay), A is the bonus coefficient per unit of sales exceeding the budget, X is expected sales, and B is the budget used in the subordinate's bonus function. A subordinate's net pay is his/her pay minus the cost of the effort level in each period.

An experiment lasted approximately two-and-a-half hours. At the end of the experiment, the laboratory dollars were converted to NTD by setting conversion rates at NT$0.02 for a laboratory dollar. At the end of the experiment, participants completed a post-experimental questionnaire and were paid a NT$100 fee, along with their earnings from the experiment. The average payment per participant was NT$348 in the loose-to-tight treatment and NT$363 in the tight-to-loose treatment.

3.4. Data Analysis

Because the sample size was small in each treatment, the central limit theorem seems inapplicable (Anderson, Sweeney, & Williams, 2011). When the assumption of the normal distribution is not valid, a nonparametric test is appropriate. A Mann-Whitney U test is a nonparametric alternative to the one-way analysis of variance and is used to compare the subordinates' effort between treatments. A Wilcoxon signed-ranks test provides a nonparametric alternative to the paired t-test and is applied to analyze differences in subordinates' effort within treatments.

IV. RESULTS

A total of 11 participants were dropped from the study pool because they failed the manipulation check or did not complete the experiment. Seventy-two percent of the participants were female.

4.1. Manipulation Checks

The post-experimental questionnaire contained several statements designed to test the effectiveness of experimental controls and ensure that participants understood the task. Participants responded to these statements on a seven-point Likert scale with 1 indicating ''Strongly Disagree,'' 4 indicating ''Neutral,'' and 7 indicating ''Strongly Agree.'' The checks involve tests of mean differences from the neutral response of 4. Responses indicate that participants understood that expected sales are related to the level of effort contribution (mean response 5.63, SD= 1.23, t=12.80, p< 0.001). Responses indicate that reputation effects were effectively controlled, and the superior learned about the effort that the subordinate selected (reversed question) (mean response 2.47, SD=1.85, t=-7.96, p<0.001). Further, responses indicate that participants perceived a financial incentive to set a budget that was below the expected sales and choose minimum effort, as participants understood that setting a low budget can get a higher bonus (mean response 5.34, SD= 1.19, t=10.86, p< 0.001), and effort is costly as well as the cost of effort increases with the level of effort (mean response 4.95, SD= 1.64, t=5.55, p< 0.001).

4.2. Descriptive Statistics

Table 3 presents the distribution of mean budgets and effort levels for each treatment. As shown in Table 3, Panel A, in the loose-to-tight treatment, the first 12 periods of loose budget condition, the majority of subordinates (14 subjects, or 30 percent) propose a sales budget between 111 and 120 units, and 24 percent of the subjects provide high effort level >=8, whereas, in the last 12 periods of tight budget condition, the majority of subordinates (18 subjects or 39 percent) propose a sales budget between 151 and 160 units, and 23 of the 46 subjects (50 percent) provide high effort level >=8.

As shown in Table 3, Panel B, in the tight-to-loose treatment, the first 12 periods of tight budget conditions, the majority of subordinates (20 subjects, or 42 percent) propose a sales budget between 161 and 170 units, and 20 of the 47 subjects (42 percent) provide high effort level >=8, whereas, in the last 12 periods of loose budget conditions, the majority of subordinates (14 subjects, or 30 percent) propose sales budget between 100 and 110 units, and 19 of the 47 subordinates (40 percent) provide high effort level >=8.

The results indicate that the subordinates intended to propose low sales budgets in the superior's loose and tight budget conditions. When the superior changing budgets from loose to tight budgets, had a profound effect on high effort levels (24% to 50%), and while changing budgets from tight to loose budgets, had a little decreasing effect on high effort levels (42% to 40%). Furthermore, as shown in Panel A and B of Table 3, the majority of subordinates were likely to provide moderate effort levels (7-7.99). Figure 2 presents the distribution (percent) of effort levels by loose-to-tight treatment (Panel A) and tight-to-loose treatment (Panel B), respectively.

Table 3 Distribution of Mean Budget and Effort Level by Treatment

Panel A: Loose-to-Tight treatment (n=46)

Budget [a]	The first 12 periods: Loose		The last 12 periods: Tight	
	Frequency	Percent	Frequency	Percent
100~110	3	7	0	0
111~120	14	30	0	0
121~130	10	22	0	0
131~140	6	13	0	0
141~150	3	7	0	0
151~160	6	13	18	39
161~170	2	4	15	32
171~180	2	4	10	22
181~190	0	0	3	7
191~200	0	0	0	0
Effort level [b]	**The first 12 periods: Loose**		**The last 12 periods: Tight**	
	Frequency	Percent	Frequency	Percent
1-1.99	0	0	0	0
2-2.99	0	0	1	2
3-3.99	1	2	0	0
4-4.99	6	13	4	9
5-5.99	6	13	1	2
6-6.99	9	20	4	9
7-7.99	13	28	13	28
8-8.99	5	11	10	22
9-9.99	5	11	11	24
10	1	2	2	4

Panel B: Tight-to-Loose treatment (n=47)

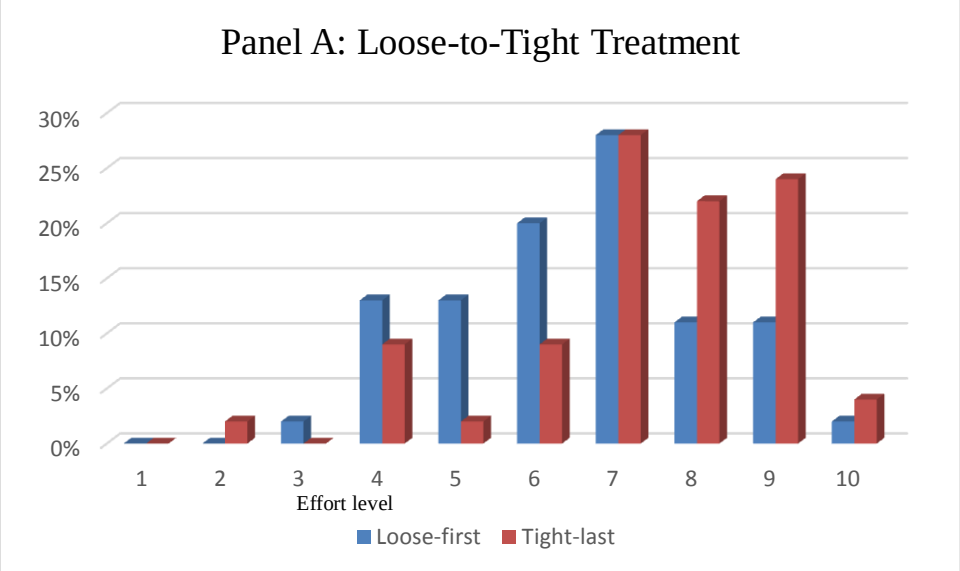
Budget [a]	The first 12 periods: Tight		The last 12 periods: Loose	
	Frequency	Percent	Frequency	Percent
100~110	0	0	14	30
111~120	0	0	9	19
121~130	0	0	8	17
131~140	0	0	4	8
141~150	0	0	3	6

151~160	7	16	2	4
161~170	20	42	3	7
171~180	15	31	1	2
181~190	3	7	0	0
191~200	2	4	3	7

	The first 12 periods: Tight		**The last 12 periods: Loose**	
Effort level [b]	Frequency	Percent	Frequency	Percent
1-1.99	1	2	5	11
2-2.99	3	7	0	0
3-3.99	0	0	1	2
4-4.99	2	4	5	11
5-5.99	2	4	4	8
6-6.99	3	7	3	7
7-7.99	16	34	10	21
8-8.99	15	31	9	19
9-9.99	5	11	6	13
10	0	0	4	8

[a] Budget: The final budget that is agreed upon by the superior. Subordinates propose a budget fall within the range of 100 to 200 units, with a uniform distribution of (100, 105, 110, …, 200) units.

[b] Effort level: Subordinates privately choose an effort level from 1 to 10 levels based on the budget agreed upon by the superior.



Mean rank

	Loose - Tight [a] (n=46)	Tight - Loose [b] (n=47)	Test statistics	
			Z	*P*
First 12 periods	**Loose budget**	**Tight budget**		
1	40.54	53.32	-2.313	0.021
2	38.71	55.12	-2.984	0.003
3	40.70	53.17	-2.263	0.024
4	42.87	51.04	-1.491	ns
5	43.64	50.29	-1.199	ns
6	43.02	50.89	-1.421	ns
7	45.46	48.51	-0.554	ns
8	47.00	47.00	0.000	ns
9	43.91	50.02	-1.107	ns
10	44.33	49.62	-0.958	ns
11	47.79	46.22	-0.284	ns
12	46.47	47.52	-0.192	ns
All	41.26	52.62	-2.029	0.042
Last 12 periods	**Tight budget**	**Loose budget**		
1	53.51	40.63	-2.323	0.020
2	53.46	40.68	-2.307	0.021
3	51.78	42.32	-1.708	0.088
4	51.86	42.24	-1.746	0.081
5	48.91	45.13	-0.686	ns
6	46.80	47.19	-0.070	ns
7	52.93	41.19	-2.128	0.033
8	55.08	39.10	-2.905	0.004
9	50.50	43.57	-1.268	ns
10	50.14	43.93	-1.131	ns
11	50.15	43.91	-1.136	ns
12	51.65	42.45	-1.705	0.088
All	51.71	42.39	-1.664	0.096

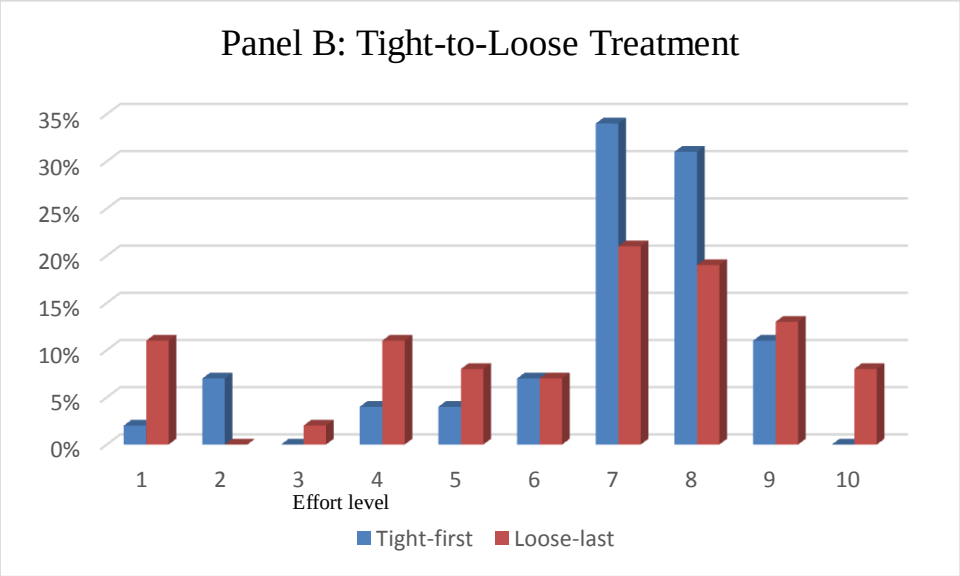


Figure 2. The Distribution (Percent) of Effort Levels by Treatment

4.3. Tests of Hypotheses

H1 predicts that subordinates in a tight budget condition will exert higher effort than those in a loose budget condition. To test H1, effort levels were compared between treatments by using a Mann-Whitney U test. Table 4 shows that effort levels in the tight budget condition score a higher mean rank than in the loose budget condition in each period. Moreover, 3 mean ranks of the first 12 periods between loose and tight budget conditions were statistically significant ($p<0.05$), and 7 mean ranks of the last 12 periods between loose and tight budget conditions were statistically significant ($p<0.05$) or marginally significant ($p<0.1$). In addition, the mean rank of all first 12 periods between treatments, loose budget condition (41.26) vs. tight budget condition (52.62), was statistically significant ($Z=-2.029$, $p=0.042$, two-tailed) and the mean rank of all last 12 periods between treatments, tight budget condition (51.71) vs. loose budget condition (42.39), was marginally significant ($Z=-1.664$, $p=0.096$, two-tailed). These results support H1 and are consistent with previous research (e.g., Locke & Latham, 2002; Van der Stede, 2000) that a higher level of effort occurred when the budget target was challenging but achievable, and a lower level of effort occurred when the budget was easy to attain.

Table 4 Comparing Individual Effort Levels between Treatments by Period

ns = not significant.

H2 predicts that a superior change in budgets from loose to tight budgets, subordinates' effort will be higher than their earlier effort in a loose budget condition. To test H2, I examine differences in effort levels between the first 12 periods and the last 12 periods in the tight-to-loose treatment using a Wilcoxon signed-ranks test. The results in Table 5, Panel A show that, in the loose-to-tight treatment, subordinates' effort in a tight budget condition (the last 12 periods) was significantly ($p<0.05$) or marginally ($p<0.1$) higher than their earlier effort in a loose budget condition (the first 12 periods). In addition, in the loose-to-tight treatment, the mean effort level of the last 12 periods (tight budget) was significantly higher than the earlier mean effort level of the first 12 periods (loose budget) ($Z=-3.356$, $p=0.001$, two-tailed), implying that changes in budgets from loose to

tight motivate subordinates to exert more effort than their earlier effort in a loose budget condition. The result supports H2 and is consistent with previous research (e.g., Locke & Latham, 2002; Van der Stede, 2000) that tight budget targets lead to higher effort than loose budget targets.

Table 5: Comparing Effort Level within treatments by period

Panel A: Loose to Tight treatment (n=46)										
	Negative rank				Positive rank				Test statistics	
Period	n	Mean rank	Sum of rank		n	Mean rank	Sum of rank	Ties n	Z	*P*
1	8	17.00	136.00		30	20.17	605.00	8	-3.420	0.001
2	9	18.28	164.50		29	19.88	576.50	8	-2.994	0.003
3	14	17.82	249.50		25	21.22	530.50	7	-1.965	0.049
4	10	17.90	149.00		26	19.88	517.00	10	-2.898	0.004
5	13	14.85	193.00		25	21.92	548.00	8	-2.581	0.010
6	8	17.13	137.00		23	15.61	359.00	15	-2.178	0.029
7	12	13.63	163.50		26	22.21	577.50	8	-3.010	0.003
8	14	15.25	213.50		24	21.98	527.50	8	-2.286	0.022
9	10	15.95	159.50		28	20.77	581.50	8	-3.072	0.002
10	12	12.83	154.00		20	18.70	374.00	14	-2.062	0.039
11	13	14.19	184.50		20	18.83	376.50	13	-1.724	0.085
12	11	13.95	153.50		20	17.13	342.50	15	-1.858	0.063
All	10	20.75	207.50		34	23.01	782.50	2	-3.356	0.001
Panel B: Tight to Loose treatment (n=47)										
	Negative rank				Positive rank				Test statistics	
Period	n	Mean rank	Sum of rank		n	Mean rank	Sum of rank	Ties n	Z	*P*
1	29	21.10	612.00		12	20.75	249.00	6	-2.361	0.018
2	21	18.43	387.00		10	10.90	109.00	16	-2.730	0.006
3	22	19.73	434.00		13	15.08	196.00	12	-1.956	0.050
4	18	15.28	275.00		14	18.07	253.00	15	-0.207	ns
5	14	15.18	212.50		16	15.78	252.50	17	-0.412	ns
6	13	17.04	221.50		19	16.13	306.50	15	-0.796	ns
7	16	16.53	264.50		15	15.43	231.50	16	-0.324	ns
8	16	19.34	309.50		15	12.43	186.50	16	-1.208	ns
9	15	15.37	230.50		14	14.61	204.50	18	-0.282	ns
10	17	19.26	327.50		16	14.59	233.50	14	-0.842	ns

11	16	20.00	320.00		20	17.30	346.00		11	-0.205	ns
12	16	14.38	230.00		12	14.67	176.00		19	-0.617	ns
All	25	24.74	618.50		20	20.82	416.50		2	-1.140	ns

ns = not significant.

H3 predicts that a superior change in budgets from tight to loose budgets, subordinates' effort will not be lower than their earlier effort in a tight budget condition. To test H3, I examine differences in effort levels between the first 12 periods and the last 12 periods in the loose-to-tight treatment using a Wilcoxon signed-ranks test. The results in Table 5, Panel B show that, in the loose-to-tight treatment, 9 of the 12 periods, subordinates' effort in a loose budget condition (the last 12 periods) was not significantly ($p>0.1$) lower than their earlier effort in a tight budget condition (the first 12 periods). In addition, in the tight-to-loose treatment, the mean effort level of the last 12 periods (loose budget) was not significantly lower than the earlier mean effort level of the first 12 periods (tight budget) ($Z=-1.140$, $p=0.254$, two-tailed), implying that changes in budget targets from tight to loose do not induce subordinates to exert less effort. The result supports H3 and is consistent with Fisher, et al. (2015) when work relationships extend multiple periods, reciprocity appears for strategic concerns.

4.4. Supplemental Analysis of Ethical Concerns regarding Low Budgets and Low Effort Levels

To gain a better understanding of subordinate ethical concerns, the following two statements were included in the post-experimental questionnaire. Participants responded to these two statements on a Liker scale from 1 "strongly Disagree" to 7 "Strongly Agree":

1. While playing the role of the subordinate, it would have been unethical for me to propose a low budget.
2. While playing the role of the subordinate, it would have been unethical for me to provide a low level of effort.

The two ethics statements generated the full range of responses from 1 to 7. I test the mean differences from the neutral response of 4. The mean response to Statement #1 was 3.45 (SD = 1.59), which is significantly different from 4 ($t = -3.32$, $p=0.001$, two-tailed), implying participants did not agree that providing a low budget is unethical. Participants' response to Statement #2 was that providing a low level of effort is unethical (mean 4.22, SD = 1.78, $t= 1.17$, $p=0.246$, two-tailed), which is not significantly different from 4. These results show that participants' strategic concerns (e.g., proposing a low budget is associated with excess bonus payments, and the cost of effort is a convex function that reflected an increasing marginal disutility for effort) become relatively more important than ethical concerns.

V. DISCUSSION AND CONCLUSION

The findings of this study indicate that the subordinates intended to propose low budgets in the loose budget condition, and even in the tight budget condition, the subordinates were likely to propose moderate budgets between 165 and 170 units within the range of 100 to 200 units. In addition, the majority of subordinates were likely to provide moderate effort levels (7-7.99) from the range of 1 to 10 levels. These findings are consistent with previous research (e.g., Merchant & Manzoni, 1989; Fisher, et al., 2000) that subordinates are more likely to set a low budget because a low budget ensures subordinates an incremental monetary gain from the incremental effort.

Consistent with previous research, tight budget targets lead to a higher level of effort than loose budget targets. Especially, when a superior change in budgets from loose to tight budgets, subordinates' effort levels are significantly higher than their earlier effort levels in a loose budget condition. However, when a superior change in budgets from tight to loose budgets, subordinates' effort is not significantly lower than their earlier effort in a tight budget condition, because subordinates increase the expected values of bonuses by proposing a low budget, and responding to the low budget with high effort. Reciprocity appears for strategic concerns is consistent with Fisher et al., (2015). In addition, in a supplemental analysis of ethical concerns regarding proposing a low budget and providing low effort, participants in a participative budgeting setting were more likely to have strategic concerns than ethical concerns.

The findings of this study have implications for the practice of goal settings and motivation of budgets in a budgeting process. If a superior first sets a budget at loose and then tight, subordinates have a little benefit from exerting effort than in the earlier loose budget condition and may induce some adverse consequences such as complaints, emotional exhaustion, and resignation as well as it is easy for them to forget a superior earlier loose-budget favor. In contrast, if a superior first sets a budget at tight and then loose, subordinates will view this loose budget as a gift, and respond to work hard as usual in the earlier tight budget condition. This study suggests that when subordinates learn the norms, values, and goals and tend to stay in the organization as a member, and if superiors believe that subordinates will be motivated by reciprocity, then superiors may change budgets from tight to loose budgets to motivate subordinates to exert high effort as well as achieve win/win results for both superiors and subordinates.

Certain limitations of this study should be noted. First, as with all laboratory experiments, the results depend on the specific experimental task, treatments, and parameter values used. Second, to control for a variety of factors, participants could only communicate budget proposals with the superior via a form. In practice, however, superiors analyze economic conditions, market competition, production capacity, as well as selling expenses when developing the sales budget. Besides, superiors will most likely consult with salespeople who have more experience and more knowledge of current trends as well as customer territory than the superior does. After gathering all information, superiors decide on the sales budget. Third, in my experiment, I assume an increase in effort increased expected sales results. In practice, however, salespeople are facing several uncertainties in marketing, and sales results might be affected by unfavorable uncontrollable factors such as the Covid-19 crisis. Fourth, the experiment excludes many real-world influences, such as reputation and image management, which may arise from long-term relationships and repeated interactions. Fifth, reward incentives include cash, tangible and intangible rewards. Prior research (Choi & Presslee, 2022; Mitchell, Presslee, Schulz, & Webb, 2022) finds that the type of reward incentives leads to different effects on individual effort. Future research could focus on tangible or intangible rewards in sales budget settings. Finally, work motivation can be contagious between colleagues, within teams, and competitors, with wide-ranging effects on effort and performance. The psychological effects of work motivation are beyond the scope of this study but would be an interesting question for future research.

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Appendix: Examples of the Experiment

Example 1: Loose budget condition

First step: A subordinate wrote a sales budget of 135units on the negotiation form.

Round 1

Negotiation times	1	2	3	4
Your sales volume budget	135			
Superior decision (agree "O" /not agree "X")				

Second step:

The superior decided to agree or not agree on the budget proposal depending on drawing a ping pong ball from a 130~140 units box in which there are one ping pong ball with a "X" and 9 ping pong balls with a "O". The superior drew a "O" ping pong.

90 percent: 130~140 units

O	O	O	O	O
O	O	O	O	X

The superior wrote down a decision on the negotiation form.

Round 1

Negotiation times	1	2	3	4
Your sales volume budget	135			
Superior decision (agree "O" /not agree "X")	O			

Third step:

When the budget was set, a participant select an effort level 7, and she/he drew a ping pong ball (150) from a box in the 8/10 probability condition and drew another ping pong ball (185) from a box in the 2/10 probability condition.

8/10 probability: 150~170 units

150	155	160
165	170	

2/10 probability:180~200 units

180	185	190
195	200	

Expected sales volume: 150 × 8/10 + 185 × 2/10= 157 units

Payoff = 250 + (5) (157-135) = 360

Net Payoff = 360 – 100 = 260

Example 2: Tight budget condition

First step: A subordinate wrote a sales budget of 155 units on the negotiation form.

Round 1

Negotiation times	1	2	3	4
Your sales volume budget	155			
Superior decision (agree O /not agree X)				

Second step:

The superior decided to agree or not agree on the budget proposal depending on drawing a ping pong ball from a 150~165 units box in which there are7 ping pong balls with a "X" and 3 ping pong balls with a "O". The superior drew a "X" ping pong.

30 percent: 150~165 units

O	O	O	X	X
X	X	X	X	X

The superior wrote down a decision on the negotiation form.

Round 1

Negotiation times	1	2	3	4
Your sales volume budget	155	165		
Superior decision (agree "O" /not agree "X")	X			

Then, the negotiation form was sent back to the subordinate, and the subordinate resubmitted a sales budget of 165 units.

Again, the superior decided to agree or not agree on the budget proposal depending on drawing a ping pong ball from a 150~165 units box in which there are 7 ping pong balls with a "X" and 3 ping pong balls with a "O". The superior drew a "O" ping pong.

30 percent: 150~165 units

O	O	O	X	X
X	X	X	X	X

The superior wrote down a decision on the negotiation form.

Round 1

Negotiation times	1	2	3	4
Your sales volume budget	155	165		
Superior decision (agree "O" /not agree "X")	X	O		

Third step:

When the budget was set, a participant select an effort level 8, and she/he drew a ping pong ball (170) from a box in the 8/10 probability condition and drew another ping pong ball (195) from a box in the 2/10 probability condition.

8/10 probability: 160~180 units			2/10 probability:190~200 units		
160	165	170	190	195	200
175	180				

Expected sales volume: 170 × 8/10 + 195 × 2/10= 175 units

Payoff = 250 + (5) (175-165) = 300

Net Payoff = 300 – 120 = 180