INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.
The contract selection effects of performance evaluation error and disclosure policy: An application in public accounting

Sayre, Todd Lamson, Ph.D.

The University of Arizona, 1994
THE CONTRACT SELECTION EFFECTS OF PERFORMANCE EVALUATION ERROR AND DISCLOSURE POLICY: AN APPLICATION IN PUBLIC ACCOUNTING

by

Todd Lamson Sayre

A Dissertation Submitted to the Faculty of the COMMITTEE ON BUSINESS ADMINISTRATION In Partial Fulfillment of the Requirements For the Degree of DOCTOR OF PHILOSOPHY In the Graduate College THE UNIVERSITY OF ARIZONA 1994
As members of the Final Examination Committee, we certify that we have read the dissertation prepared by Todd Lamson Sayre entitled The Contract Selection Effects of Performance Evaluation Error and Disclosure Policy: An Application in Public Accounting and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy/Business Administration.

Date 6-6-94

Date 6-13-94

Date 6-30-94

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copy of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dissertation Director

Date 6-8-94
STATEMENT BY AUTHOR

This dissertation has been submitted in partial fulfillment of requirements for an advanced degree at The University of Arizona and is deposited in the University Library to be made available to borrowers under rules of the Library.

Brief quotations from this dissertation are allowable without special permission, provided that accurate acknowledgment of source is made. Requests for permission for extended quotation from or reproduction of this manuscript in whole or in part may be granted by the head of the major department or the Dean of the Graduate College when in his or her judgment the proposed use of the material is in the interests of scholarship. In all other instances, however, permission must be obtained from the author.

SIGNED: [Signature]
ACKNOWLEDGEMENTS

I want to express my thanks to the people who served on my dissertation committee: Bill Waller, Galen Sevcik, and Jeff Schatzberg. Their contributions and friendship helped make the dissertation process more enjoyable and enriching. The helpful suggestions of Ken Kroner, Mark Ross, and Doug Prawitt are also gratefully acknowledged. I especially want to thank Bill Waller for challenging me to think through the difficult issues and for helping me in my efforts to become a better researcher and teacher.

I am grateful to my wonderful family and friends for their encouragement and understanding during my time in the Ph.D. program. I am unable to express in words the appreciation felt for my grandparents' love and support.
# TABLE OF CONTENTS

## ABSTRACT ................................................................. 7

## 1. INTRODUCTION ....................................................... 9

1.1 Overview of the Research Questions ......................... 9

1.2 Hypotheses .................................................................. 10

1.3 Motivation .................................................................. 10

1.4 Research Method ...................................................... 12

1.5 Outline of Study ..................................................... 14

## 2. LITERATURE REVIEW ................................................... 15

2.0 Overview ................................................................. 15

2.1 The Role of Accounting in Providing Performance Incentives 15

2.2 The Selection Effects of Contract Design ....................... 19

2.3 Overview of the Tournament Literature ....................... 22

2.3.1 The tournament model .......................................... 22

2.3.2 Why firms use tournaments .................................... 24

2.3.3 Drawbacks of the tournament model ......................... 26

2.3.4 Some suggested resolutions .................................... 28

2.3.5 Self-selection in tournaments ................................. 29

2.3.6 Evidence on tournaments ....................................... 30

2.3.7 The up-or-out model ........................................... 31

## 3. DEVELOPMENT OF HYPOTHESES .................................... 33

3.1 Employment Setting .................................................. 33

3.2 Description of the Up-or-Out Contract ......................... 33

3.3 Performance Measurement Error ................................. 34

3.4 Disclosing Terminated Worker Performance ................... 35

## 4. RESEARCH METHOD ..................................................... 37

4.0 Overview of Research Method .................................... 37

4.1 Overview of First Experiment ................................. 40

4.1.1 Instructions and practice round ......................... 40

4.1.2 The experiment ................................................. 41

4.2 Overview of Second Experiment ............................. 45

4.2.1 Experiment procedures ........................................ 46

4.2.2 Practice session ................................................ 46

4.2.3 Instructions ..................................................... 47

4.2.4 Interview excerpts ............................................. 47

4.2.5 Responses ........................................................ 49
5. RESULTS ........................................................................................................51
  5.0 Overview of Results ........................................................................51
  5.1 Overview of First Experiment Results ...........................................51
  5.1.1 Test of hypothesis H1 .................................................................51
  5.1.2 Test of hypothesis H2 .................................................................52
  5.1.3 Across treatment comparisons ..................................................52
  5.2 Overview of Second Experiment Results ......................................53
  5.2.1 Test of hypothesis H1 .................................................................54
  5.2.2 Test of hypothesis H2 .................................................................54
  5.2.3 Across treatment comparisons ..................................................55
  5.2.4 Comparison of skill rating to GPA ............................................56
  5.3 Summary and comments .................................................................56

6. CONCLUDING REMARKS .................................................................58
  6.1 Contribution .....................................................................................58
  6.2 Limitations .......................................................................................59
  6.3 Future Research ...............................................................................59
  6.4 Conclusions ......................................................................................60

APPENDIX A: FIGURES .............................................................................61
APPENDIX B: RESEARCH MATERIALS ................................................64
APPENDIX C: TABLES .............................................................................98
REFERENCES ..........................................................................................111
When faced with various contract options, better workers self-select to those that pay according to performance (Salop and Salop 1976; Demski and Feltham 1978; Guasch and Weiss 1980; Chow 1983; Waller 1985; Waller and Chow 1985; Dillard and Fisher 1990). Similarly, this study suggests that public accounting firms, characterized by up-or-out contracts where workers are promoted or terminated based on the relative rank of their performance, design contracts that will attract better workers. This study hypothesizes that a low-skill worker's expected value of an up-or-out contract: (Hypothesis H1) is positively related to the error associated with employee performance measurement and (Hypothesis H2) is lower when the performance of terminated workers is disclosed versus when it is not. As a consequence of reducing the expected value, low-skill workers will tend to select other contracts. Hypothesis H1 is related to the analytical implications of tournament research by Nalebuff and Stiglitz 1980; Lazear and Rosen 1981; O'Keeffe, Viscusi, and Zeckhauser 1984; McLaughlin 1988).

Two experiments were used to test the hypotheses. Both asked subjects to compare and state their preferences regarding two contracts; however, the first emphasized control while the second emphasized mundane realism. The data of both experiments strongly supported hypothesis H1.
In the second experiment, this support was stronger yet for the responses of the subject's with the more extreme skill ratings. Results related to hypothesis 2 of the first experiment were weakly significant and of the second experiment were significant but opposite from the prediction.
1. INTRODUCTION

1.1 Overview of the Research Questions

Public accounting firms aggressively seek out and recruit the top workers in the labor market. By using various observable attributes, applicant pools are formed then culled to find the most desirable prospects (Spence 1973; 1974a; 1974b; Stiglitz 1975; and Wolpin 1977). A potentially less costly means of recruiting desirable workers is through contract design. When faced with various contract options, better workers self-select to those that pay according to performance (Salop and Salop 1976; Demski and Feltham 1978; Guasch and Weiss 1980; Chow 1983; Waller 1985; Waller and Chow 1985; Dillard and Fisher 1990). Similarly, this study suggests that public accounting firms can, and perhaps do, design contracts that will attract better workers.

Public accounting firms are typically characterized by up-or-out contracts where workers are promoted or terminated based on the relative rank of their performance (Berton, 1991). This study contributes empirical evidence on two questions. What are the selection effects of up-or-out contracts with (1) different performance measurement errors? and (2) a policy of disclosing (versus not disclosing) the performance of terminated workers seeking subsequent employment?
1.2 Hypotheses

This study hypothesizes that a low-skill worker's expected value of an up-or-out contract: (Hypothesis H1) is positively related to the error associated with employee performance measurement and (Hypothesis H2) is lower when the performance of terminated workers is disclosed versus when it is not. As a consequence of reducing the expected value, low-skill workers will tend to select other contracts.

Hypothesis H1 is related to the analytical implications of tournament research by Nalebuff and Stiglitz 1980; Lazear and Rosen 1981; O'Keefe, Viscusi, and Zeckhauser 1984; McLaughlin 1988). Hypothesis H2 relates to Waldman (1990) who asserts that the employer market bids up a retained worker's wage since retention signals high skill. It seems plausible that the employer market would, similarly, bid down a terminated worker's wages since termination signals low skill. The wages of a low-skill worker are bid down even more when performance is disclosed as it would tend to further signal low skill.

1.3 Motivation

Empirical evidence concerning the selection effects of up-or-out contracts (1) fosters a better understanding of public accounting firms and (2) contributes, in a meaningful way, to the existing performance incentive research. The self-selection effects of the up-or-out contracts used by public accounting firms have been neither addressed
specifically nor, even in an indirect way, investigated empirically. Results from this study provide some insight into how accounting firms design contracts to recruit higher quality candidates. Still, the theory may not describe the contract designs of those employers who find the costs of enhanced performance measurements and performance disclosures outweigh the benefits. Enhancing performance measurements increases costs in terms of imposing additional information requirements on the firm while performance disclosures on terminated workers may trigger costly lawsuits.¹

Researchers have deduced that accounting information, through its use in employee contracts, plays an important role in providing performance incentives (Jensen and Meckling 1976; Fama and Jensen 1983a and 1983b; Klein 1983; Jensen 1983, and for reviews: Baiman 1982; Levinthal 1988; Baiman 1990; Pavlik, Scott, and Tiessen 1993). However, although a significant share of businesses are organized as up-or-out (e.g. partnerships, cf. Baker, Jensen, and Murphy 1988, p. 695), little research has investigated the performance incentives of their contracts. Contributing empirical evidence on the self-selection effects (an aspect of

¹ According to top-level management at some of the big-six CPA firms, the litigious environment is such that employer-imposed restrictions may be placed on written performance disclosures. However, many times these restrictions are circumvented by direct discussions with prospective employers.
performance incentives) of up-or-out contracts furthers this area of accounting research.

1.4 Research Method

Two experiments were used to test the hypotheses. Both asked subjects to compare and state their preferences regarding two contracts; however, the first emphasized control while the second emphasized mundane realism (Webster and Kervin (1971; Fromkin and Streufert 1976; Cook and Cambell 1979; Swieringa and Weick 1982; Plott 1982; Berg, Coursey, and Dickhaut 1990). The advantage of emphasizing control stems from its ability to provide more direct tests of a theory. Mundane realism is emphasized in the second experiment to determine whether the predictions verified in the controlled setting are generalizable to more natural situations relevant to public accounting firms. In both instances, subjects were upper level accounting students who, since this study's theoretic concerns can be interpreted in terms of recent accounting graduates entering the job market, are representative of the workers specified in the theory.

The sessions of both experiments corresponded to four between-subject treatments: (1) high error/disclosure; (2) high error/no disclosure; (3) low error/disclosure and; (4) low error/no disclosure. Tailoring each session to a corresponding between-subject treatment diminished the potential for demand effects as subjects were less able to
infer from fluctuations in the independent variables the responses predicted in the theory.

In the first experiment, subjects were assigned, in groups of eight, to one of four sessions each consisting of eight rounds. Each round, they were assigned a skill and opponent skill and asked to select a payment scheme by which they would be paid.\textsuperscript{2} The choices included Payment Scheme A, representing a flat-pay contract, and Payment Scheme B, representing an up-or-out contract. To test the hypotheses, several sign tests were performed. The test statistic was a one-tailed significance probability on the difference in payment scheme selections across treatment variables. The results supported hypothesis H1 and weakly supported hypothesis H2.

The second experiment proceeded as follows: (1) subjects were asked to suppose that a CPA firm and a consumer goods corporation had made them offers for employment; (2) given that the corporation paid $25,000 annually, each subject stated the annual salary the CPA firm would need to pay such that s/he would be indifferent between the offers; and (3) subjects rated their abilities relative to the other employees at the CPA firm. The results strongly supported hypothesis H1 and were stronger yet using the more extreme skill ratings. Results related to hypothesis H2 were

\textsuperscript{2} Baiman and Lewis (1989) similarly assigned skill to their subjects.
significant but opposite from what was predicted. Further analysis found that this result was driven primarily by the subjects with higher skill ratings.

1.5 Outline of Study

The remainder of this paper is organized as follows: The second chapter reviews the relevant literature; the third chapter develops the theory and hypotheses; the forth chapter details the research method; the fifth chapter provides the results of the experiment; and the sixth chapter summarizes the results and concludes the paper.
Chapter 2. LITERATURE REVIEW

2.0 Overview

The focus of this dissertation is on the selection effects of up-or-out contracts with (1) different performance measurement errors and (2) a policy of disclosing (versus not disclosing) the performance of terminated workers seeking subsequent employment. Three areas of research relevant to this focus are reviewed: (1) the role of accounting information in providing performance incentives; (2) the selection effects of various contract designs; and (3) the performance incentives of tournament contracts of which the up-or-out contract is a sub-set.

2.1 The Role of Accounting in Providing Performance Incentives

This section first reviews the literature engendering the now widely accepted contractual perspective of the firm. It then discusses how the separation of ownership and control, incomplete information, and self-interested workers combine to create agency problems, and how contract design partially resolves these problems (Smith 1776; Berle and Means 1932; Coase 1937; Alchian and Demsetz 1972; Jensen and Meckling 1976; Baiman 1982; Fama and Jensen 1983a and 1983b; Klein 1983; Jensen 1983; Levinthal 1988; Baiman 1990; Pavlik, Scott, and Tiessen 1993).
The seminal research of Coase (1937) explains that firms exist because the principal’s direction provides a cheaper means of allocating resources than does the price mechanism of the market. "...the operation of a market costs something and by forming an organisation and allowing some authority (an "entrepreneur") to direct the resources, certain marketing costs are saved (p. 85)."³

Alchian and Demsetz (1972), however, emphasize that the coordination of transactions occurs not through the principal’s direction but rather by the contractual relationships with his employees (cf. Klein 1983 p. 373). This sentiment is demonstrated by the authors’ response to the question: What distinguishes relationships in the firm from those in the market? They answer:

It is in a team use of inputs and a centralized position of some party in the contractual arrangements of all other inputs. It is the centralized contractual agent in a team productive process—not some superior authoritarian directive or disciplinary power (italics are theirs, p. 777-778).

This led to the perspective of the firm as a set of overlapping enforceable contractual relationships, both implicit and explicit (Jensen and Meckling 1976; Fama and Jensen 1983a; Klein 1983; Jensen 1983). Jensen (1983) summarizes this perspective as follows:

---
³ The costs associated with managing the firm, given bounded rationality, is why all transactions are not organized within one gigantic firm (Coase 1937).
...it is productive to define an organization as a legal entity that serves as a nexus for a complex set of contracts (written and unwritten) among disparate individuals... The nexus of contracts view helps us to see organizations in a way that can provide useful insights. It leads to inquiry about why certain contractual relationships arise and how those relations respond to changes in the environment (p. 108).

The usefulness of the nexus of contracts view arises from its provision of a framework through which other theories of the firm may be better understood. One such theory arises from the separation of ownership and control--another widely accepted aspect of the firm.

In all firms which hire employees there exists, at least to some degree, a separation of ownership and control--or more precisely, "the separation of residual risk bearing from decision functions (Fama and Jensen 1983b p. 331)." At the very least, each employee has control over his own labor and, in this capacity, acts as an agent for the principal. As a firm becomes larger and more difficult to manage, the principal is motivated to delegate more decision making authority (i.e. control) to his agents (Fama and Jensen 1983a). Delegating more control permits an agent to better assist the principal in various operations of the firm; however, this comes at a cost. Agents may abuse their control at the expense of the principal. Such agency problems were recognized by principals long ago as the following quote of Adam Smith (1776) indicates:
The directors of such [joint-stock] companies, however, being the managers rather of other peoples money than of their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Like the stewards of a rich man, they are apt to consider attention to small matters as not for their master's honour, and very easily give themselves a dispensation from having it. Negligence and profusion, therefore, must always prevail, more or less, in the management of the affairs of such a company (Book I, Chapter V).\

Contemporary academics have over time developed a more structured approach to examining such agency problems (for reviews, see Levinthal 1988; Baiman 1990; Pavlik, Scott, and Tiessen 1993). Along with the separation of ownership and control, agency models typically assume: (1) that the principal has incomplete information regarding state information and/or agent inputs; (2) goal conflict between the agent and principal; and (3) that the agent is risk-averse and effort-averse. Given these assumptions, Baiman (1990) maintains that:

[researchers] share a common view of that interaction between owners, managers and employment contracts: (1) managers act to maximize their expected utility and hence their behavior can be influenced by the design of their employment contracts; and (2) owners and managers collectively bear the cost of any agency problems, hence they have an incentive to design contracts which

---

4 Jensen and Meckling (1976) had this quote on page 306.
5 Although some researchers (e.g. Demsetz 1983) disagree with some assumptions of agency theory, there is little doubt of its usefulness in describing the firm (see Baiman 1990). And descriptive validity, according to Friedman (1957), is the sole criterion by which the value of a theory should be measured.
efficiently mitigate any underlying agency problems (p. 350).  

That principals can limit non-cooperative agent behavior through implementing and enforcing the appropriate contract (or reward) structure fits well with the nexus of contracts perspective of the firm. This is expressed by Jensen (1983) who states:

Notice how conveniently [the assumption that agency costs can be minimized through contracts] dovetails with the notion of organizations as a nexus of contracts; its application there implies that the organizational form, its contracts, will be those that minimize the agency costs (p. 331).

Indeed, although viewing firms as a nexus of contracts is not a necessary precursor to agency theory, it does provide a convenient framework. That contracts (1) establish firm boundaries and (2) are written to minimize agency costs serves as the grounding premises for this dissertation.

2.2 The Selection Effects of Contract Design

This section reviews the analytical and empirical research on the self-selection effects (a type of agency problem) of employee contract design (Salop and Salop 1976; Demske and Feltham 1978; Guasch and Weiss 1980; Chow 1983; Waller 1985; Waller and Chow 1985; Dillard and Fisher 1990). The self-selection of a worker to a contract arises from the

---

6 The costs associated with the agents' non-cooperative behavior (i.e. agency costs) include the costs of controlling agent behavior through structuring and monitoring contracts and any residual loss, including the costs stemming from the fact that it doesn't pay to enforce all contracts perfectly (Jensen and Meckling 1976).
principal's inability to observe a prospective agent's performance relevant attributes (e.g. skill). Consequently, the principal may hire low-skilled applicants who falsely claimed the requisite level of skill (Demski and Feltham 1978). Perhaps guided by the contractual perspective of the firm, Demski and Feltham (1978) reason that: "...appropriately designed contracts may achieve the desired matching of skills and tasks by inducing the workers to self-select contracts that achieve that matching (p. 341)." 7 The remaining section briefly reviews some of the studies suggesting the self-selection effects of specific contract designs.

Salop and Salop (1976) maintain that a two-part contract (TPC) with an entrance fee reduces the proportion of "fast quitters" hired--ultimately reducing turnover costs. Waller (1985), through an experiment, supports the implications of their work finding that subjects who self-selected to the TPC tended to have lower precontracting subjective probabilities of quitting than did the subjects who selected the flat wage contract.

Guasch and Weiss (1980) analytically examine the effect on self-selection of a contract which charges a fee for a

---

7 Spence (1973) suggests that a job applicant's observable attributes (e.g. physical appearance, job experience, college transcripts) are relevant in deducing performance-related attributes (e.g. skill). Good grades translate, though imperfectly, into good performance. To the extent observable attributes correspond to performance-related attributes, self-selection problems will be alleviated.
pre-employment test equal to the difference between an applicant's wage in the training program and the wage he could receive elsewhere. Applicants who failed the test were paid less than those who passed the test. The authors find that, given workers have accurate information regarding their probabilities of passing the test, only high-skill workers apply.

Demski and Feltham (1978) show that budget-based contracts, which specify a bonus for meeting an accounting-based performance standard, may be used to attract a larger proportion of higher skilled workers. This is because the lower a worker's skill, the less likely that worker's performance will meet the standard. Low-skill workers, then, finding such contracts too risky, self-select to contracts with fewer performance requirements. This study is especially important to accounting researchers for it demonstrates the use of accounting-based measurements in obviating the self-selection problem.

Chow (1983) experimentally investigates whether workers self-select among employment contracts according to skill. A pre-test decoding task was administered to determine high and low skill subjects. The results indicated that a larger (smaller) proportion of high-skill (low-skill) subjects selected a budget-based contract which rewarded high pay for meeting or exceeding the performance standard and
substantially lower pay otherwise contract over a flat-pay contract.

Waller and Chow (1985) found similar experimental results using a budget-based contract with fixed pay plus a bonus per unit of performance over standard. These findings were replicated by Dillard and Fisher (1990).

2.3 Overview of the Tournament Literature

Tournaments award prizes to contestants according to the rank order of their performance; winning a prize is unaffected by the margin of victory. The horse with the fastest time wins the race; the student is graded on a curve; the best managers at a CPA firm are promoted to partner.

The theoretical underpinnings of contestant behavior in tournaments have been developed largely in the context of the employment relationship (Nalebuff and Stiglitz 1980; Lazear and Rosen 1981; Green and Stokey 1983; Dye 1984; O'Keeffe, Viscusi, and Zeckhauser 1984; and for reviews, McLaughlin 1988; Holmstrom and Tirole 1989; Levinthal 1988; Rosen 1992). This literature explores the performance effects of tournament contracts some of which have been corroborated by recent experimental studies (Bull, Schotter and Weigelt 1987; Chow and Haddad 1990; Fredrickson 1992; Schotter and Weigelt 1992) as well as field studies (Medoff and Abraham 1980; Murphy 1985; Leonard 1990).

2.3.1 The tournament model
Some of the fundamental characteristics of tournament contracts were demonstrated through two-worker one period models (Nalebuff and Stiglitz 1980; Lazear and Rosen 1981; O'Keefe et al. 1984). Worker performance is used to determine the winner, awarded a fixed prize $W$, and the loser, awarded a fixed prize $L$, where $W > L$. Worker $i$'s performance $q_i$ is a function of his effort $\mu_i$ and the stochastic environment: $q_i = \mu_i + p + e_i$. This stochastic environment is comprised of (1) a common error $p$, included in the performance of all workers, and (2) an individual-specific stochastic error $e_i$.

The probability that worker $i$ wins is $P_i = \text{prob}(q_i > q_j) = \text{prob}(\mu_i - \mu_j > e_j - e_i)$. Thus, the rank order of worker $i$'s performance depends on his effort $\mu_i$ and individual-specific error $e_i$ as well as worker $j$'s effort and individual-specific error $e_j$. The common error $p$ affects both workers similarly and drops out of the rank order comparison. The only relevant variance for the tournament, then, is $2\sigma^2_e$, twice the variance of the individual-specific errors.

The common error $p$ bears two interesting interpretations. One is activity-specific measurement error. For example, $j$ and $i$ may have the same supervisor whose biased assessments affect all workers similarly. This is similar to monitoring all workers by a mechanical counting device that might run too fast or too slow in any

---

8 This performance equation is additive in effort and errors, similar to Lazear and Rosen (1981). Nalebuff and Stiglitz (1983) employed a performance equation with a multiplicative common error. However, the main findings of the studies were similar. For a thorough discussion of this matter, see McLaughlin (1988).
given trial. The other interpretation of $p$ is true random variation that affects the enterprise as a whole. For example, suppose all firms produce with the same technology, but that in a given period some firms do better or worse than others (Lazear and Rosen 1981, p. 857-858).

Interpretations of individual-specific error correspond to those of the common error. In the case of activity-specific measurement error, the supervisor's bias varies between performance assessments. The resulting difference in performance assessments represents the individual-specific error. In the true random error case, if a firm has a bad year decreasing the performance of all workers, you might have a very good year increasing your performance relative to other workers. This increase represents the individual-specific error.\textsuperscript{9}

\subsection*{2.3.2 Why firms use tournaments}

Previous research cites various explanations for the use of tournament contracts over individualistic contracts (e.g. piece rates). Three of the more generally acknowledged explanations are reviewed here. First, tournaments are able to incorporate indivisible rewards. O'Keeffe et al. (1984) note that when prizes are indivisible, as with job promotions, tournaments preserve their performance incentives. Workers will exert effort to increase their

\textsuperscript{9} Whereas in the Lazear and Rosen (1981) and Nalebuff and Stiglitz (1983), error was determined exogenously, O'Keeffe, et. al. (1984) allowed for discretion in the effort-monitoring process. That is, the employer was able to increase or decrease the randomness in performance measurement process.
probability of winning the one prize. Alternatively, typical individualistic contracts are unable to manage indivisible rewards at all.

Second, monitoring costs may be lower because (1) since tournaments act to select the best workers, it is not essential to evaluate the performance of the also-rans with great care (O'Keeffe et al. 1984) and (2) tournaments require only ordinal measurements which tend to involve lower information costs than the cardinal performance measurements of individualistic contracts (Baiman 1990; Holmstrom and Tirole 1989). McLaughlin (1988) illustrates the latter point nicely stating that:

(Typically,)...it is cheaper to see which of two piles of coal is bigger than to weigh both; similarly, it is less costly to determine which associate in a law or accounting firm, or assistant professor, or tennis player is doing better than his respective counterpart than to determine the precise value of each one's output (p. 247).

Third, and lastly, tournaments may reduce risk to the worker. Lazear and Rosen (1981) maintain that common error \( p \) adds noise to the performance measurement of individualistic contracts. Thus, the relevant variance is \( \sigma^2 + \sigma_p^2 \), as opposed to \( 2\sigma^2 \) of the tournament which filters out the common error. When workers are risk-averse, as common error increases relative to the individual-specific error, the tournament contract tends to dominate individualistic contracts. This is because the risk associated with the tournament \( 2\sigma^2 \) would be less than that of the piece rate \( \sigma^2 + \sigma_p^2 \).
(also see McLaughlin 1988 and Nalebuff and Stiglitz 1983). However, comparing tournament contracts to individualistic contracts, no performance difference exists in the risk-neutral case. For all contracts, risk can be costlessly shifted to the workers eliciting the first-best level of effort (i.e. workers will continue exerting effort until the marginal cost of effort equals the marginal product of effort).

### 2.3.3 Drawbacks of the tournament model

Although tournaments seem to dominate individualistic contracts in the presence of high common error, they sometimes fail to elicit the appropriate global and marginal individual incentives for effort. Moreover, tournaments are vulnerable to collusion by workers to reduce their effort and to the sabotage of opponent output. These drawbacks are discussed in this section. First, small prize spreads may not elicit global incentives for effort. Rather, a small prize spread motivates workers to supply zero effort and collect the smaller prize (O'Keeffe et al. 1984; McLaughlin 1988). This is explained succinctly by McLaughlin (1988):

> Since the Nash solution to the basic two-contestant tournament gives a probability of winning equal to $\sigma_p^2$.

---

10 Fredrickson (1992) and Chow and Haddad (1990) experimentally tested and found support for the implications of a similar proposition from research on relative performance contracts (cf. Holmstrom 1982 and Baiman and Demski 1980). This proposition was also supported by Antle and Smith (1986) in a field study.

11 Nalebuff and Stiglitz (1983, p. 40) maintain that social rather than economic incentives may provide appropriate incentives for effort even when the prize spread is small relative to the optimal tournament.
$1/2$, the equilibrium effort $\mu^*$ level could be deathly but the probability of winning remains $1/2$. Beyond some critical effort level $\mu$, it is better to shirk (avoiding all the disutility of effort) and collect the bottom prize (p. 235).

Second, given a perfectly competitive market for labor, prize spreads too small or large relative to precision will not provide the appropriate marginal incentives for effort (Lazear and Rosen 1981; Nalebuff and Stiglitz 1983; O'Keeffe et al. 1984; and McLaughlin 1988). O'Keeffe et al. (1984) maintain that, given a perfectly competitive market for labor, prize spread and performance measurement precision are inversely related. A prize spread too small relative to precision motivates workers to under supply effort. This is similar to, but not as drastic as, the global incentive problem where effort is zero. A prize spread too large relative to precision entices workers to either oversupply effort or find employment elsewhere.

A third reason tournaments may fail to elicit the appropriate individual incentives for effort occurs when workers are heterogeneous in skill. Dye (1984) uses the following example to explain this point:

...if it is common knowledge to A and B that A is twice as productive as B, then B might reason as follows: regardless of what effort level I select, if A selects the same effort level then I will be very unlikely to win the tournament, so the best I can do (given that effort is distasteful) is to supply no effort. A would in turn exert no effort if he believed that B reasons as above, with the net undesirable effect (from the principal's point of view) that no effort would be exerted by either participant in the tournament (p. 147).
Lastly, tournaments are vulnerable to collusion and sabotage (Dye 1984). Workers, paid according to relative performance, have an incentive to collude to reduce their effort. Collusion is a hazard for the employer, particularly when few workers participate in the tournament. Moreover, workers are motivated to sabotage their opponents' output to increase their chances of winning. By comparison, neither collusion nor sabotage directly threaten individualistic contracts.

2.3.4 Some suggested resolutions

Even with the drawbacks discussed in the previous section, most organizations use some form of tournament-based performance incentive contract (Baker et al. 1988, p. 600). It seems, therefore, that firms are somehow able to alleviate these drawbacks. This section describes the methods researchers have suggested to resolve some of the drawbacks to using tournaments. First, O'Keeffe et al. (1984) suggests that when prize spreads are too small (too large) the employer can provide workers with global as well as marginal incentives for effort by increasing (decreasing) the performance measurement precision. For example:

Small prize gaps, such as minor differences in pay among typists, must be coupled with a system that measures output quite closely (as is now being done in some typing pools with word processors); otherwise sufficient incentives will not be provided. Conversely if the prize spread is quite large, as in the case of a promotion to an important corporate position, a large random
element is required to prevent the participants from working excessively (p. 34).

To introduce such a random element to the performance measurement, "monitoring should not be so precise as to diminish the impact of one or a few random occurrences. For example, the employer might choose to make spot checks occasionally rather than frequently (p. 32)."

Second, related to the disincentives caused by heterogeneous workers, Lazear and Rosen (1981) suggest a competitive handicap solution. Continuing with the problem in the previous section, the less productive worker B would be given a handicap $h$ such that the more productive worker A would need to beat B by $h$ units in order to win. Not only does the value of $h$ preserve an advantage for A (i.e. he wins more than half the tournaments), it also elicits effort from B who has a reasonable chance at winning. Of course this solution is sensible only when the workers' skill is known to all.

Although both adjusting the performance measurement precision and handicapping less productive workers apparently resolve their respective problems, they lack descriptive validity (Baker et al. 1988). This issue is discussed in section 2.3.6.

2.3.5 Self-selection in tournaments

Lazear and Rosen (1981) examine whether baseball minor and major leaguers, each who knows their own skill but no one
else's, self-select to their own leagues. They find that major leaguers do not slum in the minor leagues and, instead, choose to participate in the major league tournament. In contrast, minor leaguers will climb to the majors. These climbers can be eliminated by increasing the prize spread such that their expected value decreases and they self-sort into their own league. However, as described in section 2.3.4, increasing the prize spread without simultaneously decreasing the performance measurement precision may lead to excess effort by the major leaguers.

2.3.6 Evidence on tournaments

Tournament theory suggests a plethora of testable implications; however, to date, data limitations seem to have curbed the empirical work in this area. Some field studies (Medoff and Abraham 1980; Murphy 1985; Leonard 1990) find data implying significant increases in compensation on promotion. This supports the notion that tournaments may dominate other incentive mechanisms.

Experimental studies find that: (1) on average, when skills are equal, subjects tend to supply the predicated level of effort (Bull et al. 1987) and (2) handicapping skill-disadvantaged subjects tends to increase the effort of all subjects (Bull et al. 1992).

12 Lazear and Rosen (1981) indicate that climbing may be mitigated by examining the workers' skill related credentials (cf. Spence, 1973).
13 These studies noted two persistent behavioral tendencies unanticipated by the theory including: (1) that the disadvantaged
While this evidence provides some support for tournament theory, at least two of its implications do not seem descriptively valid. The first relates to Lazear and Rosen's handicapping solution to the disincentives caused by heterogeneous workers. The second relates to the suggestion of O'Keeffe et al. (1984) of introducing a random element to the performance measurement when the prize spread is large. Baker et al. (1988) maintain that while:

... (these) solutions are technically elegant, ...
adding randomness and imposing handicaps are clearly in conflict with both casual empiricism and the objective of selecting the employee whose talents best match the demands of the job (p.602).

These criticisms suggest either (1) tournaments of a firm are suboptimal or (2) a premise(s) underlying the theory is inaccurate. For example, the theory assumes competitive markets for labor; however, some employers and industries, such as professional sports and academe, have monopsonies in certain labor markets.

2.3.7 The up-or-out model

An up-or-out contract is a tournament that specifies promotion for the winner(s) and termination of employment for the loser(s). Baker, et al. (1988) reason that such contracts are representative of academe and partnerships:

Up-or-out systems work better in situations where the required human capital is general rather than organization-specific, and where turnover is important to provide the new energy, ideas, subjects oversupplied effort and (2) a high variance in across-subject behavior.
enthusiasm and change that young people generate. These factors seem to be important in research universities and in many professional partnerships (p. 605).

Waldman (1990) is one few studies examining implications of the up-or-out contract relevant to this dissertation. Its findings indicate that the employer's decision to retain a worker acts as a signal of the worker's performance and, as a result, the employer market bids up the retained worker's wage. The worker's retention wage, then, is indirectly determined by outside firms. The author provides an intriguing empirical anecdote:

...this article provides a potential explanation for the common occurrence in academia that achieving tenure is no direct guarantee of a large salary increase. Rather, much of the return is in terms of the signal that is sent and the bidding by other firms that ensues (p. 243).

Related to this dissertation, it seems plausible that the employer market would, similarly, bid down a terminated worker's wages since termination signals low skill. The wages of a low-skill worker are bid down even more when performance is disclosed as it would tend to further signal low skill.
Chapter 3. DEVELOPMENT OF HYPOTHESES

3.1 Employment Setting

This section examines the selection effects of performance measurement error and disclosure policy in an up-or-out contract. To begin, suppose workers in the labor market apply for a position with a firm offering an up-or-out contract whereby, similar to tournaments, better workers are promoted while worse workers are forced to resign and seek employment elsewhere. Based on work experience, education, and other observable attributes, the firm culls the applicants to a smaller preferred set, homogeneous in observable attributes but heterogeneous in skill.14

3.2 Description of the Up-or-Out Contract

Characteristic of a tournament, performance $q_i$ of an up-or-out contract is a function of skill $\mu_i$ as well as an endogenous individual-specific and uniformly distributed stochastic error $e_i$:15

$$q_i = \mu_i + e_i$$

(1)

Identical to Lazear and Rosen (1981), the worker performance function presumes (1) an additive stochastic environment and (2) that the common stochastic error is filtered out of the performance measurement. Consistent with O'Keeffe et al.

---

14 An effort variable (e.g. effort aversion) could be substituted for skill without affecting the hypotheses.

15 See the preceding section for a more detailed description of what $e_i$ and the common error represent.
(1984), this study assumes that the $e_i$ represents error in the employer's performance measurement.

The up-or-out contract pays either $W$, $L$, or $Z$, where $W > L > Z$. Worker $i$ is promoted and paid $W$ with probability $P_i$. Terminated worker $i$ secures subsequent employment and is paid $L$ with probability $R_i$, but is paid $Z$ if employment is not secured. The expected value $EV_i$ of this up-or-out payment structure is expressed as:

$$EV_i = P_i(W) + (1 - P_i)[R_i(L) + (1 - R_i)(Z)]$$

Note that $P_i$ and $R_i$ are positively related to $EV_i$.

3.3 Performance Measurement Error

This section argues that the error in performance measurement is positively related to $EV_L$ (subscript $L$ represents a low-skill worker). Suppose, as figure 1 of appendix A illustrates, the performance ranges of a low-skill $\mu_L$ and high-skill $\mu_H$ worker are identical, where $\mu_H > \mu_L$. The area circumscribed by the performance extremes of each worker represents their possible performance combinations, and the shaded (unshaded) area represents where the low-skill (high-skill) worker's performance is greater. Dividing the shaded area by the total area yields the probability that the low-skill worker's performance is greater.

$$P_L = \frac{1/2 (\mu_L - \mu_H + 2e)^2}{(2e)^2}$$

$Z$ could represent welfare and/or utility from leisure.

where:
\[ e \geq (\mu_u - \mu_L)/2, \text{ otherwise } P_L = 0. \]
The derivative, \( \partial P_L / \partial e > 0 \), indicates that \( e \) varies positively with \( P_L \). This suggests the following hypothesis:18

H1: Ceteris paribus, \( \text{EV}_L \) is positively related to \( e \).

3.4 Disclosing Terminated Worker Performance

A policy of disclosing the performance of terminated workers, versus not disclosing performance, also serves to decrease \( \text{EV}_L \). Suppose when performance is not disclosed, \( R_i = \mathcal{S} \), where \( 0 < \mathcal{S} < 1 \). This probability reflects, in part, that the worker was terminated--something that could happen to either worker type.19 By comparison, when performance is disclosed, \( R_L \) is less than \( \mathcal{S} \) since performance will tend to reveal worker skill.

To explain, assume \( R_i \) equals 100% (0%) when the employer market assesses the terminated worker as high-skill (low-skill) with certainty. Figure 2 of appendix A, illustrates the performance range of a low-skill worker from segments A to B and of a high-skill worker from segments B to C. If a terminated low-skill worker's performance is disclosed:

---

18 Since \( \partial P_L / \partial e < 0 \), for high-skill workers, \( e \) is negatively related to the expected value of an up-or-out contract.

19 Variables that could affect \( \mathcal{S} \) include how the worker believes his skill, as perceived by the prospective employer, will compare to that of others in the labor market if he is terminated. Any such comparisons would be based on the observable attributes of each worker (Spence 1973). For example, comparisons to other terminated workers in the labor market may include the terminating firms': performance evaluation accuracy; employee competition; and economic pressure to force turnovers.
\[ R_L = P_L(A) (R_L/A) + P_L(B) (R_L/B) \]

where:

- \( P_L(A, B) \) is the probability that a terminated low-skill worker's performance falls within range \( A, B \); and
- \( (R_L/A, B) \) is the probability that a terminated low-skill worker secures subsequent employment given his disclosed performance fell in range \( A, B \).

Since only a low-skill worker's performance can fall in range \( A \), \( P(R_L/A) = 0\% \). Moreover, since \( P_L(B) = P_H(B) \), \( P(R_L/B) = \beta \). Thus, the probability a terminated low-skill worker secures subsequent employment is lower when performance is disclosed versus when it is not (i.e. \( \beta > P_L(B) \beta \)). This suggests the following hypothesis:\(^2\)

**H2:** Ceteris paribus, \( EV_L \) is lower when the performance of terminated workers is disclosed (versus when it is not).

Hypotheses H1 and H2 imply that when faced with various employment opportunities, an up-or-out contract with: (1) low performance measurement error and (2) a policy of disclosing terminated worker performance will influence low-skill workers to select another contract.

---

\(^2\) If the measurement error were normally, rather than uniformly distributed, the output disclosure would always yield information regarding the terminated worker's skill. However, it would be less informative the more the distributions of the high and low skill workers' outputs overlapped.

\(^2\) This assumes, of course, that performance is not measured randomly.
Chapter 4. RESEARCH METHOD

4.0 Overview of Research Method

Two experiments were used to test the hypotheses. Both asked subjects to compare and state their preferences regarding two contracts; however, the first emphasized control while the second emphasized mundane realism. Both experiments were provided since only one or the other would have left too many issues unresolved. In particular, results of only the first experiment would have left questions regarding generalizability while the second experiment alone would have lacked the control necessary to comment on the predictive power of the theory. The results of the combined experiments potentially provide both a direct test of the predicted relationships as well as enhanced generalizability of the theory to the real world.

The advantage of emphasizing control stems from its ability to more directly test the theory: "the more artificial (i.e., highly controlled) the setting in the sense that it contains all and only the theoretically specified factors, the more precisely the one theory in question may be expected to predict" (Webster and Kervin 1971, p. 268) (Also see Fromkin and Streufert 1976; Cook and Cambell 1978; Swieringa and Weick 1982; Plott 1982; Berg, Coursey, and Dickhaut 1990). Offsetting these beneficial direct tests of

---

22 Mundane realism refers to laboratory events that are similar to those that occur naturally (Swearinga and Weick 1983, p. 80).
highly controlled experiments are the costs of not ascertaining whether real world variables are interpreted in a manner consistent with the variables assumed in the theory. As an example, a controlled experiment typically would not test the assumption that a worker is able to estimate his relative skill. Rather, it would be endowed in some abstract fashion (i.e. "you have 5 fewer points than your opponent"). Whether subjective interpretations of real world variables translate to reasonably accurate assessments of relative skill is not addressed. Then, even if the results of the controlled experiment supported the predictions, the theory may not be generalizable to the real world.

An experiment emphasizing mundane realism, while not providing as direct a test, may help to determine the robustness of the theory. This type of experiment superimposes a context over the theoretical variables. For instance, suppose, rather than endowing relative skill, the subject, in the context of seeking employment, is provided with a typical new hire's grade point average. If by comparing his grade point average to that of the typical new hire he generates a subjective estimate of relative skill, the theory would be considered more robust (i.e. real world variables exist which can be interpreted in terms of those in the theory).

Adding the results of this type of experiment to those of the controlled experiment potentially provides both a
direct test of the predicted relationships as well as enhanced generalizability. Moreover, even if results of the two experiments are mixed, some information will have been gained. If the results of both experiments support the predictions, the researcher can tentatively conclude that not only are the theoretical variables alone responsible for the results, but that they exist, in some fashion, in the real world. Without the experiment emphasizing mundane realism, that the real world variables exist would have had to have been taken for granted.

When the results of an experiment emphasizing mundane realism fail to support the prediction, the theory is not necessarily wrong, particularly when the results of a controlled experiment support the predictions; however, questions of generalizability should be considered more carefully. Whether the behavior found in such an experiment is driven by the variables specified in the theory or other extraneous factors is difficult to determine.23 Indeed, the theoretical relationships may exist but are shrouded by the effects of the extraneous variables. Furthermore, other real world variables may exist that could be interpreted as the theoretical variables (i.e. real world variables other than grade point average could indicate relative skill). In any

23 While permitting generalization to the real world, results of context rich experiments are typically difficult to interpret. This sentiment is echoed by Swieringa and Weick (1982) who state that: "mundane realism may stir together cognition and action so that distinct components and relations are no longer visible (p. 80)."
case, although the theoretical relationships may still exist, the question of generalizability becomes more serious.

The sessions of both experiments corresponded to four between-subject treatments: (1) high error/disclosure; (2) high error/no disclosure; (3) low error/disclosure and; (4) low error/no disclosure. Tailoring each session to a corresponding between-subject treatment diminished potential demand effects as subjects were less able to infer from fluctuations in the independent variables the responses predicted in the theory.

4.1 Overview of First Experiment

Thirty-two undergraduate accounting students, most in their last year of course work, were recruited as subjects and assigned, in groups of eight, to one of four sessions. A session consisted of eight rounds and was held in an experimental economics laboratory at the University of Arizona where the subjects could be seated apart, in carrels. Each round, the subjects were asked to select a payment scheme by which they would be paid. The choices included: Payment Scheme A, representing a flat-pay contract, and Payment Scheme B, representing an up-or-out contract.

4.1.1 Instructions and practice round

To begin a session, the subjects gathered at the front of the lab where materials for the experiment were arranged on a table for the subjects to examine, including (1) numbered white poker chips and (2) 35 red and 65 blue poker
chips. Instructions were provided outlining the key phases of a round (see appendix B, section I, part 1). Next, a practice round described the payment schemes and asked the subjects to think to themselves which they preferred. The experimenter showed how different outcomes could cause either scheme to pay more than the other. The calculations involved in these outcomes were identical to those in the experiment explained in the following section.

4.1.2 The experiment

After the practice round, the poker chips were placed into cloth bags and the subjects seated themselves at the carrels. Each round, the subjects were asked to select either (1) Payment Scheme A that paid $1.00 or (2) Payment Scheme B that paid either $1.50, $1.25, or $.75, representing the theoretical variables \( W, L, \) and \( Z \), respectively (See appendix B, section I, part 2 for descriptions of these payment schemes by treatment).

Subjects were paid $1.50 when their total score, representing \( q_i \), was greater than their opponent's. Total score equaled an assigned beginning score, representing \( \mu_i \), plus or minus some randomly determined adjustment, representing \( e_i \). While the opponent's beginning score was always 200.5, the subject's beginning scores varied across

\[^{24}\text{The practice and experiment rounds were identical except for the numbers involved. The practice round used a subject beginning score of 150 while the experiment used 100, 140, 165, and 240. The role of the beginning score is explained in the following section.}\]

\[^{25}\text{Baiman and Lewis (1989) similarly assigned skill to their subjects.}\]
rounds: 100, 140, and 165, all representing $\mu_L$. The order in which the beginning scores were presented was randomized across subjects. To determine the adjustments, subjects blindly drew twice with replacement from the cloth bag containing the white numbered poker chips. The first chip drawn was used to adjust the subject's beginning score, and the second, the opponent's beginning score. The range of possible adjustments was from -55 to +55 for the low error treatments and from -90 to +90 for the high error treatments. In terms of the theory, the wider range corresponds to a higher $e$.

If the subject's total score was less than his opponent's, pay was either $1.25 or $.75. The prior probability of each payment varied across the no disclosure and disclosure treatments. For the no disclosure treatments, if the subject's total score was less than his opponent's, the cloth bag containing 35 red poker chips and 65 blue poker chips was used to determine the pay. If the subject drew a blue (red) chip, he was paid $.75 ($1.25). In terms of the theory, the 35% chance of drawing a red chip corresponds to $e$.

For the disclosure treatments, if the subject's total score was greater than his opponent's lowest possible total score, a subject beginning score of 240 was used to infer the payment scheme selection of a high-skill worker. Since the high-skill worker's behavior is not relevant to the hypotheses, the focus is on the lower beginning scores.
score (e.g. 145.5 assuming an adjustment range of -55 to +55), he was paid either $1.25 or $.75 determined precisely as in the no disclosure treatments. However, if the subject's total score was less than his opponent's lowest possible total score, he was paid $.75. Compared to the no disclosure treatments, the probability of this occurrence imposes additional risk on subjects with beginning scores lower than their opponent's and, in terms of the theory, corresponds to $P_x(A)$.

Risk preferences are controlled typically through either the conventional lottery technique (for example, see Young 1985) or inducing utility functions of a particular type (see Berg et al. 1986 and Waller 1988). However, the reliability of the utility function determined from a lottery is dubious (Hershey et al. 1982; Hershey and Schoemaker 1985; Selto and Cooper 1990) and the settings where it is appropriate to induce risk preferences are unclear (Cooper and Selto 1993). Because of this, and since both procedures add complexity and length to an experiment, a different approach to controlling risk preferences was taken here. This approach, while not perfect, seemed less costly and at least as reliable as the others.

To explain, refer to appendix C, table 1 which shows the expected values of Payment Scheme B by treatment and subject beginning scores. An expected value of less (greater) than $1.00 indicates that a risk neutral subject should select
Payment Scheme A (B). For example, at a beginning score of 140, the expected value for the high error/no disclosure treatment is $1.0517 and for the low error/no disclosure treatment is $.9832. Accordingly, a risk neutral subject would select Payment Scheme B in the high error/no disclosure treatment and Payment Scheme A in the low error/no disclosure treatment. These responses would indicate support for hypothesis H1 that $EV_L$ is positively related to $e$.

Now, suppose a risk averse subject makes a similar comparison. However, he decides that more than $.0517 ($1.0517 - $1.00) is required to bear the risk associated with Payment Scheme B and selects Payment Scheme A in both treatments. In this case, the subject's risk preference acts to conceal the treatment effects. This would present a problem if only a beginning score of 140 were used and a substantial portion of subjects were risk averse.

Raising the expected values in each treatment, through increasing the beginning score to 165, obviates this conundrum. Then, even if a large portion of subjects is risk averse, the treatment effects will be apparent. In the high error/no disclosure treatment, the risk averse subject will select Payment Scheme B with an expected value of $1.1103 assuming a premium of $.1103 compensates for the additional risk.\textsuperscript{27} However, in the low error/no disclosure treatment the

\textsuperscript{27} Of course even the $.1103 may be an inadequate premium for some very risk averse subjects.
expected value is only $1.0569 and Payment Scheme A is chosen. This example implies that an identical increase in the beginning scores in both treatments eliminates the confounding effects of this risk averse subject's responses yet maintains the qualitative differences across the treatments.\textsuperscript{28}

However, this procedure is not perfect. While it permits the experiment to evoke treatment effects even when risk preferences are diverse, the aggregate response measurements will be noisy. With beginning scores of 140 and 165, the risk neutral (risk averse) subject will select Payment Scheme B twice (once) in the \textit{high error/no disclosure} treatment and once (zero times) in the \textit{low error/no disclosure} treatment. The aggregate result would indicate that Payment Scheme B was selected three times in the \textit{high error/no disclosure} treatment and once in the \textit{low error/no disclosure} treatment. In this case, even though the measurements are noisy, the treatment effects are as predicted. Ultimately, then, the cost of this approach to controlling risk preferences is in terms of increasing the sample size such that the treatment effects can be seen in spite of the noise.

4.2 Overview of Second Experiment

\textsuperscript{28} A similar argument can be made related to risk seeking subjects. Consequently, a beginning score of 100 is used to decrease the expected values for Payment Scheme B across the cells.
The second experiment proceeded as follows: (1) upper division accounting students were recruited as subjects and asked first to suppose that a CPA firm—the up-or-out contract—and a consumer goods corporation had made them offers for employment; (2) given that the corporation paid $25,000 annually, each subject stated the annual salary the CPA firm would need to pay such that s/he would be indifferent between the offers; (3) subjects rated their abilities relative to the other employees at the CPA firm; and (4) subjects listed their accounting course grades.

4.2.1 Experiment procedures

Each treatment required several sessions of 5 to 15 different subjects. Undergraduate accounting majors were enlisted from upper division accounting courses at the University of Arizona and Texas A&M University with the provision that they would be paid $10 and that their responses would be anonymous. To begin a session, the subjects were provided with written materials (see appendix B, section II) composed of: (1) a practice session; (2) instructions for the experiment; (3) interview excerpts; and (4) a response section. The experimenter read the materials aloud, stopping when necessary for the subjects to write in their responses.

4.2.2 Practice session

For the practice session, subjects were asked to suppose that they had had interviews with various firms for
employment after graduation, and, as a result, had received employment offers from two firms: (1) Bank of New York—a large financial institution and (2) Benz Corporation—a large computer software firm. The subjects were provided with an excerpt from each interview specifying various attributes of each employment offer. After reading these excerpts, the subjects were asked to complete the following sentence:

Given that Bank of New York has offered an annual salary of $25,000, Benz Corporation would need to offer an annual salary of $__________for me to be indifferent between the offers.

4.2.3 Instructions

For the experiment, similar to the practice session, subjects were instructed to suppose that they had had interviews with various firms for employment after graduation, and, as a result, had received employment offers from two firms: (1) GMM Corporation—a large consumer goods firm and (2) Icerman and Hoover (I&H) CPAs—a large public accounting firm. Information regarding these offers was provided in the form of excerpts from the imaginary interviews.

4.2.4 Interview excerpts

To create a realistic context for the experiment, the excerpts were constructed using, as a guide, recruiting brochures of large corporations (e.g. Procter and Gamble) and the Big Six CPA firms. Excerpts from the GMM Corporation interview were identical for all treatments and were written
as to foster the impression of a flat-pay contract. Excerpts from the I&H CPAs interview included those which gave the impression of an up-or-out contract. These excerpts were identical for all treatments. For example:

Once per year, a Promotion Committee, comprised of senior managers, assesses the overall performance of the assistant and staff auditors. The Committee ranks the staff and assistant auditors separately, based on their overall performance. The higher ranked employees are promoted to the next level. For example, assistants with high overall performance assessments are ranked at the top of their group and promoted to the staff level. The assistants who fall at the bottom of the ranking may be forced to resign. Promotions of senior level employees and higher follow a similar process but occur less often than once per year.

Excerpts relating to high and low error treatment variables outlined I&H's performance measurement procedures. The high measurement error excerpts imply that promotions would be based on a rough estimate of performance. For example:

During the year, members of the Promotion Committee make inquiries to superiors (e.g., seniors or managers) about the performance of the subordinates they have had on previous engagements (e.g., assistant and staff auditors). Such inquiries are usually very brief and informal, and superiors typically respond by indicating whether a subordinate's performance has been satisfactory or unsatisfactory.

By comparison, the low measurement error excerpts imply that promotions are based on a more accurate assessment of performance. For example:

After each audit engagement, a superior (e.g., senior or manager) uses an Engagement Evaluation Matrix to evaluate the performance of each
subordinate who worked on the engagement (e.g., assistant and staff auditor). The superior uses a ten point scale (where 0 is poor and 10 is excellent) to rate the subordinate's performance across fifteen important professional dimensions. Superiors take great care to rate each subordinate's performance along these dimensions accurately. The superior then sends the completed Matrixes to the Promotion Committee.

Excerpts related to the disclosure and no disclosure treatment variables specified I&H's performance disclosure policy for those employees who were terminated or quit and sought employment elsewhere. The no disclosure excerpt implies that a terminated employee's performance would not be disclosed to any prospective employer:

For an employee who is forced or who chooses to resign, I&H will provide to his or her prospective employer(s) only information regarding time of employment. This will be done regardless of the employee's performance (e.g. good or bad) as it limits I&H's exposure to future litigation.

The disclosure excerpt implies that a terminated employee's performance would be disclosed to prospective employers:

For an employee who is forced or who chooses to resign, I&H will provide to his or her prospective employer(s) a letter of reference appraising employee performance. To furnish this type of information, all new hires are asked to sign a waiver. This waiver states that an ex-employee will not hold I&H liable for supplying honest assessments of his/her performance to other employers. This limits our exposure to future litigation.

4.2.5 Responses

After reading the excerpts, the subjects were asked to complete the following sentence:
Given that GMM Corporation has offered an annual salary of $25,000, I&H CPAs would need to offer an annual salary of $\underline{}$ for me to be indifferent to the offers.

Next, after all subjects had responded, they broke a seal and turned to the post experiment questionnaire. The first question asked the subjects to estimate their abilities relative to those of the other assistant auditors at I&H by indicating on a scale the percentage of auditors whose ability was lower than theirs.

To provide a baseline to which the subjects could compare their ability, one of the excerpts stated that, "The average accounting GPA of the recruits I&H will hire into the assistant level this season is expected to be about 3.5 (on a 4.00 scale)." Finally, the subjects were asked to fill-in their accounting course grades.
Chapter 5. RESULTS

5.0 Overview of Results

This section presents the results of each experiment. While, in both cases, hypothesis H1 was strongly supported, the results of hypothesis H2 were mixed. The tables referred to in this section are contained in appendix C.

5.1 Overview of First Experiment Results

Table 2 shows the Payment Scheme selections by treatment and subject beginning scores. To test the hypotheses, several sign tests were performed. The test statistic was a one-tailed significance probability for the total difference in the subjects' payment scheme selections between variables.\(^{29}\)

5.1.1 Test of hypothesis H1

Hypothesis H1 states that \( EV_L \) is positively related to e. Table 3 indicates a significant difference between the high error and the low error treatments (\( p = .004 \)). In 32 cases, subjects in the high error treatments selected payment scheme B when subjects in the low error treatments selected payment scheme A, while in 13 cases subjects in the high error treatments selected payment scheme A when subjects in the low error treatments selected payment scheme B. This difference of 19 (32 - 13) corresponds to the difference in Payment B selections between high and low error treatments on

\(^{29}\) As expected, payment B was selected in every case when the beginning score was 240.
Table 2 (i.e. 19 = 54 - 35). These results are consistent with hypothesis H1.

5.1.2 Test of hypothesis H2

Hypothesis H2 states that $EV_L$ is lower when the performance of terminated workers is disclosed (versus when it is not). Table 4 indicates that there is a weakly significant difference between the no disclosure and disclosure treatments ($p = .111$). In 26 cases, subjects in the no disclosure treatments selected payment scheme B when subjects in the disclosure treatments selected payment scheme A, while in 17 cases subjects in the disclosure treatments selected payment scheme B when subjects in the no disclosure treatments selected payment scheme A. These results are weakly consistent with hypothesis H2.

5.1.3 Across treatment comparisons

Although overall the results supported the hypotheses, comparisons across treatments bring to question the robustness of the theory. Table 2 shows that the responses in low error/disclosure treatment are opposite to the prediction. Payment Scheme B was chosen more often in this treatment compared to the low error/no disclosure and the high error/disclosure treatments. So while the overall results supported the hypotheses, whether the theory predicts well under a wide range of conditions is still suspect.
Various explanations for results opposite to what was predicted may be advanced. Perhaps a more risk seeking group of subjects was enlisted in this treatment. Such a group would tend to select Payment Scheme B more often. Perhaps the combination of variables complicated the low error/disclosure treatment such that heuristically determined approximations of the expected value of Payment Scheme B were somehow biased upward. Investigation into these conjectures, and any others, for the anomalous across treatment results is left to future research.

5.2 Overview of Second Experiment Results

One hundred subjects participated, however, the responses of one were disregarded as it was apparent that the instructions were misunderstood.\textsuperscript{30} Table 5 shows, by treatment, information on the remaining 99 subjects' indifference salaries and relative skill ratings

Table 6 provides indifference salary averages categorized by treatment and skill. The low-skill (high-skill) category includes 50 (49) subjects with skill ratings of 74% or less (75% or greater). Table 7 provides similar information but only for 65 subjects with the more extreme skill ratings. The high-skill category includes 28 subjects with ratings of 83% or greater and the low-skill includes 37

\textsuperscript{30} In the relative skill rating, which is in effect a probability assessment, the subject marked 0.
subjects with ratings of 67% or less. The hypotheses were examined using separate ANOVAs on the responses of tables 6 and table 7, the results of which are presented in tables 8 and 9, respectively. The indifference salary for I&H was the dependent variable.

5.2.1 Test of hypothesis H1

Hypothesis H1 states that $EV_L$ is positively related to $e$. In terms of this experiment, this implies that, as $e$ decreases, subjects with lower (higher) skill ratings should indicate higher (lower) indifference salaries. According to the ANOVAs on tables 8 and 9, the interaction of performance measurement error and skill on indifference salary is statistically significant ($F = 7.864$, and 7.749, respectively, both with $p < 0.01$). These results combined with tables 6 and 7, which indicate the relationships were in the predicted direction, support H1.

5.2.2 Test of hypothesis H2

Hypothesis H2 states that $EV_L$ is lower when the performance of terminated workers is disclosed (versus when it is not). This implies that subjects with lower (higher) skill ratings should indicate higher (lower) indifference salaries when the performance of terminated workers is

---

31 To examine the more extreme ratings, approximately 1/3 (34/99) of the middle responses were eliminated. Since many skill ratings were identical (e.g. 12 ratings of 80%), the responses in each skill category are unequal—37 low-skill and 28 high-skill. Other reasonable divisions of the extreme responses did not qualitatively affect the results.

32 Two outliers are included in the ANOVA on table 7 as the qualitative results were unaffected by excluding them.
disclosed versus when it is not. According to tables 8 and 9, the interaction of disclosure policy and skill on indifference salary is significant (F = 2.802, p = .098 and F = 3.918, p = 0.053, respectively). However, tables 6 and 7 indicate the relationship is opposite of the predicted direction (i.e. low-skill (high-skill) subjects' average indifference salary was lower (higher) when performance was disclosed versus when it was not).

To investigate further, table 10 shows the results of an ANOVA performed on the 28 high-skill subjects. Disclosure policy is a significant main effect on required salary (F = 5.047, P < 0.05). Table 11 shows the results of an ANOVA performed on the 37 low-skill subjects finding that disclosure policy is not significant on required salary. These ANOVAs imply that the high-skill subjects alone are responsible for the finding opposite of what was predicted.

5.2.3 Across treatment comparisons

Comparing the indifference salaries across cells in tables 6 and 7 provides more detail regarding the subjects implied employment preferences. Of particular interest are the changes in indifference salaries from the high error/disclosure cell to the low error/disclosure where the high skill (low skill) subjects' indifference salaries decreased (increased). This behavior seems to be consistent with the theory. That is, if performance is to be disclosed,
as skill increases the preference for low measurement error increases. This behavior is characterized in the statistical analysis by the interaction of performance measurement error, disclosure policy, and skill. However, as indicated on both tables 8 and 9, this interaction is insignificant. Thus, although the cell indifference salaries vary as predicted across the cells mentioned above, the related interaction was not significant.

5.2.4 Comparison of skill rating to GPA

The results of ANOVAs identical to those of tables 8 and 9 but with grade point average in place of skill rating showed insignificant results. Table 12 shows the results of regressing grade point average on skill rating, the results of which are significant (t = 4.599, p < .01). The combination of these findings imply that while a strong relationship exists between the perceived relative skill of a student and course grades, one is not completely revealed by the other. This supports the maintained assumption of the theory that an information asymmetry exists between the employer and worker with respect to worker skill.

5.3 Summary and comments

The data of both experiments strongly supported hypothesis H1. In the second experiment, this support was stronger yet for the responses of the subjects with the more extreme skill ratings. Results related to hypothesis H2 of the first experiment were weakly significant and of the
second experiment were significant but opposite from the prediction. Further analysis found that this result was driven solely by the subjects with higher skill ratings. Apparently, the theory related to hypothesis H1 is valid under both very controlled conditions as well as situations more characteristic of natural settings. The theory related to hypothesis H2 was supported in only the artificial setting; however, whether it holds in more natural settings is unclear. Another experiment may, through perhaps a different operationalization of the disclosure treatments, find support for H2.
Chapter 6. CONCLUDING REMARKS

6.1 Contribution

This study provides evidence on the selection effects of up-or-out contracts with different performance measurement errors and a policy of disclosing (versus not disclosing) the performance of terminated workers seeking subsequent employment. Results from two experiments supported the proposition that a low-skill worker's expected value of an up-or-out contract is positively related to the error associated with employee performance measurement. These results contribute in two important ways to accounting research. First, they imply that CPA firms can, and perhaps do, attempt to attract higher quality candidates through effectively evaluating worker performance. Second, they illustrate yet another instance where accounting information might be used to provide performance incentives.

Results were mixed regarding the proposition that a low-skill worker's expected value of an up-or-out contract is lower when the performance of terminated workers is disclosed versus when it is not. While the results of the controlled experiment indicated weak support, those of the more realistic experiment were opposite of the prediction. Another experiment may, through perhaps a different operationalization on the disclosure treatments, find support for H2.
6.2 Limitations

This section discusses two limitations related to the findings of this dissertation. First, this study did not determine whether workers' observable attributes are sufficient to distinguish skill-type. These observable attributes may enable employers to cull applicant pools to a smaller worker set sufficiently homogenous in skill. Then, distinguishing worker skill-types by their contract choice would be unnecessary.

Second, the theory is relevant only when low-skill workers have at least two employment options. However, many real-world instances exist where these workers have offers from only a large CPA firm. Although these workers may find an accurate performance evaluation process less attractive, they would still accept employment since it is their only offer. A related point is that the decrease in a low-skill worker's expected utility related to more accurate performance evaluations may not offset the difference in pay between employment options. For example, if the CPA firms pay is comparatively high, low-skill workers will chance termination even when performance evaluations are very accurate.

6.3 Future Research

Future research might address various performance issues related to up-or-out contracts. Except for the assumption that relative performance contracts filter out common
uncertainty from employee performance measurements, there has been little empirical work in this area. Any findings may have direct implications for CPA firm employee policy.

6.4 Conclusions

The results indicate that performance measurement error affects worker contract selection according to skill-type. This implies that CPA firms can, and perhaps do, reduce their performance measurement error to attract higher quality candidates. The results also indicate that while in a very artificial setting disclosing the performance of terminated workers may serve to attract better workers, this is not necessarily the case in practice.
APPENDIX A: FIGURES
Figure 1

Diagram Comparing Worker Performance

\[ p_L = \frac{1/2(\mu_H - \mu_L + 2e)^2}{(2e)^2} \]

where:
- \( \mu_H \) is the high-skill worker's skill;
- \( \mu_L \) is the low-skill worker's skill;
- \( e \) is the individual-specific error;
- \( \mu_H \geq \mu_L \geq e \geq (\mu_H - \mu_L)/2 \), otherwise \( P(q_L > q_H) = 0 \).
Figure 2

Diagram of High-Skill and Low-Skill Workers' Performance Regions

\[ \mu_H - e \quad \mu_L \quad \mu_H - e \quad \mu_L + e \quad \mu_H \quad \mu_H + e \]

\( \square \) low-skill employee's output  \( \square \) high-skill employee's output

where:
\( \mu_H \) is the high-skill worker's skill;
\( \mu_L \) is the low-skill worker's skill; and
\( e \) is the individual-specific error.
I. First Experiment Materials
1. Instructions

INTRODUCTION

Welcome and thank you for participating in this experiment. This experiment will take approximately one hour and is comprised of several rounds. Your pay will depend on the decisions you make during the experiment. In each round, you will be faced with a choice of two payment schemes. The payment schemes may differ each round. You will be requested to select the payment scheme by which you prefer to be paid. After you have made your selection, payments will be determined for each payment scheme. You will be paid according to the payment scheme which you selected.

The payment schemes provided to you will be different from those provided to the other participants. Therefore, payments will be calculated separately for each person and your decisions will be confidential. Furthermore, since the payment schemes do differ among you, do not base your decisions on what you think someone else is doing.

At the beginning of each round you will be provided with the following: (1) a description of two payment schemes labeled A and B; (2) a "Payment Scheme Selection Form;" and (3) a regular white envelope. After reading about Payment Schemes A and B, you will be asked to indicate the payment scheme by which you wish to be paid on the "Payment Scheme Selection Form" and place this form in the white envelope. Pay will then be determined for each payment scheme and you will be paid according to your selection.

To illustrate the procedures which will be followed in each round, an example is provided. The payment schemes described in the example are similar to the ones you will face later, and you should decide which payment scheme you think is "best."
INSTRUCTIONS

1. You will be provided with the following: (1) descriptions of Payment Scheme A and Payment Scheme B; (2) a "Payment Scheme Selection Form;" and (3) a regular white envelope.

2. Read the descriptions of Payment Scheme A and Payment Scheme B.

3. Indicate the payment scheme by which you wish to be paid on the "Payment Scheme Selection Form" and place this form in the white envelope.

4. When it is your turn, the experimenter will calculate pay for both Payment Schemes A and B.

5. The experimenter will open the envelope containing your completed "Payment Scheme Selection Form," and you will be paid according to the payment scheme you selected.

6. Your payment for the round will be recorded on the "Payment Sheet" taped atop your desk.

7. The material for this round will be collected and you will be given material for the next round. You can begin working on this new material immediately.

8. At the end of the experiment, the total of your payments for all of the rounds will be paid.
2. Description of Payment Schemes

a. High Error/No Disclosure Treatment

DESCRIPTION OF PAYMENT SCHEMES A & B

Payment Scheme A

Under Payment Scheme A, you will be paid $1.00, for sure.

Payment Scheme B

Under Payment Scheme B, you will receive a total score and your opponent will receive a total score. When your total score is greater than your opponent's total score, you will receive the highest payment possible; $1.50. When your total score is less than your opponent's you will receive either $1.25 or $.75. The following steps describe how the total scores for you and your opponent will be determined as well as how your payment will be calculated.

Step 1: Determination of Your Total Score

- Your total score is equal to your beginning score plus or minus an adjustment. In this round, your beginning score is 150.

- To adjust your beginning score, you will draw a numbered poker chip from a cloth bag provided by the experimenter. This cloth bag will contain 181 poker chips numbered from -90 to +90, including zero. The number on the poker chip you draw will be used to adjust your beginning score.

The largest possible positive adjustment to your beginning score which can be drawn from the cloth bag is +90. This adjustment added to your beginning score (150) would give you a total score of 240. The largest possible negative adjustment is -90. This adjustment subtracted from your beginning score (150) would give you a total score of 60. Therefore, your total score will be somewhere between 60 and 240 depending on the adjustment.
Step 2: Determination of Your Total Opponent's Score

- Your opponent's total score is equal to a beginning score plus or minus an adjustment. Your opponent's beginning score is 200.5.

- The adjustment to your opponent's beginning score will be determined in exactly the same way as your adjustment. Thus, the poker chip drawn for your adjustment will be replaced and you will draw another chip from the same cloth bag containing 181 poker chips. This time, however, the poker chip you draw will be used to adjust your opponent's beginning score.

  *The largest possible positive adjustment to your opponent's beginning score which can be drawn from the cloth bag is +90. This adjustment added to your opponent's beginning score (200.5) would give your opponent a total score of 290.5. The largest possible negative adjustment to your opponent's beginning score which can be drawn from the cloth bag is -90. This adjustment subtracted from your opponent's beginning score (200.5) would give your opponent a total score of 110.5. Therefore, your opponent's total score will be somewhere between 110.5 and 290.5 depending on the adjustment.*

Step 3: Determination of Your Payment

Your payment will be determined as follows:

- If your total score is greater than your opponent's, you will receive $1.50.

- If your total score is less than your opponent's, you will receive either $1.25 or $.75. To determine which amount you will be paid, you will draw from a cloth bag containing 100 poker chips. This bag contains 65 blue poker chips and 35 red poker chips. If the poker chip drawn from this bag is blue, you will be paid $.75. If the poker chip drawn is red, you will be paid $1.25.
PAYMENT SCHEME SELECTION FORM

Please indicate the payment scheme under which you would like to be paid this round.

Check One: Payment Scheme A _____ Payment Scheme B _____
b. Low Error/No Disclosure Treatment

DESCRIPTION OF PAYMENT SCHEMES A & B

Payment Scheme A

Under Payment Scheme A, you will be paid $1.00, for sure.

Payment Scheme B

Under Payment Scheme B, you will receive a total score and your opponent will receive a total score. When your total score is greater than your opponent's total score, you will receive the highest payment possible; $1.50. When your total score is less than your opponent's you will receive either $1.25 or $.75. The following steps describe how the total scores for you and your opponent will be determined as well as how your payment will be calculated.

Step 1: Determination of Your Total Score

- Your total score is equal to your beginning score plus or minus an adjustment. In this round, your beginning score is 150.

- To adjust your beginning score, you will draw a numbered poker chip from a cloth bag provided by the experimenter. This cloth bag will contain 111 poker chips numbered from -55 to +55, including zero. The number on the poker chip you draw will be used to adjust your beginning score.

The largest possible positive adjustment to your beginning score which can be drawn from the cloth bag is +55. This adjustment added to your beginning score (150) would give you a total score of 205. The largest possible negative adjustment is -55. This adjustment subtracted from your beginning score (150) would give you a total score of 95. Therefore, your total score will be somewhere between 95 and 205 depending on the adjustment.
Step 2: Determination of Your Total Opponent's Score

- Your opponent's total score is equal to a beginning score plus or minus an adjustment. Your opponent's beginning score is 200.5.

- The adjustment to your opponent's beginning score will be determined in exactly the same way as your adjustment. Thus, the poker chip drawn for your adjustment will be replaced and you will draw another chip from the same cloth bag containing 181 poker chips. This time, however, the poker chip you draw will be used to adjust your opponent's beginning score.

The largest possible positive adjustment to your opponent's beginning score which can be drawn from the cloth bag is +90. This adjustment added to your opponent's beginning score (200.5) would give your opponent a total score of 290.5. The largest possible negative adjustment to your opponent's beginning score which can be drawn from the cloth bag is -90. This adjustment subtracted from your opponent's beginning score (200.5) would give your opponent a total score of 110.5. Therefore, your opponent's total score will be somewhere between 110.5 and 290.5 depending on the adjustment.

Step 3: Determination of Your Payment

Your payment will be determined as follows:

- If your total score is greater than your opponent's, you will receive $1.50.

- If your total score is less than your opponent's, you will receive either $1.25 or $.75. To determine which amount you will be paid, you will draw from a cloth bag containing 100 poker chips. This bag contains 65 blue poker chips and 35 red poker chips. If the poker chip drawn from this bag is blue, you will be paid $.75. If the poker chip drawn is red, you will be paid $1.25.
PAYMENT SCHEME SELECTION FORM

Please indicate the payment scheme under which you would like to be paid this round.

Check One: Payment Scheme A _____  Payment Scheme B _____
c. High Error/Disclosure Treatment

DESCRIPTION OF PAYMENT SCHEMES A & B

Payment Scheme A

Under Payment Scheme A, you will be paid $1.00, for sure.

Payment Scheme B

Under Payment Scheme B, you will receive a total score and your opponent will receive a total score. When your total score is greater than your opponent’s total score, you will receive the highest payment possible; $1.50. When your total score is less than your opponent’s you will receive either $1.25 or $.75. The following steps describe how the total scores for you and your opponent will be determined as well as how your payment will be calculated.

Step 1: Determination of Your Total Score

- Your total score is equal to your beginning score plus or minus an adjustment. In this round, your beginning score is 150.

- To adjust your beginning score, you will draw a numbered poker chip from a cloth bag provided by the experimenter. This cloth bag will contain 181 poker chips numbered from -90 to +90, including zero. The number on the poker chip you draw will be used to adjust your beginning score.

The largest possible positive adjustment to your beginning score which can be drawn from the cloth bag is +90. This adjustment added to your beginning score (150) would give you a total score of 240. The largest possible negative adjustment is -90. This adjustment subtracted from your beginning score (150) would give you a total score of 60. Therefore, your total score will be somewhere between 60 and 240 depending on the adjustment.
Step 2: Determination of Your Total Opponent’s Score

- Your opponent’s total score is equal to a beginning score plus or minus an adjustment. Your opponent’s beginning score is 200.5.

- The adjustment to your opponent’s beginning score will be determined in exactly the same way as your adjustment. Thus, the poker chip drawn for your adjustment will be replaced and you will draw another chip from the same cloth bag containing 181 poker chips. This time, however, the poker chip you draw will be used to adjust your opponent’s beginning score.

The largest possible positive adjustment to your opponent’s beginning score which can be drawn from the cloth bag is +90. This adjustment added to your opponent’s beginning score (200.5) would give your opponent a total score of 290.5. The largest possible negative adjustment to your opponent’s beginning score which can be drawn from the cloth bag is -90. This adjustment subtracted from your opponent’s beginning score (200.5) would give your opponent a total score of 110.5. Therefore, your opponent’s total score will be somewhere between 110.5 and 290.5 depending on the adjustment.

Step 3: Determination of Your Payment

Your payment will be determined as follows:

- If your total score is greater than your opponent’s, you will receive $1.50.

- If your total score is 110 or less, you will receive $.75

- If your total score is greater than 110 but less than your opponent’s, you will receive either $1.25 or $.75. To determine which amount you will be paid, you will draw from a cloth bag containing 100 poker chips. This bag contains 65 blue poker chips and 35 red poker chips. If the poker chip drawn from this bag is blue, you will be paid $.75. If the poker chip drawn is red, you will be paid $1.25.
PAYMENT SCHEME SELECTION FORM

Please indicate the payment scheme under which you would like to be paid this round.

Check One: Payment Scheme A ____ Payment Scheme B ____

__________________________________________________________
d. Low Error/Disclosure Treatment

DESCRIPTION OF PAYMENT SCHEMES A & B

Payment Scheme A

Under Payment Scheme A, you will be paid $1.00, for sure.

Payment Scheme B

Under Payment Scheme B, you will receive a total score and your opponent will receive a total score. When your total score is greater than your opponent's total score, you will receive the highest payment possible; $1.50. When your total score is less than your opponent's you will receive either $1.25 or $.75. The following steps describe how the total scores for you and your opponent will be determined as well as how your payment will be calculated.

Step 1: Determination of Your Total Score

- Your total score is equal to your beginning score plus or minus an adjustment. In this round, your beginning score is 150.

- To adjust your beginning score, you will draw a numbered poker chip from a cloth bag provided by the experimenter. This cloth bag will contain 111 poker chips numbered from -55 to +55, including zero. The number on the poker chip you draw will be used to adjust your beginning score.

The largest possible positive adjustment to your beginning score which can be drawn from the cloth bag is +55. This adjustment added to your beginning score (150) would give you a total score of 205. The largest possible negative adjustment is -55. This adjustment subtracted from your beginning score (150) would give you a total score of 95. Therefore, your total score will be somewhere between 95 and 205 depending on the adjustment.
Step 2: Determination of Your Opponent's Total Score

- Your opponent's total score is equal to a beginning score plus or minus an adjustment. Your opponent's beginning score is 200.5.

- The adjustment to your opponent's beginning score will be determined in exactly the same way as your adjustment. Thus, the poker chip drawn for your adjustment will be replaced and you will draw another chip from the same cloth bag containing 111 poker chips. This time, however, the poker chip you draw will be used to adjust your opponent's beginning score.

The largest possible positive adjustment to your opponent's beginning score which can be drawn from the cloth bag is +55. This adjustment added to your opponent's beginning score (200.5) would give your opponent a total score of 255.5. The largest possible negative adjustment to your opponent's beginning score which can be drawn from the cloth bag is -55. This adjustment subtracted from your opponent's beginning score (200.5) would give your opponent a total score of 145.5. Therefore, your opponent's total score will be somewhere between 145.5 and 255.5 depending on the adjustment.

Step 3: Determination of Your Payment

Your payment will be determined as follows:

- If your total score is greater than your opponent's, you will receive $1.50.

- If your total score is 145 or less, you will receive $.75

- If your total score is greater than 145 but less than your opponent's, you will receive either $1.25 or $.75. To determine which amount you will be paid, you will draw from a cloth bag containing 100 poker chips. This bag contains 65 blue poker chips and 35 red poker chips. If the poker chip drawn from this bag is blue, you will be paid $.75. If the poker chip drawn is red, you will be paid $1.25.
PAYMENT SCHEME SELECTION FORM

Please indicate the payment scheme under which you would like to be paid this round.

Check One: Payment Scheme A _____ Payment Scheme B _____
______________________________________________________________
II. Second Experiment Materials
1. Practice Session

INTRODUCTION

Welcome and thank you for participating in this experiment. In this experiment you will face the option of two employment offers: one from firm 1 and one from firm 2. You will be provided with information on the attributes of each offer. Annual salary will be included as part of the attributes of firm 1's offer but not firm 2's. You will be asked to state the annual salary that firm 2 would need to pay such that you would be indifferent between the offers. "Indifference" implies that you would allow a coin flip to determine which offer to accept.

To illustrate, suppose that you have had interviews with various firms for employment after graduation. As a result of these interviews, you have received employment offers from two firms: (1) Bank of New York—a large financial institution and (2) Benz Corporation—a large computer software firm. An excerpt from each interview, provided below, specifies some of the attributes of the employment offers.

Excerpt from Bank of New York Interview:
- Bank of New York is a large financial institution serving New York state as well as 13 other states in the east. You will be assigned to our Financial Services Department in downtown New York. Along with the typical services provided by most regional banks, Bank of N.Y. is expanding into many promising areas. Presently, we are researching the possibility of providing an on-line banking service. This would allow our customers to conduct their financial transactions in their homes or offices.
Excerpt from Benz Corporation Interview:

- Benz Corporation is one of the largest computer software firms in the country. You will be assigned to our Finance Department in Los Angeles. Our products are concentrated in education and money management. Last year our software was the number one seller in these markets. We recently introduced a word processing program which is selling exceptionally well.

Bank of N.Y. has offered you an annual salary of $25,000. Given no further information about the offers, state the annual salary which Benz Corporation would need to pay such that you would be indifferent between the offers. Remember, "indifference" implies that you would allow a coin flip to determine which offer to accept. Indicate your response by completing the sentence below.

Given that Bank of N.Y. has offered an annual salary of $25,000, Benz Corporation would need to offer an annual salary of $_______________ for me to be indifferent between the offers.

The salary you filled in should make the sentence above logically consistent with the following statements:

(1) If Benz Corp. offers this salary, I will not prefer one contract over the other.

(2) If Benz Corp. offers more than this salary, I will prefer employment with Benz Corp.

(3) If Benz Corp. offers less than this salary, I will prefer employment with Bank of N.Y.
2. Experiment instructions

INSTRUCTIONS

For this experiment, you are again asked to suppose you have had interviews with various firms for employment after graduation. Similar to the example, you have received offers from two firms: (1) GMM Corporation—a large consumer goods firm and (2) Icerman and Hoover (I&H) CPAs—a large public accounting firm. You will be provided with relevant excerpts from each interview.

This time, the excerpts contain more extensive information about the employment opportunities. You will also be given information regarding the annual salary of GMM Corporation and asked to state the annual salary which I&H CPAs would need to pay such that you would be indifferent between the offers.
Excerpts from the GMM Corporation Interview

Background

- GMM Corporation is a well-known manufacturer of consumer goods based in Chicago with branches in most large U.S. cities as well as Europe. GMM's product lines include soft drinks, soap, toothpaste, coffee, and many others. Total sales of GMM have consistently placed among the top 20 U.S. industrial corporations.

- GMM Corporation operates in a quickly changing, competitive market. We are constantly searching for profitable new products as well as improvements to existing products. Recently, we introduced a line of diaper products which are performing extremely well. Last year, through a discount-based promotion strategy, our toothpaste lines increased their market share by 5%.

Job Description

- We are interviewing you for a position in our Finance Department in Houston where one of our largest branches is located.

- Our Finance Department will provide you an opportunity to become a top financial manager. You can expect to gain training and experience in every aspect of finance and accounting.

- Most of the senior financial managers at GMM are CPAs, and passing the CPA exam is encouraged. Working in our Finance Department fulfills the CPA license experience requirement.

- Your initial assignment will depend on your background, area of interest, and the needs of the organization. However, your first assignment is not critical—it's the long run and your exposure to all facets of the Finance Department that counts.

- There are many career paths within the Finance Department; it all depends on you and your abilities. Our objective is to foster your growth as a top financial manager. GMM promotes from within so we want to prepare you for the long term.

- For all employees, the average annual raise is 5%. Small bonuses are also given on promotion. GMM will pay you a starting annual salary of $25,000.
Excerpts from the I&H CPA Firm Interview

Background

- I&H is one of the largest CPA firms in the world with branches across the U.S., Europe, and Asia. I&H's Headquarters is located in New York City, the site of our first office which opened in 1900. You will be hired as an Assistant Auditor and assigned to our Auditing Department in the Houston, Texas office.

- I&H has more clients in the Fortune 500 than any other firm. You will have the opportunity to specialize in industry, government, or financial institutions. Your area of expertise will depend primarily on your interests. We'll support your choice with training and experience to develop you into the professional you want to be.

- There are 6 experience levels at I&H; Assistant, Staff, Senior, Manager, Senior Manager, and Partner. As is typical of CPA firms, the number of people in the upper levels at I&H is much smaller than in the lower levels. Promotion to each level comes with a raise in salary. For all employees, the average annual raise is 20%, ranging from 15% to 25%.

- I&H prides itself on the excellence of its employees and hires only the highest achievers. The average accounting course GPA of the recruits I&H will hire into the assistant level this season is expected to be about 3.5 (on a 4.00 point scale).
Job Description

- At our Houston office, you can expect interesting audit engagements on, for example, Texas' largest bank or a large computer software company. You will be assigned to audit engagements based on your interests and firm need.

- As an assistant auditor, you will serve an integral role on the audit engagement. You can expect to perform various auditing functions such as assessing client control systems, evaluating the tax implications of particular accounting options, and assisting in the preparation of financial statements and management letters.

- Once per year, a Promotion Committee, comprised of senior managers, assesses the overall performance of the assistant and staff auditors. Based on these overall performance assessments, the Committee ranks the assistant auditor group and staff auditor group separately. The higher ranked employees are promoted to the next level. For example, assistants with high overall performance are ranked at the top of their group and promoted to the staff level. The assistants who fall at the bottom of the ranking may be forced to resign. Promotions of employees at the senior and manager levels follow a similar process but occur less often than once per year.
4. Treatment Variable Excerpts

a. High performance measurement error excerpts

- During the year, members of the Promotion Committee make inquiries to superiors (e.g., seniors or managers) about the performance of the subordinates they have had on previous engagements (e.g., assistant and staff auditors). Such inquiries are usually very brief and informal, and superiors typically respond by indicating whether a subordinate's performance has been satisfactory or unsatisfactory. Most Committee members will have some impression regarding the performance of the assistant and staff auditors.

- The Promotion Committee members discuss among themselves their impressions of each assistant and staff auditor's performance. Like the Committee member's inquiries to the supervisors, these discussions are also quite informal. From these discussions, the Committee generates a consensus on the overall performance of each auditor which it then uses to develop separate rankings for the staff and assistant auditors.

- A particular assistant's rank is determined by the Committee consensus on his overall performance relative to the Committee consensus on the overall performance of the other assistants. The higher ranking assistant auditors are promoted to the next level. Those assistants with a lower ranking may be forced to resign.
b. Low performance measurement error excerpts

- After each audit engagement, a superior (e.g., senior or manager) uses an Engagement Evaluation Matrix to evaluate the performance of each subordinate who worked on the engagement (e.g., assistant and staff auditors). The superior uses a ten point scale (where 0 is poor and 10 is excellent) to rate the subordinate's performance across fifteen important professional dimensions. Superiors take great care to rate each subordinate's performance along these dimensions accurately. The superior then sends the completed Matrixes to the Promotion Committee.

- The Promotion Committee accumulates the Engagement Evaluation Matrixes for each assistant and staff auditor. Typically, by year's end, each assistant and staff auditor will have 10 to 15 Matrixes. The Committee evaluates the Matrixes to determine an overall performance score for each auditor. These scores range from 0 to 100. The Committee takes these evaluations very seriously and much time and effort is spent to ensure the accuracy of each assistant and staff auditor's overall performance score.

- Based on these overall performance assessments, the Committee ranks the assistant auditor group and staff auditor group separately. A particular assistant's rank, for example, is determined by his/her overall performance score relative to the overall performance scores of the other assistants. In the event of a tie between two or more assistants, further information is gathered from the engagement superiors until the tie is broken (e.g., their performance can be distinguished from each other). The higher ranking assistant auditors are promoted to the next level. Those assistants with a lower ranking may be forced to resign.
c. No disclosure policy excerpts

- For an employee who is forced or who chooses to resign, I&H will provide to his or her prospective employer(s) only information regarding time of employment. This will be done regardless of the employee's performance (e.g. good or bad) as it limits I&H's exposure to future litigation.

d. Disclosure policy excerpts

- For an employee who is forced or who chooses to resign, I&H will provide to his or her prospective employer(s) a letter of reference appraising employee performance. To furnish this type of information, all new hires are asked to sign a waiver. This waiver states that an ex-employee will not hold I&H liable for supplying honest assessments of his/her performance to other employers. This limits our exposure to future litigation.
In this section, you are asked to state the annual salary which I&H would need to pay such that you would be indifferent between the offers by completing the sentence below. To foster an accurate response, you are encouraged to review excerpts from either of the interviews. Please complete the following sentence:

Given that GMM Corporation has offered an annual salary of $25,000, I&H CPAs would need to offer an annual salary of $______________ for me to be indifferent to the offers.

The salary you filled in should make the sentence above logically consistent with the following statements:

(1) If I&H CPAs offer this salary, I will not prefer one contract over the other.

(2) If I&H CPAs offer more than this salary, I will prefer employment with I&H CPAs.

(3) If I&H CPAs offer less than this salary, I will prefer employment with GMM Corp.
Post-Experimental Questionnaire

Suppose you were hired as an assistant auditor by I&H CPAs. Estimate your abilities relative to those of the other assistant auditors at I&H CPAs. Indicate your response by marking an "x" on the scale below. Marking "x" at 60% indicates that your abilities are better than 60% of the assistants.

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

My abilities are the worst

My abilities are the best
This set of questions asks you to state information related to your accounting course grades. It is extremely important that you answer each question as honestly and accurately as possible. All of your responses will be completely confidential.

If you are unsure of an answer, make your best guess. If you have not completed a particular course (e.g., this semester's course(s)), leave the question blank.

**Accounting 229--Intro. to Financial Accounting**

(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.

   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).

   Knowledge Grade ______ (on a 4.00 scale)

**Accounting 230--Intro. to Managerial Accounting**

(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.

   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).

   Knowledge Grade ______ (on a 4.00 scale)
Accounting 315--Accounting in Corporate Environment
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______ (on a 4.00 scale)

Accounting 327--Intermediate Accounting I
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______ (on a 4.00 scale)

Accounting 328--Intermediate Accounting II
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______ (on a 4.00 scale)
Accounting 329--Cost Accounting
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______ (on a 4.00 scale)

Accounting 401--Advanced Accounting
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______ (on a 4.00 scale)

Accounting 405--Income Tax
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______ (on a 4.00 scale)
Accounting 407--Auditing
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______ (on a 4.00 scale)

Accounting 425--Corporate Tax Planning
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______ (on a 4.00 scale)

Accounting 427--Accounting & Financial Information Systems
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______ (on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______ (on a 4.00 scale)
Accounting 435--Contemporary Problems in Accounting
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.

Course Grade _______(on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).

Knowledge Grade _______(on a 4.00 scale)

Accounting 440--Accounting Theory
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.

Course Grade _______(on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).

Knowledge Grade _______(on a 4.00 scale)

Accounting 484--Accounting Internship
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.

Course Grade _______(on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).

Knowledge Grade _______(on a 4.00 scale)
Accounting 489--International Accounting
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______(on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______(on a 4.00 scale)

Accounting--Other
(1) Indicate the school in which you completed the course.
   a. Texas A&M University
   b. Other

(2) Indicate the grade you received for the course in the space provided below.
   Course Grade ______(on a 4.00 scale)

(3) Indicate the grade you feel most accurately reflects your knowledge of the course material (answer may differ from question #2).
   Knowledge Grade ______(on a 4.00 scale)
APPENDIX C: TABLES
Table 1

Expected Values of Payment Scheme B by Treatment and Beginning Score
Where: $W = $1.50, $L = $.1.25, $Z = $.75

<table>
<thead>
<tr>
<th>No Disclosure</th>
<th>High Error</th>
<th>Low Error</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beg Score</td>
<td>Expected Value</td>
</tr>
<tr>
<td>100</td>
<td>0.9811</td>
<td></td>
</tr>
<tr>
<td>140</td>
<td>1.0517</td>
<td></td>
</tr>
<tr>
<td>165</td>
<td>1.1103</td>
<td></td>
</tr>
<tr>
<td>Ave.</td>
<td>1.0477</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disclosure</th>
<th>Beg Score</th>
<th>Expected Value</th>
<th>Beg Score</th>
<th>Expected Value</th>
<th>Beg Score</th>
<th>Expected Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0.8929</td>
<td></td>
<td>100</td>
<td>0.7679</td>
<td>100</td>
<td>0.8304</td>
</tr>
<tr>
<td>140</td>
<td>1.0059</td>
<td></td>
<td>140</td>
<td>0.8967</td>
<td>140</td>
<td>0.9513</td>
</tr>
<tr>
<td>165</td>
<td>1.0869</td>
<td></td>
<td>165</td>
<td>1.0134</td>
<td>165</td>
<td>1.0502</td>
</tr>
<tr>
<td>Ave.</td>
<td>.9952</td>
<td></td>
<td>Ave.</td>
<td>0.8927</td>
<td>Ave.</td>
<td>0.9440</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Beg Score</th>
<th>Expected Value</th>
<th>Beg Score</th>
<th>Expected Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>0.9370</td>
<td>100</td>
<td>0.8475</td>
</tr>
<tr>
<td>140</td>
<td>1.0288</td>
<td>140</td>
<td>0.9400</td>
</tr>
<tr>
<td>165</td>
<td>1.0986</td>
<td>165</td>
<td>1.0351</td>
</tr>
<tr>
<td>Ave.</td>
<td>1.0215</td>
<td>Ave.</td>
<td>0.9409</td>
</tr>
</tbody>
</table>
Table 2

Descriptive Data on the Payment Scheme B
Selections by Treatment and Subject Beginning Score
n = 48 per cell

<table>
<thead>
<tr>
<th>High Error</th>
<th>Low Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beg Payment</td>
<td>Beg Payment</td>
</tr>
<tr>
<td>Score Scheme</td>
<td>Score Scheme</td>
</tr>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>No Disclosure</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td>Disclosure</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>140</td>
</tr>
<tr>
<td></td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>Total</td>
</tr>
</tbody>
</table>
Table 3
Comparison of Payment Scheme Selections
Between High Error and
Low Error Treatments

<table>
<thead>
<tr>
<th>Beg. Score</th>
<th># of Obs.</th>
<th>High Error**</th>
<th>Low Error***</th>
<th>Significance</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>32</td>
<td>16</td>
<td>2</td>
<td></td>
<td>.020</td>
</tr>
<tr>
<td>140</td>
<td>32</td>
<td>15</td>
<td>7</td>
<td></td>
<td>.067</td>
</tr>
<tr>
<td>165</td>
<td>32</td>
<td>7</td>
<td>4</td>
<td></td>
<td>.275</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>32</td>
<td>13</td>
<td></td>
<td>.004</td>
</tr>
</tbody>
</table>

** Numbers indicate the times subjects in the High Error treatments selected Payment Scheme B when the subjects in the Low Error treatments selected Payment Scheme A.

*** Numbers indicate the times subjects in the Low Error treatments selected Payment Scheme B when the subjects in the High Error treatments selected Payment Scheme A.
Table 4

Comparison of Payment Scheme Selections Between No Disclosure and Disclosure Treatments

<table>
<thead>
<tr>
<th>Beg. Score</th>
<th># of Obs.</th>
<th>No Disclosure**</th>
<th>Disclosure***</th>
<th>Significance Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>32</td>
<td>9</td>
<td>3</td>
<td>.073</td>
</tr>
<tr>
<td>140</td>
<td>32</td>
<td>9</td>
<td>9</td>
<td>.500</td>
</tr>
<tr>
<td>165</td>
<td>32</td>
<td>8</td>
<td>5</td>
<td>.291</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>26</td>
<td>17</td>
<td>.111</td>
</tr>
</tbody>
</table>

** Numbers indicate the times subjects in the No Disclosure treatments selected Payment Scheme B when the subjects in the Disclosure treatments selected Payment Scheme A.

*** Numbers indicate the times subjects in the Disclosure treatments selected Payment Scheme B when the subjects in the No Disclosure treatments selected Payment Scheme A.
Table 5

Descriptive Data on Indifference Salaries and Skill Ratings by Treatment

<table>
<thead>
<tr>
<th></th>
<th>High Error</th>
<th>Low Error</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 29</td>
<td>n = 28</td>
<td>n = 57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salary:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>20,000</td>
<td>18,000</td>
<td>28,039</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>35,000</td>
<td>45,000</td>
<td>29,317</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ave</td>
<td>27,534</td>
<td>28,561</td>
<td>29,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skill rating:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>30</td>
<td>20</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>95</td>
<td>93</td>
<td>66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ave</td>
<td>73</td>
<td>70</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 21</td>
<td>n = 21</td>
<td>n = 42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salary:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>18,000</td>
<td>20,000</td>
<td>28,749</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>45,000</td>
<td>40,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ave</td>
<td>29,633</td>
<td>29,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skill rating:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min</td>
<td>20</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max</td>
<td>93</td>
<td>90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ave</td>
<td>68</td>
<td>66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>n = 50</td>
<td>n = 49</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ave Salary</td>
<td>28,416</td>
<td>28,749</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ave Skill</td>
<td>71</td>
<td>68</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 6

Descriptive Data on
Indifference Salary Averages of
High-Skill and Low-Skill Subjects by Treatment
n = 99

<table>
<thead>
<tr>
<th>No Disclosure</th>
<th>High Error</th>
<th>Low Error</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-skill</td>
<td>n = 12</td>
<td>n = 14</td>
<td>n = 26</td>
</tr>
<tr>
<td>E(s) = $28,583</td>
<td>E(s) = $30,264</td>
<td>E(s) = $29,488</td>
<td></td>
</tr>
<tr>
<td>High-skill</td>
<td>n = 17</td>
<td>n = 14</td>
<td>n = 26</td>
</tr>
<tr>
<td>E(s) = $26,794</td>
<td>E(s) = $26,857</td>
<td>E(s) = $26,823</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>n = 29</td>
<td>n = 28</td>
<td>n = 57</td>
</tr>
<tr>
<td>E(s) = $27,534</td>
<td>E(s) = $28,561</td>
<td>E(s) = $28,039</td>
<td></td>
</tr>
<tr>
<td>Disclosure</td>
<td>Low-skill</td>
<td>Low-skill</td>
<td>Low-skill</td>
</tr>
<tr>
<td>Low-skill</td>
<td>n = 12</td>
<td>n = 12</td>
<td>n = 24</td>
</tr>
<tr>
<td>E(s) = $28,442</td>
<td>E(s) = $30,792</td>
<td>E(s) = $30,619</td>
<td></td>
</tr>
<tr>
<td>High-skill</td>
<td>n = 9</td>
<td>n = 9</td>
<td>n = 18</td>
</tr>
<tr>
<td>E(s) = $31,222</td>
<td>E(s) = $26,611</td>
<td>E(s) = $28,917</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>n = 21</td>
<td>n = 21</td>
<td>n = 42</td>
</tr>
<tr>
<td>E(s) = $29,633</td>
<td>E(s) = $29,000</td>
<td>E(s) = $29,317</td>
<td></td>
</tr>
</tbody>
</table>

Where: E(s) = average indifference salary.
Table 7

Descriptive Data on Indifference Salary Averages of Extreme High-Skill and Low-Skill Subjects by Treatment

\[ n = 65 \]

<table>
<thead>
<tr>
<th></th>
<th>No Disclosure</th>
<th>Low Error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Error</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-skill</td>
<td>n = 8</td>
<td>n = 11</td>
</tr>
<tr>
<td></td>
<td>E(s) = $27,250</td>
<td>E(s) = $31,109</td>
</tr>
<tr>
<td>High-skill</td>
<td>n = 10</td>
<td>n = 6</td>
</tr>
<tr>
<td></td>
<td>E(s) = $26,200</td>
<td>E(s) = $24,167</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>n = 18</td>
<td>n = 17</td>
</tr>
<tr>
<td></td>
<td>E(s) = $26,667</td>
<td>E(s) = $28,659</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Disclosure</th>
<th>Low Error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High Error</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low-skill</td>
<td>n = 9</td>
<td>n = 9</td>
</tr>
<tr>
<td></td>
<td>E(s) = $26,256</td>
<td>E(s) = $31,389</td>
</tr>
<tr>
<td>High-skill</td>
<td>n = 7</td>
<td>n = 5</td>
</tr>
<tr>
<td></td>
<td>E(s) = $32,929</td>
<td>E(s) = $27,200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>n = 16</td>
<td>n = 14</td>
</tr>
<tr>
<td></td>
<td>E(s) = $29,175</td>
<td>E(s) = $29,893</td>
</tr>
</tbody>
</table>

Where: \( E(s) \) = average indifference salary.
Table 8

Analysis of Variance
Relationship of Indifference Salary to Performance Measurement Error, Disclosure Policy, and Skill
n = 99

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares (in 000s)</th>
<th>DF</th>
<th>Mean Square (in 000s)</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>220,022</td>
<td>1</td>
<td>220,022</td>
<td>7.420</td>
<td>.008</td>
</tr>
<tr>
<td>Measurement Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disclosure Policy</td>
<td>54,200</td>
<td>1</td>
<td>54,200</td>
<td>1.828</td>
<td>.180</td>
</tr>
<tr>
<td>Skill</td>
<td>28,111</td>
<td>1</td>
<td>228,111</td>
<td>0.948</td>
<td>.333</td>
</tr>
<tr>
<td>Interactions:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x Skill</td>
<td>233,201</td>
<td>1</td>
<td>233,201</td>
<td>7.864</td>
<td>.006</td>
</tr>
<tr>
<td>Disclosure Policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x Skill</td>
<td>83,083</td>
<td>1</td>
<td>83,083</td>
<td>2.802</td>
<td>.098</td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x Disclosure Policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>x Skill</td>
<td>33,769</td>
<td>1</td>
<td>33,769</td>
<td>1.139</td>
<td>.289</td>
</tr>
</tbody>
</table>

R squared = .131
### Table 9

Analysis of Variance
Relationship of Indifference Salary to Performance Measurement Error, Disclosure Policy, and Skill

n = 65

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares (in 000s)</th>
<th>DF</th>
<th>Mean Square (in 000s)</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main effects:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>248,565</td>
<td>1</td>
<td>248,565</td>
<td>8.583</td>
<td>.005</td>
</tr>
<tr>
<td>Measurement Error</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disclosure Policy</td>
<td>64,266</td>
<td>1</td>
<td>64,266</td>
<td>2.219</td>
<td>.142</td>
</tr>
<tr>
<td>Skill</td>
<td>20,255</td>
<td>1</td>
<td>20,255</td>
<td>0.699</td>
<td>.406</td>
</tr>
<tr>
<td><strong>Interactions:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Error</td>
<td>x Skill</td>
<td>224,420</td>
<td>1</td>
<td>224,420</td>
<td>7.749</td>
</tr>
<tr>
<td>Disclosure Policy</td>
<td>x Skill</td>
<td>113,471</td>
<td>1</td>
<td>113,471</td>
<td>3.918</td>
</tr>
<tr>
<td>Performance</td>
<td>x Disclosure Policy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Error</td>
<td>x Skill</td>
<td>12,689</td>
<td>1</td>
<td>12,689</td>
<td>0.438</td>
</tr>
</tbody>
</table>

R squared = .216
Table 10

Analysis of Variance
High-Skill Subjects' Relationship
of Indifference Salary to Performance
Measurement Error, Disclosure Policy
n = 28

<table>
<thead>
<tr>
<th>Source of Variation (in 000s)</th>
<th>DF</th>
<th>Source of Variation (in 000s)</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Error</td>
<td>98,843</td>
<td>1</td>
<td>98,843</td>
<td>3.191</td>
</tr>
<tr>
<td>Disclosure Policy</td>
<td>156,343</td>
<td>1</td>
<td>156,343</td>
<td>5.047</td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Error x Disclosure Policy</td>
<td>22,402</td>
<td>1</td>
<td>22,402</td>
<td>0.723</td>
</tr>
</tbody>
</table>

R squared = .281
Table 11

Analysis of Variance
Low-Skill Subjects' Relationship of Indifference Salary to Performance Measurement Error, Disclosure Policy
n = 37

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares (in 000s)</th>
<th>DF</th>
<th>Mean Square (in 000s)</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Error</td>
<td>184,565</td>
<td>1</td>
<td>184,565</td>
<td>6.927</td>
<td>.013</td>
</tr>
<tr>
<td>Disclosure Policy</td>
<td>1,165</td>
<td>1</td>
<td>1,165</td>
<td>0.044</td>
<td>.836</td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement Error</td>
<td>x Disclosure Policy</td>
<td>3,706</td>
<td>3,706</td>
<td>0.139</td>
<td>.712</td>
</tr>
</tbody>
</table>

R squared = .179
Table 12

Regression of Skill Rating on Grade Point Average
n = 99

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t</th>
<th>p (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>29.662</td>
<td>8.804</td>
<td>3.369</td>
<td>0.001</td>
</tr>
<tr>
<td>Average Grade</td>
<td>12.477</td>
<td>2.713</td>
<td>4.599</td>
<td>0.000</td>
</tr>
</tbody>
</table>

R squared = .17
REFERENCES


116
