The Effects of Individual Horizon Preferences and Project Horizon on Managers' Resource Allocation Decisions under a Subordinate-Superior Framework

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DEDICATION

I dedicate this dissertation to my good Lord in heaven whose words keep inspiring and supporting me in my journey through this doctoral program and through this life. I also dedicate this dissertation to my wife, Yang Liu, and my daughter, Gabrielle L. Wang, who both sacrificed a lot through these years. Finally, I dedicate this dissertation and give thanks to my parents, my church family and many friends who have supported me throughout my journey. I will always appreciate all they have done.

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ABSTRACT

I examine the effects of subordinate managers' and their superiors' individual horizon preferences along with the effects of project horizon on managers' resource allocation decisions. I define horizon preference as an individual's general preference for long-term versus short-term results. Project horizon is the period it takes to realize substantially all the benefits from a project. In my experiment, business students assume the role of project managers who must allocate a budget to two projects. One project offers the possibility of significant immediate benefits but with limited future benefits, while the other offers the possibility of limited immediate benefits but with significant future benefits. Holding employment horizon constant, the case where managers share the same horizon preference with their superior is straightforward. However, when preferences diverge I predict and find that short-term oriented managers will be more likely to adapt their decisions to their superiors' preferences than will long-term oriented managers.

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I. INTRODUCTION

The aim of this study is to examine the interactive effects of managers' and their superiors' individual horizon preferences on managers' resource allocation decisions. In my study, I define horizon preference as an individual's general preference for long-term versus short-term results, while project horizon is the period it takes to realize substantially all the benefits from a project. The definition of horizon preference is consistent with definitions of planning horizon (Das 1987) and time horizon (Thaler 1999). Further, the construct of horizon preference closely relates to but differs from the constructs of employment horizon (Dikolli 2001) and managerial myopia (Bhojraj and Libby 2005). A manager is considered to have a short-term horizon preference when he prefers to attain benefits in the near future and a long-term horizon preference when he prefers to attain benefits in the distant future. A project is considered short-term if it offers the possibility of significant immediate benefits but with limited future benefits and long-term if it offers the possibility of limited immediate benefits but with significant future benefits.

It is important to investigate this issue because middle-level managers often must allocate resources to projects having different horizon implications. For example, in Hunton et al. (2008), corporate managers may choose to decrease discretionary expenditures on quality control projects, thus increasing short-term earnings.

Alternatively, they may choose to increase discretionary expenditures on quality control procedures, thus potentially improving long-term financial performance by identifying production problems. Similarly, managers may choose to increase spending on a long-term oriented research and development (R&D) project, expecting improved long-term financial performance. Alternatively, they may choose to decrease or even discontinue spending on such a R&D project, aiming to boost short-term earnings. In this study, I refer to projects such as quality control projects and R&D projects as internal process improvement projects. Given the horizon implications of internal process improvement projects, managers' choices over these projects can have important implications over a firm's allocation of economic resources and over the firm's short-term and long-term financial performances (Bhojraj and Libby 2005).

Findings of existing literature suggest that middle-level managers will consider their own horizon preferences and the horizon of the projects when making resource allocation decisions. For example, Miller and Le Breton-Miller (2006) find that long-term focused management outspends short-term focused management in R&D and in capital investments in plant, equipment, and information technology. Hunton et al. (2008) find that managers with long-term incentive contracts are more willing than managers with short-term incentive contracts to increase expenditures on quality control procedures that can improve future firm performance. In contrast, Farrell et al. (2008) find that employees with short-term employment horizon allocate less effort than employees with long-term employment horizon to actions that increase future firm performance.

Further, findings of accounting literature suggest that middle-level managers may also consider their superiors' horizon preferences when making resource allocation

decisions. For example, Harrell (1977) finds that Air Force officers are strongly influenced by goals emphasized by their superiors when making decisions, so much so that they even ignore a formal policy statement when their superiors appear to do so. Buchman et al. (1989) find that auditors consider their superiors' views when making decisions in ambiguous situations. Wilks (2002) find that auditors who know the partners' view evaluate individual evidence items and make going-concern judgment consistently with the partner's view.

What is yet unclear is how middle-level managers jointly consider their own horizon preferences together with their superiors' horizon preferences when making resource allocation decisions. In one case, when managers' and their superiors' horizon preferences align, findings of the judgment and decision-making literature suggest that managers will follow the aligned preferences, which is the salient solution (Tetlock 1985). However, it is unclear whether the effect of the superior's preference is additive above and beyond the preference of the subordinate manager in pursuing the salient solution. In another case, when managers' and their superiors' horizon preferences are not aligned, it is unclear how managers will resolve the conflicting preferences and to what extent they will allocate their resources in following their resolutions.

I test this question using an experiment. This setting allows me to vary perceptions of a superior's horizon preferences, to measure theory-consistent process variables, and to control for alternative explanations. In my experiment, I implement a between-subjects factorial design with two independent variables. Specifically, I provide participants, who assume the role of a manager, cues about their superior's horizon preference by varying the level of the superior's long-term investment activities and the

nature of her incentive plan. In the long-term (short-term) perspective condition, the superior invests more (less) than industry peers in R&D projects, in continued professional education for employees, and in socially and environmentally friendly projects. Further, the superior regularly exercises all stock options that are part of her compensation as they become available. In the long-term (short-term) perspective condition, the superior retains (sells) the stocks. As a result, the superior owns a substantial (negligible) amount of firm stocks. Given this context, participants decide how much unexpected budget surplus to allocate between two projects that differ in horizon (dependent variable). The short-term project offers significant immediate benefits but with limited future benefits, while the long-term project offers limited immediate benefits but with significant future benefits. Lastly, I measure participants' horizon preferences (independent variable one) and their perceptions of the superiors' horizon preference (independent variable two).

The study finds support for its propositions. First, I propose and find some evidence that managers' individual horizon preferences influence their resource allocation decisions. Second, I propose and find that managers' beliefs about their superiors' horizon preferences influence their resource allocation decisions. Finally, consistent with the prediction based on managers' foci on their self-interests, I propose and find that short-term managers are more likely to be influenced by their superiors' preferences than long-term managers are.

The results of the study have several theoretical contributions. First, the study contributes by showing the manner in which middle-level managers' individual horizon preferences and his superiors' individual horizon preferences interact to affect managers'

resource allocation decisions. Prior studies have not investigated this interaction. Second, the findings support the notion that communication about superiors' long-term (short-term) horizon preferences will motivate more resources allocated towards long-term (short-term) projects. Finally, the study contributes to the control literature by examining the role of a manager's assumptions about his superior's preferences as a behavioral control in a superior-subordinate framework.

The results of the study also have practical contributions. Divisional managers often hold substantial influence over the capital invested in their divisions (Scapens 1982). This study finds that, somewhat counter to popular intuition, information about organizational superiors' preferences will have greater effects on decisions made by short-term managers than on those made by long-term managers. Knowledge about subordinates' differential horizon preferences and reactions to superiors' preferences can be helpful to superiors who need to understand how their actions and preferences affect the behavior of others throughout the organization.

The next section develops a theoretical basis for my predictions and presents formal hypotheses. I begin with discussions and predictions about the effects of managers' horizon preferences and superiors' horizon preferences regarding managers' resource allocation decisions. I then discuss and predict the interaction effects of managers' horizon preferences and superiors' horizon preferences. The theoretical discussions and predictions are followed by a description of the experimental study, the planned analyses and the experimental results. Conclusions, limitations, and implications are presented last.

II. BACKGROUND AND HYPOTHESES

Consistent with definitions in existing literature, I refer to managers' individual horizon preferences as their general preferences for long-term versus short-term outcomes. For example, Das (1987) refers to a planning horizon as the length of the future time period that decision-makers consider when planning and executing the firm's strategies. Thaler (1999) refers to time horizon as a decision frame through which decision-makers choose to aggregate future outcomes. Both Das (1987) and Thaler (1999) refer to the subjective time-framing nature of horizon preference through which decision-makers weigh immediate or distant future outcomes. Hence, in my study, I consider a manager to have a short-term horizon preference when he prefers benefits in the near future and to have a long-term horizon preference when he prefers benefits in the distant future.

The construct of horizon preference relates to but differs from the constructs of employment horizon and managerial myopia. First, with respect to employment horizon, the existing literature defines it as the length of a manager's remaining employment with a firm. For example, Farrell et al. (2008) operationalize a long employment horizon by informing a sandwich maker that s/he will remain with the same shop throughout all work periods. They then operationalize a short employment horizon by informing a sandwich maker that s/he will work for a different sandwich shop in each work period.

Other studies, such as Dechow and Sloan (1991), use a manager's proximity to retirement as a proxy for his employment horizon. Existing literature suggests that when a manager's employment horizon is short, he may behave like a manager with a short-term horizon preference, i.e. decreasing R&D expenditures (Dechow and Sloan 1991). Conversely, when a manager's employment horizon is long, he may behave like a manager with a long-term horizon preference, i.e. allocating efforts to actions that increase future firm performance (Farrell et al. 2008).

However, it can be problematic to equate a short employment horizon with a short-term horizon preference and to equate a long employment horizon with a long-term horizon preference. Existing literature suggests that employment horizon is only one of many incentives or pressures that are associated with individuals' horizon preferences. Equating employment horizon with horizon preference disregards the effects of other incentives and pressures such as incentive contracts (Hunton et al. 2008) and capital market pressures (Bhojraj and Libby 2005). Consistent with such suggestion, Murphy and Zimmerman (1993) find an inconclusive association between short employment horizon and expected behavioral effects of short-term horizon preference, such as decreases in R&D expenditure. This is because a manager with a short employment horizon, such as when he is close to retirement, can have a long-term horizon preference if he anticipates post-retirement board service (Brickley et al. 1999). Conversely, a manager with a long-term employment horizon may have a short-term horizon preference if he is subject to incentive plans or capital market pressures that focus on current period earnings (Bhojraj and Libby 2005; Hunton et al. 2008).

Second, with respect to managerial myopia, Bhojraj and Libby (2005) define managerial myopia as managers' desire to achieve a high current stock price by inflating current earnings at the expense of longer-term cash flows. Hence, similar to the construct of horizon preference, the construct of managerial myopia reflects managers' trade-off decisions between short-term benefits and long-term benefits. However, the present study differs in terms of theoretical underpinning and empirical emphasis. The construct of managerial myopia relies primarily on economic arguments, while the construct of horizon preference relies primarily on behavioral arguments. Further, in Bhojraj and Libby (2005), the construct of managerial myopia focuses on managers' earnings manipulation decisions for external financial reporting purposes. In the present study, the construct of horizon preference focuses on managers' internal resource allocating decisions without necessarily a regard to earnings manipulations for external financial reporting purposes.

Managers' Horizon Preferences

Existing studies find that managers consider their own horizon preferences when making resource allocation decisions. For example, Miller and Le Breton-Miller (2006) find that long-term focused management outspends short-term focused management in R&D and in capital investments in plant, equipment, and information technology. Hunton et al. (2008) find that managers with long-term incentive contracts are more willing than managers with short-term incentive contracts to increase expenditures on quality control procedures that can improve future firm performance. In contrast, Dechow and Sloan (1991) find that firms with top executives close to retirement are associated with less expenditures on R&D projects. Farrell et al. (2008) find that employees with short-term

employment horizon allocate less effort than employees with long-term employment horizon to actions that can increase future firm performance.

Hence, existing literature suggests that a middle-level manager's horizon preference will influence his resource allocation decisions among projects with various horizons. Middle-level managers, such as division managers, increasingly have substantial influence over resources invested in their divisions (Scapens 1982). Similar to a decision-maker studied in existing literature, a middle-level manager with long-term horizon preference will likely allocate more resources in a long-term project that offers the possibility of significant future benefits. In contrast, a middle-level manager with a short-term horizon preference will allocate fewer resources in such a long-term project. Instead, he will likely allocate more resources in a short-term project that offers the possibility of significant immediate benefits. In order to maintain consistency with prior findings, I propose the following hypothesis.

> **H1. A manager's horizon preference influences his resource allocation decisions among projects having varying horizons such that a manager with a long-term horizon preference will be more likely than a manager with a short-term horizon preference to invest in a long-term project.**

Superiors' Horizon Preferences

Organizational decision-makers do not work in social vacuums. Findings of management and accounting literature suggest that decision-makers in an organizational setting will consider their superiors' preferences when making decisions. Frequently, their superiors evaluate their decisions and their performance, thus providing an incentive

for managers to ascertain their superiors' preferences and to conform their decisions accordingly. In addition, their superiors often have organizational, industry, and domain knowledge that middle-level managers do not have access to except through their superiors. Subject to such influences, middle-level decision-makers in an organization care about their superiors' preferences in order to pitch projects that have a greater chance of acceptance by superiors (Bendor et al. 1987). Consistent with this notion, Harrell (1977) finds that Air Force officers are strongly influenced by goals emphasized by their superiors when making decisions, so much so that they even ignore a formal policy statement when their superiors appear to do so. Buchman et al. (1989) find that auditors consider their superiors' views when making decisions in ambiguous situations. Wilks (2002) finds that auditors who know their audit partners' view evaluate individual evidence items and make going-concern judgment consistently with the partner's view. These findings suggest that middle-level managers, as organizational decision-makers, will care about their superiors' preferences and try to conform to the superiors' preferences when making resource allocation decisions.

Arguably, subordinate managers will consider their superiors' horizon preference and adopt a preference-consistent strategy, in the same way as they consider their superiors' other preferences and adopt a preference-consistent strategy. When the superior appears to be long-term oriented, a subordinate will likely allocate more resources to a long-term project, to be consistent with the superior's horizon preference. In contrast, when the superior appears to be short-term oriented a subordinate will likely allocate fewer resources to a long-term project but instead, he will likely allocate more

resources to a short-term project that offers the possibility of significant immediate benefits. Therefore, I propose the following hypothesis.

> **H2: A manager's beliefs about his superior's horizon preference influence his resource allocation decisions between projects of varying horizons such that a manager who believes his superior is long-term oriented will be more likely than a manager who believes his superior is short-term oriented to invest in a long-term project.**

Interactions

When a manager's horizon preference aligns with his superior's horizon preference, the superior's preference should increase the magnitude of the manager's motivation to allocate resources accordingly. For instance, when both the manager and his superior prefer short-term results, the manager will allocate resources to the short-term project because it is the salient solution (Tetlock 1985). When preferences conflict, however, the manager will likely engage in elaborate trade-offs.

In discussing the kinds of trade-offs that managers may undertake, it is helpful to consider that a short-term manager is sensitive to immediate gains and losses, including those implied in the misalignment of a long-term versus a short-term horizon. A manager who prefers short-term results gains immediate results from a potentially better performance rating by following the superior's preference than otherwise. He values his superior's rating because his superior's opinion about his performance matters for his immediate rewards.

In contrast, a long-term manager is less sensitive to immediate gains and losses, including those implied in the misalignment of preferences, than a short-term manager is. By definition, a manager with a long-term horizon preference cannot react to short-term influences and continue to behave consistently with his preference. That is, if a long-term manager does react to short-term influences, his behavior becomes short-term, in conflict with his preference.

Consequently, to the extent that a manager prefers long-term results, he will likely disregard short-term influences. That is, a long-term manager will likely allocate resources to the long-term project regardless of his superior's preferences. This happens because a manager with a long-term preference values the future project benefits and is thus, less sensitive to short-term influences than the short-term manager. The long-term manager will likely discount the short-term gains implied in a potentially good rating from his short-term superior. Therefore, I propose the following hypothesis.

H3: A manager who prefers short-term results will be more likely to be influenced by his beliefs about his superior's preference than will a manager who prefers long-term results.

III. RESEARCH METHOD

Experimental Task

I elicit the experimental data using a standard, paper-pencil decision case. Participants read a business case that asks them to assume the role of a project manager who needs to make a resource allocation decision. A sample instrument is included in the appendix.

Experimental Design

The design of my experiment is a between-subjects factorial design with two independent variables. I measure one independent variable (Perceptions of Superior's Horizon Preference) after varying cues regarding the superiors' horizon preferences at two levels, i.e., long-term versus short-term. I measure the other independent variable (Manager's Horizon Preference) by asking participants to self-assess their own horizon preferences. Subject to the hypothesized influences of the independent variables, participants allocate an unexpected budget surplus between otherwise similar long- and short-term projects. To analyze the data, I will dichotomize both of the measured independent variables, thus transforming my design to a 2 by 2 between-subjects factorial design. I will test my hypotheses using an Analysis of Variance (ANOVA) model and a planned contrast.

Superior's Horizon Preference

I measure managers' beliefs about the superior's horizon preference by presenting participants with a panel of cues that suggest the superior's preference is either long- or short-term. Although subordinate managers would like to know their superior's horizon preference, they cannot directly observe an individual's actual horizon preference. Recall that, according to its definition, an individual's horizon preference exists in the minds of the individual. Accordingly, managers can only infer their superior's horizon preference through her actions, statements, and incentives. Most directly, managers may receive a superior's statements about her horizon preference. Without specific means to verify the underlying mental construct, however, managers cannot be certain that these statements reflect the true horizon preference as they may consist of nonbinding communications that are labeled as "cheap talk" in the economic literature (Crawford and Sobel 1982). Further, the existing literature suggests that a superior does not always reveal her preference to her subordinates who sometimes engage in opportunistic behaviors once they know the superior's preference (Corr 1983). Consequently, managers may find it difficult to detect their superior's actual horizon preference based solely on their superior's assertions and may seek additional cues.

Existing management and accounting literature suggests that long-term resource allocation activities, such as investment in R&D and in staff training and in social and environmentally friendly projects, are actions consistent with a superior adopting a long-term horizon preference. Long-term resource allocation activities generate benefits in the long-run, but have immediate observable costs (Porter and Kramer 2006). For example, suppose managers observe that their superior invests in R&D, human capital and social

and environmental performance to achieve long-run benefits, often with limited immediate benefits. Investment in R&D and staff training can develop core competencies that will benefit the firm in the long-run (Kaplan 2008). These long-run benefits come in the form of market leadership in innovation, quality, brand building, or operations excellence, respectively, and decades of competitive advantage (Le Breton-Miller and Miller 2006). While intensive R&D and training can build knowledge capital, investment in staff keeps that capital inside the firm (Miller and Lee 2001). Finally, it has been asserted that investment in social and environmental performance can provide access to valuable resources that may be needed in the future (Le Breton-Miller and Miller 2006), lend stability and credibility to an enterprise and build long-term relationships with external stakeholders (Le Breton-Miller and Miller 2006). Given a high (low) level of investment in these types of activities, it is reasonable for managers to assume that their superior prefers long-term (short-term) results to short-term (long-term) results.

Existing accounting rules in which costs related to R&D, personnel training, and many social and environmental activities are all expensed against current earnings, reinforcing the above conclusion. A superior with a short-term horizon preference prefers higher current earnings to higher future earnings, and thus are less willing to invest in activities with long-term benefits when current earnings are affected. Knowing this, managers may utilize a firm's long-term investment activities to help them infer the superior's horizon preference.

Managers may also use a superior's incentive plans as cues to infer her horizon preference. For example, Dikolli (2001) recommends designing the principals' horizon preferences into agents' incentive plans, so that these contracts can influence agents'

farsighted efforts. Consistent with this notion, empirical evidence suggests that when executive incentive plans emphasize the firm's long-term performance (e.g., options without near-term exercise rights), management is more likely to invest in projects that have long-term payoffs. For example, Cheng (2004), using archival data, finds a positive association between changes in the value of CEO annual option grants and changes in R&D spending. In contrast, evidence suggests that management whose incentive plans emphasize the firm's current performance over its future performance may be motivated to undervalue projects that have long-term payoffs. Consistent with this notion, Laverty (2004), using survey data, finds that strong short-term incentives are positively associated with management's strategies that undervalue long-term prospects. Hence, knowing the superior's incentive plans can help managers infer their superior's horizon preference. Following the terms used in existing accounting literature (Koonce et al. 2011), I refer to indicators such as a superior's investment activities and a superior's incentive plans as cues.

Though a superior's incentive plans can serve as an important cue of her horizon preference, it is not sufficient to use this cue alone. For example, findings of O'Reilly et al. (1991) suggest that when a superior experiences a lack of fit between her long-term oriented incentive plans and the short-term oriented organizational culture, she becomes short-term oriented and prone to turnover. Hence, managers are likely to observe short-term employment horizon outcomes, such as increased turnover among executives, as being associated with long-term oriented executive incentive plans. If subordinate managers only heed the cue about the long-term executive incentive plans, they may come to an incorrect conclusion. Instead, they are more likely to accurately infer the

actual horizon preferences of their superior when they consider cues about incentive plans along with other cues mentioned above.

To sum up, findings of existing literature suggest that managers may use cues, such as the superiors' incentive plans and their investment activities, to infer their superiors' likely horizon preferences. Hence, to vary perceptions of the superior's horizon preference, I state in the long-term (versus short-term) case that a superior invests more (versus less) than industry peers in R&D projects, in continued professional education for employees, and in socially and environmentally friendly projects. Further, the superior regularly exercises all stock options that are part of her compensation as they become available and retains (versus sells) the stocks.

Pretest of Cues

I pre-tested my instrument to ensure that the participants will interpret the cues appropriately. I asked twelve Ph.D. students majored in business administration to work through a preliminary version of the test instrument. In the instrument, participants encountered six variables that, as suggested by existing literature, may provide information regarding managers' horizon preferences. These six variables are a firm's investment in R&D (Miller and Le Breton-Miller 2006), investment in human capital (Tsui 1997), investment in social and environmental performance (Le Breton-Miller and Miller 2006), executive turnover (Weisbach 1995), management's forthcomingness (Hussainey and Walker 2009), and management's performance evaluation system (Ullrich and Tuttle 2004). In the preliminary test instrument, each of these six variables is presented as a piece of information about management practices. For example, a firm's investment in R&D (in human capital; in social and environmental performance) is stated

as "(*The firm's*) i*nvestment in R&D (in training and skill-building programs; in pollution control, energy consumption, employee health and safety, and community relations) is higher than industry average*." Executive turnover is stated as "(*The firm's*) t*op-executive turnover rate is less frequent than industry average*." Management's forthcomingness is stated as *"(The firm issues) more forthcoming disclosures than typical industry practices."* Management's performance evaluation system is stated as *"(The firm's) usage of comprehensive performance evaluation system rather than sole reliance on financial measures*."

Before presenting information about management practices, the preliminary test instrument provides the prompt: "*Please circle the number that indicates the extent to which you think each of the following management practices reflect management's long-term or short-term horizon preference*." Participants then rated these six practices (six variables) in terms of their relevance in determining management's horizon preference. Participants' responses are recorded on 7-point scales, anchored by one representing "Short-term" and seven representing "Long-term."

The results show that variables regarding a firm's investment activities and variables related to executives' incentives (management turnover and management's performance evaluation system) are believed to be most highly relevant in inferring management's horizon preference. Based on the findings, I operationalize the superior's horizon preference in my instrument by using cues related to the superior's incentive plans and her investment activities.

Measuring Manager's Beliefs of Superior's Horizon Preference

An experimental setting allows me not only to vary cues regarding the superiors' horizon preferences but ultimately to elicit managers' perceptions of their superior's horizon preferences based on their assessment of the horizon cues provided in the experiment. I measure participants' perceptions of the superior's horizon preferences by adapting the scale items used in Marginson et al. (2010). In their study, each subject, who is one of division managers of an international firm, agrees or disagrees with scales that measure whether he will focus on achieving short-term performance or long-term performance. Using pretests, I adapt selected items from their scales to fit the current context by changing the focus of the questions from a self-assessment to an assessment of the superior. Specifically, the study asks every participant whether he believes that (1) the superior is likely to prefer short-term performance to long-term benefits, (2) the superior is likely to strive to achieve short-term results more than long-term pay-offs, (3) the superior is likely to focus more on actions that will produce good short-term performance than on actions that will improve long-term financial effectiveness. Higher raw scores represent that participants perceive their superior to have a short-term horizon preference. To facilitate easy understanding of results, I reverse-code the three raw scores such that higher scores represent that participants perceive their superior having a long-term horizon preference. I then sum these three reverse-coded scores into one interval variable.

Manager's Horizon Preference

I measure the horizon preference of the participant in the role of manager by adapting the scales used in Marginson and McAulay (2008) and in Marginson et al. (2010). Specifically, I measure a manager's inherent horizon preference on 8-point scales,

anchored by one representing "Disagree" and eight representing "Agree." The scale items ask every participant to assess his belief about himself that in general, he (1) prefers short-term pay-offs to long-term benefits, (2) strives to achieve short-term results more than long-term pay-offs, and (3) is likely to focus more on actions that will produce good short-term results than on actions that will improve long-term results. Higher raw scores indicate that participants perceive themselves having a short-term horizon preference. Again, to facilitate easy understanding of results, I reverse-code these three raw scores such that higher scores represent that participants perceive themselves having a long-term horizon preference. I sum the above three reverse-coded measures into one interval variable, which I refer to as the managers' horizon preferences.

Dependent Variable

The dependent variable is the subordinate managers' resource allocation decisions, measured as a percentage allocation of unexpected budget surplus between two projects. One project invests in internal process improvements that offer significant immediate benefits but with limited future benefits, i.e., the short-term project. The other project invests in internal process improvements that offer limited immediate benefits but with significant future benefits, i.e., the long-term project. Every participant provides his response by picking one of eleven percentage mix ranging from 0% to the short-term project (and 100% to the long-term project) to 100% to the short-term project (and 0% to the long-term project) in increments of 10%.

Controlled Variables

To equalize the benefits derived by investing between the two projects, all participants read that both the short-term project and the long-term project equally benefit from each dollar of the budget surplus. Both projects are of the same nature consisting of "internal process improvements." The primary difference between the two projects lies in the timing of the benefits. Additionally, to control the implication of employment horizon and to ensure a better measurement of horizon preference as defined in the present study, I state in each case that both the project manager and his superior expect to stay employed in the firm for a long while. Therefore, differences in managers' resource allocations between projects should result solely from their subjective preferences for benefits within different periods, rather than on the amount of economic benefits or the length of employment horizon.

Post-Experiment Questions

In a post-experimental questionnaire, I ask demographic questions regarding age, gender, education, work experience and courses taken in finance and accounting.

Participants

Business school instructors in a regional public university in the United States help me recruit a group of 63 anonymous and willing upper-level undergraduate and graduate students who complete the business case of my experiment in their classes. To keep their responses strictly anonymous, the business case informs participants not to write their names anywhere in the case instrument. To encourage voluntary participation, students can freely discontinue their participation at any time without any penalty.

These 63 participants have completed fundamental course work in accounting, economics, finance, marketing and management before they enroll in the upper-level and graduate classes. In general, the case takes them approximately seven minutes to finish. As captured by the post-experimental questionnaire, the mean (median) age of participants is 25.94 (24.00) years, and the mean (median) years of full-time work experience is approximately four (two). Approximately 52 percent of the participants are male. The mean (median) number of courses in accounting and finance taken by participants are approximately six (five). Except for the number of accounting and finance courses taken, all other demographic measures do not vary by experimental conditions, suggesting that my random assignment of participants to experimental conditions is successful. Importantly, the number of accounting and finance courses taken does not affect the dependent variable.

IV. RESULTS

Examinations of Scale and Orthogonality

Before I test my hypotheses, I first verify the reliability of measured variables and the assumption of orthogonality between independent variables. According to the principle component analysis, three measures of self-assessed horizon preferences all load on to a single factor. The reliability of these three measures is high, with a Cronbach's alpha of 0.85. Similarly, the principle component analysis indicates that three measures of a manager's perception of the superior's horizon preference all load on to a single factor. The reliability of these three measures is high, with a Cronbach's alpha of 0.94. Further, the correlation between managers' perceptions of the superior's horizon preference and managers' self-assessed horizon preference is insignificant ($p = 0.54$), indicating orthogonality.

Examination of Perception Variation

To test whether cues have produced significant variations in participants' beliefs and whether participants understand the cues correctly, I use the summed reverse-coded scores of managers' perceptions of the superior's horizon preference to conduct a t test. Given the 8-points scales, the midpoint in the summed scores is used to distinguish the perception of short-term versus long-term. Thus, a summed score between 3 and 13 suggests that participants consider their superiors to be short-term oriented, while a

summed score between 14 and 24 suggest that participants consider their superiors to be long-term oriented. The results show that participants who view the long-term cues consider their superior to be long-term oriented (mean = 17, n=31). Participants who view the short-term cues consider their superior to be short-term oriented (mean = 8.75, n = 32). The difference in mean scores suggests that participants understand the cues correctly. The t test between these two groups is significant ($t = 6.33$, $p < 0.001$), suggesting that cues have produced significant variations in participants' perceptions.

Test of Hypotheses

Consistent with the categorical nature of my hypotheses (i.e., short-term versus long-term), to test Hypothesis 1 through Hypothesis 3, I construct a 2 x 2 table by transforming the interval independent variables into categorical independent variables. First, I dichotomize managers' horizon preferences into two levels at the sample median of 17, with scores one through 17 classified as short-term and scores 18 through 24 classified as long-term. Then I dichotomize managers' perceptions of the superior's horizon preference into two levels at the sample median of 12, with scores one through 12 classified as short-term and scores 13 through 24 classified as long-term. Based on the two dichotomized variables, I construct the 2 x 2 table, showing estimated marginal means for cell A through Cell D in Table 4.1. These means are also plotted in Figure 4.1.

As showed in Table 4.1 and Figure 4.1, an ordinal interaction seems to exist. To examine this interaction, I performed an ANOVA with a planned contrast. Panel A of Table 4.2 shows the conventional ANOVA with the default main effects and the disordinal interaction test. Panel B is most pertinent to my investigation and presents the main and interaction effect contrast that I hypothesize. Panel C presents the follow-up

simple effects tests. Because I predict an ordinal interaction based on my hypotheses, contrast coding is the most appropriate and most powerful means of testing my hypotheses (Buckless and Ravenscroft 1990). Consistent with my predictions, contrast weights are +1 each in the two long-term conditions for managers' horizon preferences (Cell B and Cell D in Table 4.1). Contrast weight is +1 in the condition in which managers' horizon preferences are short-term while managers' perceptions of the superior's horizon preference are long-term (Cell C in Table 4.1). Contrast weight is -3 in the condition in which both managers' horizon preference and managers' perceptions of the superior's horizon preference are short-term (Cell A in Table 4.1). With these contrast coding, I not only allow for testing main effects of managers' horizon preferences and managers' perceptions of the superior's horizon preferences but also a specific type of interaction effect between managers' horizon preferences and managers' perceptions of the superior's horizon preferences.

Hypothesis 1 predicts that a manager's horizon preference influences his resource allocation decisions among projects having varying horizons such that a manager with a long-term horizon preference will be more likely than a manager with a short-term horizon preference to invest in a long-term project. As shown in Table 4.1, for a manager with a short-term horizon preference, the main effect mean is to allocate 53% of budget to the long-term project and for a manager with a long-term horizon preference, the main effect mean is to allocate 56% of budget to the long-term project. As shown by the mean difference (3%), a manager allocates more budget to the long-term project when he is long-term oriented than when he is short-term oriented. This is consistent with the

prediction of Hypothesis 1. However, as shown in Panel A of Table 4.2, the mean difference is not significant (F = 0.428, p = 0.515). Hence, Hypothesis 1 is not supported.

Hypothesis 2 predicts that a manager's beliefs about his superior's horizon preference influence his resource allocation decisions between projects of varying horizons such that a manager who believes his superior is long-term oriented will be more likely than a manager who believes his superior is short-term oriented to invest in a long-term project. As shown in Table 4.1, for a manager who believes that his superior has a short-term horizon preference, the main effect mean is to allocate 50% of budget to the long-term project. For a manager who believes that his superior has a long-term horizon preference, the main effect mean is to allocate 60% of budget to the long-term project. As shown by the mean difference (10%), a manager allocates more budget to the long-term project when he believes that his superior is long-term oriented than when he believes that his superior is short-term oriented. This is consistent with the prediction of Hypothesis 2. Further, as shown in Panel A of Table 4.2, the mean difference is significant (F=4.011, p = 0.05). Hence, Hypothesis 2 is supported.

Essentially, Hypothesis 3 predicts that a long-term manager will be more likely to invest more budget in the long-term project than in the short-term project, no matter what he believes regarding his superior's horizon preference. In contrast, a short-term manager will be more likely to invest more budget in the long-term project than in the short-term project when he believes his superior is long-term oriented and invest less budget in the long-term project than in the short-term project when he believes that his superior is short-term oriented. Hence, among four conditions, only in the condition in which both a manager's horizon preference and a manager's perception of the superior's horizon

preference are short-term will a manager invest less budget in the long-term project than in the short-term project (Cell A in Table 4.1). In all the other three conditions, a manager will invest more budget in the long-term project than in the short-term project. Hence, Hypothesis 3 predicts such a pattern among cell means as designated in Table 4.1: (Cell B + Cell C + Cell D)/3 > Cell A. Table 4.1 shows that such a pattern does exist in that (0.54 + 0.61 + 0.57) / 3 > 0.44. As shown in panel B of Table 4.2, the planned contrast accommodating the predicted pattern is significant ($F = 5.541$, $p = 0.022$). As shown in panel C of Table 4.2, follow-up tests also show that for a manager with a short-term horizon preference, his beliefs regarding his superior's horizon preference significantly influence his budget allocation decisions ($F = 5.894$, $p = 0.018$). In contrast, for a manager with a long-term horizon preference, his beliefs regarding his superior's horizon preference do not significantly influence his budget allocation decisions ($F = 0.188$, $p = 0.666$). Hence, Hypothesis 3 is supported. [1]

[1] I also use a regression model to test my hypotheses. The model is estimated as: $Y = \beta0 + \beta1$*Managers Horizon Preferences + $\beta2$*Perceptions of Superior Horizon Preference + $\beta3$* Managers Horizon Preferences * Perceptions of Superior Horizon Preference + εij. In this model, Y is the observed budget allocation percentages to the long-term project. Managers Horizon Preferences take on the centered sum scores of three reverse-coded self-assessed interval values of the managers' horizon preferences. Perceptions of Superior Horizon Preference take on the centered sum scores of three reverse-coded interval values of managers' perceptions of the superior's horizon preference. As shown in Figure 4.2 through Figure 4.5, basic assumptions for the regression model are satisfied. $\beta1$ is significant ($t = 2.38$, $p = 0.02$), supporting Hypothesis 1. $\beta2$ is significant ($t = 2.43$, $p = 0.02$), supporting Hypothesis 2. $\beta3$ is significant ($t = -2.12$, $p = 0.04$), providing supporting evidence to Hypothesis 3.

V. CONCLUSIONS, LIMITATIONS, AND IMPLICATIONS

The strengths and limitations of this study should be kept in mind when evaluating the results. First, the study employs standard decision case methods using business students who are not randomly selected from the overall population of project managers. As recommended in Elliott et al. (2007), the external validity of experimental studies employing students as participants relies on the nature of the experimental task. The task in this study requires students to draw simple connections between their beliefs of planning horizons and their decisions to allocate resources. Hence, students own the capability to complete such a task, meeting recommendations made in Elliott et al. (2007). Further, prior studies, such as Farrell et al. (2008), employ students for a similar decision scenario to the one in this study but with seemingly more integrative complexity. Nevertheless, care should be exercised when generalizing the results to other groups and tasks.

The knowledge gained from this study should have important practical and theoretical implications. From the perspectives of superiors, the results provide insights into how managers attribute cues to superiors' horizon preferences and react to such cues. This study finds that cues about organization superiors' preferences will have varying effects on resource allocation decisions made by short-term managers versus those made by long-term managers. In settings with few long-term incentives for managers, the

results suggest that short-term oriented division managers are more subject to organizational superiors' influences than long-term oriented division managers are.

Knowledge about subordinates' differential horizon preferences and reactions can help organizational superiors who often work under budgetary constraints to initiate and carry out strategic goals. For example, one approach of accomplishing long-term strategic goals is to design long-term incentives into all compensation plans to achieve a certain long-term horizon. However, such an approach requires certain levels of long-term incentives that may not be available to superiors. This study suggests that an alternative approach is to keep middle-level managers focused on their short-term performances while providing them with strong signals of superiors' long-term strategic orientation. Such signals can be superiors' incentive plans or/and superiors' investment activities. Hence, this study recommends a behavioral control that has not been empirically tested before.

The current study extends the existing literature on myopic decision-making by examining such decision-making behaviors through different tasks and under different incentives, thus enhancing the external validity of this research paradigm. Bhojraj and Libby (2005) examine the effect of managerial myopia on managers' decision-making behaviors in an external financial reporting setting. They find that more frequent external reporting appeared to induce myopic decision-making behaviors, in terms of choosing a short-term project over a long-term project, in the presence of external stock market pressure. Hunton et al. (2008) examine the effect of myopic decision-making in an internal reporting setting. They find that more frequent internal monitoring can also induce myopic decision-making behaviors, in terms of managers' willingness to

discontinue a long-term risky project, in the presence of internal financial incentives. Findings of my study support the effect of myopic decision-making in an internal budget allocation setting. My results show that seemingly weak psychological incentives, such as the perceived positive evaluation from the aligned short-term horizon preferences, can also induce myopic decision-making behaviors, in terms of more budget allocation to a short-term project than a long-term project. As recommended by Hunton et al. (2008), future studies may continue examining the effects of myopic decision-making through different tasks, monitoring frequencies, incentive structures, and multi-period implications.

Findings of this study hold implications for the behavioral research of other stakeholders, such as investors. Existing literature suggests that investors need to look at situational pressures when assessing management's disclosures (Bhojraj and Libby 2005). This study suggests that investors also need to look at factors that may indicate characteristics of decision makers, such as managers' horizon preferences, when assessing management's disclosures. Factors that carry information regarding managers' horizon preferences include managers' incentive plans and their investment activities. Investors' understanding of managers' horizon preferences may potentially enhance confidence in management's disclosures. Future studies can empirically examine this link.

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APPENDIX

Sample Instrument (the long-term cues condition)

GENERAL INSTRUCTION

For purposes of this study, please assume that you work as a project manager in the floor mat division of GLW Inc. This division produces industrial and commercial floor mats. In the following pages, you will read background information about GLW and specific information regarding the floor mat division's current practices. The information you will read is not intended to include all the information that would potentially be available if you were evaluating a real-life situation. However, for purposes of this study, please base your judgments on the information provided.

CORPORATE BACKGROUND INFORMATION

Please assume that you are a project manager in the floor mat division of GLW, Inc. GLW has multiple divisions which are operated as stand-alone investment centers. Each division manager oversees all operating, investing, and financing decisions in that investment center. You directly report to the manager of the floor mat division who determines your assignments and compensation.

Employment Horizon

You expect to stay in GLW for a long while, i.e., at least five to ten years. Similarly, the manager of the floor mat division, your superior, is also expected to stay in GLW for a long while, i.e., at least five to ten years.

Unexpected Budget Surplus

As a manager, you are looking at how to spend a significant and unexpected budget surplus. There are two approaches you may adopt.

- You may spend your budget surplus on internal process improvements that will immediately benefit projects that you manage but with limited benefit to future projects.

- You may also spend your budget surplus on internal process improvements that will ultimately benefit future projects that you manage but with limited benefit to immediate projects.

Assuming that both approaches will equally benefit from any amount of additional money, you are considering how you would allocate the unexpected budget surplus between these two approaches.

Additional Information about Your Division Manager

As you think about how to spend the budget surplus, you recall that your superior, the manager of the floor mat division, consistently invests **significantly more** than the average of industry peers in

- research and development projects
- continued professional education for employees, and
- socially and environmentally friendly projects for local communities.

In addition, you learn from a reliable source that your superior regularly exercises all stock options that are part of a division manager's compensation as they become available and **retains** the stocks. As a result, your division manager owns a **substantial** amount of stock in GLW.

1. Based on the information provided so far, please circle the number that indicates your level of agreement or disagreement with the following statements.	**Disagree**							**Agree**
a) The division manager is likely to prefer short-term performance to long-term benefits.	1	2	3	4	5	6	7	8
b) The division manager is likely to strive to achieve short-term results more than long-term pay-offs.	1	2	3	4	5	6	7	8
c) The division manager is likely to focus more on actions that will produce good short-term performance than on actions that will improve long-term financial effectiveness.	1	2	3	4	5	6	7	8

DECISION TASK

1. Based on the information in this case, please select below the percentage mix (from A through K) that reflects how you would allocate the budget surplus between the two alternatives.

Circle one →	A	B	C	D	E	F	G	H	I	J	K
Percent allocated to process improvements that mostly benefit immediate projects but with limited benefit to future projects	0	10	20	30	40	50	60	70	80	90	100
Percent allocated to process improvements that mostly benefit future projects but with limited benefit to immediate projects	100	90	80	70	60	50	40	30	20	10	0
Total Percentage	100	100	100	100	100	100	100	100	100	100	100

Please complete this question before turning the page.
(Turn to the next page)

2. Please circle the number that indicates your level of agreement or disagreement with the following statements.	**Disagree**							**Agree**
a) In general, I prefer short-term pay-offs to long-term benefits.	1	2	3	4	5	6	7	8
b) In general, I strive to achieve short-term results more than long-term pay-offs.	1	2	3	4	5	6	7	8
c) In general, I am likely to focus more on actions that will produce good short-term results than on actions that will improve long-term results.	1	2	3	4	5	6	7	8

FIGURES

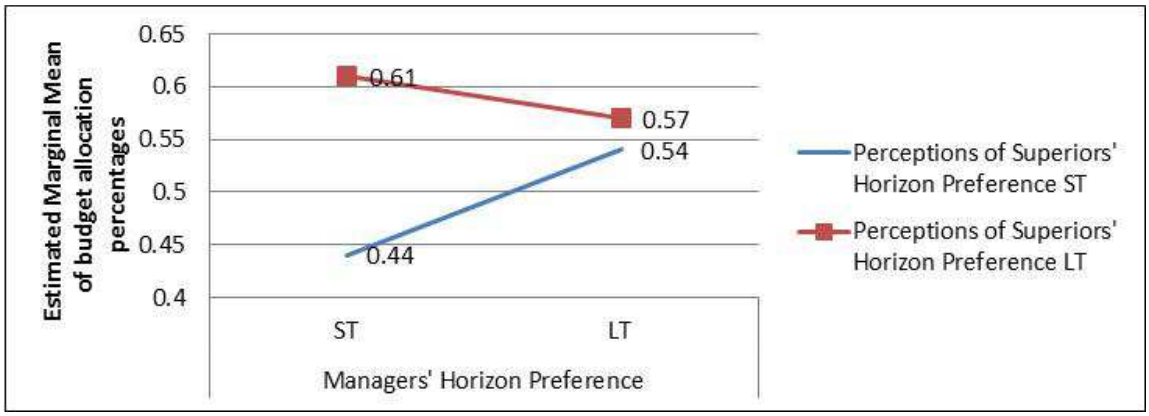

Figure 4.1: Plot of Estimated Marginal Means

Dependent Variable Coding: values greater (less) than 0.5 mean that participants allocate more (less) than 50% of the budget surplus to the long-term project; the value of 0.5 means that participants allocate equal percentage to both the short-term and the long-term project.

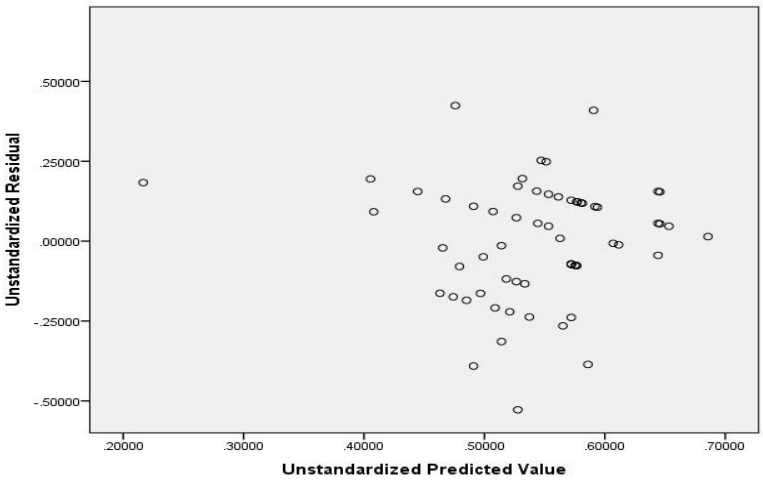

Figure 4.2: Diagnosis of equal variances of error terms

Note: in the above Figure, the error terms appear to have a constant variance since the scatter pattern of the error terms around zero is constant.

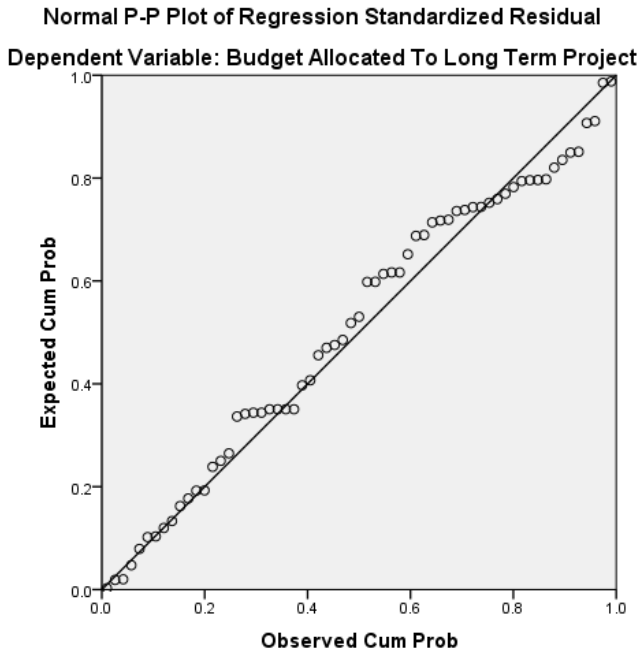

Figure 4.3: Diagnosis of normal distribution of error terms

Note: the error terms seem to be normally distributed since the plot in the above Figure comes close to straight line.

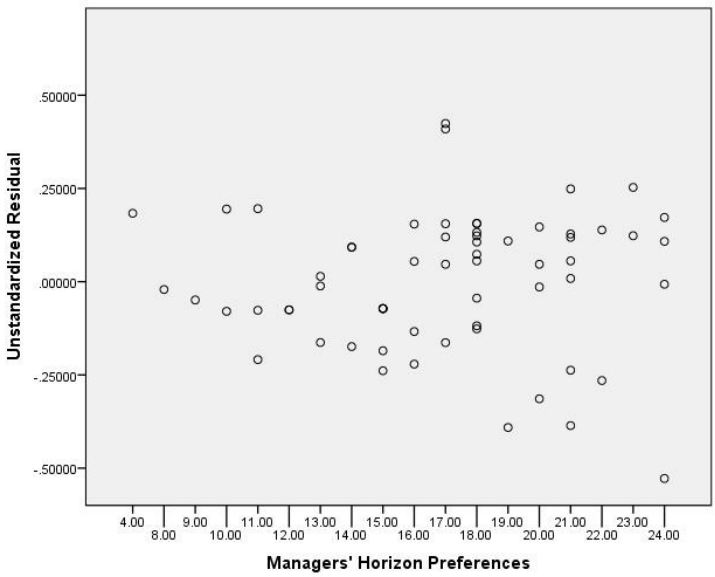

Figure 4.4: Diagnosis of Linear Relationship between Error Terms and Managers' Horizon Preferences

Note: the relationship between managers' horizon preferences and managers' budget allocation decisions seems non-linear since the scatter pattern of the error terms around zero does have curved trends in the above Figure.

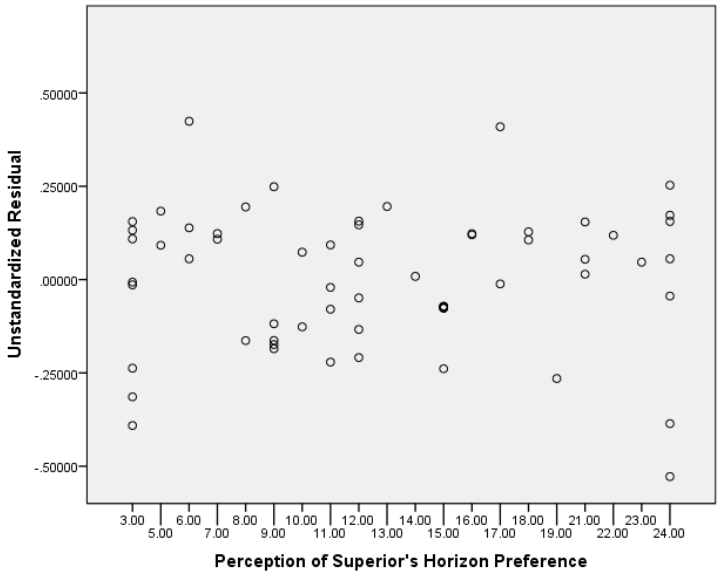

Figure 4.5: Diagnosis of Linear Relationship between Error Terms and Managers' Perceptions of Superiors' Horizon Preferences

Note: the relationship between managers' perceptions of the superior's horizon preference and managers' budget allocation decisions seems linear since the scatter pattern of the error terms around zero does not have curved trends in the above Figure.

TABLES

Table 4.1: Estimated Marginal Mean in 2 x 2

	Managers' Horizon Preferences (Dichotomized)		
Managers' Perceptions of Superior's Horizon Preference (Dichotomized)	Short-Term	Long-Term	Row Mean
Short-Term	Cell A: 0.44 (n=16)	Cell B: 0.54 (n=18)	0.50 (n=34)
Long-Term	Cell C: 0.61 (n=16)	Cell D: 0.57 (n=13)	0.60 (n=29)
Column mean	0.53 (n=32)	0.56 (n=31)	

Note: the dependent variable is the percentage of budget allocated to the long-term project. A score higher than 0.5 means that a subordinate allocates more than 50% of his budget surplus to the long-term project.

Table 4.2: Tests of Hypotheses

Panel A: Conventional ANOVA

Tests of Between-Subjects Effects

Dependent Variable: Budget Allocated To Long Term Project

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	.237[a]	3	.079	2.151	.103
Intercept	18.368	1	18.368	499.751	.000
PerceptionOfSuperiorHorizonPreference	.147	1	.147	4.011	.050
ManagersHorizonPreference	.016	1	.016	.428	.515
PerceptionOfSuperiorHorizonPreference * ManagersHorizonPreference	.070	1	.070	1.905	.173
Error	2.168	59	.037		
Total	20.928	63			
Corrected Total	2.406	62			

a. R Squared = .099 (Adjusted R Squared = .053)

Panel B: Test of Hypothesis 3 using Contrast Coding

Test Results

Dependent Variable: Budget Allocated To Long Term Project

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	.204	1	.204	5.541	.022
Error	2.168	59	.037		

Panel C: Simple Effects Tests of Hypothesis 3

Univariate Tests

Dependent Variable: Budget Allocated To Long Term Project

Managers' Horizon Preferences (Dichotomized)		Sum of Squares	df	Mean Square	F	Sig.
-1.00	Contrast	.217	1	.217	5.894	.018
	Error	2.168	59	.037		
1.00	Contrast	.007	1	.007	.188	.666
	Error	2.168	59	.037		

Each F tests the simple effects of Percepton of Superior's Horizon Preference (Dichotomized) within each level combination of the other effects shown. These tests are based on the linearly independent pairwise comparisons among the estimated marginal means.

Note: in panel B, the contrast tests the relationship among cell means as shown in Table 4.1: (Cell B + Cell C + Cell D)/3 – Cell A > 0. In Panel C, the coding of -1 indicates short-term horizon preference, while the coding of 1 indicates long-term horizon preference.