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ACADEMY OF ACCOUNTING AND FINANCIAL STUDIES JOURNAL

CONTENTS

LETTER FROM THE EDITORS

Welcome to the *Academy of Accounting and Financial Studies Journal,* an official journal of the Allied Academies, Inc., a non profit association of scholars whose purpose is to encourage and support the advancement and exchange of knowledge, understanding and teaching throughout the world. The *AAFSJ* is a principal vehicle for achieving the objectives of the organization. The editorial mission of this journal is to publish empirical and theoretical manuscripts which advance the disciplines of accounting and finance.

Dr. Janet Dye, University of Alaska Southeast, is the Accountancy Editor and Dr. Denise Woodbury, Weber State University, is the Finance Editor. Their joint mission has been to make the *AAFSJ* better known and more widely read.

As has been the case with the previous issues of the *AAFSJ*, the articles contained in this volume have been double blind refereed. The acceptance rate for manuscripts in this issue, 25%, conforms to our editorial policies.

The Editors work to foster a supportive, mentoring effort on the part of the referees which will result in encouraging and supporting writers. They will continue to welcome different viewpoints because in differences we find learning; in differences we develop understanding; in differences we gain knowledge and in differences we develop the discipline into a more comprehensive, less esoteric, and dynamic metier.

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MANUSCRIPTS

MANAGEMENT FRAUD AND STOCK PRICE PERFORMANCE

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ABSTRACT

Corporate scandals as measured by accounting irregularities and other misdealings by management have been pervasive in recent years. Such irregularities, however, are not new. We collect a sample of companies that have been the subject of an Securities and Exchange Commission enforcement release and investigate wether the stocks of these companies are long-term good investments. Specifically, we examine the three year period after the enforcement release and find that our sample has a much lower survival rate than an industry-matched group of firms. Further, in the one year period subsequent to the enforcement release, our sample of firms experience negative returns. Interestingly, however, our group of matched firms perform (statistically) as poorly as the "fraud" firms in the year after the enforcement release. This is consistent with contagion effects in industries where one firm is accused of fraudulent activities.

INTRODUCTION

Recent corporate scandals at companies such as Enron, WorldCom, and Tyco (among others) have brought to light the potentially devastating impact of management misbehavior on shareholder wealth. Although these recent scandals have increased the focus on accounting irregularities and improper actions by management, instances of corporate improprieties have a long history. In general shareholders have suffered upon the revelation of these improprieties. Nourayi (1994) and Feroz, et al. (1991) find significant average abnormal returns of 13% to 33% upon announcements of SEC enforcement actions involving potential management misdealings.

While it is generally accepted that illegal and/or improper corporate actions result in immediate losses to shareholders, the long-term impact on shareholder wealth remains unclear. Debondt and Thaler (1985), Brown, et al. (1988), Atkins and Dyl (1990), Bremer and Sweeny (1990), Akbigbe, et al. (1998) and Li (1998) all find evidence that market participants overreact to negative news announcements and confirm subsequent short-term price reversals to account for these overreactions. Investors are likely to overreact to management fraud as well. Indications of management fraud, however, typically lead to greater uncertainty for investors over a longer horizon than the shorter-term reversals found by Debondt and Thaler (1985) and others. Thus, we examine

a longer time period in order to determine whether the short-term reaction to revelations of corporate fraud are the result of an overreaction to negative information by market participants. If investors systematically overreact to revelations of management fraud in the short-term, stocks of these companies may generate longer-term excess returns.

In particular, we examine the long-term buy and hold returns of companies that are the subject of an SEC enforcement release. We focus on the Securities Exchange Commission Act of 1934 section 10(b) enforcements, which are indicative of management fraud. If investors overreact as in DeBondt and Thaler (1985), purchasing the stock of a company which is being subjected to an SEC investigation could generate excess returns. On the other hand, if markets are indeed weak form efficient, such "purchasing opportunities" are unlikely to generate superior returns.

DATA AND METHODOLOGY

For our study we require a sample of companies with known fraudulent financial statements. The Securities Acts of 1933 and 1934 were passed with two main objectives: (1) to provide investors with material financial and other information concerning securities offered for public sale, and (2) to prohibit misrepresentation, deceit, and other fraudulent acts and practices. Because the government delegates enforcement powers concerning management fraud to the SEC, we use the SEC enforcement releases to collect our sample of companies with fraudulent financial statements.

An issue with our use of SEC enforcement releases is the assumption of the guilt of the companies in the SEC enforcement. These assumptions may not be entirely true. Since the details of discussions between the companies and the SEC are unavailable, the company may view conceding as the path of least cost. This raises questions regarding the validity of considering these companies' financial statements as fraudulent. However, from inspection of the enforcement releases and the background on how the SEC pursues litigation, we feel assuming that the companies issued fraudulent financial statements is reasonable.

The SEC enforces cases of fraudulent financial statements through section 10(b) and rule 10b-5 of the Securities act of 1934. Section 10(b) and rule 10b-5 makes it unlawful for any person to "use or employ" a "manipulative or deceptive device or contrivance" in connection with publicly traded securities. While cases involving 10(b) usually involve management fraud, not all cases mentioning 10(b) involve fraudulent financial statements. Several SEC enforcement releases are public announcements and do not involve a financial statement. We exclude these companies from our sample. Because the SEC enforcement releases have no consistent pattern for denoting fraudulent financial statements we use two additional criteria besides the explicit mention of 10(b). These two criteria are the statements of violating the anti-fraud provisions or falsifying the accounting records. We include in our final sample only those firms that have stock price information on Research Insight (Compustat) for at least one month after the month in which the enforcement action is released. Also, the enforcement release must follow the fraudulent statements

by no more than six accounting cycles. The choice of six is arbitrary. The longest lag we identify is 11 accounting cyles, the shortest one accounting cycle, and the median is 4.5 accounting cycles. These criteria result in a sample of 33 firms with an SEC release.

In order to determine the relative performance of these companies, we also collect a matched sample of firms that do not have an enforcement action during the same period. Using matched firms reduces the need to adjust for risk, time varying returns and other factors. We match companies based on the 4-digit standard industrial classification (SIC) code and annual sales revenue from Research Insight. As a check, we compare the SIC codes in Research Insight with the companies' individual 10-Ks and Moody's industry summaries to detect any noticeable discrepancies. Table 1 contains a breakdown by SIC code for the firms with fraudulent statements. As shown, the largest number (58%) of the sample are from the 3000 SIC code grouping (Manufacturing). We suspect that this clustering presents no problem in our analysis given the matching procedure we use in our subsequent statistical tests.

Table 1: Sample by Industry Classification

SIC Code Range	Number
1000-1999	1
2000-2999	7
3000-3999	19
4000-4999	1
5000-5999	2
7000-7999	2
8000-8999	1

To assess the performance of the ER firms, we calculate the geometric mean holding period return for the period that begins at the end of the month two months before the enforcement release and ends at the end of the month after the release. We also calculate the one-year geometric mean holding period return beginning at the end of the month of the enforcement release. That is, to calculate the one year holding period return (HPR) for each firm we first add one to each firm's monthly return and then multiply each of these sums. Finally, we subtract one from this product in order to achieve an annualized return. For the HPR surrounding the enforcement release, we use the three month HPR.

As in Barber and Lyon (1997), we also calculate the abnormal holding period return (AHPR) to determine the relative performance of the ER firms. We calculate AHPR by computing the HPR (as described above) for the sample firm and the HPR for its matched firm then subtracting the HPR of the matched firm from the HPR of the sample firm. We then calculate t-statistics to determine whether the average HPR or AHPR for our sample differs statistically from zero. The t-statistic is calculated by taking the sample average HPR (or AHPR) and dividing by a standard error. The standard error is defined as the cross-sectional standard deviation of returns divided by the square root of the sample size.

RESULTS

Not all of the firms in our sample remain as on-going concerns for the sample period. To determine the propensity for ER firms to be delisted from the exchanges on which they trade, we examine the three year period subsequent to the enforcement release. In Table 2, we present the number of ER firms and matched firms (and percentage of the initial sample size) that remain over the three years after the enforcement action is announced. Of the ER firms in the sample, only two-thirds (22) remain after three years. In fact, eight (24%) of the ER firms are delisted within one year of the SEC announcement. By contrast, only one of the matched firms is delisted in this three-year window. At a minimum, this may indicate that investing in ER firms poses a greater risk than investing in similar firms without enforcement releases.

Table 2: Survival Rate of Fraudulent and Matched Firms

Year	Remaining ER Firms	Percentage	Remaining Matched Firms	Percentage
0	33	100%	33	100%
1	25	76	33	100
2	24	73	32	97
3	22	67	32	97

In order to determine the underlying cause for the delisting, we examine delisting codes from the Center for Research in Securities Prices (CRSP) database and search the Lexis-Nexis newswire data service for reports about these companies. We report the results of this analysis in Table 3. As shown, two of the eleven delisted firms (18%) are acquired or merged into other companies. Three firms (27%) become insufficiently capitalized and are removed by the exchange. Insufficient capitalization and subsequent delisting generally portends bankruptcy or liquidation. In the best

case, shareholders suffer a loss in the liquidity of their shares if those shares are delisted from an exchange. Two firms fail to register with the exchange or file timely financial statements. Similar to the insufficient capitalization problem, this would be indicative of a diminished capacity for the company to continue operations. The remaining four firms are delisted for unknown reasons. The one delisted matched firm experienced a merger. Thus, given the reasons for delisting, it does appear that investing in ER firms is relatively risky.

Table 3: Reasons for Delisting using CRSP Code Identifiers

Reason	ER Firms	% of Delisted ER Firms	Matched Firms	% of Delisted Matched Firms
Merger/Acq	2	18	1	100
Insuff. Capital	3	27	-	-
No Registration	2	18	-	-
Unknown	4	36	-	-
Totals	11	100	1	100

Next, we examine whether the announcement of an SEC enforcement action generates an overreaction on the part of investors, and, therefore, results in longer-term excess returns for investors who purchase the stock after the enforcement release. We first determine the return in the three month window surrounding the release. Although we are not examining the announcement effect per se, we do expect this return to be consistent with the findings of Nourayi (1994) and Feroz, et al. (1991). That is, we expect a negative average return over this period. We next examine whether the post-release performance of the ER firms differs statistically from a benchmark return.

Interestingly, neither the HPR nor AHPR for this time period are statistically distinguishable from zero. Although the average HPR is of the expected sign at -1.21%, the t-statistic of -0.593 is far from any conventional significance level. The average AHPR, which is the more relevant measure of return, is -0.06% with a t-statistic of -0.027. These unexpected findings may result from two sources. First, the three month window may be too long to adequately isolate negative market reactions at the SEC announcement. Second, given our matching procedure, which involves choosing similar companies with the same 4-digit SIC code, the matched firms may experience a contagion reaction. Such reaction still leaves unexplained the lack of significance of the raw HPRs. We leave the exploration of this to future research.

Table 4: Returns for Firms with an SEC Enforcement Release		
Variable	Average	t-test
3-month HPR	-1.21%	-0.593
3-month AHPR	-0.06%	-0.027
1-year HPR	-2.62%	-2.078*
1-year AHPR	-2.06%	-1.311
Notes: *Significant at the 5% level.		

The average HPR over the year beginning after the enforcement release for this sample is -2.62%. The t-statistic of -2.078 is statistically significant at the 5% level. Although the average AHPR for our sample is negative (-2.06%), this return is not statistically different from zero (with a t-statistic of -1.311). Thus, it appears that ER firms experience returns that are, on average, no different from their matched counterparts. Given the negative returns overall, it appears that the stocks of firms that are the subject of an SEC enforcement release represent bad investments over the year subsequent to the ER. Because of the negative return, investors may be able to profit by engaging in the short selling of these securities post-ER announcement.

More interesting, however, is the "bad" performance of the matched firms. The matched firms have an actual average return of approximately 0.6% for the year subsequent to the enforcement release. Thus, an ER may provide investors with two distinct investment guidelines. First, short (or avoid) the common stock of companies that are the subject of an SEC ER. Second, avoid stocks of similar companies within the same (4-digit SIC) industry grouping, as these firms seem to suffer from guilt by association in the year following an ER on a company in the industry.

SUMMARY AND CONCLUSIONS

We examine the short-term and long-term performance of a sample of firms that are accused of fraud by the SEC relative to a sample of matched firms. First, we find that the survival rate of fraudulent firms is much lower than for the matched firms over the three year period subsequent to an SEC enforcement release. Second, our results indicate that firms for which an enforcement release is issued (ER firms) have, on average, a -2.6% return in the year subsequent to the enforcement release. Third, we find that our sample of firms accused of fraud by the SEC have statistically similar returns to a group of matched firms during a three month window surrounding the announcement or for the year subsequent to the enforcement release. The lack of a differential return between the ER firms and the matched firms during this period of time may result from contagion effects. Finally, we find that the returns of our "fraud" sample stocks, on average, are no

different than the return on the matched firm stocks for the year subsequent to the enforcement release.

Collectively, these results indicate that investors do not profit typically from purchasing the stock of firms that are the subject of an SEC enforcement release. Further, there appear to be long-term industry "fall-out" effects from these announcements. Thus, our results provide two guidelines for investors. First, avoiding stocks of companies that are the subject of SEC enforcement releases (or possibly shorting these stocks) may be prudent and result in overall higher portfolio returns. Second, avoiding the stocks of companies similar to the those of companies that are the subject of an SEC enforcement release (where similarity is determined by the 4-digit SIC code and level of sales) would likely benefit investors given the relatively poor performance of these stocks in the one year period subsequent to the enforcement release of our sample firms.

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THE RELATIONSHIP BETWEEN THE EXISTENCE OF ANTITAKEOVER DEVICES AND CORPORATE SOCIAL PERFORMANCE

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ABSTRACT

Based on stakeholder theory, this paper presents a study that investigates the firm-stakeholder relationship. The study is undertaken as an interdisciplinary approach drawing on the finance, management, and accounting literature to build a theoretical platform from which we derive testable hypotheses of linkage between antitakeover devices and measures of corporate social performance. The findings indicate that firms that meet the demands of their stakeholders employ shareholder approved antitakeover devices. Furthermore, the results support the proposition that firms, which adopt poison pills, are not meeting the demands of their stakeholders. Firms with poison pills were found to have lower Corporate Social Performance scores than firms without poison pills.

INTRODUCTION

Recent events relating to the collapse of Enron and Arthur Anderson leave many individuals questioning the effectiveness of modern corporate governance. This study examines one corporate governance mechanism, the antitakeover device and its relationship to corporate social performance.

Why shareholders approve antitakeover devices is somewhat of a mystery to both researchers and practitioners. Jensen and Ruback (1983) provide evidence that takeovers can be profitable for the shareholder. They report abnormal stockholder returns of twenty to thirty percent for firms that are targets of successful mergers and tender offers. Yet, managers propose and shareholders continue to approve devices that help to prevent a firm from being taken over, presumably depriving themselves of the returns associated with takeovers. Hence, shareholders must be approving some types of antitakeover devices because they provide other benefits.

Using stakeholder theory, this study investigates the adoption of antitakeover devices from a firm-stakeholder perspective. Stakeholder theory asserts that managers must meet the demands of

multiple stakeholder groups such as shareholders, consumers, employees, and community to remain competitive or to achieve a competitive advantage. One way to evaluate whether a firm is meeting stakeholder demands is to use a broad-based corporate social performance (CSP) measure (Clarkson, 1995; Ruf *et al*. 2001; Wartick and Cochran, 1985; Wood, 1991a, 1991b). Companies with good CSP are those that are meeting the demands of their stakeholders. Such firms can receive a competitive advantage because of relationships with their stakeholders that are based on trust and cooperation, with resulting future reductions in contracting costs (Jones 1995).

While trust between the firm and its stakeholders can reduce contracting costs, opportunistic behavior by managers can increase contracting costs. Prior research on the adoption of antitakeover devices has investigated opportunism and trust based on two competing hypotheses: the shareholder interest hypothesis or the management entrenchment hypothesis. Shareholder interest assumes trust between current shareholders and existing management. For example, shareholders pass antitakeover devices believing that management will use this protection to benefit the firm's shareholders. The management entrenchment hypothesis assumes opportunistic behavior from the firm's management. Examples include managers proposing and supporting antitakeover devices to protect their own jobs in the case of a takeover.

Prior research studies, for the most part, have investigated these competing hypotheses by examining the stock market reaction to the announcement of a specific type of antitakeover device. Positive market reactions have been associated with the adoption of antitakeover devices believed to protect efficient management, such as fair-price amendments and non-financial-effects amendments. Negative market reactions result when firms adopt antitakeover devices that protect inefficient management, specifically, poison pills. Assuming shareholders adopt antitakeover devices to protect managers who are promoting firm efficiency, it is expected that managers of these firms will be also be practicing good stakeholder management and hence receive higher ratings of corporate social responsibility.

The remainder of this paper is organized as follows: The next section presents the theoretical model for examining the firm-stakeholder relationship and the specific hypotheses being investigated. The methodology used in the study is presented in the third section, followed by the results and conclusions.

THEORETICAL BACKGROUND

Freeman (1984) extends the neo-classical view of the firm and suggests that firms increase shareholders' wealth by responding to demands of multiple stakeholders, as well as other market stimuli. While, in the past, shareholders have been considered the most important stakeholder group, stakeholder theory states that firms must meet the needs and interests of other stakeholder groups such as customers, employees, and community to accrue financial benefits for stockholders

(Clarkson, 1995). Lerner and Fryxell's (1994) study supports this assertion by finding that managers may assume a stakeholder perspective without diminishing stockholder objectives. Ruf *et al*. (2001) provide further evidence that shareholders of firms meeting the demands of a broad group of stakeholders receive a larger return than do shareholders of those firms not meeting the demands. Jones (1995) asserts that the focus of instrumental stakeholder theory is the contract, i.e. the relationship between the firm and its stakeholders. Based on agency theory, he argues that by firms can minimize contracting costs by developing mutual trust and cooperation with their stakeholders. Efficient contracting can be accomplished by minimizing 1) the monitoring costs that result from the principal checking on the agent, 2) the bonding costs incurred to guarantee that the agent's actions do not have negative consequences for the principal, and 3) a residual loss which results from monitoring and bonding when agents behavior and principals interest are not fully aligned (Jensen & Meckling, 1976). By meeting stakeholders' demands, as indicated by high CSP ratings, firms develop good standing with their stakeholders and hence are able to minimize contracting costs, thereby achieving efficiency.

Firms have implicit and explicit contracts with various constituents (Freeman, 1984). Explicit contracts, such as those with suppliers, reflect specific terms of trade. With explicit contracts, managers have few options in meeting the terms of these contracts. Managers have much more discretion in satisfying implicit contracts. Minimizing contracting costs are particularly important with implicit contracts. A firm's reputation for fulfilling implicit contracts will determine how well the manager can negotiate explicit terms of trade (Bowen *et al*., 1995 and Cornell and Shapiro, 1987). Given that managers must choose among the many approaches for satisfying implicit contracts, performance with respect to fulfilling theses contracts may be a better measure of management's skill than actual performance in fulfilling explicit contracts.

Fulfilling implicit contracts includes establishing trust in relationships with customers, suppliers, and employees. For example, customers will be more likely to buy from a firm that has established a reputation for providing quality products in a timely manner. A firm can build a reputation with its suppliers by insistence on fair dealing with both suppliers and their competitors. Firms establish trust with their employees by being dedicated to meeting employees' needs and adhering to respect and dignity for all employees.

Benefits of satisfying implicit contracts include: negotiated favorable terms of trade, reduced litigation costs due to unsafe products or unreliable products, heading off labor dispute costs, and avoidance of environmental clean-up costs. CSP relates mainly to implicit contracts because CSP issues are based largely on stakeholder expectations. Management's ability to meet implicit contracts should therefore be reflected in a firm's CSP score.

Baysinger and Butler (1985) suggest that shareholders who have a majority interest in a firm are able to optimize utility by developing and maintaining an ongoing contractual relationship with existing management. Shareholder approved antitakeover devices represent explicit contracts between management and shareholders. For antitakeover devices to minimize contracting costs,

they must be approved by shareholders to protect managers who are performing well when meeting the terms of implicit contracts. Non-shareholder approved devices (poison pills) appear, from the literature, to protect inefficient managers. Protecting inefficient managers increases contracting costs.

Although a majority of firms on the NYSE/AMEX exchanges have adopted some form of antitakeover device, the selection and pattern of adoption varies among firms. Two factors believed to dictate the type and/or combination of devices adopted are individual firm characteristics and environmental conditions such as threat of an undesirable takeover. Firm characteristics, the factor of interest in this study, have been investigated based on two primary theories: the shareholder interest hypothesis and management entrenchment hypothesis. The shareholder interest hypothesis posits that managers pursue activities that protect and enhance the interests of shareholders (Grossman & Hart, 1980; Linn & McConnell, 1983). The management entrenchment hypothesis asserts that managers pursue activities that protect their own interest at shareholders expense (Cary, 1969 and Williamson, 1975).

When managers sponsor amendments that favor their own interests as opposed to stockholder interests, it is assumed they are attempting to protect their poor performance (Martin & McConnell, 1991). Studies have shown that managerial inefficiency increases when managers are protected by antitakeover devices (Bertrand and Mullinathan 1999, Garvey and Hanka 1999, and Gompers, Ishii and Metrick 2001). Inefficient managers fear takeover because of the risk of being replaced after a takeover. Replacement of inefficient managers and the efficient re-deployment of the firm's assets have been suggested as a principle motivation behind many takeovers (Pickens 1986). Walsh (1989) reported that top managers in firms that have been taken over are much more likely to be replaced than in firms not taken over. Arguments that antitakeover devices serve management interest are grounded in agency theory and rely on three propositions: 1) managers' interests diverge from owners' interest; 2) monitoring by stockholders is imperfect, permitting managers the ability to make decisions that benefit themselves at the expense of stockholders; 3) the market for corporate control limits managerial discretion (Meade and Brown, 1995). These propositions collectively describe an atmosphere where managers seek to enact antitakeover devices to protect themselves. Although managers generally initiate antitakeover corporate charter amendments, shareholders have to approve them, with the exception of poison pills.

Assuming shareholders are rational, it follows that they must be approving antitakeover devices to protect benefits that accrue or might accrue to owning the existing firm. We believe that shareholders adopt antitakeover devices for two basic reasons. First, shareholders in certain types of organizations adopt devices anticipating a premium if and when the firm becomes a takeover target. In this case, shareholders believe that antitakeover devices empower managers to bargain for the highest share price in the event of a takeover attempt. Second, shareholders in other types of firms adopt devices anticipating that the benefits associated with continued ownership exceed the premiums that may be derived from a takeover. Both reasons imply a trust between shareholders

and existing management. Furthermore, because antitakeover devices help to ensure continuing existence of the current entity, stakeholders, such as customers, employees, and community, also benefit from adoption of these devices.

When shareholders adopt antitakeover devices, they signal their belief that managers are efficient and hence need protection from a takeover. Harris (1994), for example, found that stronger managers head target firms than bidder firms, suggesting that good management needs to be protected. Shareholders may also approve antitakeover devices, with the expectation of receiving greater benefits in the future by deferring or preventing a takeover. Several studies provide support for shareholders protecting management in order to reap future financial gains. In a study by Ravenscraft (1991), highly profitable firms that were taken over were found to have a faster decline in profitability than highly profitable firms that were not taken over. Kane *et al*. (2000) found that firms with high levels of shareholder approved protection enjoyed a smoother earnings stream, were able to maintain relatively lower levels of cash, and used fewer sales dollars to service debt. They concluded that shareholders approve antitakeover devices to help ensure continued existence of a firm that is providing benefits to shareholders. Furthermore, adopting antitakeover devices may avoid financial losses for shareholders. Ikenberry and Lakonishok (1993) found negative abnormal returns associated with proxy contests.

For this study, we concentrate on three types of antitakeover devices: fair-price and non-financial effects corporate charter amendments, which are approved by shareholders, and non-shareholder approved poison pills. These devices were selected because they appear to provide a firm with strong protection from takeover and have been analyzed in prior studies. The fair-price amendment requires bidders to pay a "fair price" for all shares where fair price is often stated in terms of market price plus some premium, or some pre-determined multiple of the target firm's earnings per share. With most fair-price amendments, there is a clause that allows the amendments to be waived if the board of directors approves the merger or if a supermajority vote of the shareholders is accomplished. Typically, a supermajority vote constitutes 75 to 80 percent approval by the shareholders. DeAngelo and Rice (1983) and Linn and McConnell (1983) studied market reactions to announcements of a firm's intent to adopt fair-price amendments. Using monthly excess returns, Linn and McConnell report positive market reactions and conclude that fair-price amendments are in shareholders' interests. DeAngelo and Rice report neutral responses from tests of daily excess returns. They interpret the results as evidence, though weak, that fair-price amendments favor stockholder interests.

Non-financial effects amendments, also called stakeholder amendments, would seem to be one of the most powerful aids to thwarting a takeover. These devices give management the option of considering the interests of stakeholders other than stockholders when faced with a possible takeover of the firm. Managers may therefore block a takeover attempt if they believe the resulting merger would have negative consequences for the firm's employees, customers, suppliers, or the community where the firm operates. When testing market reactions to non-financial effects

antitakeover amendments, Meade *et al*. (1996) found positive market responses, concluding that stockholders approve of this type of antitakeover amendment.

Different types of antitakeover devices have been examined in various studies, but the strongest support for the management entrenchment hypothesis comes from studies analyzing market reactions to poison pill enactment. Poison pills, unlike the two devices discussed above, do not amend the corporate charter, thereby not requiring shareholder approval. Poison pills are stock rights and are approved by the board of directors. Pills force potential bidders to negotiate with a target's board of directors. If the board does not like the bid, they can take actions that make the firm an unattractive takeover target. In particular, Malatesta & Walkling (1988) and Ryngaert (1988) found negative market reactions to announcements of the enactment of these particular devices. Malatesta & Walkling (1988) also found that firms with poison pills had lower financial performance than firms without pills. They concluded that poison pills protect inefficient management.

Prior studies cited above reveal that the market approves the adoption of fair-price and non-financial effects amendments. Poison pills, contrarily, have not elicited the market's approval. There would seem to be "good devices", the amendments and "bad devices", the poison pills. In firms with good devices, shareholders have approved protection for managers who are successful in negotiating terms of trade effectively. It is expected that these firms would also have high CSP ratings. Because managers in firms with poison pills have sought protection from the takeover market without seeking shareholder approval and have been found to be inefficient (Malatesta and Walkling 1988), we would expect this set of firms to have lower CSP ratings. We would therefore expect the good devices to be positively related to measures of CSP and the bad devices to be negatively related.

HYPOTHESES DEVELOPMENT

We propose that stakeholder theory provides an explanation for the existence of some types of antitakeover devices. Donaldson and Preston (1995) argue that stakeholder theory is both instrumental and managerial and that it provides a framework for testing certain corporate behaviors, in this case, protection of efficient managers by adopting shareholder approved antitakeover devices. Stakeholder theory would seem to suggest that when managers practice good stakeholder management of implicit and explicit contracts and therefore achieve efficiency, stockholders would desire to preserve the corporate nexus from takeover and ensuing possible breakup of the firm or expulsion of present management teams.

As argued earlier, based on stakeholder theory, firms that meet the demands of a broad group of stakeholders (indicated by positive CSP ratings) are able to remain competitive or to achieve a competitive advantage. Ruf *et al*. (2001) demonstrate that shareholders financially benefit when a company has good CSP, implying that good CSP is related to efficient management. It is

expected then that firms with high CSP will have shareholder-approved antitakeover devices that protect efficient managers. More specifically, firms that adopt fair-price or non-financial-effects amendments will have higher CSP than firms that do not adopt these amendments. The first hypothesis is:

H_1: CSP will be higher for firms with shareholder-approved antitakeover amendments than for firms without either amendments or poison pills.

Although poison pills may protect a firm from a takeover, they are not shareholder-approved and hence have the potential to provide protection for inefficient management. Malatesta and Walkling's (1988) findings provide support for the argument that firms with poison pills are less efficient. If shareholders had wanted to shield the firm from a takeover, they would have passed one of the more powerful antitakeover devices themselves. Given that managers who promote poison pills can protect inefficient behavior, it would follow that they would also not be meeting the demands of other stakeholder groups. Hence, it is anticipated that firms with poison pills will have lower CSP than firms that do not have poison pills. Based on the above discussion the following hypotheses are tested:

H_2: CSP will be higher for firms without poison pills than for firms with poison pills.

Following the same argument put forth above, firms in which shareholders approve antitakeover devices that protect good management will meet the demands of a broad group of stakeholders more than firms that adopt antitakeover devices to protect inefficient management. Hence, it is also expected that firms with shareholder-approved devices, i.e. fair-price or non-financial effects amendments will have higher CSP than firms that have poison pills.

H_3: CSP will be higher for firms with shareholder-approved antitakeover amendments than for firms with poison pills.

METHODOLOGY

To evaluate whether companies are meeting the demands of their stakeholders, a corporate social performance (CSP) measure was developed based on a methodology proposed by Ruf *et al*. (1998). This approach develops a composite measure of CSP by 1) identifying the dimensions of CSP; 2) evaluating the firms' performance on these dimensions; 3) determining the relative importance of each dimension; and 4) synthesizing the results of relative importance and social

performance scores. For this study, five CSP issues were identified: community relations, employee relations, environment, product/liability, and concern for women/minorities. Although consensus on the totality of relevant CSP issues has not been reached, these five issues have been consistently identified in the literature for over twenty years. For examples, see the Research and Policy of the Committee for Economic Development (1971), American Institute of Certified Public Accountants (1977), Ernst and Ernst (1978), and studies by Rockness and Williams (1988), Harte *et al*. (1991 and Kurtz *et al*. (1992).

Evaluation of the five CSP dimensions, the second step, was obtained from the Kinder, Lydenberg, and Domini Corporation (KLD) social rating system. Since its inception in 1990, KLD has annually rated approximately 650 firms on the five dimensions of CSP cited above. Although other rating systems exist, the KLD ratings are considered "the best-researched and most comprehensive CSP measure currently available" (Wood and Jones, 1995: 239). Several advantages of KLD over other measures of CSP are: 1) KLD employs consistent criteria annually, 2) KLD uses the same research staff to evaluate companies within an industry, 3) Annually, KLD evaluates a large number of companies with respect to each dimension. Performance ratings for the five CSP dimensions are on a 5-point scale from -2 (major concern) to neutral to +2 (major strength).

To determine the relative importance of the five CSP issues, a survey was mailed to 400 financial executives. The financial executives were selected from the Financial Executive Institute mailing list. The response rate was thirty-two percent. Financial executives represent high level corporate management who are generally heavily involved with strategic planning and policy decision. Because strategic planning and policy decisions cover corporate social performance issues as well as merger and acquisition activities, this group of stakeholders was considered appropriate for the survey.

Relative importance of CSP dimensions is determined in the survey by using the principles of the Analytical Hierarchy Process, AHP (Saaty, 1980, 1986). The AHP provides a "fundamental scale of relative magnitudes expressed in dominance units in the form of paired comparisons" (Saaty, 1980). For each pair of social dimensions, the respondents were asked to indicate (a) their preference for a particular dimension, and (b) the strength of their preference using a scale of "equal importance" to "absolutely more important" using a scale of 1 to 9. (For further discussion on the procedures for deriving the weights see Ruf *et al*. (1998). The aggregation of the results of the questionnaire represents an overall measure of the relative importance of the dimensions for the entire group of respondents, with the aggregated weights assigned to each dimension of social performance. An independent evaluation of the firm's performance on each dimension is determined next, ranking the performance of a given company on each dimension of social performance. The product of the performance score on a given dimension and the weight of that dimension are then computed. The process is repeated for each dimension. Finally, the composite measure of CSP is computed as the sum of the products. Graves and Waddock (1994) also advocate and use this method of determining CSP.

The Investors Responsibility Research Center (IRRC) 1993 database provided information about the existence of antitakeover devices. For this study, we are interested in three powerful antitakeover devices: (1)fair-price and (2)non-financial effects corporate charter amendments, and (3)poison pills. A total of 387 firms met this study's information requirements, having both KLD CSP scores and either one of the devices of interest or no devices of any kind. For the test of Hypothesis One, total sample size was 99 firms. Of these 99, 60 firms had either a non-financial effects or a fair-price amendment, but no poison pill. Thirty nine firms had no device, either poison pill or amendment. Sample size for testing Hypothesis Two was 354 firms. Two hundred eighty firms had a poison pill or had a pill/amendment combination and 99 firms had either no pill or no device. For the test of hypothesis Three, the sample size totaled 173 firms, 60 had amendments but no poison pills and 113 had poison pills but no amendments.

Independent multiple regression models were used to test the hypotheses. Because firm size and industry affiliation are known to be related to CSP, these variables are controlled for in the analysis. The logarithm of size is used as a control variable in all hypotheses tested. Size is measured as market value of a firm's common stock and preferred stock plus the book value of its liabilities. Two-digit SIC code, the industry affiliation, was treated as a classification variable. The general regression model is as follows:

$$CSP_i = \beta o + \beta_{k-1} IND_{k-1} + \beta_k Size + \beta_{k+1} X_i + \epsilon_i$$

where

k	=	The number of industry categories.
IND_k	=	The industry group to which firm i belongs.
CSP	=	Corporate social performance.
Size	=	Measured by the logarithm of a firm's equity.
X	=	A dummy variable representing the various dichotomous existence of the antitakeover devices.

RESULTS

The results of the regression models are presented in Table 1. Hypothesis one proposes that firms with shareholder-approved devices will have higher CSP than firms with no devices, i.e. no amendments or poison pills. The results support the assertions that firms, which adopt shareholder-approved antitakeover amendments, have higher CSP than firms with no antitakeover devices. Hypothesis two and hypothesis three examine the relationships between CSP and the adoption of non-shareholder approved devices. Hypothesis two proposes that firms that do not have poison pills will have higher CSP than firms with poison pills. The regression results support

hypothesis two. Firms without poison pills had higher CSP than firms with poison pills. To test hypothesis three, we examined the relationship between CSP for firms with shareholder-approved charter amendments and firms with poison pills. The results reveal that CSP is significantly higher for firms with amendments than for firms with poison pills, supporting hypothesis three.

Table One: Multiple Regression Results of the Relationship Between CSP and Antitakeover Devices.

Hypothesis	Sample Size	Model Fp-value	Size p-value	Industry p-value	Dummy p-value
H_1	99	2.220	-. 003	na	.214
		.020	.911	.046	.015
H_2	354	4.970	-.056	na	.111
		.000	.000	.000	.022
H_3	173	4.830	.049	na	.167
		.000	.003	.000	.002

$CSP_i = \beta o + \beta_{k-1} IND_{k-1} + \beta_k Size + \beta_{k+1} X_i + \epsilon_i$
k = The number of industry categories.
IND_k = The industry group to which firm i belongs.
CSP = Corporate social performance.
Size = Measured by the logarithm of a firm's equity.
X = A dummy variable representing the various dichotomous conditions with respect to takeover protection stated in the hypotheses

CONCLUSIONS

Using stakeholder theory, the firm-stakeholder relationship is investigated by examining the relationship between enactment of antitakeover devices and firms' CSP scores. The findings provide evidence that managers, who meet the demands of a broad group of stakeholders, as indicated by CSP, are found in firms with shareholder-approved antitakeover devices. These devices have the ability to preserve the existence of the corporate nexus and to protect the interests of the firm's stakeholders. The findings provide empirical support for Jones contention that contracting costs are reduced when "corporate morality is reflected in the policies and decisions of the firm and in the nature of its direct dealings with corporate stakeholders" (1995, p.418).

As discussed earlier, trust and opportunism are important dimensions of the firm-stakeholder relationship. To examine trust and opportunism, we tested two hypotheses: shareholder interest and management entrenchment. The findings suggest that firms with shareholder-approved devices

perform higher on CSP than firms without such devices, supporting the shareholder interest hypothesis. This provides empirical evidence that shareholders adopting antitakeover devices are aware of management's efficient contracting with stakeholders and hence adopt these devices to protect efficient management. Further research is needed to examine whether improving the relationship between the firm and specific stakeholders groups reduces contracting costs and provides the firm with a competitive advantage. Furthermore, research on the financial impact of these contracts on stakeholders' wealth is also needed.

Support for the management entrenchment hypothesis was also found. Results indicate that firms with poison pills have lower CSP when compared with either firms without poison pills or with firms with shareholder-approved antitakeover amendments. Given that shareholders do not approve poison pills, these finding provide further support that adopting poison pills may protect inefficient managers, at the expense of other stakeholders.

In conclusion, the findings offer preliminary information regarding the firm-stakeholder relationship. Results are limited to the three types of antitakeover devices examined. Further research is needed on other types of antitakeover devices. More importantly, research is needed to explore how the relationships uncovered in this study relate to financial performance.

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MANAGEMENT TURNOVER AND MYOPIC DECISION-MAKING

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ABSTRACT

This paper provides an agency theory explanation for the managerial myopia, or shortsightedness that is present in many corporations. Our premise is that corporate managers may not actually be short-sighted, but are acting in what they perceive as their personal long-term best interests, rather than maximizing shareholders' wealth. Managers may perceive an implicit contract, based on the experience of their predecessors, regarding their expected longevity with their current employers.

If managers believe their tenure with their current employer will be short, they are unlikely to undertake activities that are costly in the short run, and enrich the company only after a long period of time, since they do not longer expect to remain with their employer to share the rewards. Our hypothesis is that, all else being equal, the greater the rate of senior management turnover, the smaller the percentage of revenue that a firm will invest in long-term projects, such as R&D or employee training. Management and CEO stock ownership can have a mitigating effect, since the greater the percentage of the firm that is owned by management, the more management's incentives should be aligned with those of other shareholders. This paper provides a theoretical model to demonstrate that, the greater the probability that the manager will remain with the firm for a long period of time, the more the manager will invest in long-term projects that maximize shareholders' wealth.

INTRODUCTION

This paper uses agency theory to explain the managerial myopia, or shortsightedness, manifested in many corporations, particularly in industries in which a long-term perspective is particularly important, such as technology-intensive industries. The hypothesis under investigation is that managerial turnover, and a corporate culture that facilitates rapid turnover, may be a cause of this myopic decision-making.

Under-investment in R&D may be one manifestation of managerial short-term orientation, due to rapid managerial turnover. Under-investment in other long-term ventures, such as employee training, and the cultivation of new markets, may be other manifestations.

The problem of short-term orientation has ramifications for international trade as well as corporate finance since rapid turnover of corporate management is more prevalent in the United

States than in other industrialized nations. We look to agency theory, and specifically to management turnover, for a possible explanation of managerial shortsightedness.

Corporate culture engenders implicit contracts. In the absence of a written employment contract, if a manager is employed by a firm with a history of rapid turnover, the manager can reasonably expect to be with the firm for a relatively short period of time, and to plan accordingly. Conversely, when there is a corporate culture that fosters longevity, the manager can reasonably expect, even without a written contract, to have a relatively long stay with the firm.

It is noteworthy that the market appears to appropriately reward long-term investment, such as investment in R&D, especially in technology-intensive growth industries in which R&D expenditures have resulted in profitable new products in the recent past. While the market appears to be relatively efficient in valuing long-term investment, many corporate managers seem to have an inappropriately short planning horizon, as they under-invest in research and development and other long-term projects, presumably to maximize their firms' short-term profitability. Therefore, corporate managers' behavior appears to be inconsistent with their responsibility to maximize shareholder wealth.

We suggest that under-investment does not necessarily indicate a lack of managerial foresight. On the contrary, managers may be thinking long term, but acting in their own long-term best interests, not that of shareholders. Based on their predecessors' experience, many corporate managers may recognize the likelihood that their longevity with their current employer is limited. They conclude that they stand to gain little by taking actions that will benefit their employers only after they leave the firm. However, they can expect to be rewarded generously for increasing their employers' short-term profits. Ironically, many corporate managers, who are believed to have too short a planning horizon, seem to have sufficient foresight to realize they are likely to change employers before the long-term consequences of their decisions are realized.

Myopic, or shortsighted, behavior can take many forms, of which under-investment in R&D is only one. The reason that a self-serving manager with a short planning horizon would be especially anxious to minimize the firm's investment in research and development is that R&D is intangible, so a manager's productivity with respect to R&D is not immediately recognizable.[1] Uncertainty exists regarding the success of a particular research project and the time it will take for completion.[2] R&D deals with products and processes not yet in existence, which makes estimates of future cash flows especially difficult.

Therefore, the value of a manager's contribution to a firm by investing in R&D is unlikely to be recognized right away. A manager who expects to leave the firm in the foreseeable future may not expect to be rewarded for his or her investment in the firm's R&D activities.

The remainder of this paper is organized as follows. Section II reviews the literature dealing with managerial incentives and longevity, and with the economic impact of long-term investment, particularly investment in research and development. Section III introduces mathematical models

of self-interested managerial behavior with respect to long-term investment when longevity is uncertain. Section IV concludes.

PRIOR LITERATURE

Managers' tendency to act in their self-interest, rather than that of shareholders, may result in an inappropriately short-term orientation. This aspect of the agency problem is discussed by Pinches (1981), Donaldson (1984), Holmstrom and Ricart i Costa (1986), Stein (1988), and Meulbroek, Mitchell, Mulherin, Netter and Poulsen (1990).

Sometimes myopic behavior is explained in terms of risk-avoidance and anti-takeover activity. For example, Stein (1988) describes myopic behavior as an "invisible" form of anti-takeover activity: by increasing short-term profitability at the expense of long-term investment, management may be seeking to avoid a takeover attempt by reducing the potential profitability of the firm's stock to a corporate raider.

The literature also discusses the incentives provided by management compensation schemes, which often reward short-term results. Holmstrom and Ricart i Costa (1986) and Parks and Conlon (1995) discuss the problems of providing the proper incentives to managers whose behavior cannot be observed directly. Holmstrom and Ricart i Costa point out that, since managerial effort is not observable, managers tend to be evaluated on the basis of short-term results.

There is literature dealing with the consequences of managerial myopia. Pinches (1981) shows that sub-optimal capital budgeting decisions can result when management's planning horizon is inappropriately short. Thakor (1990) discusses the continued use of payback as a tool for evaluating capital budgeting decisions. A possible explanation for the continued use of payback is that managers are only willing to invest in projects that they believe will be profitable during the time they expect to remain with their current employers.[3]

Donaldson (1984) maintains that managers tend to be motivated to maximize *visible* measures of success, such as quarterly sales or accounting profits, rather than shareholders' wealth. Porter (1990) points out that, relative to firms in other nations, many U.S. corporations maintain a short-term perspective, emphasizing quarterly earnings. He argues that fear of takeovers makes managers more concerned about short-term earnings fluctuations. He also points out that since the bonus component of managerial compensation can be high, and average tenure in management positions is short, foregoing this year's bonus for a higher one next year is unusual. He makes the argument that, compared with other industrialized nations, U.S. firms invest too small a portion of their revenue in R&D and other long-term initiatives.

Reichheld (1996) discusses the dangers inherent in short-term thinking, and the adverse impact of high employee and management turnover on productivity and profitability. He states that in high-turnover corporations, it "probably makes more sense for employees at every level to spend part of each workday figuring out how to maximize their own careers, searching for safety nets or

better opportunities elsewhere." Reichheld also discusses how some low-turnover firms, which he calls "loyalty leaders," enhance their productivity by aligning the incentives of managers and employees with those of the company.

Reichheld (1996) discusses the high rate of managerial turnover. He attributes some of this to involuntary turnover resulting from "impatience with managers who don't meet short-term goals." He also explains how voluntary turnover will increase when "managers themselves see no reason to stick with a business through its inevitable ups and downs.... In either case, the end result is poor continuity, limited planning and investment horizons, and a slide back down the productivity and learning curves. that will embellish their resumes."

Ingram (1970), Carter (1971), Coughlin and Schmidt (1985), Hom and Griffith (1995) Huselid (1995) and Lee, Mitchell, Wise and Fireman (1996) address factors that influence voluntary turnover. The fact that an organization's policies, or corporate culture, influence voluntary turnover is relevant, as it supports the idea that managers can use the firm's history of turnover, whether voluntary or involuntary, to estimate their expected tenure.

Ben-Zion (1978), Bernstein and Nadiri (1978), Ben-Zion (1984), Griliches (1984), Jarrell (1985), McConnell and Muscarela (1985), Jose, Nichols and Stevens (1986), Cockburn and Griliches (1988), Levin (1988), Chan, Martin and Kensinger (1990), Hirschey (1992), Henriques (1994), and Kelm, Narayanan and Pinches (1995) discuss the market's response to changes in a firm's level of R&D investment. The studies found that the market responds favorably to increases in R&D investment, particularly in industries that have a recent track record of commercial success in the development of new products and processes. For example, Ben-Zion (1978) found empirical evidence that the value of a firm's common stock is positively correlated with R&D expenditures.

Overall, these studies indicate that the market values increases in R&D investment. Cockburn and Griliches (1988) found that R&D investment and patents are valued most highly in industries in which such investment has proven itself profitable in the recent past. Levin (1988) found that the appropriability (free-rider problem) of R&D is enhanced by the mobility of employees. This supports the idea that companies will invest less in R&D when there is high turnover.

Chan, Martin and Kensinger (1990) found that the market generally responds favorably to announcements of increases in R&D expenditures, even when there are simultaneous announcements of decreases in net earnings, especially in the pharmaceutical, electronics, information processing, instruments, semiconductors, and telecommunications industries.

The evidence suggests that the market interprets R&D increases as indicative of future growth opportunities and increases in shareholder wealth. In other words, the market is fairly efficient in evaluating expected future earnings. The market rewards long-term planning, and responds favorably to productive R&D activities and other long-term investment. The market apparently does not share the myopia exhibited by many corporate managers.

THEORETICAL MODEL

For simplicity, we consider a three-date, two-period world. On date 0, the terms of the manager's compensation package are set, and the manager decides how much of the firm's revenue will be devoted to long-term investment, such as R&D. On date 1, the manager might or might not be terminated, or given an incentive to leave the firm.

This study does not distinguish between voluntary and involuntary turnover. There are three reasons for this. First of all, at higher levels of management, involuntary turnover is often made to appear voluntary. Second, whether a firm fires managers, or creates an environment (corporate culture) in which there are few incentives to stay, the result is the same. Finally, a firm whose culture encourages long-term planning is likely to screen managers prior to hiring or promoting them, reducing the need to fire poor performers. Such a long-term-oriented culture is also likely to provide incentives to remain with the firm.

Let *p* represent the probability that the manager will remain with the firm. On date 2, the revenues resulting from the long-term investment are realized by the firm, whether the manager remains with the firm during the second period or not.

We employ the following notation. The firm's earnings from sources other than R&D, indexed by the two periods, are denoted by e_j, j = 1,2. The firm's long-term investment during period 1 is denoted by y_0, and $f(y_0)$ represents the firm's incremental period 2 cash flow resulting from the period 1 long-term investment. We assume $f'(y_0) > 0$ and $f''(y_0) < 0$; that is, the return on long-term investment is an increasing but concave function of the amount invested. The firm's market value on date 0, after the level of long-term investment is announced, is S_0.

We assume the manager's cash compensation has a fixed component, denoted by m, plus a bonus that is a linear function of the firm's period *j* earnings, denoted by b_j. (We define b_j as k x e_j, where k represents the fraction of the firm's earnings paid to the manager as a bonus.)

We obtain that the manager's cash compensation, w_j (j=1,2) over the two time periods is:

$$(3.1) \quad w_1 = m + b_1 = m + k(e_1 - y_0).$$
$$(3.2) \quad w_2 = m + b_2 = m + k(e_2 + f(y_0)),\ 0 < k < 1.$$

For simplicity, we assume that the discount rate is zero and that all investors are risk-neutral wealth maximizers. We assume that the manager is also risk-neutral, and interested in maximizing his or her total compensation, which may be different than maximizing shareholder wealth.

We use y_0* to represent the optimal amount of long-term investment from the shareholders' perspective. This is the level of long-term investment that maximizes shareholders' wealth, and is the benchmark for efficient investment. We represent the manager's preferred level of investment by $y_{0,m,}$ which represents the level of long-term investment that maximizes the manager's expected

wealth, under the assumption that the manager's total compensation consists of a fixed salary plus a cash bonus, as described above.

Since our model contains only two periods, and we have defined the discount rate as 0, the value of S_0, which is the discounted (at 0%) value of future cash flows, can be expressed as

$$(3.3) \quad S_0 = (e_1 - y_0) + (e_2 + f(y_0)).$$

Proposition 1 characterizes the efficient level of R&D investment on date 0.

Proposition 1: *The unique efficient level of R&D investment on date 0, denoted by y_0*, satisfies the equation:*

$$(3.4) \quad f'(y_0^*) = 1.$$

Proof:

Total cash flows are:	$e_1 + (e_2 + f(y_0))$
Less salary and bonus:	$-[m + k(e_1 - y_0)] - [m + k(e_2 + f(y_0))]$
Less R&D spending:	$-y_0$
Net cash flow is:	$e_1 + (e_2 + f(y_0)) - m - k(e_1 - y_0) - m - k(e_2 + f(y_0)) - y_0$
Which simplifies to:	$e_1(1 - k) + e_2(1 - k) + f(y_0)(1 - k) - y_0(1 - k) - 2m$
Maximizing with respect to y_0:	$f'(y_0)(1 - k) = (1 - k)$
	$f'(y_0) = 1$

According to Proposition 1, the efficient level of long-term investment is characterized by a first-order condition that equates the firm's marginal gain in additional cash flow with the marginal cost of incremental long-term investment. Equation (3.4) implicitly defines the hurdle rate for long-term investment.

However, a firm's long-term investment is likely to be sub-optimal when the manager faces uncertainty regarding his or her continued employment. We assume that the probability of the manager remaining employed with the firm during period 2 is p ($0<p<1$). We also assume that manager is risk neutral, and seeks to maximize his or her expected wealth.

Proposition 2: *If the manager's compensation consists of a fixed salary plus a bonus that is a linear function of the firm's net income, then the uniquely defined level of long-term investment that maximizes the manager's expected wealth, denoted by $y_{0,m}$, will be less than the efficient investment y_0* since $p<1$.*

Proof: Given the compensation package defined in Equations (3.1) and (3.2), the manager chooses the level of long-term investment y0 that solves the problem:

(3.5) $max\ \{[m + k(e_1 - y_0)] + p[m + k(e_2 + f(y_0))]\}$.

We observe that the second term of Equation (3.5) is the manager's expected period 2 compensation. The first-order condition implies that the manager's optimal level of investment $y_{0,m}$ is such that

(3.6) $f'(y_{0,m}) = 1/p$.

Since the objective function (3.5) is concave in y_0, the solution $y_{0,m}$ defined by equation (3.6) is unique. Since $1/p > 1$, and f' is a decreasing function of y_0, it follows that $y_0,m<y_0*$.

Proposition 2 shows that a self-serving manager whose compensation includes a bonus based on short-term earnings, and who is uncertain about his or her longevity with the firm, has an incentive to under-invest (invest less than y_0*) in long-term projects such as R&D. This is because the expected marginal opportunity cost of long-term investment to the manager is 1/p times the opportunity cost to the shareholders.

According to Equation (3.6), as the probability that the manager will remain with the firm in the long run decreases, the manager's incentive to invest in R&D decreases. Turnover, coupled with compensation tied to short-term earnings, thus leads to a short-term orientation by creating incentives for managers to under-invest in long-term projects. The under-investment is likely to become more severe as the manager's probability of retention decreases.

Under a scenario in which the manager is certain of continued employment in period 2 (p = 1), there should be not disparity between the planning horizons of managers and shareholders.

Proposition 3: *If the firm is committed to retaining the manager in period 2 (p = 1), then $y_{0,m} = y_0*$.*

Proof: Using Equation (3.6) with p = 1, we obtain Equation (3.4), which demonstrates that, when continued employment is assured, $y_{0,m} = y_0*$.

Proposition 3 shows that a high degree of employment security tends to align a manager's incentives with those of shareholders.[4]

CONCLUSION

This article attempts to provide a rigorous theoretical argument to show that turnover, and the expectation of future managerial turnover, it likely to provide corporate managers with the

incentive to focus on short-term profit, and to overlook opportunities to enhance shareholders' long-term wealth. Empirical support for the inverse relationship between management turnover, particularly CEO turnover, and investment in research and development, was the subject of a recent paper (Graber, 2003). This article attempts to show that turnover is likely to result in sub-optimal investment in all sorts of long-term ventures, not only in research and development.

One way to mitigate the impact of managerial turnover on a firm's planning horizon might be to compensate managers with stock as well as cash. To the extent that managers own stock in the corporation, they are also owners, so their goals are likely to be more closely aligned with those of other shareholders. It might also be argued that managers who own substantial amounts of stock in the company, and whose goals are more closely aligned with the company that employs them, might be more likely to remain with their current employer. So compensating managers with stock might have the added benefit of reducing *voluntary* turnover.

The theoretical model presented in this paper should be applicable, not only to senior management, but to turnover at all levels within an organization. It seems logical that the behavior and motivation of employees at all levels is likely to be influenced by their expectations regarding the length of their continued employment with their current employers. Those who expect to remain with their employers for a long period of time are more likely to be concerned with the long-term well being of their employer, thus minimizing agency costs.

ENDNOTES

[1] By contrast, investments in tangible assets are easier to evaluate, and construction in progress can be observed.

[2] Ben-Zion (1984) discusses the uncertainty surrounding R&D.

[3] Because of its long-term nature, R&D has a relatively high payback period. Therefore, use of the payback method in capital budgeting may result in under-investment in R&D.

[4] It is noteworthy that, in Japanese firms, where a policy of lifetime employment is generally practiced, there is a tendency to invest a larger percent of revenue in R&D and other long-term ventures than is the case in U.S. firms.

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THE PERFORMANCE OF US INTERNATIONAL FUNDS DURING THE ASIAN FINANCIAL CRISIS

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ABSTRACT

The objective of this study is to examine the performance and investment strategies of the US managed foreign equity mutual funds during the Asian Financial Crisis period. Our findings indicate that a high geographic concentration strategy contributes to excess returns, even after controlling for various fund characteristics including tenure and expense ratio. However, these actively managed funds do not demonstrate superior performance against a passively managed bogey portfolio during the 1997 Asian Financial Crisis.

INTRODUCTION

The Asian Financial Crisis in 1997 affected many Asian countries including Thailand, South Korea, Indonesia, Malaysia, Taiwan, Singapore and Hong Kong. While some countries recovered faster than the others, most of them suffered substantially and their financial markets took a sharp decline during the 1997-1998 period. Kho and Stulz (2000), and Chowdhry and Goyal (2000) examine the banking industries of these Asian countries during the crisis and conclude that the effectiveness of the IMF programs is limited. Ang and Ma (2001) study the market crashes in four Asian economies and show that analysts fail to adjust their forecasts after these markets crashed. Chakrabarti and Roll (2002) show that volatility contagion in terms of covariance, correlation and volatility between European and East Asian countries increase significantly during the Asian crisis.

In recent years, total net asset value of international funds has grown tremendously. The popularity of global investing lies very much in the advocacy of benefits of international diversification among portfolio managers though the findings remain to be controversial (see for example, Solnik (1974) and Speidell and Sappenfield (1992)). Earlier studies on global investing such as Cho, Eun and Senbet (1986) generally examined the benefits of international diversification from the perspective of degree of integration of the world market. As the benefits of international diversification rely on the correlation structure of market returns, from various countries, performance of international mutual funds provides a basis for further tests on international investing (see Cumby and Glen (1990), and Droms and Walker (1994)). Recent research, however, has shifted to identify the important determinants in achieving superior returns when investing globally.

Among those diversified international funds, some managers may "actively" manage the portfolios by concentrating on selected securities, industry sectors, or regions, while some may follow more passive strategies by "indexing." It is obvious that in order to earn above-average returns, fund managers have to possess superior skills in security selection and market timing. However, prior research on international mutual funds (see Cumby and Glen (1990), Eun, Kolodny and Resnick (1991), and Kao, Cheng, and Chan (1998)) do not find supportive evidence that international fund managers are good market timers or stock pickers. Nevertheless, Capaul (1999) found that for industry-specific equity portfolios, certain investment strategies earned above-average returns with varying degrees of significance when compared with equally-weighted and market-cap weighted indexes.

An interesting topic related to the Asian financial crisis is the performance of the US mutual funds investing in the foreign markets during the crisis period. A prudent international fund manager needs to decide the composition of countries and securities of the portfolio. Strategic asset allocation would be challenging if the regions being invested happen to be in a financial crisis. Consequently, fund managers investing in international market including Asian countries face a very difficult task during the Asian financial crisis period.

In this paper, we examine the performance of foreign equity funds in relation to their fund characteristics, management attributes, and investment strategies. Furthermore, we investigate whether foreign fund managers have superior selection abilities with respect to individual securities, industry sectors and geographical regions. Many asset management firms try to add value to international equity portfolios through a process called tactical country allocation, which strategically over-weighs stocks of some countries while under-weighs stocks of other countries relative to a regional or global benchmark. Since regional asset allocation is a unique aspect in international investing, this article serves to provide new insights into analysis of mutual fund performance as well as diversification benefits during a crisis period. We also investigate whether these portfolio managers pursue a top-down or bottom-up approach in investing. Our evidence presents that a superior international investment strategy is not necessarily related to diversification in international funds. For global investing, pure diversification may not be optimal, and actively managed portfolios may be better than passively managed global index funds during a volatile market environment such as the Asian Financial Crisis.

DATA AND SAMPLE STATISTICS

Originally, focusing on US-based mutual funds investing in the Asian region would be a logical choice for our study. However, our 1997-1998 data set from Morningstar has a limited number of Asian funds, preventing a full-scale study focusing on them. Second, in order for us to learn the ability of US fund managers in allocating investment among crisis-infected and non-crisis

regions, we have to evaluate mutual funds investing beyond the Asian regions. Therefore, we have decided to examine international funds which focusing on non-US securities.

To invest globally, besides specific country funds, US mutual fund investors can choose between world funds or foreign funds. World funds invest in both US and non-US securities while foreign funds invest primarily in non-US securities with a 5% cap in US securities. As world funds typically load up more than 50% of their portfolio assets in US securities, we examined foreign funds only since they provide a wider spectrum of portfolio compositions outside the US for analysis.

The sample of foreign equity funds is obtained from Morningstar Ondisc mutual fund database. The monthly Principia Plus/Pro disks contain data on foreign equity funds' characteristics such as Morningstar's monthly computed beta (BETA), price to book ratio (P/B), market capitalization (CAP), manager's tenure (TENURE), expense ratio (EXPENSE), and turnover ratio (TO) of each fund as well as monthly returns. The disks also contain self-reported portfolio composition data with portfolio dates and / or asset composition dates that are updated by each fund itself periodically. Because earlier disks from Morningstar are unavailable, we are limited to the data set collected between January 1997 and December 1998. [1] The selection criterion results in 200 observations in the sample where 95 funds are from 1997 and 105 funds are from 1998.

According to the reporting format of Morningstar, portfolio composition data consist of fund asset holdings across countries, industries and securities. Geographic allocation of foreign funds is primarily classified as in Europe, Japan, Pacific (excluding Japan), Latin America, and others, with a 5% ceiling in the US. Industrial sector allocation is divided into ten different sectors in utilities, energy, financial, industrial cyclical, consumer durable, consumer staples, service, retail, health, and technology. Moreover, each fund reports the number of securities in its portfolio and the total market value of top ten portfolio holdings. These data enable us to construct measures of allocation strategies with respect to geographic, industrial and security selection.

To examine our sample funds' country allocation decisions, we construct a Herfindahl-style geographic concentration index (CONG) as follows:

$$CONG = \sqrt{\sum_{1}^{5} \frac{(V_i)^2}{\sum_{1}^{5} V_i}}$$

where i = 1 to 5 geographical regions excluding the US;

V_i = total market value of securities that invested in the ith region

This geographic concentration index ranges from 1 to 0.4472. A higher index value denotes a more concentrated geographic region allocation strategy. To the extent that the fund invests equally in all five different regions (i.e. $V_i = 1/5$), the index tends to be close to 0.4472. If the geographic

region allocation is based on the relative market value of a region's equities in a world portfolio excluding the US, the value will be 0.6166 in 1997 and 0.6813 in 1998, respectively.

To examine strategies with respect to concentration in industries, we construct a similar Herfindahl-style industrial concentration index (CONS):

$$CONS = \sqrt{\sum_{1}^{10} \frac{(V_i)^2}{\sum_{1}^{10} V_i}}$$

where j = 1 to 10 different industrial sectors;

V_i = total market value of securities that invested in the jth industrial sector

Similar to the geographic concentration measure CONG, the larger the industrial concentration measure CONS, the more concentrated the fund invests in some particular industrial sectors and vice versa. The index ranges from 1 to 0.3162 where 1 denotes extreme concentration in only one industry and 0.3162 denotes an equal investment across all ten industrial sectors.

Finally, we proxy for degree of concentration in individual securities using the two variables in Morningstar's database: number of securities in the fund (NUM) and the total market value of top ten portfolio holdings as a percentage of the fund's assets (TOP10)[2] If a fund uses a more concentrated strategy by investing in fewer stocks, then TOP10 should be relatively large and NUM should be relatively small or vice versa.

RESULTS

Descriptive statistics of these variables for the sample foreign equity funds for 1997 and 1998 are reported in Table 1. Foreign equity funds in our sample seem to have relatively lower risk than the comparative market portfolios, as the average beta is only 0.61 in 1997 and 0.69 in 1998 with standard deviations of less than 0.10. Some statistics are very different between 1997 and 1998. For example, the average price-to-book ratio of funds is higher in 1998. Average size of funds measured by market capitalization is also larger in 1998. In terms of allocation and selection strategies, funds seem to concentrate on fewer securities and invest more heavily in certain regions in 1998, despite the fact that their industry composition does not change too much. Therefore, our analyses will account for the time period differences.

To further analyze the regional / country allocation effect during the crisis period, we use a performance attribution analysis to compare the fund's performance with a bogey portfolio. The bogey portfolio is a completely passive portfolio with market value weights in geographic regions and investment in indexes only. The weighting for each region (country) is based on the relative market value of its equities in the world portfolio.

Table 1.Descriptive Statistics for Sample Foreign Equity Funds

Panel A: 1997

Variable	Mean	Median	St. Dev	Min	Max
BETA	0.61	0.62	0.09	0.37	0.75
P/B (ratio)	3.59	3.40	1.12	1.60	8.60
CAP ($ million)	9325	8283	5340	314	23621
EXPENSE (ratio)	1.37	1.40	0.42	0.18	2.39
TENURE (years)	5.47	5.00	2.93	1.00	17.00
TO (times)	51.58	39.00	41.04	4.00	178.00
NUM	196	119	206	32	1128
TOP10 (%)	22.81	22.10	6.95	10.02	55.47
CONS	0.382	0.377	0.026	0.345	0.471
CONG	0.698	0.695	0.068	0.544	0.883
No. of observations	95				

Panel B: 1998

Variables	Mean	Median	St. Dev	Min	Max
BETA	0.69	0.70	0.08	0.39	0.91
P/B (ratio)	4.87	4.80	1.89	1.90	12.20
CAP ($ million)	14343	13775	7461	391	32044
EXPENSE (ratio)	1.34	1.32	0.43	0.47	2.50
TENURE (years)	5.30	5.00	3.06	1.00	18.00
TO (times)	59.17	48.00	44.52	2.00	210.00
NUM	176	110	191	26	1180
TOP10 (%)	26.30	23.80	8.84	12.99	60.23
CONS	0.394	0.383	0.038	0.346	0.558
CONG	0.790	0.787	0.077	0.551	0.978
No. of observations	105				

Note:
BETA = beta of the foreign equity fund as published by Morningstar; P/B= price to book value ratio;
CAP = median market capitalization; EXPENSE = expense ration; TENURE=fund manger's tenure in years;
TO = fund turnover ratio; NUM=total number of securities in the fund;
TOP10 = total market value of top ten securities held in the fund as a percentage of the fund's total asset value;
CONS = Herfindahl-style industrial sector concentration index;
CONG = Herfindahl-style geographic region concentration index.

This information is obtained from Goldman, Sachs International Ltd.'s World Investment Strategy Highlights. However, since foreign equity funds' investments in the US securities are limited to 5%, we cannot use the relative market value of the US equities as the benchmark weight in the bogey portfolio. As a result, we use the sample mean US holdings in 1997 and 1998, respectively, instead. Then, we adjust the other benchmark weightings in the world portfolio to sum up to 100% in total. A comparison of the benchmark weights and foreign funds' average weights in each region are reported in Table 2.

Table 2: Relative Market Value of each Geographic Region in the World Portfolio (US adjusted) versus Average Geographic Allocation of Sample Foreign Funds

Panel A: weights in 1997 (%)

	Geographic Region (Country)							
	CONG	US	Europe	Japan	Pacific (exclude Japan)	Latin America	Others	Total
Benchmark weights	0.6166	2.86	45.18	40.85	3.60	2.58	4.97	100
Actual weights	0.6981	2.86 (3.07)	61.58 (9.74)	13.76 (11.24)	16.41 (11.67)	4.49 (3.99)	0.91 (1.27)	100
Over/Under Weight		-	+16.4	-27.09	+12.81	+1.91	-4.06	

Panel B: weights in 1998 (%)

	Geographic Region (Country)							
	CONG	US	Europe	Japan	Pacific (exclude Japan)	Latin America	Others	Total
Benchmark weights	0.6813	2.40	63.73	23.14	4.42	2.31	3.99	100
Actual weights	0.7898	2.40 (2.65)	75.00 (8.98)	12.90 (6.20)	5.92 (4.85)	2.12 (2.89)	1.66 (2.98)	100
Over/Under Weight		-	+11.27	-10.24	+1.50	-0.19	-2.33	

Note: In reporting the relative market value of each (region) country's equities in the world portfolio, market values of the US equities are replaced by the sample mean US holdings in 1997 and 1998, respectively. However, all CONG are computed without the US weightings. Source is from World Investment Strategy Highlights, Goldman, Sachs International Ltd., London June/July 1996, and March 1999. Standard deviations of actual fund weights in each region (country) are reported in brackets.

Based on the benchmark weights, CONG should be 0.6166 in 1997 and 0.6813 in 1998. Both are lower than the average CONG values of sample foreign funds. A closer look reveals that the relative market value of European equities has increased in 1998 while Japan has decreased significantly. However, even so, average foreign funds are still more bullish toward Europe but bearish toward the Japanese stock market. These funds overweight the allocation in Europe by more than 10% in both years and underweight the allocation in Japan correspondingly. These foreign funds are also bullish towards the Pacific region (excluding Japan) and considerably overweight in this region in 1997. These findings suggest that the sample foreign funds mostly perform an active "region / country allocation" strategy during the crisis period.

PERFORMANCE ATTRIBUTION ANALYSIS OF SAMPLE FUNDS

To see whether the actively managed foreign funds outperform the passive bogey portfolio, we proceed to compare the funds' returns with benchmark portfolios' returns. We measure fund performance as trailing 1-month to 6-month compound returns following the reported portfolio composition date for each fund[3]. For the bogey portfolios' returns, we use monthly index returns for the five countries (regions) obtained from Morgan Stanley Capital International (MSCI). We use US long-term bond yield as returns of the region named OTHERS. It is 0.5299% monthly for 1997 and 0.4396% monthly for 1998.

As the portfolio compositions of our sample funds are based on different reported portfolio or composition dates, an important step to construct the bogey portfolio is to match the fund returns in a specific month with the index returns of the same month to ensure accurate comparison between the two. We then multiply the respective country's (region's) index returns with its benchmark weight to compute the benchmark performance. The formula for bogey portfolio monthly return is as follows:

$$R_{Bj} = \sum_{i=1}^{6} W_{Bi} * I_{ij}$$

where i = 1 to 6 different regions;
j = 1 to 6 months;
W_{Bi} = neutral weight for ith region in either 1997 or 1998;
I_{ij} = index return for ith region in jth month (same month as the foreign fund);
RB_j = benchmark return for bogey portfolio in jth month

After we compute the monthly returns for each fund and its matching bogey portfolio, we can then obtain the monthly excess returns:

$$ER_j = R_{Fj} - R_{Bj}$$

where j = 1 to 6 months;
R_{Fj} = foreign fund return in jth month;
R_{Bj} = benchmark return for bogey portfolio in jth month

To complete the performance attribution analysis, the last step is to decompose the excess return into two components. One component is the geographic allocation effect and the other is the sector and security selection effect. The geographic allocation effect can be measured as:

$$GA_j = \sum_{i=1}^{6} (W_{Fi} - W_{Bi}) * I_{ij}$$

where i = 1 to 6 different regions;
j = 1 to 6 months;
W_{Fi} = fund's actual weight for ith region on portfolio date;
W_{Bi} = neutral weight for ith region in either 1997 or 1998;
I_{ij} = index return for ith region in jth month (same month as the foreign fund);
GA_j = geographic allocation effect in jth month

The sector and security selection effect can in turn be measured as:

$$SS_j = R_{Bj} - GA_j = \sum_{i=1}^{6} (W_{Fi}) * S_{ij} - I_{ij}$$

where j = 1 to 6 months;
SS_j = sector and security selection effect in jth month

The excess returns and effects are first computed on a monthly basis individually, and then compounded to obtain the respective 3-month and 6-month holding period excess returns and effects.

FOREIGN EQUITY FUNDS VERSUS BOGEY PORTFOLIOS

Table 3 shows the results of performance attribution analysis of our sample funds for holding periods from 1 month to 6 months. Results of t-test for the significance of returns are also reported.

As shown, almost all returns of foreign funds and bogey portfolios are insignificantly different from zero in 1997. The returns are much better in 1998 as all are significantly positive. However, these positive returns do not lead to positive excess returns in 1998. Instead, excess returns are all significantly positive in 1997. These results suggest that when some Asian countries were struggling to recover from the crisis in 1998, foreign fund managers in our sample on average fail to beat the benchmark. However, when the Asian and the global markets perform poorly in 1997, fund managers tend to outperform a passively managed global portfolio. The results hold true for short-term and intermediate-term investment horizons.

Table 3.Performance Attribution Analysis of Sample Equity Funds: Comparisons of Average Returns of Foreign Equity Funds with Bogey Portfolios and Geographic Allocation Effect and Selection Effect

Holding period	Foreign Equity Funds	Bogey Portfolios	Excess (Fund - Bogey)	Geographic Allocation Effect	Selection Effect
1997					
1-month	-2.150	-2.458	0.308**	-0.411	0.718***
	(5.630)	(5.194)	(1.531)	(2.230)	(1.917)
3-month	-0.126	-1.528	1.483***	1.456***	-0.002
	(8.673)	(8.967)	(2.764)	(2.328)	(2.575)
6-month	6.267***	0.311	5.846***	4.574***	1.137***
	(8.930)	(5.997)	(4.580)	(4.121)	(3.098)
1998					
1-month	5.540***	7.339***	-1.798	-0.330	-1.468
	(3.306)	(3.612)	(2.514)	(0.828)	(2.199)
3-month	10.371***	12.654***	-2.089	-0.239	-1.842
	(8.888)	(9.899)	(3.093)	(0.913)	(3.061)
6-month	13.393***	16.653***	-2.963	-1.387	-1.578
	(7.893)	(7.742)	(4.689)	(1.738)	(4.339)

Note: The holding period returns are trailing monthly-compounded returns tracked after each fund's reported portfolio composition date in 1997 and 1998. All data are in percentage. Bogey portfolio represents a passive global investment strategy matched for the same specific months in the holding period. Standard deviations are reported in brackets. The null hypothesis is the average return equals to zero. The two-tailed p-value of the t-statistics for the null was calculated by dividing the average return by the standard deviation of returns divided by the square root of the number of observations.

* p-value less than 0.10
** p-value less than 0.05
*** p-value less than 0.01

Top-down and bottom-up are the two approaches to fundamental analysis in equity investment. Fund managers claim that, in domestic mutual funds, 80% of abnormal returns are derived from asset allocation decisions, but not from stock picking. Will we find similar results in foreign mutual funds where country allocation decisions play a determinant role? The last two columns in Table 3 list the contributions of geographic allocation effect as well as selection effect to excess returns. In 1997 where excess returns are positive, selection decision seems to be the only significant contributing factor in immediate short-term investment horizon. For longer-term investment horizon such as 3-month and 6-month, geographic allocation decision seems to be more important and accounts for almost all the excess returns. In 1998 where all average excess returns are insignificantly negative, neither effect contributes significantly. Nonetheless, geographic allocation effect seems to account for a much smaller part of the negative excess returns, which can be interpreted as a better strategy. Overall, the results suggest that foreign equity fund managers have superior skills in country allocation decisions compared to sector and security selection decisions in the crisis period.

Table 4: Distribution of Fund Performance, Geographic Allocation Effect and Selection Effect

Holding Period		Number of Funds	Average Excess Return	Geographic Allocation Effect	Selection Effect
1997					
1-month	ER < 0	43	-1.038	-1.538	0.501
	ER > 0	52	1.420	0.522	0.899
3-month	ER < 0	26	-1.872	0.751	-2.633
	ER > 0	69	2.747	1.722	0.990
6-month	ER < 0	6	-4.141	-1.612	-2.493
	ER > 0	89	6.519	4.991	1.381
1998					
1-month	ER < 0	82	-2.589	-0.491	-2.098
	ER > 0	23	1.022	0.244	0.778
3-month	ER < 0	81	-3.232	-0.320	-2.904
	ER > 0	24	1.768	0.036	1.742
6-month	ER < 0	83	-4.546	-1.677	-2.877
	ER > 0	22	3.011	-0.294	3.322

Note: ER represents excess returns. All return data are in percentage. There are 95 funds in 1997 and 105 funds in 1998.

In order to further examine the ability of fund managers with respect to country allocation decisions and security selection decisions, we break down the funds into two groups: one with positive and one with negative excess returns. Table 4 shows the distribution of excess returns as well as the contribution from related geographic allocation effect and selection effect. The return distribution confirms that the foreign equity funds outperform the bogey portfolios in 1997 but perform poorly comparing to their benchmark in 1998. Among the 321 negative excess returns, the majority is due to inferior sector and security selection decisions. For the 279 positive excess returns, results are mixed. However, in more than half of the cases, most of the excess returns are derived from superior country allocation decisions. Consequently, security selection still appears to be a less significant factor in contributing to excess returns.

Empirical evidence on domestic mutual funds suggests that top-down is a better approach in investment. In other words, if the macroeconomic analysis is correct, determining the right asset mix in the portfolio gives the most return. Extending this logic to international investment will imply regional / country allocation is the most important factor. Our results so far seem to be consistent with previous studies.

Table 5: Average Weightings (%) of each Geographic Region in Sample Foreign Funds based on CONG

Panel A: 1997

	Geographic Region (Country)						
Quartile	CONG	US	Europe	Japan	Pacific (Exclude Japan)	Latin America	Others
Q1	0.784	3.73	73.13	9.85	9.79	2.96	0.54
Q2	0.715	2.65	63.19	6.87	22.86	3.86	0.58
Q3	0.676	1.74	59.59	18.06	16.85	3.18	0.57
Q4	0.613	3.35	49.90	20.52	16.12	8.10	2.00

Panel B: 1998

	Geographic Region (Country)						
Quartile	CONG	US	Europe	Japan	Pacific (Exclude Japan)	Latin America	Others
Q1	0.886	3.46	84.96	7.67	1.84	1.02	1.05
Q2	0.807	2.24	77.60	11.85	5.03	1.92	1.36
Q3	0.771	1.54	73.69	15.68	6.39	1.85	0.84
Q4	0.698	2.34	64.18	16.25	10.25	3.64	3.34

Note: There are 95 funds in 1997 and 105 funds in 1998.

In Table 5, we sort the foreign equity funds in order by the geographic concentration measure CONG and then compare the asset allocation across the seven regions in different quartiles. Recall from Table 2 that an average foreign fund overweighs Europe and Pacific but underweighs Japan substantially in 1997. The allocation decisions are similar in 1998 but at a lower level. From the benchmark weights information, it is clear that Europe has gained its significance in the world market in 1998 while Japan has lost its share. On the average, funds are still more bullish towards European stocks than Japanese stocks. More insights into these allocation decisions can be found when we group the funds in quartiles in Table 5. First, it is the least concentrated quartile (Q4), which has comparable CONG ratio of the bogey portfolio in both years. This suggests that the majority of funds have a highly concentrated strategy. Second, though with similar CONG ratio, the average sample funds in Q4 do not invest in the same style as the bogey portfolio. The sample funds are bearish towards Japan and bullish towards other Asian countries in Pacific and Latin America. Third, for the more concentrated quartiles, Q1, the differences in investment patterns magnify. These funds are even more bearish towards Japan, and their over-investment is mainly focused on Europe.

FUND RETURNS ON CHARACTERISTICS AND INVESTMENT STRATEGIES

What are the most important factors in determining global equity fund performance? And how does the top-down approach and bottom-up approach fare in total and excess returns? We conduct a series of regression analyses using different fund characteristics and a year dummy as the explanatory variables. The dependable variables are performance for three holding periods: one-month, three-month, and six-month. Table 6 reports the results for total returns and Table 7 reports results for excess returns over the bogey portfolio. Despite the high explanatory power (ranging from 17% to 51% adjusted R-square), not many variables are significant. One interesting fact we observe though is, for total returns, the longer the holding period, the less explanatory power the variables have. For excess returns, the pattern is reversed. The most significant variable among all is the year dummy. Reconfirming with our earlier findings from Table 3, the year dummy is positive for total returns and negative for excess returns. The results convey an important message about performance evaluation: it all depends on how the performance is measured. While total returns of foreign funds are high in 1998, the returns are actually below their passive benchmark. On the contrary, the total returns are negative in 1997, but they actually outperform their passive benchmark.

A closer look also shows that the other variables, which are significantly related to excess returns, are not to total returns. These variables include beta, tenure of managers, and expense ratio. As expected and consistent with previous literature, beta is positively related to excess returns while tenure and expense ratio is negatively related to excess returns.

Table 6: Cross-Sectional Regressions of Average Returns on Fund Characteristics and Investment Concentration Strategies

Independent Variable	Dependent Variable					
	AR1		AR3		AR6	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
BETA	0.321	0.07	0.721	0.07	4.889	0.48
P/B	-0.277	-1.64	0.124	0.31	0.294	0.75
CAP	0.171	0.38	0.369	0.36	-1.339	-1.26
TO	-0.013	-1.43	-0.010	-0.58	0.004	0.28
TENURE	0.015	0.12	0.013	0.06	0.130	0.68
EXPENSE	-0.251	-0.28	0.007	0.00	-2.734	-1.58
NUM	0.966	2.11**	0.954	1.07	0.797	0.85
CONS	-3.743	-0.36	-28.711	-1.24	-31.510	-1.11
CONG	3.948	0.68	10.075	0.84	23.361	2.10**
YEAR	7.820	9.06***	9.721	5.96***	5.125	3.02***
Cons tant	-8.055	-1.10	-4.629	-0.27	8.748	0.47
Adjusted R^2	0.43		0.25		0.17	

Note: CAP and NUM are logarithm.
* significant at 10% in a 2-tailed test
** significant at 5% in a 2-tailed test
*** significant at 1% in a 2-tailed test

COUNTRY SELECTION STRATEGY AND GEOGRAPHIC ALLOCATION EFFECTS

Besides total returns and excess returns, there are two other performance measures that we have derived from performance attribution, geographic allocation and security selection effects. These measures can assess what kind of superior skills the fund managers possess, and what constitutes an effective top-down or bottom-up approach. These relationships, however, may not be directly measured by regressing on total returns or excess returns. Table 8 reports the regression results for geographic concentration effect. The geographic concentration measure, CONG, is positively significant for all holding periods. Thus, the higher CONG is, the larger excess returns can be derived from superior geographic allocation strategies. This effect grows with holding

periods, with 6-month being the strongest with a 50% adjusted R-square. Recalled from Table 5, funds with high CONG (Q1) overinvest in Europe heavily and underinvest in Japan and other Pacific region. This active region / country allocation strategy contributes significantly to a successful top-down approach in investing in global portfolios.

Table 7: Cross-Sectional Regressions of Total Excess Returns on Fund Characteristics and Investment Concentration Strategies

	Dependent Variable					
Independent Variable	ER1		ER3		ER6	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
BETA	2.896	1.25	6.709	2.19*	11.906	1.93*
P/B	-0.165	-1.34	0.126	0.81	0.374	1.38
CAP	0.378	1.42	1.026	2.83***	-1.015	-1.36
TO	-0.007	-1.41	-0.003	-0.55	-0.007	-0.76
TENURE	-0.009	-0.16	-0.156	-2.24*	-0.186	-2.03*
EXPENSE	-0.740	-1.74*	-1.048	-1.98*	-2.847	-2.84***
NUM	0.139	0.76	-0.253	-1.11	-0.071	-0.16
CONS	2.221	0.30	5.526	0.69	-2.710	-0.18
CONG	3.634	1.25	0.004	0.00	6.015	0.74
YEAR	-2.632	-6.25***	-4.890	-9.80***	-10.477	-9.50***
Constant	-6.880	-1.42	-10.540	-2.04*	8.813	0.83
Adjusted R^2	0.27		0.40		0.51	

Note: CAP and NUM are logarithm.
* significant at 10% in a 2-tailed test
** significant at 5% in a 2-tailed test
*** significant at 1% in a 2-tailed test

Table 9 reports the regression analysis results for sector and security selection effect. The results are similar to that for excess returns. The higher the beta, the larger the market capitalization, the shorter the tenure, and the lower the expense ratio, all lead to larger excess returns derived from

superior security selection strategies. Nevertheless, neither concentrating on a few number of securities (NUM) nor on industries (CONS) is a significantly effective bottom-up strategy, despite the fact that they are positive. Opposite to the results for geographic concentration, the explanatory power of the variables decrease with the holding period from 30% adjusted R-square for the 1-month sample to 17% R-square for the 6-month sample.

Table 8: Cross-Sectional Regressions of Excess Returns from Geographic Allocation Effect on Fund Characteristics and Investment Concentration Strategies

	Dependent Variable					
Independent Variable	GA1		GA3		GA6	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
BETA	-1.262	-0.71	-0.099	-0.05	1.794	0.52
P/B	-0.035	-0.46	-0.071	-1.05	-0.096	-0.67
CAP	-0.143	-0.80	-0.206	-1.28	-0.845	-2.78***
TO	-0.004	-1.27	0.002	0.64	-0.001	-0.23
TENURE	0.039	0.92	-0.009	-0.21	0.007	0.12
EXPENSE	-0.011	-0.03	-0.259	-0.72	-1.115	-1.46
NUM	0.038	0.23	-0.064	-0.40	-0.075	-0.23
CONS	-1.224	-0.29	-5.725	-1.55	-9.489	-1.05
CONG	3.731	1.83*	7.649	3.31***	11.999	2.65***
YEAR	0.013	0.04	-2.175	-5.55***	-6.649	-9.09***
Constant	-0.547	-0.19	1.045	0.39	8.515	1.40
Adjusted R^2	0.00		0.24		0.50	

Note: CAP and NUM are logarithm.
* significant at 10% in a 2-tailed test
** significant at 5% in a 2-tailed test
*** significant at 1% in a 2-tailed test

Table 9: Cross-Sectional Regressions of Excess Returns from Selection Effect on Fund Characteristics and Investment Concentration Strategies

Independent Variable	Dependent Variable					
	SS1		SS3		SS6	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
BETA	4.158	1.94*	6.905	2.27**	10.375	2.19**
P/B	-0.130	-1.14	0.198	1.28	0.470	2.15**
CAP	0.521	1.90*	1.228	3.49***	-0.162	-0.27
TO	-0.002	-0.47	-0.006	-1.06	-0.007	-0.84
TENURE	-0.047	-0.97	-0.144	-2.42**	-0.184	-2.40**
EXPENSE	-0.728	-1.88*	-0.768	-1.67*	-1.636	-1.89*
NUM	0.101	0.53	-0.193	-0.87	-0.001	0.00
CONS	3.446	0.54	11.246	1.46	7.092	0.59
CONG	-0.097	-0.04	-7.603	-2.21**	-6.153	-1.06
YEAR	-2.644	-6.86***	-2.690	-5.12***	-3.703	-4.25***
Constant	-6.334	-1.46	-11.687	-2.47**	-0.199	-0.03
Adjusted R^2	0.30		0.30		0.17	

Note: CAP and NUM are logarithm.
* significant at 10% in a 2-tailed test
** significant at 5% in a 2-tailed test
*** significant at 1% in a 2-tailed test

CONCLUSION

The 1997 Asian Financial crisis led to a severe economic downturn to many Asian countries during 1997 to 1998. Such a financial disaster should have affected the performance of international mutual funds. Foreign equity mutual funds have gained its popularity recently in the US as more investors try to achieve higher portfolio diversification through investing in the global market. Nevertheless, managers of foreign funds may either diversify passively by following the world index or actively pursue country and industry selection strategies. Using a portfolio attribution methodology and measures of investment concentration strategy with respect to security selection,

industry selection, and geographic region selection, we evaluate the performance and investment strategies of the US managed foreign equity mutual funds during the Asian Financial Crisis period. We specifically investigate whether foreign fund managers have superior selection abilities in these areas. Our findings indicate that a highly geographically concentrated strategy contributes to excess returns, even after controlling for various fund characteristics including tenure and expense ratio. Nevertheless, these actively managed funds do not demonstrate superior performance against a passive market portfolio during the 1997 Asian Financial Crisis.

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PREDICTING RELATIVE STOCK PRICES: AN EMPIRICAL STUDY

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ABSTRACT

This study investigates the ability of two valuation methods, the income approach and the comparable sales approach, to predict the year-ahead, rank-ordered prices of publicly traded stocks. The sample firms are stratified by industry. Actual values and rank measurements are used in general models. Cross-sectional and pooled data is analyzed using nonparametric and parametric statistical methods.

Overall, the results support the use of both valuation approaches. Several of the variables used in the valuation models were able to explain a substantial amount of the variation in ranked year-ahead prices. However, it was noted that results could vary by SIC code and that care must be taken when valuing stocks in different industries. Also, as expected it was generally easier to predict the rank of year-ahead prices than to predict actual prices.

INTRODUCTION

This study investigates the ability of two valuation methods, the income approach and the comparable sales approach to predict the year-ahead, rank-ordered prices of publicly traded stocks. In general, researchers strive to identify valuation models which have high explanatory power and model coefficients which are stable across populations, and over time. They also prefer to use parametric statistical methods in order to obtain greater power. Unfortunately, the models used in most prior valuation studies had low explanatory power and coefficients which were unstable over time.

This study investigates valuation from a relative versus an absolute perspective. The decision to predict relative price ranks instead of actual values is motivated by two ideas. First, when analysts advise clients to either buy, sell, or hold a stock, the recommendation is based on the stock's expected performance relative to other stocks. Expected performance is in effect ranked as better, worse, or the same compared to other stocks. Second, if only limited success has been obtained when attempting to predict actual prices, then why not use a more general measure? If the underlying valuation process is somewhat understood, it should be easier to compare two stocks and predict which stock should have a higher price, rather than predict the actual price of each stock.

This situation is analogous to betting on a sporting event. If there is a valid understanding of the strengths and weaknesses of each team, it should be easier to predict the winner of the event, rather than predict the actual score.

METHODOLOGY

This study investigates the valuation of publicly traded stocks from a relative versus an absolute perspective. It evaluates the association of year-ahead rank-ordered stock prices with variables used in two basic valuation models. The industries included in the study are based on a random sample of four-digit SIC codes. It is assumed that stratifying firms based on four-digit SIC codes will control for differences between industries. The number of companies within each four-digit SIC code varies considerably. Annual sample sizes range from as few as five firms to as many as 59. The data from each SIC code was analyzed both annually, and pooled across the sample period (1981-1994). The annual results were difficult to interpret. Results varied widely between and within SIC codes. The pooled results by SIC code are easier to interpret and are reported in the tables.

Spearman's rank correlation coefficient (r_s), a nonparametric measure of association, is computed using the SPSS exact test module for small-sample nonparametric tests. Values for Spearman's r_s can range between -1 and +1. Spearman's rank correlation coefficient has an asymptotic relative efficiency of .912 compared to the Pearson correlation coefficient when data meets the assumptions necessary for the Pearson correlation coefficient to be valid (Daniel, 1990). Nonparametric methods are useful when rank-order is of interest and when data sets are sparse or do not meet the assumptions necessary to rely on parametric methods. The Pearson correlation coefficient, a parametric measure of association, is also computed for comparative purposes.

Spearman's rank correlation coefficient (r_s) is used to measure the degree of association between pairs of rankings and is equal to the Pearson correlation coefficient computed using ranks instead of actual values. Thus, the value of the Spearman rank correlation coefficient can be squared and is equal to the coefficient of determination (R^2) computed for a simple linear regression when the actual values of both the independent and dependent variables have been replaced by their ranks.

This valuation study uses independent variable specifications suggested by both theory and practice. It also measures the association between independent variables measured in $year_{(t)}$ and price ranks in $year_{(t+1)}$. As such, the models can be considered predictive models. Thus, statistically significant values for Spearman's r_s can be squared and interpreted as the strength of the model's predictive ability.

Supplemental analysis is also performed for all hypotheses. It is intended to help summarize the results, determine whether the alternative variable specifications provide the same or additional information, and to evaluate whether the quality of the information changes over time.

LITERATURE REVIEW

Both academic and professional literature was reviewed in order to identify the valuation approaches and independent variables used in this study. As noted in Foster (1986), many early studies used cross-sectional multiple regression methods to investigate the relationship between firm or equity valuation and independent variables such as expected earnings. The results generally indicated that some coefficients were significant but none were stable over time. This indicated an inability to use the results for predictive purposes. Possible explanations for the results could include measurement error, the existence of omitted variables, misspecified relationships, and/or market inefficiencies.

After the seminal stock price research efforts of the late 1960's and early 1970's, researchers generally switched their focus to predicting stock returns. However, in the 1990's there was renewed interest in price valuation models. Ohlson (1995) and Feltham and Ohlson (1995) developed a model in which firm value is equal to book value plus the net present value of excess earnings on book value, when clean surplus accounting is used. A basic version of this model was described in Appeals and Review Memorandum (A.R.M.) 34 in 1920.

Bernard (1995) noted that models using the book value of equity and abnormal earnings predictions based on Value Line forecasts explained security prices substantially better than a valuation model using expected dividends. A series of articles by Fama and French challenged the validity of the capital asset pricing model (CAPM) and renewed interest in valuation models. Fama and French (1992) note that beta alone does not explain the cross-section of stock returns and that firm size, as measured by market capitalization, and the (book value/market value of equity) ratio are related to returns. Fama and French (1993, 1994, 1995, and 1996) discuss, test and defend their model. They concluded that their model could explain most of the anomalies noted in regard to the CAPM model. Daniel and Titman (1997) disagreed with the Fama and French conclusion and argued that the differences in returns were due to firm characteristics. Penman (1996) found that both the price/earnings ratios (P/E) and price/book value of equity ratios (P/B) were positively correlated with the premium of market price over book value and future abnormal earnings.

The professional literature identifies a host of methods and variables potentially relevant to the valuation process. Many of the following variables are included in this study. Tax related valuations, prepared for closely held or infrequently traded businesses, must consider the factors noted in Revenue Ruling 59-60 (1959) and other promulgations issued by the Internal Revenue Service (IRS). The general factors include: 1) the nature of the business and history of the enterprise; 2) the general economic outlook, and the condition and outlook of the specific industry; 3) the book value of the stock and the financial condition of the business; 4) the earnings capacity of the company; 5) the dividend paying capacity; 6) whether or not the enterprise has goodwill or other intangible value; 7) prior sales of the stock and the size of the block of stock to be valued; and 8) the market price of stocks of corporations engaged in the same or similar line of business, having

their stocks actively traded in a free and open market, either on an exchange or over the counter. The Internal Revenue Service also noted that the facts and circumstances of the each case must be considered when estimating fair market value and that the weight of the factors is determined by the nature of the business.

Although Revenue Ruling 59-60 applies to closely held or infrequently traded stocks, the factors indicated are expected to be useful in explaining differences between the prices of publicly traded stocks. As such, this study stratifies the sample firms by industry and includes variables related to equity, size, financial condition, earnings, dividends, cash flows, returns, growth, and other profitability measures.

Support for the factors noted in Revenue Ruling 59-60 appears throughout the professional literature. The professional literature tends to focus on either business valuation (Copeland et al. 1994; Cornell 1993; Ehrhardt 1994; Fishman et al. 1994; Trugman 1993) or the selection of common stocks for investment purposes (Bernhard 1980; Damodaran 1994; Frailey 1997; Graham 1973; O'Neil 1995). Both business appraisers and investors consider many of the factors discussed in Revenue Ruling 59-60 and use variations of the income approach and comparable sales approach.

INCOME APPROACH

The income approach is based on the underlying theory that the price of an investment should not exceed the "value of the income" received from the investment. This approach can be applied to the firm as a whole, or to the separate debt and equity components. The income approach is most appropriate when the underlying assets are being used to their highest and best use, and when buying or selling decisions are being made for business versus personal reasons. Two popular applications of the income approach include capitalizing earnings and discounting expected cash flows. The basic capitalized earnings model is: Price = "Normal" earnings of the investment/Capitalization rate. The basic discounted expected cash flows model is: Price = Expected net future cash flows of the investment/Discount rate.

In order to operationalize the numerator of the capitalized earnings model, the normal earnings of the investment must be specified and measured. This study uses actual current amounts consistent with a random walk assumption and evaluates the performance of three different earnings specifications on a per share basis. Supplemental analysis is also performed to determine whether the predictive ability of the models can be improved by including growth rate measures.

In order to operationalize the numerator of the discounted expected cash flows model it is necessary to specify which cash flows will be valued. This study evaluates the performance of six different cash flow specifications on a per share basis (three to the company, three to the shareholder) and uses actual current amounts consistent with a random walk assumption.

Supplemental analysis is also performed to determine whether the predictive ability of the models can be improved by incorporating growth rate measures.

It is expected that the rank of year-ahead price per share will be directly associated with the rank of current-year income and cash flow per share measures, for firms within the same four-digit SIC code. Hypothesis 1 (stated in the alternative) is:

H1:	There is a direct relationship between (Income; Cash flows)$_{(t)}$ and Price $_{(t+1)}$

The null hypothesis of no association will be rejected if: r_s (computed) > positive r_s (critical value). Income per share specifications for year$_{(t)}$ include 1) operating income after depreciation (OIAD); 2) earnings before interest and taxes (EBIT); and 3) net income (NI).

Cash flows per share specifications for year$_{(t)}$ include cash flows to the company and to the stockholder. Cash flows per share to the company are specified as: 1) net cash flows from operations (CFO for years 1981-1987; CFON for years 1988-1994); 2) net cash flows from operations - net cash flows for investing activities (CFOLI for years 1981-1987; CFONLI for years 1988-1994); and 3) net cash flows (NCF).

Cash flows per share to the stockholder for year$_{(t)}$ are specified as: 1) dividends per share (DPS); 2) dividend payout ratio (DPR), which is defined as (dividends per share)/(net income per share); and 3) free cash flows to equity per share (FCFE) which is defined as (net cash flows + dividends on common stock - proceeds from sale of common stock + purchases of common stock)/(common shares used to compute earnings per share).

Price $_{(t+1)}$ is specified as the year-ahead December 31 closing price, as adjusted for stock splits and dividends relative to the December 31 closing price year$_{(t)}$ as per the annual COMPUSTAT tapes.

Supplemental analysis is also performed to determine if the alternative specifications for income, cash flows to the company, and cash flows to the shareholder provide the same or additional information, and whether the quality of the information changes over time.

To operationalize the denominator of the capitalized earnings model and the discounted expected cash flows model, it is necessary to determine the appropriate capitalization rate and discount rate, respectively. The Internal Revenue Service noted in Revenue Ruling 59-60 that the appropriate capitalization rate depends on the nature of the business, the risk involved, and the stability of earnings. Two methods are widely used to estimate capitalization and discount rates, the build-up approach and the capital asset pricing model (CAPM). The build-up approach adds the risk-free rate of return, a general risk premium for the difference in risk between stocks and bonds, and a specific risk premium based on the firm's business or industry. The CAPM adds the risk-free rate of return, and a risk premium for market risk which can not be avoided through diversification (beta times the expected difference in returns between the stock market and the risk free rate). This study investigates factors used in the build-up approach.

If actual current income or cash flow measures are used in the numerator of the income approach models (a random walk assumption) then all perceived risk should be reflected in the denominator of the model. It is expected that firms with different levels of risk will have different capitalization or discount rates, and that the rates will approximate year-ahead total returns. This study intended to use annual cross-sectional analysis to control for changes in the risk-free rate of return and the general risk premium. It was reasoned that if the risk-free rate of return and general risk premiums could be controlled, then differences in capitalization or discount rates should be due to industry or firm specific factors. Firms within the same industry should have similar risk factors. Thus, differences in capitalization or discount rates between firms within the same industry should be primarily due to measurable differences between the firm's industry-relevant risk factors. Growth, profitability, size and financial condition have been suggested as proxies for industry and firm specific risk. Supplemental analysis evaluates the association of selected growth (5), profitability (7), size (3), and financial condition (4) variable specifications with year-ahead total returns, and the ability of those variables to improve the explanatory power of the variables used in the income approach models.

COMPARABLE SALES APPROACH

The comparable sales approach is also known as the market approach or the relative sales value approach. It is based on the underlying theory that perfect substitutes should have the same price and that similar assets should sell for similar prices. This approach can be applied to the firm as a whole, or to the separate debt and equity components. The comparable sales approach is most appropriate when substitutes exist and direct comparisons can be made between the products. Stocks can be viewed as products and can be compared based upon their measured level of value relevant variables.

The basic comparable sales model is: Price = (price multiple or ratio) x (independent variable amount). This model can be viewed as: price per share = (unit price) x (quantity per share). The price multiple is simply the unit price of the value relevant variable being acquired (such as price per dollar of income, cash flows, sales, assets, etc.), and quantity is the firm's per share level of the variable in which the rate is denominated. The price multiple or ratio is interpreted in the same manner as a regression coefficient.

To implement this model, one must first identify "comparable firms." Firms may be considered comparable when they are similar along factors mentioned in the valuation literature. These factors include the nature and condition of the business and industry, growth prospects, economic conditions, operating risks, financial leverage and the stability of earnings. Similar firms should have similar price multiples. If firms have different price multiples, then there must be some differences between the firms which are considered relevant. For example, there could be differences

in the perceived quality of the income, cash flows, sales, etc. per share. A simple analogy is that while similar quantities of the same grade of wheat should have the same unit price, different grades of wheat should have different unit prices. This study attempts to ensure comparability among sample firms by stratifying the firms by four-digit SIC code.

Second, the researcher must identify which variables are associated with value and determine how to measure them. Variables used in practice and suggested by theory include the income and cash flow measures previously discussed in the income approach section, and size related variables. Size related variables can either ignore the effect of debt, such as sales or total assets, or consider it, such as the book value of stockholders equity. This study uses actual current values consistent with a random walk assumption and then ranks them.

It is expected that the rank of year-ahead price will be directly associated with the rank of current-year income, cash flow, and size specifications, for firms within the same four digit SIC code. Hypothesis 1 evaluates the association between the income and cash flow variable specifications and year-ahead price. Hypothesis 2 evaluates the association between the size variable specifications and year-ahead price. It is also expected that some of the size variable specifications are more appropriate for predicting the value of the firm as a whole versus the price of the equity component. As such, this study also investigates whether the association between year-ahead price and the size variable specifications is improved when total debt is included in the model. Additional analysis evaluates whether the association between the year-ahead price and the income, cash flow, and size variable specifications is improved when growth measures are included in the model.

It is expected that the rank of year-ahead price will be directly associated with the rank of current-year size per share measures, for firms within the same four digit SIC code. Hypothesis 2 (stated in the alternative) is:

H2:	There is a direct relationship between $Size_{(t)}$ and $Price_{(t+1)}$

The null hypothesis of no association will be rejected if: r_s (computed) > positive r_s (critical value). Size specifications which ignore debt are measured on a per share basis at the end of $year_{(t)}$ and include: 1) net sales (SPS); 2) adjusted book value of total assets (TAPS); and 3) and adjusted book value of tangible assets (TGAPS). Size specifications which consider debt are measured at the end of $year_{(t)}$ and include: 1) book value of common stockholder's equity per share (CSEPS); and 5) net tangible assets per share (NTGA) which is defined as (adjusted book value of tangible assets - total debt) per share. $Price_{(t+1)}$ is specified as the year-ahead December 31 closing price, as adjusted for stock splits and dividends relative to the December 31 closing price $year_{(t)}$.

SAMPLE SELECTION

The data for this study was obtained from the annual COMPUSTAT tapes and covered the period 1981-1994. Firms were stratified by four-digit SIC code and 30 of the 148 qualifying four-digit SIC codes were ultimately selected on a random basis for testing. To insure adequate power for the nonparametric tests, SIC codes with fewer than five active firms in each year of the study were eliminated from consideration in the sample. It initially appeared that 185 SIC codes were eligible for selection. Subsequently, 33 additional SIC codes were eliminated due to insufficient minimum annual sample size and four Depository institutions SIC codes (6000-6099) were eliminated due to their data format. The SIC codes selected and their maximum pooled sample size over the period 1981-1994 are presented in Table 1.

Table 1: Sample Description, 1981-1994

SIC Code	Industry description	Maximum pooled sample size
1311	Crude petroleum and natural gas	595
1381	Drilling oil and gas wells	130
1531	Operative builders	301
2040	Grain and mill products	71
2761	Manifold business forms	98
2800	Chemicals and allied products	104
2834	Pharmaceutical preparations	447
2844	Perfume, cosmetic, toilet preparations	102
2860	Industrial organic chemicals	126
2911	Petroleum refining	455
3140	Footwear, except rubber	95
3420	Cutlery, hand tools, general hardware	112
3490	Misc. fabricated metal products	167
3510	Engines and turbines	101
3540	Metalworking machinery	102
3559	Special industry machinery	108
3570	Computer and office equipment	84
3661	Telephone and telegraph apparatus	133
3674	Semiconductor, related devices	250
3711	Motor vehicles and car bodies	109

Table 1: Sample Description, 1981-1994		
SIC Code	Industry description	Maximum pooled sample size
3724	Aircraft engine, engine parts	70
4011	Railroads, line-haul operating	118
4911	Electric services	825
4923	Natural gas transmission and distribution	228
4924	Natural gas distribution	522
4941	Water supply	112
5051	Metals service centers-wholesale	71
5063	Electrical apparatus and equip.-wholesale	71
5140	Groceries and related products-wholesale	88
5912	Drug and proprietary stores	115

RESULTS: HYPOTHESIS 1

It was expected that there would be a direct relationship between the rank of year-ahead price ($year_{(t+1)}$) and the rank of current-year income and cash flows variable specifications ($year_{(t)}$). The results for Hypothesis 1 are reported in Table 2. The table provides the range of values of Spearman's rank correlation coefficient for each variable tested and the number of SIC Codes for which the value was significant. The supporting tables for each SIC Code are available, but have not been presented.

The association between the ranked current-year income per share specifications (OIAD, EBIT, NI) and ranked year-ahead price was positive and significant for each pooled SIC code in the sample. Spearman's rank correlation coefficients ranged from a low of .434 to a high of .813 (Table 2). The level and range was similar for all three income specifications. Spearman's rank correlation coefficient is equal to the Pearson correlation coefficient computed using ranks instead of actual values. As a result, the value of the Spearman's rank correlation coefficient can be squared and is equal to the coefficient of determination (R^2) computed for a simple linear regression when actual values of both the independent and dependent variables have been replaced by their ranks. As such, it can be stated that the ranked current-year income specifications could explain between approximately 19%-66% of the variation in ranked year-ahead stock prices. The results indicate that while the income specifications are relevant to the valuation process, results do vary by industry and that there is room for improvement in the model.

The association between the ranked current-year cash flows to the company specifications and ranked year-ahead price was mixed. The association between ranked current-year net cash flows from operations (CFO for years 1981-1987; CFON for years 1988-1994) and ranked year-ahead price was positive and significant for all but a few pooled SIC codes in the sample. Spearman's rank correlation coefficients ranged from a low of -.029 to a high of .845 (Table 2).

The association between ranked current-year net cash flows from operations - net cash flows for investing activities (CFOLI for years 1981-1987; CFONLI for years 1988-1994) and ranked year-ahead price was not significant for any SIC codes during 1981-1987, but was positive and significant for 27 SIC codes during 1988-1994 (Table 2). The statement of cash flows was not a required part of the financial statements for years ending before July 15, 1988 and thus there is a difference between the cash flow variable specifications before and after 1988. This did not appear to be a serious problem regarding cash flows from operations but could be a problem regarding the cash flows from investing activities.

The association between ranked current-year net cash flows (NCF) and ranked year-ahead price was only significant for five SIC codes. Spearman's rank correlation coefficients ranged from a low of -.039 to a high of .275 (Table 2).

The association between ranked current-year cash flows to the shareholder and ranked year-ahead price was generally positive and significant as expected. Spearman's rank correlation coefficients ranged from a low of -.439 to a high of .780 (Table 2). In general, association was higher for dividends per share (DPS) and free cash flows to equity per share (FCFE) than it was for the dividend payout ratio (DPR).

For comparative purposes, the values of the Pearson correlation coefficient were also computed for all income and cash flow variables. When each SIC code was pooled over the 1981-1994 period, the Pearson values generally had a wider range but were consistent with the results of the nonparametric tests.

HYPOTHESIS 1: SUPPLEMENTAL ANALYSIS

Supplemental analysis was performed to determine if the alternative specifications for income, cash flows to company, and cash flows to the shareholder provided the same or additional information, and whether the quality of the information changed over time. The entire sample was separately pooled and ranked for the periods 1981-1994, 1988-1994, and 1981-1987. Variable specifications reported under the full model were entered into the regression and backward elimination was performed. The requirement for entry was a probability of F of .05. The requirement for removal was a probability of F of .10. Each variable was noted as either included in, or excluded from, the final model.

Table 2: Association Between Ranked Year-ahead Price and Ranked Current-year Income and Cash Flow Variables Using Spearman's Rank Correlation Coefficient (r_s)
Significance based on one-tail test at .05 level

	High	Low	Number of SIC Codes Positive and Significant
Income:			
OIAD	.813	.485	30
EBIT	.793	.434	30
NI	.788	.493	30
Cash flows to company:			
CFO	.818	.312	30
CFON	.845	-.029	27
CFOLI	.097	-.779	0
CFONLI	.777	.113	27
NCF	.275	-.039	5
Cash flows to shareholders:			
DPS	.780	.225	30
DPR	.544	-.439	20
FCFE	.578	.092	25

Description of Variables Used in Table 2:

Year-ahead price:
$Price_{(t+1)}$ = December 31 closing price, as adjusted for stock splits and dividends relative to $Price_{(t)}$

Income specifications for $year_{(t)}$:
OIAD = Operating income after depreciation per share
EBIT = Earnings before interest and taxes per share
NI = Net income per share

Cash flows to company specifications for $year_{(t)}$:
CFO = Net cash flow from operations per share (1981-1987)
CFON = Net cash flow from operations per share (1988-1994)
CFOLI = Net cash flows from operations - net cash flows for investing activities per share (1981-1987)
CFONLI = Net cash flows from operations - net cash flows for investing activities per share (1988-1994)
NCF = Net cash flows per share

Cash flows to shareholder specifications for $year_{(t)}$:
DPS = Dividends per share
DPR = Dividend payout ratio: (dividends per share)/(net income per share)

FCFE = Free cash flows to equity per share: (net cash flows + dividends on common stock - proceeds from sale of common stock + purchases of common stock)

The results for the ranked current-year income specifications (OIAD, EBIT, NI) indicate that all three variables provide similar information, that little is gained by using more than one variable for prediction purposes, and that there is little change in the predictive ability of the models over time. The adjusted R^2 for the 1981-1994 pooled full model is .494 and the values for all pooled periods lie within a range of .031. The adjusted R^2 for the separate models over the pooled periods fell within the range of .414 to .498.

The results for the ranked current-year cash flow to company specifications indicate that the ranked current-year cash flow from operations variables (CFO, CFON) explain over 90% of the variation explained by the full models. The adjusted R^2 for the full model is .477 for 1988-1994, and .379 for 1981-1987. It is difficult to determine whether the explanatory power of cash flow from operations increased because the data items used changed in 1988. Ranked current-year net cash flows (NCF) explained almost none of the variation in any of the periods.

The results for the ranked current-year cash flows to shareholder specifications indicate that ranked current-year dividends per share (DPS) was more useful than either the ranked current-year dividend payout ratio (DPR) or ranked current-year free cash flows to equity (FCFE). The adjusted R^2 for the full model is .409 for 1981-1994 and within .013 for the other reported pooled periods. The adjusted R^2 for the DPS separate models over all pooled periods fell within the range of .349 to .400. The adjusted R^2 for the DPR and FCFE separate models over all pooled periods fell within the range of .081 to .133 and .159 to .208, respectively.

The above results were also tested using actual values instead of ranks. The adjusted R^2 for regressions using ranks was generally at least 33% higher in all cases than the adjusted R^2 for regressions using the actual values.

It was also expected that year-ahead total returns could proxy for the capitalization rate or discount rate used in the income approach models. It was also expected that growth, profitability, size and financial condition could proxy for industry and firm specific risk and could be used to predict year-ahead total returns. As such, ranked year-ahead total returns were regressed on ranked current-year growth (5), profitability (7), size (3), and financial condition (4) variable specifications. The results were disappointing. For comparative purposes, ranked year-ahead total returns were also regressed on ranked current-year dividends per share. It was found that the ranked current-year dividends per share captured most of the information contained in the ranked current-year growth, profitability, size and financial condition variable specifications. Ranked current-year dividends per share were then used as a surrogate for the capitalization rate or discount rate in the income approach models.

It was found that including ranked current-year dividends per share a surrogate for the capitalization or discount rate in regressions with the ranked current-year income and cash flow to company variable specifications did little to improve their ability to predict ranked year-ahead price. The adjusted R^2 of the models increased by less than .05, or by approximately less than 10%. Tables for the above results are available, but have not been presented.

RESULTS: HYPOTHESIS 2

It was expected that there would be a direct relationship between the rank of year-ahead price ($year_{(t+1)}$) and the rank of current-year size per share variable specifications ($year_{(t)}$). Results for Hypothesis 2 are reported in Table 3. The table provides the range of values of Spearman's rank correlation coefficient for each variable tested and the number of SIC Codes for which the value was significant. The supporting tables for each SIC Code are available, but have not been presented.

The association between the ranked current-year size per share specifications that ignored debt levels [net sales (SPS), adjusted book value of total assets (TAPS), adjusted book value of tangible assets (TGAPS)] and ranked year-ahead price was positive and significant for at least 28 of the 30 pooled SIC codes. Spearman's rank correlation coefficients ranged from a low of -.087 to a high of .813 (Table 3). The level and range was similar for all three variables. For comparative purposes, the values of the Pearson correlation coefficient were also computed. When each SIC code was pooled over the 1981-1994 period, the Pearson values generally had a wider range but were consistent with the results of the nonparametric tests.

Table 3: Association Between Ranked Year-ahead Price and Ranked Current-year Size Specifications using Spearman's rank correlation coefficient values (r_s)
Significance based on one-tail test at .05 level

	High	Low	Number of SIC Codes Positive and Significant
Size (ignores debt):			
SPS	.780	-.087	28
TAPS	.799	.280	30
TGAPS	.813	-.019	29
Size (considers debt):			
CSEPS	.895	-.120	29
NTGA	.728	-.228	25

Descriptions used in Table 3:

Year-ahead price:
Price $_{(t+1)}$: The December 31 closing price, as adjusted for stock splits and dividends relative to $Price_{(t)}$

Size specifications for $year_{(t)}$ that ignore debt:
SPS = Net sales per share
TAPS = The adjusted book value of total assets per share
TGAPS = The adjusted book value of tangible assets per share

Size specifications for $year_{(t)}$ that consider debt:
CSEPS = Book value of common stockholder's equity per share
NTGA = Net tangible assets per share: (adjusted book value of tangible assets - total debt)

The association between the ranked current-year size per share specifications that considered debt levels had more variation. The Spearman's rank correlation coefficients for the ranked current-year book value of common stockholder's equity per share (CSEPS) and ranked year-ahead price ranged from a low of -.120 to a high of .895 and were significant for 29 of the 30 SIC codes (Table 3). The Spearman's rank correlation coefficients for ranked current-year net tangible assets per share (NTGA) and ranked year-ahead price ranged from a low of -.228 to a high of .728 and were significant for 25 of the 30 SIC codes (Table 3). For comparative purposes, the values of the Pearson correlation coefficient were also computed. When each SIC code was pooled over the 1981-1994 period, the Pearson values generally had a wider range but were consistent with the results of the nonparametric tests.

HYPOTHESIS 2: SUPPLEMENTAL ANALYSIS

Supplemental analysis was performed to determine if the alternative specifications for size provided the same or additional information, and whether the quality of the information changed over time. The entire sample was separately pooled and ranked for the periods 1981-1994, 1988-1994, and 1981-1987 using the same procedures discussed for the supplemental analysis of Hypothesis 1.

The results for the ranked current-year size specifications that ignored debt levels (SPS, TAPS, TGAPS) indicate that all three variables provide similar information, that little is gained by using more than one variable for prediction purposes, and that there is little change in the predictive ability of the models over time. The adjusted R^2 for the 1981-1994 pooled model is .384 and all pooled periods lie within a range of .044. The adjusted R^2 for the separate models over the pooled periods fell within the range of .297 to .379. The above models were also tested using actual values instead of ranks. The adjusted R^2 for regressions using ranks was generally at least 50% higher than the adjusted R^2 for regressions using the actual values. Tables for the above results are available, but have not been presented.

The current-year size specifications that considered debt levels [book value of common stockholder's equity per share (CSEPS), net tangible assets per share NTGA)] were also further tested. As the variables were highly correlated, a pooled model was not analyzed. However, results for the separate models indicate that CSEPS is more useful for predicting year-ahead price and is more stable over time than NTGA. The adjusted R^2 for the CSEPS separate models over the pooled periods were very stable and fell within the range of .455 to .477. The adjusted R^2 for the NTGA separate models over the pooled periods fell within the range of .238 to .350. The above models were also tested using actual values instead of ranks. The adjusted R^2 for regressions using ranks for CSEPS was generally slightly higher than the adjusted R^2 for regressions using the actual values. In contrast, the adjusted R^2 for regressions using ranks for NTGA was generally substantially higher

than the adjusted R^2 for regressions using the actual values. Tables for the above results are available, but have not been presented.

Value multiples based on size measures that ignore debt can be viewed as gross value multiples for the firm as a whole. Gross firm value should equal the market value of the equity plus the market value of the debt. To the extent that total debt per share divided by the size variable per share is the same between firms, the firms should have the same price multiples. To the extent that firms have different debt/size ratios, they should have different price multiples.

It was expected that including ranked current-year total debt along with the ranked current-year size specifications would improve the predictive ability of the regression of ranked year-ahead price. The entire sample was separately pooled and ranked for the periods 1981-1994, 1988-1994, and 1981-1987. All of the regressions were significant. When individually tested with ranked current-year total debt, each of the ranked current-year size variables that ignored debt were significant and had coefficients with the expected sign. Although ranked current-year total debt per share (TLPS) was often significant in the regressions, it did little to improve the power of ranked current-year sales per share (SPS) or ranked current-year adjusted book value of tangible assets per share (TGAPS), to predict the rank of year-ahead stock prices. The adjusted R^2 increased by less than .04 in any period. Including ranked current-year total debt per share (TLPS) along with the ranked current-year adjusted book value of total assets per share (TAPS) initially appeared to increase the adjusted R^2 of the model. However, this result must be interpreted with caution as the two variables were highly correlated.

The above regressions were also run using actual values instead of ranks. The adjusted R^2 for regressions using ranks was generally at least 50% higher than the adjusted R^2 for regressions using the actual values for all but the combined (TAPS) and (TLPS) model, where the difference was negligible. The supporting tables are available, but have not been presented.

SUPPLEMENTAL ANALYSIS: GROWTH RATES

Researchers have noted that firms within the same industry can have different price multiples based on the same value relevant variable. This could be due to perceived differences in the quality of the variable being measured. The difference between firm growth rates is frequently proposed as an explanation for the difference in quality between variable measures. For example, many would argue that two firms with the same level of current earnings, but different earnings growth rates, should have different Price/Earnings ratios. This issue is closely related to whether the actual or an expected variable measurement is multiplied by the price ratio, and what assumptions are made about expected value, such as random walk, naive trend, or time series.

As this study used actual firm-level measures, supplemental analysis was performed to determine: 1) whether including growth measures for income, cash flow, and size variable specifications would materially increase the predictive ability of the comparable sales models; and

2) whether the quality of the information changed over time. The growth measures evaluated included the change in level from the prior year ($year_{(t)}$ - $year_{(t-1)}$), the one year growth rate ($year_{(t)}$/ $year_{(t-1)}$), and the change in one year growth rate [($year_{(t)}$/ $year_{(t-1)}$)/($year_{(t-1)}$/ $year_{(t-2)}$].The entire sample was separately pooled and ranked for the periods 1981-1994, 1988-1994, and 1981-1987 using the same procedures discussed for the supplemental analysis of Hypothesis 1.

All of the models were significant. The adjusted R^2 of each regression was used to evaluate the usefulness of each model. For comparative purposes, the adjusted R^2 of each simple linear regression for the underlying ranked current-year income, cash flow and size variables was also noted. The results indicated that including ranked growth variables in the regressions did very little to increase the explanatory power of the models above that provided by the underlying ranked current-year income, cash flow or size measures. None of the adjusted R^2 values increased by more than .03. The supporting tables are available, but have not been presented. This finding provides additional support for the decision to use actual current values (random walk assumption) when measuring the income, cash flow and size variable specifications.

SUPPLEMENTAL ANALYSIS: PRICE AT CURRENT-YEAR END

For comparative purposes, the market value of common stockholder's equity per share at December 31 of the current-year (PC12: $Price_{(t)}$ at closing) was also used to predict year-ahead price. It was found to have the highest and most stable level of association with year-ahead price ($Price_{(t+1)}$) compared to any other single variable in the study. Spearman's rank correlation coefficients ranged from a low of .786 to a high of .949 and were significant for all 30 SIC Codes tested.

The above results were also tested using actual values instead of ranks. The adjusted R^2 for regressions using ranks for the current-year market value of common stockholder's equity per share (PC12) was generally slightly higher than the adjusted R^2 for regressions using the actual values.

In addition, a regression including the ranked current-year income, cash flow, and size variables was run and found to have no additional explanatory power over that provided by a model using only the ranked current-year market value of common stockholder's equity per share (PC12). When PC12 was not included in the model, total explanatory power was reduced by more than .26, or by approximately 32% for the 1981-1994 period. When actual values were used in the regressions instead of ranks, the results were consistent with the above conclusions.

CONCLUSIONS

This study investigates the ability of two valuation methods, the income approach and the comparable sales approach, to predict the year-ahead, rank-ordered prices of publicly traded stocks. The income approach was investigated with Hypothesis 1 and with supplemental analysis. The

comparable sales approach was investigated with Hypotheses 1 and 2 and with supplemental analysis.

It was expected that ranked current-year income and cash flow variable specifications would be directly associated with ranked year-ahead price (H1). The ranked current-year income variables were found to be significant and directly associated with ranked year-ahead price. All three income specifications provided consistent results and there was little practical difference in explanatory power between them. However, although the ranked current-year income variables were significant, they explained less than 50% of the variation in ranked year-ahead price. In addition, the cash flow variables were found to be less useful than the income variables.

It was expected that ranked current-year size variable specifications would be directly associated with ranked year-ahead price (H2). Size variable specifications either ignored or considered the effect of debt. The ranked current-year size variables that ignored debt (SPS, TAPS, TGAPS) were found to be significant and directly associated with ranked year-ahead price. All three variable specifications provided consistent results and there was little practical difference in explanatory power between them. However, although the ranked current-year size variables were significant, they explained less than 40% of the variation in ranked year-ahead price. Supplemental analysis indicated that including ranked current-year total debt in the regressions generally did very little to improve the explanatory power of the variables, and it also created problems with multicollinearity in the model.

Additional analysis indicated that including selected ranked growth variables along with the underlying ranked current-year income, cash flow and size measures that ignore debt, in the regressions of year-ahead price did very little to increase the explanatory power of the models. This finding provides support for using current-year values (a random walk assumption) in the valuation models.

The ranked current-year size variables that considered debt (CSEPS, NTGA) were found to be significant and directly associated with ranked year-ahead price. Although both variable specifications provided consistent results, book value of common stockholder's equity per share (CSEPS) generally had higher explanatory power. However, although the ranked current-year size variables that considered debt were significant, they explained less than 50% of the variation in ranked year-ahead price.

For comparative purposes, ranked current-year market value of common stockholder's equity per share (PC12: i.e. $Price_{(t)}$) was also used to predict the year-ahead, rank-ordered stock prices and was found to have the highest and most stable level of association compared to any other variable used in the study. The adjusted R^2 for the 1981-1994 pooled sample was .846 and all pooled periods fell within a range of .032. In addition, a regression including the ranked current-year income, cash flow, and size variables was run and found to have almost no additional explanatory power over that provided by a model using only the ranked current-year market value of common stockholder's equity per share (PC12). When PC12 was not included in the model, total explanatory power was

reduced by more than .26, or by approximately 32% for the 1981-1994 period. Unfortunately, knowing that ranked current-year price is a very good predictor of ranked year-ahead ranked price doesn't help explain how the initial rankings were established.

The conclusions drawn from this study were also tested using actual values instead of ranks. As expected, it was generally easier to predict the rank of year-ahead prices than it was to predict the actual year-ahead prices. The adjusted R^2 for regressions using ranks was generally (with two exceptions) at least 33% higher than the adjusted R^2 for regressions using the actual values. However, there was little practical difference between using ranks and actual values for the current-year market value of common stockholder's equity per share (PC12) and the book value of common stockholder's equity per share (CSEPS). The difference in adjusted R^2 between a regression using the ranks compared to a regression using actual values was less than .03 for PC12 and slightly more for CSEPS for the 1981-1994 period.

Overall, the results support the use of the income approach and the comparable sales approach to predict ranked year-ahead stock prices. Both methods were able to explain a substantial amount of the variation in ranked year-ahead prices and the explanatory power was reasonably consistent over the 1981-1994 period. However, each method has room for improvement. In addition, the analysis by SIC code indicated that results varied by SIC code and that care must be taken when valuing stocks in different industries.

LIMITATIONS

As with all research efforts, this study is subject to certain limitations. Due to data availability, only those firms reported on COMPUSTAT have been included in the sampling population and sampling period. These firms may not be representative of the entire population of firms and care should be taken in generalizing the results to firms not reported in COMPUSTAT. Also, the generalizability of the results to other time periods may be limited to the extent to which conditions during the time period covered by COMPUSTAT are different from other time periods.

In general, nonparametric statistical methods are not as powerful as parametric methods under conditions where the assumptions necessary to rely on parametric methods are met. However, nonparametric methods should be used when stratified sample sizes are small, and data does not meet the assumptions necessary for parametric methods. Also, in order to allow adequate statistical power, four-digit SIC codes with fewer than five firms were excluded from the study.

Firms were stratified by four-digit SIC code and a large random sample of four-digit SIC codes was selected. Each four-digit SIC code was analyzed both separately and pooled along with all of the other SIC codes selected, over various time periods. Drawing samples based on SIC code implicitly assumes that SIC codes can control for industry differences. This assumption may not be valid to the extent that firms are also involved in other lines of business. Also, to the extent that

industries do differ, the results obtained by examining one industry may not be generalizable to other industries.

This study assumes that the market is efficient. To the extent that inefficiencies exist, differences which exist between the model predictions and actual prices ranks may be inappropriately identified as model related errors. To the extent the market is efficient, differences between predicted price rank and actual price rank could be due to a number of reasons including model misspecification, measurement error, and differences across the sample firms and/or differences over time.

Many alternative variable specifications exist for each of the models examined. This study recognized that fact and examined a large number of alternatives. However, it did not examine all possible variable choices and as such, there is no assurance that other variables might not have performed better than the ones examined.

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BUSINESS WEEK BOARD RANKINGS AND SUBSEQUENT STOCK RETURNS

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ABSTRACT

Recent corporate bankruptcies have placed renewed focus on the role of a firm's board of directors; therefore, I study rankings of the best and worst boards of directors as published by Business Week. Similar to prior studies examining survey data, I find that the portion of the rankings determined via investment manager survey is biased by the "halo effect." However, I also find that the rankings as a whole, and particularly the portion calculated via quantitative analysis, do provide information that can be used in a trading strategy capable of generating positive abnormal returns, thereby implying that board strength does matter.

INTRODUCTION

The fall of large firms such as Enron and WorldCom has led to renewed interest in the debate surrounding the importance of a firm's board of directors. In principle, the board exists to represent stockholder interests by reducing agency costs through oversight of management and dissemination of information to the investing public. However, recent accounting scandals, allegations of excessive compensation, apparent self-dealing, and outright business failures have highlighted the ineffectiveness of some boards, raising the question of whether a stronger board might have prevented, or at least constrained, certain ill-considered management actions.

Prior studies have examined the importance of certain individual board characteristics; however, I am unaware of a single measure of board quality that has been extensively studied or proven to be informative for predicting long-run return. To address this issue, I investigate stock price performance for portfolios of companies with the best and worst boards of directors as published by *Business Week*. These rankings are determined through a process integrating investment manager survey results and *Business Week*'s quantitative analysis of board characteristics.

Similar rankings, such as *Fortune*'s Most Admired Companies and *Institutional Investor's* Investment Manager All-Stars, have previously been studied, with authors concluding that these rankings are primarily determined by prior stock return, an outcome of the "halo effect," and are, therefore, not unbiased representations of the primary variables of interest. If this is the case for *Business Week* rankings, then using the rankings for the purpose of investment decisions may be inappropriate. However, if the bias is not present, or if it can be eliminated, then firms with the best

boards should outperform those with the worst boards, thereby providing information that can lead to profitable portfolio formation.

In testing the rankings, I find that the halo effect has an influence on the survey portion of the rankings; however, I also find that the rankings as a whole are informative in creating profitable trading strategies. Specifically, I find that an average positive quarterly abnormal return of 3.72 (4.78) percent can be earned in the three-year (five-year) period subsequent to the rankings being published. These returns are achieved by going long in the firms classified as having a best board of directors and by shorting the firms classified as having a worst board of directors.

As a further extension, I adjust the rankings by eliminating the portion of the rankings, i.e. the survey component, influenced by the halo effect. I find that this "re-ranking" increases the level and significance of the positive abnormal return. Given the results, I conclude that board strength does matter and that information on a firm's board of directors can be implemented into profitable trading strategies.

AGENCY COSTS, INTERNAL CONTROL, AND THE BOARD OF DIRECTORS

The seminal work by Jensen and Meckling (1976) provides the primary starting point for the majority of research focusing on internal control and agency costs. Jensen and Meckling (1976) identify agency costs as resulting from a separation of ownership and control; however, this separation would not create a conflict if all actions of the manager were known and controllable by the owners. Thus, the discussion of agency costs could also be one of making information accessible to current and potential owners. As such, Jensen and Meckling (1976) argue that agency costs could be reduced by advancements in auditing, formal control systems (i.e., a more effective board of directors), and security analyst following. In this analysis, I concentrate specifically on the effectiveness of the board of directors in reducing agency costs and increasing security returns.

The laws of the state in which a firm is incorporated typically specify the requirement for a firm to be managed by a board of at least three directors. Directors on these boards are intended to represent the interests of owners by improving internal control and reducing agency costs. They should provide advice and counsel to managers, act as discipline for potentially unlawful or unethical activity, and serve as crisis handlers, thereby strengthening internal control, reducing agency costs, and increasing return. Having recognized the potential benefits, investment managers such as TIAA-CREF and the California Public Employees' Retirement System are placing increased importance on a firm's board of directors, implying that stronger boards, i.e. stronger internal controls, do in fact lead to lower agency costs and improved stock performance.

In one of the first studies on boards of directors, Mace (1972) states that the generally accepted roles of boards have little relation to what they actually do in practice, primarily because directors are most often hand-selected by the president. Thus, the agency costs which boards were designed to reduce are potentially increased if an improper structure or focus is adopted. In fact,

Core, Holthausen and Larcker (1999) report that firms with weaker governance structures have greater agency problems, thereby leading to worse performance.

Recent empirical literature has attempted to identify the characteristics of boards that strengthen internal control and reduce agency costs by further aligning the interests of board members with shareholders, by enabling shareholders to elect a more effective board, or by increasing the amount of information provided to owners and the market as a whole. The most researched area seems to be the effect of independent, outside directors on the results of the firm. Beasley (1996) finds that fraudulent firms are more likely to have a larger proportion of insiders on the board, and Beasley and Petroni (2001) find that independent boards are more likely to hire an auditor with a greater degree of industry-specific experience, thereby reducing agency costs. Byrd and Hickman (1992) find that bid premiums for takeover attempts are higher for target firms that have a larger proportion of independent directors. Additionally, Cotter, Shivdasani, and Zenner (1997) find that when the target firm's board is independent, shareholders earn higher gains from tender offers.

Aside from member independence, other board characteristics also appear to influence internal control and performance. The amount of firm equity held by directors (Bhagat, Carey, & Elson, 1999) has been shown to be positively correlated to performance, which is consistent with the 1995 recommendation of the National Association of Corporate Directors to increase the use of equity-based compensation to better align the interests of shareholders with directors. Also, Vafeas (1999) and Xie, Davidson, and DaDalt (2003) find that board meeting frequency is related to performance, and Yermack (1996) illustrates that board size is also influential.

The results of these studies show that many characteristics of board structure are influential in determining the internal control structure, agency costs, and performance of a firm, as well as the associated return on its securities. Thus, a measure of overall board quality would be beneficial for conducting research in the areas of agency costs, internal control, and asymmetric information, and particularly for use as a criterion in making investment decisions. I describe a potential measure in the next section.

DATA DESCRIPTION

Rather than evaluating an overall quality indicator, previous studies of boards of directors have generally concentrated on a single board characteristic such as the number of independent directors, the number of meetings, or the level of ownership. I attempt to address this issue by using rankings published by *Business Week* magazine. *Business Week* first reported on the best and worst boards of directors on November 26, 1996, with subsequent rankings on December 8, 1997, and January 24, 2000. An updated report was released by *Business Week* on October 7, 2002; however, *Business Week* has changed the format and no longer gives numerical rankings. Additionally, the survey is now conducted among governance experts rather than investment managers.

Hayes and Lee (1999) study *Business Week*'s rankings for the 1997 survey; however, they only focus on returns nine months after publication and do not recognize or adjust for the potential halo effect. Also, the study of returns only reports simple t-statistics for the difference between market-adjusted return. Thus, my research adds additional surveys, incorporates past returns and potential biases, and looks at long-run return after adjusting for multiple factors.

For each report, *Business Week* surveyed the largest pension funds and money managers, who were asked to identify the best and worst boards of directors based on four categories: accountability to shareholders (*SurvAcct*), quality of directors (*SurvQu*), independence (*SurvInd*, and corporate performance (*SurvPerf*). The companies, approximately 210, identified by the survey respondents were then subjected to an analysis by *Business Week* focusing on the areas of accountability (*GuidAcct*), quality (*GuidQu*), and independence (*GuidInd*).

In *Business Week*'s quantitative analysis, the independence score is based on the number of outsiders on specific committees, particularly the audit and compensation committees, and the board as a whole. *Accountability* is based on directors' equity interest in the firm, number of meetings per year, and whether or not the board is elected every year. *Quality* is determined by the number of boards a director sits on and the experience level of the director in the firm's core business. The areas measured fall closely in line with the characteristics of a board that were found to be important in controlling agency costs and predicting performance. The overall score (maximum of 100 points) is based evenly on the survey score and the analysis score, each with a maximum of 50 points. Finally, the boards are ranked from best to worst, and the best and worst twenty-five are reported for each survey.

Data on prices and returns before and after the survey announcement are gathered from the CRSP database. To conduct abnormal long-run return analyses, I use the Fama and French (1992, 1996) model as extended by Carhart (1997). I obtain the relevant factor data from Ken French's website. Data on company specific items such as the number of shareholders and sales level come from *Compustat*, where data for the November 1996 and December 1997 rankings come from December of 1996 and 1997, respectively, and data for the January 2000 ranking come from December 1999.

COGNITIVE ERROR AND THE HALO EFFECT IN SURVEY DATA

Because the *Business Week* rankings are based, in part, on survey results, they may be influenced by the "halo effect." The term halo effect was first used by Thorndike (1920) and is described by Nisbett and Wilson (1977) as the "influence of a global evaluation on evaluations of individual attributes." This implies that firms with overall good reputations or past performance (the global evaluation) are also viewed as having good boards of directors (the individual attribute).

Nisbett and Wilson (1977) conduct further experiments and conclude that the evaluation of attributes are influenced by the halo effect even when there is sufficient information to allow for an

independent assessment of the specific characteristic. Thus, even if the individuals surveyed by *Business Week* could specifically evaluate boards of directors, it is possible that they are unduly influenced by other, more global characteristics, such as name recognition and past returns.

The halo effect is an example of the behavioral phenomenon known as "representativeness," which is a type of cognitive error. The seminal work in this area was conducted by Tversky and Kahneman (1974). They explain that people rely on a limited number of heuristic ("rule-of-thumb") principles that allow them to reduce the complex tasks of assessing probabilities and predicting values to simpler judgmental operations.

Specifically, representativeness involves answering the question, "What is the probability that object A belongs to class B?" This question is particularly relevant to survey data where respondents are asked to judge whether a firm is in one group or another. Tversky and Kahneman (1974) find that individuals tend to diverge from rational reasoning by failing to properly consider base rate probabilities, which amounts to a violation of Bayes' Rule. Wood (1996) identifies the results of this error as a tendency to select companies with good pasts rather than good futures.

As an example, some researchers have relied on *Fortune* magazine's list of the most admired companies to proxy for reputation. However, analysis of this survey indicates that rankings are heavily determined by past financial performance and are not unbiased predictors of reputation or future performance (e.g., Black, Carnes, & Richardson, 2000; Fombrun & Shanley 1990; Shefrin & Statman, 1995). In fact, surveys with results that are predominately determined by past returns may actually rank firms in the direction opposite to what is expected relevant to future returns. As noted by Barberis, Shleifer, and Vishny (1998, p. 308), "securities with strings of good performance, however measured, receive extremely high valuations, and these valuations, on average, return to the mean."

In a similar fashion, the rankings of investment analysts have also been found to be influenced by cognitive error. Li (2002) finds that the investment manager all-stars published by *Institutional Investor* are based more on reputation and recognition than on actual performance. Additionally, even though performance is more important for a similar ranking in the *Wall Street Journal*, the criteria for being included in the evaluation effectively introduces a similar bias.

The existence of the halo effect suggests that using the *Business Week* rankings may be problematic. So, in the analyses that follow, I test for the importance of the halo effect, and I also evaluate stock price performance for the companies as ranked by *Business Week* and also for a re-ranked sample designed to exclude the portion of the *Business Week* ranking that is survey based.

DESCRIPTIVE STATISTICS

Panels A and B of Table 1 report descriptive statistics for all three surveys combined. The panels contain means and standard deviations for firms with the best boards and worst boards, as

well as a difference of means test between the groups. The variables in Panel A are firm specific measures obtained from financial statements and market prices. These items are defined as follows:

MV	= total equity market value (capitalization) in millions;
Shareholders	= total number of shareholders in thousands;
MVperHolder	= market value per shareholder in thousands;
EIS	= the absolute value of extraordinary income scaled by total sales;
CASHA	= balance sheet cash as a percentage of total assets;
Y-t	= cumulative market-adjusted buy-and-hold returns in percent calculated over the t years preceding the survey, t = 1, 3, 5; and
Y+t	= cumulative market-adjusted buy-and-hold returns in percent calculated over the t years following the survey, t = 1, 3, 5.

As shown in Panel A of Table 1, the companies rated as having the best boards have a significantly higher market value at the time of the survey, as well as a larger market value per shareholder, which is a proxy used by Merton (1987) to identify the influence of large, external shareholders. The larger market value per shareholder is consistent with Shleifer and Vishny (1997), who conclude that large shareholder blocks are necessary for effective corporate governance. However, the best boards tend to be firms that have higher cash on hand, which is in contrast to the prediction of Jensen (1986), who suggests that higher FCF leads to increased agency costs. In unreported results, I also test FCF scaled by assets and sales, but find this to be more related to past performance than the agency costs Jensen intends. Cash on the balance sheet is likely a better representation of management's overall inclination to retain cash rather than to pay out to owners. Extraordinary income is often thought to be associated with earnings management, which might be more common or more significant for firms with weaker boards. However, the two groups are not significantly different in terms of absolute extraordinary income reported.

Table 1: Descriptive Statistics

The following panels provide descriptive statistics for all three surveys combined. Additionally, t-statistics for a difference of means test assuming unequal variances are reported. The category Best reports values for the best boards of directors in *Business Week*'s survey (approximately 25 companies per survey), and Worst reports values for the worst boards of directors in *Business Week*'s survey (approximately 25 companies per survey). Panel A reports firm and market characteristics, and Panel B reports *Business Week* ranking scores. *MV* is market value in millions as of the date of survey. *Shareholders* is the total number of shareholders in thousands owning stock. *MVperHolder* is market value per shareholder in thousands. *EIS* is the absolute value of extraordinary income scaled by sales. *CASHA* is balance sheet cash scaled by assets. Overall is the total score from the *Business Week* survey and analysis; whereas, *Survey* and *Analysis* are the components from the industry survey and from *Business Week*'s guideline analysis, respectively. *SurvAcct, SurvQu, SurvInd* and *SurvPerf* are scores from the survey for board accountability, quality, independence, and company performance, respectively. *GuidAcct, GuidQu*, and *GuidInd* are analysis scores from

Table 1: Descriptive Statistics

Business Week for board accountability, quality, and independence, respectively. *Y-5, Y-3,* and *Y-1* are the market-adjusted returns in percent for the five years, three years and one year prior to the survey, respectively. *Y+1, Y+3,* and *Y+5* are the market-adjusted returns in percent for the one year, three years and five years after the survey, respectively. All returns are computed on a buy-and-hold basis. Data from *Compustat* are from December of the same year for the 1996 and 1997 surveys, and data for the 2000 survey are from December 1999.

Panel A: Firm and Market Characteristics

	Best		Worst		Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	t-statistic	p-value
MV	92156.0	90410.0	12243.0	20697.0	6.83	.0001
Shareholders	223.4	308.2	251.6	632.7	-0.28	.7830
MVperHolder	2235.9	7089.4	268.4	426.8	2.21	.0304
EIS	.0001	.0007	.0005	.0024	-1.04	.2995
CASHA	.1377	.1524	.0917	.1324	1.68	.0958
Y-5	297.87	904.99	-142.0	91.73	3.71	.0001
Y-3	99.69	195.12	-84.4	61.82	6.84	.0001
Y-1	11.56	56.15	-29.4	39.71	4.42	.0001
Y+1	5.24	35.54	10.66	54.18	-0.60	.5500
Y+3	26.88	136.61	-24.8	121.79	1.63	.1086
Y+5	0.41	86.89	-33.40	91.15	1.53	.1325

Panel B: Business Week Ranking Scores

	Best		Worst		Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	t-statistic	p-value
Overall	66.4	8.0	30.2	10.4	na	na
Survey	28.5	6.3	2.0	6.3	25.72	.0001
Analysis	37.9	6.7	28.3	9.3	7.23	.0001
SurvAcct	8.5	0.7	3.0	1.5	29.60	.0001
SurvQu	8.5	0.6	3.3	1.3	30.63	.0001
SurvInd	8.2	0.8	3.0	1.4	27.58	.0001
SurvPerf	8.5	0.8	2.9	1.4	29.40	.0001
GuidAcct	7.3	2.5	4.6	3.5	5.63	.0001
GuidQu	6.9	1.7	6.2	2.3	1.93	.0551
GuidInd	8.0	1.8	5.7	3.5	5.20	.0001

na = not applicable

The returns for the best boards are significantly higher prior to the survey, which could be a result of a better board, or it could be indicative of further behavioral factors influencing the survey results. If historical returns are the result of having a better board (i.e., the survey is unbiased), I would expect continued higher returns for the firms with the best boards after the survey. With the exception of one-year return, this is what I find. Subsequent returns in the three- and five-year periods following the survey are indeed larger for firms classified as having a best board; however, the difference is not as significant as the pre-survey period. If I eliminate the 2000 survey and conduct the test on one-year return (or if median values are used), the difference is also positive, with a t-statistic of 0.60. The 2000 survey contains a larger proportion of tech stocks in the best category. With the collapse of the internet "bubble," the results for one-year return are somewhat different than the prior surveys.

The items reported in Panel B represent results from the *Business Week* rankings. The first item is the overall score (*Overall*). By construction, the highest ranked firms have higher scores, so a statistical comparison is not meaningful. The next two items, *Survey* and *Analysis*, are the scores from the survey and analysis portions of the rankings. Not surprisingly, the best firms have a higher score on both measures, but the difference is much more pronounced, both numerically and statistically, in the survey portion than in the analysis portion, which can be seen by comparing the t-statistics of 25.72 and 7.23, respectively. This is also true for the individual components of the survey portion (*SurvAcct, SurvQu, SurvInd,* and *SurvPerf*) as compared to the individual analysis portions (*SurvAcct, SurvQu,* and *SurvInd)*. These results tend to foreshadow the effect of cognitive error in the rankings, particularly in the survey component.

TESTS AND RESULTS

Based on the empirical results related to other industry surveys, I test for the existence of the halo effect and further analyze the relation between rankings and past returns, as well as between survey and analysis scores. If the data are indeed biased by the halo effect, I would expect that past returns would be highly correlated to overall scores and that survey results would be significantly different from analysis results. Table 2 reports the correlations between historical measures of return (*Y-1, Y-3*, and *Y-5*) and the various components of the *Business Week* rankings. I find that historical return is much more correlated to survey portions than it is to analysis portions, indicating a degree of halo effect in the survey results.

To further identify if the survey portion is biased, I test the difference in accountability, quality, and independence scores between survey results and analysis results. Table 3 reports the t-statistics for a difference of means test between survey and analysis scores for both categories (i.e., the best and worst boards). The results show a general consistency for each individual survey and for the surveys as a whole. For the best boards of directors, the survey scores are significantly higher

than the analysis scores (positive t-statistic), with the opposite being true for the worst boards of directors (negative t-statistic). This indicates that survey respondents (investment analysts) tend to overestimate the abilities of the board of directors of recently high performing companies and to underestimate the abilities of boards of directors of recently poor performing companies.

Table 2: Correlations

The following table provides correlations between historical returns and survey and analysis scores. *Survey* and *Analysis* are the components from the industry survey and from *Business Week* guideline analysis, respectively. *SurvAcct, SurvQu, SurvInd* and *SurvPerf* are scores from the survey for board accountability, quality, independence, and company performance, respectively. *GuidAcct, GuidQu*, and *GuidInd* are analysis scores from *Business Week* for board accountability, quality, and independence, respectively. *Y-5, Y-3*, and *Y-1* are the market-adjusted buy-and-hold returns in percent for the five years, three years and one year prior to the survey, respectively.

Panel A: Historical Return v. Survey Scores

	Y-1	*Y-3*	*Y-5*
Survey	.3432	.4386	.2299
SurvAcct	.3452	.4746	.2716
SurvQu	.3640	.4759	.2692
SurvInd	.3311	.4173	.2564
SurvPerf	.4344	.5706	.3489

Panel B: Historical Return v. Analysis Scores

	Y-1	*Y-3*	*Y-5*
Analysis	.2037	.2919	.2560
GuidAcct	.1941	.3239	.2493
GuidQu	.0918	.1389	.1406
GuidInd	.1556	.1807	.1563

Table 3: Comparison of Survey and Analysis Scores

The following table provides a difference of means test between survey scores and analysis scores for *accountability, quality*, and *independence.* Specifications are given for each individual survey (1996, 1997 and 2000), as well as for all three surveys combined. A positive value indicates that the scores of the survey portion were higher than the scores from *Business Week*'s analytic review.

	Accountability	*Quality*	*Independence*
1996:			
Best	4.25*	5.82*	0.82
Worst	0.49	-5.59*	-2.86**
1997:			
Best	3.54*	4.48*	1.16
Worst	-2.89**	-3.44*	-7.38*
2000:			
Best	-0.96	4.16*	-0.22
Worst	-8.13*	-11.17*	-2.36**
Combined:			
Best	2.31**	4.44*	0.51
Worst	-2.10**	-5.49*	-3.58*

*, **, and *** indicate significance at the 1, 5, and 10 percent levels, respective

Thus, on a univariate basis it appears that historical returns are a highly influential variable in determining classification as a best or worst board, particularly for the survey portion. To further explore this issue, I conduct a logistic regression as follows:

$$Best = b_0 + b_1 MV + b_2 Shareholders + b_3 MVperHolder + b_4 EIS + b_5 CASHA + b_6 Y\text{-}5 + b_7 Y\text{-}3 + b_8 Y\text{-}1 + e_t$$

where, the dependent variable *Best* takes on a value of one if classified as a best board and a value of zero if classified as a worst board. In addition to market-adjusted historical returns (*Y-5, Y-3*, and *Y-1*), I add variables suspected to be influential. Past returns can be proxied by market value, *MV*, as firms with higher past returns see increases in the value of their securities. As the number of *Shareholders* increases, I expect board effectiveness to go down due to the free-rider problem. As market value per shareholder (*MVperHolder*) increases, I expect agency costs to fall and board

effectiveness to increase since relatively large external shareholders are thought to be beneficial (e.g., Merton, 1987; Shleifer & Vishny, 1997). The absolute value of extraordinary income per unit of sales (*EIS*) could potentially be a proxy for earnings mismanagement; therefore, I would expect a negative relation between *EIS* and ranking. Jensen (1986) identifies free cash flow as a proxy for agency costs. A higher free cash flow indicates less willingness to pay out cash to owners, thereby increasing agency costs. Thus, I expect a negative relation between *CASHA* and board ranking. If the halo effect is present, I would expect a positive relation between market-adjusted historical return, particularly three-year (*Y-3*) and five-year (*Y-5*), and board ranking.

Table 4 reports the results from the logistic regressions. With the exception of *CASHA,* the relations on the coefficients of the univariate (regressions (1) through (8)) logistic regressions are consistent with my expectations. Regression (9) reports the results when I include all variables. Only *MV* and *Y-5* are significant in increasing the probability that a firm's board of directors will be ranked as a best board. These results are again consistent with the halo effect, in that past performance is the most influential predictor of board ranking.

Table 4: Logistic Regression, Best v. Worst Classification.

This table presents logistic regression results for the classification of a board as either in the Best group or the Worst group. The dependent variable takes on a value of one if the company's board is in the Best group. *MV* is market value in millions as of the date of survey. *Shareholders* is the total number of shareholders in thousands owning stock. *MVperHolder* is market value per shareholder. *EIS* is the absolute value of extraordinary income scaled by total sales. *CASHA* is balance sheet cash scaled by total assets. *Y-5, Y-3*, and *Y-1* are the market-adjusted returns in percent for the five years, three years and one year prior to the survey, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	-1.1900*	.3830***	-.6030	.3250	.0410	.9230*	.7900*	.5290**	-.2770
MV	.0004*								.0001**
Shareholders		-.0001							-.0023
MVperHolder			.0020*						-.0009
EIS				-146.8					99.0800
CASHA					2.4440				-.9200
Y-5						1.7200*			.9680**
Y-3							2.5000*		1.0250
Y-1								2.7100*	-1.3780
n	111	109	108	112	109	108	108	108	101
Percent correct	90.3	27.1	81.6	12.1	63.6	91.7	90.9	75.4	95.4

*, **, and *** indicate significance at the 1, 5, and 10 percent levels, respectively.

At this point, most prior studies on survey data have concluded that survey results are biased by the halo effect and therefore unusable in the empirical and decision making processes. However, a possible endogeneity problem exists in this study in that the historically better returns for the best boards could be the result of better internal control and lower agency costs, rather than the rankings being a result of the historical return. To examine this issue, I analyze the difference in average quarterly returns in the period before the survey, the period after the survey, and for the periods combined. Table 5 presents the results of this analysis. As previously shown, return prior to the surveys being published is much higher for firms classified as having a best board of directors. However, I also find that after the survey, there is a general tendency for the firms having a best board to continue to earn more than firms having a worst board, although this difference is only significant at a low level.

Table 5: Difference in Returns

The following table presents the difference in quarterly average returns between the firms with the best and worst boards of directors. The table provides the results for the period (3-yr. or 5-yr.) prior to the survey, the period (3-yr. or 5-yr.) after the survey, and for the entire period (Y-3 to Y+3 and Y-5 to Y+5). The final row in each section gives the t-statistic for the difference test between the two groups.

	1996		1997		2000	
	3-Yr	5-Yr	3-Yr	5-Yr	3-Yr	5-Yr
Before:						
Best	3.15	1.55	4.11	3.11	4.38	3.86
Worst	-1.8	-.83	-1.57	-1.61	-1.77	-1.28
t-statistic	2.01	1.26	2.01	2.28	1.42	1.72
After:						
Best	1.14	1.54	1.53	1.09	-0.38	na
Worst	-2.53	-0.58	-4.57	-3.39	0.47	na
t-statistic	0.88	0.64	1.30	1.15	-0.17	na
Combined:						
Best	2.15	1.56	2.57	2.14	2.21	2.44
Worst	-1.85	-0.69	-3.32	-2.46	-0.76	-0.70
t-statistic	1.74	1.20	2.09	2.09	0.82	1.08

na=not available

To further examine this issue, I move past the univariate analyses and conduct a Fama-French (1992, 1996) / Carhart (1997) style long-run abnormal return analysis on each survey individually and on the surveys combined. The model used is as follows:

$$DIFF = b_0 + b_1 Market + b_2 SMB + b_3 HML + b_4 UMD + b_5 BEFORE + b_6 BMarket + b_7 BSMB + b_8 BHML + b_9 BUMD + e_t$$

where:	
DIFF	= the quarterly difference in return on the best portfolio less the worst portfolio;
Market	= the excess return (market return less the risk free rate) each quarter for the market;
SMB	= the quarterly return on small capitalization stocks less the quarterly return on large capitalization stocks;
HML	= the quarterly return on high book-to-market stocks less the quarterly return on low book-to-market stocks;
UMD	= the difference between the quarterly return on high return portfolios and low return portfolios, and it represents the momentum factor developed by Carhart (1997); and
BEFORE	= a dummy variable taking on a value of one if the quarter is before the date of article publication, zero if after.

Each of the factor portfolios (i.e., *Market, SMB, HML*, and *UMD*) are obtained from Ken French's website. To account for changes in relationships in the periods before and after the survey, I include interaction terms between *BEFORE* and each of the other variables, thereby giving *BMarket, BSMB, BHML*, and *BUMD*. After controlling for these relationships, the intercept (*alpha*) represents abnormal return in the period following the survey publication. A positive *alpha* indicates that the portfolio of firms with the best boards outperformed the portfolio of firms with the worst boards after the survey. Based on the results of Fama (1998), I choose to use value-weighted returns, which, additionally, are much more realistic of a trading strategy. (When equal-weighted returns are used, the results are even more significant than those reported.) Table 6 presents the results of this analysis.

The sign and level of *alpha* provides an answer to the question of whether the rankings are influenced more by the halo effect, actual information, or neither. If the halo effect is present, I would expect a negative and significant *alpha*, indicating reversion to the mean as identified by DeBondt and Thaler (1985) and Barberis, Shleifer, and Vishny (1998). If the rankings are "correct," then *alpha* would be positive and significant, indicating firms with a best board of directors continue to outperform those with a worst board of directors. If *alpha* is not significant, then neither factor dominates.

Table 6: Fama-French-Carhart Regressions of Long-Run Return

The following table presents the coefficients from a time series regression in the Fama-French-Carhart form. The dependent variable (*DIFF*) is the quarterly return to the best portfolio (best twenty-five) less the quarterly return on the worst portfolio (worst twenty-five). *Market* is the excess return (market return less the risk free rate) each quarter for the market. *SMB* is the quarterly return on small capitalization stocks less the quarterly return on large capitalization stocks. *HML* is the quarterly return on high book-to-market stocks less the quarterly return on low book-to-market stocks. *UMD* is the difference between the quarterly return on high return portfolios and low return portfolios. *Market return, SMB, HML*, and *UMD* values are obtained from Ken French's website. *BEFORE* is a dummy variable taking on a value of one if the quarter is before the date of article publication, zero if after. I include interaction terms between *BEFORE* and each of the other variables, thereby giving *BMarket, BSMB, BHML*, and *BUMD*. Portfolio returns are calculated using value-weighted returns. The regressions for 5-yr are performed using quarterly returns over a ten year period (five years prior to the survey and five years after, where available). The regressions for 3-yr are performed using quarterly returns over a six year period (three years prior to the survey and three years after, where available).

	1996		1997		2000		Combined	
	3-Yr	5-Yr	3-Yr	5-Yr	3-Yr	5-Yr	3-Yr	5-Yr
Alpha	8.65**	3.89***	4.11	6.22**	4.84	4.84	3.72***	4.78*
Market	-0.80***	-0.23	0.24	-0.10	-0.90	-0.90	-0.17	-0.24
SMB	-0.21	-0.68*	-0.38	-0.84*	0.03	0.03	-0.85*	-0.86*
HML	-0.90	-0.37	0.49	-0.46	-1.83***	-1.83	-0.43	-0.55**
UMD	-0.64	-0.18	0.27	-0.28	-0.45	-0.45	-0.12	-0.23
BEFORE	4.22	-0.47	9.71	0.32	-0.10	0.44	1.69	0.27
BMarket	1.21**	0.20	-0.80	0.12	0.81	0.69	0.07	0.10
BSMB	0.05	0.22	-1.20	0.10	-0.09	-0.12	0.53	0.46***
BHML	0.44	0.18	-2.58***	0.10	2.10	1.69***	0.09	0.13
BUMD	-0.46	-0.03	-2.45	-0.26	0.97	0.62	0.11	0.13

*, **, and *** indicate significance at the 1, 5, and 10 percent levels, respectively.
Note: for 2000, returns after the survey extends for only 2.75 years, i.e., through the third quarter of 2002.

Examining the results of Table 6, *alpha* is consistently large and positive. Additionally, *alpha* is statistically significant and economically large. As an example, the *alpha* of 3.89 for the five year period after the 1996 survey indicates that, at the time of publication, going long in firms classified as having a best board and short in those firms classified as having a worst board would have earned an investor an annual positive abnormal return of approximately 15.56 percent. For all surveys combined, the average quarterly (yearly) abnormal return in the three- year period following publication is 3.72 (14.88) percent and in the five-year period is 4.78 (19.12) percent. Therefore, *Business Week* rankings on board structure, even in the presence of potential cognitive bias, are informative and can be applied to profitable trading strategies.

To replicate a potentially realistic strategy, I also consider entering into the long-short portfolio on the date of the original publication, and then rebalancing this portfolio upon subsequent publications. In addition, this approach adjusts for the bias introduced by some firms being included in multiple surveys (i.e., overlapping time periods). Using monthly returns, I find that the positive abnormal return earned over the total five year period is 1.46 (17.52) percent per month (year), which is significant at the five percent level.

Examining the other coefficients in Table 6, there is no consistency in significance across the surveys. However, in interpreting those coefficients that are significant, since the dependent variable is a long-short portfolio of best minus worst, a negative coefficient indicates that firms with the best boards had a smaller (or more negative) relationship to the factor than did the firms with the worst boards. A negative and significant coefficient on *Market* indicates that the best boards were associated with firms having lower betas. A negative and significant coefficient on *SMB* indicates that the best boards were less related to the returns of a small-minus-big stock portfolio, i.e., the firms in the best category were more related to larger firms. Also, a negative and significant coefficient on *HML* indicates that the firms with the best boards were less related to portfolios of high book-to-market stocks, which could be indicative of the worst boards being associated with firms currently, or expected to be, in financial distress.

HALO EFFECT ADJUSTMENT

To this point, I have determined that the rankings of the best and worst boards are influenced by cognitive error, particularly the survey portion; however, I have also found that the rankings as a whole are informative. These results indicate that the analysis portion of the rankings is structured well enough so as to offset the halo effect bias. Thus, if I could "re-rank" the results purely on analysis scores, this should eliminate the halo effect and improve the trading strategy.

To eliminate the halo effect, I rank each survey strictly by the analysis portion of the score. I then identify the score that separates the best twenty-five boards from the worst twenty-five boards. With this score, I evaluate the original listing of best and worst boards. For the best boards, I retain all firms with analysis scores above the critical level, and for worst boards I retain all firms with scores below this level. This creates a sample that is more representative of the best and worst boards of directors as based on pure analytic criteria. Because *Business Week* does not make available the entire listing, I cannot re-rank the entire sample. If I were to re-rank only the fifty boards listed in each survey and then treat the new set as the best and worst twenty-five, this would not be a true representation of the best and worst boards as determined by analysis scores. Thus, my method is biased against finding greater abnormal returns.

With the modified rankings, I repeat the Fama-French-Carhart regression from Table 6. If my intuition is correct in that the halo effect is concentrated in the survey portion of the ranking, the re-ranked sample should create *alphas* that are more positive and significant than the previous

results indicate. Examining Table 7, I find this to be the case, particularly for the 1996 and 1997 survey results. As a comparison, consider again the five-year period subsequent to the 1996 survey. Implementing the proposed trading strategy would produce a positive quarterly abnormal return of 5.82 percent, which is approximately 23.28 percent on an annualized basis. For the surveys combined, the three-year (five-year) quarterly abnormal return is 5.44 (5.18) percent, both of which are statistically as significant as the original sample, but higher in economic significance. Thus, it appears that correcting the rankings for the halo effect improves the performance and significance of the results.

Table 7: Fama-French-Carhart Regressions of Long-Run Return on Re-ranked Data

The following table presents the coefficients from a time series regression in the Fama-French-Carhart form. Data has been re-ranked on the basis of analysis scores only. The dependent variable (*DIFF*) is the quarterly return to the best portfolio (best twenty-five) less the quarterly return on the worst portfolio (worst twenty-five). *Market* is the excess return (market return less the risk free rate) each quarter for the market. *SMB* is the quarterly return on small capitalization stocks less the quarterly return on large capitalization stocks. *HML* is the quarterly return on high book to market stocks less the quarterly return on low book to market stocks. *UMD* is the difference between the quarterly return on high return portfolios and low return portfolios. *Market return, SMB, HML*, and *UMD* values are obtained from Ken French's website. *BEFORE* is a dummy variable taking on a value of one if the quarter is before the date of article publication, zero if after. I include interaction terms between *BEFORE* and each of the other variables, thereby giving *BMarket, BSMB, BHML,* and *BUMD*. Portfolio returns are calculated using value-weighted returns. The regressions for 5-yr are performed using quarterly returns over a ten year period (five years prior to the survey and five years after, where available). The regressions for 3-yr are performed using quarterly returns over a six year period (three years prior to the survey and three years after, where available).

	1996		1997		2000		Combined	
	3-Yr	5-Yr	3-Yr	5-Yr	3-Yr	5-Yr	3-Yr	5-Yr
Alpha	13.50*	5.82**	6.34***	5.62**	1.89	1.89	5.44***	5.18*
Market	-1.22**	-0.30	-0.02	-0.23	-1.45	-1.45	-0.44	-0.37
SMB	-0.14	-0.61*	-0.19	-0.94*	1.29	1.29	-0.83*	-0.84*
HML	-1.29**	-0.52	0.59	-0.32	-2.43***	-2.43	-0.58	-0.57***
UMD	-1.06***	-0.35	0.21	-0.14	-0.51	-0.51	-0.27	-0.24
BEFORE	-9.69***	-2.20	4.68	2.37	9.49	8.67	1.90	1.63
BMarket	1.87*	0.30	-0.62	0.06	1.14	1.12	0.32	0.25
BSMB	0.26	0.03	-1.12	0.06	-1.77	-1.79	0.25	0.23
BHML	1.64	0.23	-1.88	-0.15	1.43	1.38	-0.18	-0.12
BUMD	0.26	0.15	-1.14	-0.72	-0.09	-0.09	-0.12	-0.09

*, **, and *** indicate significance at the 1, 5, and 10 percent levels, respectively.
Note: for 2000, returns after the survey extends for only 2.75 years, i.e., through the third quarter of 2002.

CONCLUSION

Within the past few years, the role of a firm's board of directors has come under increased scrutiny, as investors have begun to reevaluate the importance of these entities in reducing agency costs, preventing corporate scandal, and increasing equity return. With this focus in mind, I have analyzed practitioner rankings of firms considered to have either a best or worst board of directors.

Consistent with previous literature examining survey data, I find that *Business Week*'s rankings are influenced by the halo effect; however, I also find that the rankings as a whole are informative and can be used to create a positive return trading strategy. Additionally, I determine that by eliminating the portion of the rankings (i.e., the survey component) that is affected by cognitive bias, I can improve the level and significance of the positive abnormal return. Given these results, it appears that board quality matters and that *Business Week* survey results are informative of this quality.

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CLIENT AGE, GENDER, EDUCATION AND PERCEPTIONS OF INVESTMENT BROKER PRACTICES

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ABSTRACT

Clients' age, gender, and educational level were investigated in relation to their perceptions of investment broker practices and level of financial investment. Drawing on data from a sample of 779 investors, results of hierarchical multiple regression analyses yielded statistically significant two-way interactions among the demographic variables. This suggested that the effects of demographic variables might be more complex than suggested by previous research based on simple bivariate correlational analyses. Specifically the present study's findings suggested that: (1) Compared to the other age and educational groups studied, older investors with lower educational levels appeared to have the least trust in their broker. (2) Older women tended to have the least confidence in their own investment choices. (3) Older, well-educated investors tended to have the highest dollar level of investment.

It appears that interplay of demographic variable effects should be considered before drawing conclusions about investment preferences of age or gender groups. Recommendations for building broker-client relationships and directions for future research are suggested.

INTRODUCTION

During the past decade there has been a remarkable increase in the proportion of the U.S. population that owns stocks. This increased stock market participation has been attributed to rising aggregate net worth and demographic changes such as the maturing baby boom generation (Rex, 1999) and economic advancement of women (Sullivan, 1993).

As different age groups and more women are seeking investment brokering services (Thomas, 2000), client needs may also be changing. New behaviors on the part of the broker may be necessary as the client mix evolves. At the general level, there is some agreement in the literature concerning effective investor practices (Gray, 1994; Mushkin, 1997). Client trust in the broker has been repeatedly identified as critical for turning prospects into clients (Olivo, 1998; Reimel, 1999). Other important factors that appear to play a role in gaining clients are advisor knowledge and

understanding of client needs (Olivio, 1998) and also time spent with clients (Reimel, 1999). Fusilier, Simpson, Aby, and Simpson (1999) identified broker behaviors that were related to client satisfaction. These authors reported a considerably stronger correlation between broker behavior and client satisfaction ($r = .73$; $p<.01$) than between the variables of rate of return on investment and client satisfaction ($r = .09$; $p< .05$). This suggests that broker behavior is a critical component of client satisfaction, possibly even more important than financial outcomes such as rate of return.

Other studies have explored demographic variation in client perceptions of broker practices. These findings are reviewed below. The focus of the review is on gender and age related perceptions. Almost no literature was found on the relationship between client educational levels and perceptions of broker behavior. However, it is well known that education is strongly and positively related to income, which creates the potential for investment activity.

REVIEW OF THE LITERATURE

Age and wealth tend to be positively related in the U.S. The senior investment market is expanding as a large segment of the U.S. population enters old age. Sullivan and Ross (1999) argued that age is predictive of investment clients' attitudes and behavior. They concluded that older clients tend to be frugal, regard investing in the stock market as an emotionally threatening experience, and want firm recommendations from their financial advisors. Kaplan (1999) indicated that most seniors want help and information in order to understand their investment choices. Different asset allocations have been recommended across age groups (Stovall, 1997). Likewise, Weil (1999) and Bakshi and Chen (1994) investigated life-cycle investments. Less risk was recommended for older investors. Moreover, the literature seems to suggest that conservative investing and guidance from the financial advisor are needed for older clients.

Greco (1991), Marsh (1998), and Schumell (1996) all reported that the women's investment market is increasing. Although men have traditionally controlled most of the wealth in the U.S., women's financial holdings are on the rise. Smith Barney noted that the percentage of women clients jumped from 28% in 1995 to 40% in 1997. Women tend to see their relationship with the financial advisor as important (Hamacher, 2001; Marsh, 1998; Schumell, 1996). Greco (1991) and West (1996) reported that women are often unprepared to manage finances. They need education and want to trust and learn from their investment advisor. Women may also be more cautious and trade less than men (Barber & Odean, 2001). Thus, the women's market may require substantial time and service from financial advisors and brokers.

However, Wang (1994) summarized evidence suggesting that sales representatives at brokerages take female investors less seriously than men. The brokers studied tended to spend more time with men and recommend higher risk and return investments to men. Jacobius (2001) reported that women are less involved with their retirement accounts than are men. Conversely, Friedman

(1996) contended that baby boomers and women are gaining financial sophistication. With increased savvy, women will develop the ability to distinguish between levels of investment service quality. Inadequate broker attention and recommendations could lead to dissatisfaction on the part of knowledgeable women clients, which in turn may cause brokers to lose clients from this market segment.

PURPOSE OF THE STUDY

This study investigated the relationships of client age, gender, and education on client perceptions of broker trustworthiness and competence, as well as clients' dollar level of investment. Interactive effects were also explored among the demographic variables on client perceptions and level of investment. Because the previous literature suggested that older individuals and women desire more investment guidance, the interactive influence of age and gender on client perceptions was probed. Likewise, those who are older and more educated might have a greater investment level.

Specific hypotheses were developed on the basis of this logic and the previous findings:

Hypothesis 1:	Older investors tend to view their broker more positively in terms of trustworthiness and competence.
Hypothesis 2:	Women tend to view their broker more positively with regard to the same criteria.
Hypothesis 3:	Men have a higher dollar-level of investment.
Hypothesis 4:	Older investors have a higher level of investment.
Hypothesis 5:	Those with higher educational attainment have a higher level of investment.
Hypothesis 6:	Older investors with higher educational attainment have a higher level of investment (age x education interaction).
Hypothesis 7:	Older women perceive their brokers more positively (age x gender interaction).

METHOD

A sample of 779 investors who used brokers participated in this study. Respondents from 22 states were represented in the sample (see Table 1). Average age of the investors was 41 (s.d. = 12.93). Sixty-three percent were men and 37 percent were women. Percentages of the sample attaining various levels of education were: high school or less (18%); some college (17%); associate's degree (1%); bachelor's degree (42%); and advanced degree (22%). Education was coded

on a scale of one to five (mean = 4.31; s.d. = 1.47). Many respondents held multiple types of investments. Percentages of the sample holding various types of investments are as follows: 67% owned stocks; 66% held bonds; 64% had mutual funds; 36% held certificates of deposit; and 35% had money market funds. Percentages of the sample held the following categories of investment level: 60% held up to $49,000; 18% held an investment amount of $50,000 to $99,000; and 22% held $100,000 and above. The average annual portfolio rate of return for the sample was 16.7 percent.

Table 1: Study Participants by State

State	Frequency	State	Frequency
Alabama	23	Mississippi	1
Alaska	3	Missouri	1
Arizona	13	Nebraska	5
Arkansas	15	North Carolina	3
California	15	Oklahoma	1
Florida	1	Oregon	1
Illinois	1	South Carolina	1
Iowa	12	Tennessee	1
Louisiana	620	Texas	56
Maryland	3	Virginia	1
Minnesota	1	Wisconsin	1
		Total	779

The study questionnaire contained 20 items concerning perceptions of broker practices. An additional item addressed satisfaction with the broker's performance. All were rated on a seven-point response scale from "Strongly Agree" to "Strongly Disagree." A "Not Applicable" response was also available to respondents. Items concerning demographic variables, level of investment, and rate of return were also included. The questionnaire items are presented in Table 2. Item means and further discussion of the measure's psychometric properties appeared in Fusilier et al. (1999).

Table 2: Items Concerning Investor Perceptions of Broker Practices
My broker encourages too many transactions in my account to generate commissions (he/she "churns" my account). (R)
My broker places his/her interests ahead of mine. (R)
My broker emphasizes proprietary products rather than better performing products. (R)
My broker's commissions come before client welfare. (R)
My brokers are readily accessible to client.
My broker keeps me abreast of my portfolio's performance.
My broker solicits input regarding my investment objectives.
My broker performs in a manner consistent with my investment objectives.
My broker calls with "hot tips".
My broker is more interested in my profits than his/her own.
My brokerage firm recommendations outperform my own investment choices.
My brokerage firm is equally interested in small investment accounts and large investment accounts. My broker emphasizes his/her firm's mutual funds as opposed to autonomous funds with better performance record. (R)
If an available no-load fund outperforms a load fund that is offered by the broker, the broker will recommend the better performing product.
My broker is consistently bullish and optimistic about the market.
My broker is knowledgeable and informed about economic conditions on a continuing basis.
My broker encourages occasional caution by recommending money market funds and CDs.
My broker recommends a fully invested posture.
My broker recommends using defensive assets such as money market funds to diversity my portfolio. My broker advises clients of risks and profits associated with bond investments.
Overall, I am very satisfied with my broker's performance.
R indicates reverse coding.

Student workers and designated students from upper division business courses at a medium-sized university collected the data. The questionnaires were completed at the respondent's home or workplace. The coefficient alpha reliability for all 20 items concerning perceptions of investment practices was .82. This suggests that the items share a common core concept.

RESULTS

Correlation Analyses

Correlations were computed among the demographic variables, the twenty broker behavior questionnaire items, and level of investment. For the gender variable, men were coded as "1" and women as "2". A summed score was also computed across the 20 broker behavior items. It did not correlate significantly with any of the demographic variables.

The correlation results suggested that older respondents tended to express greater agreement with the statements:

"My broker places his/her interests ahead of mine." (reverse scored) $r = .091$, $p < .05$
"My broker emphasizes proprietary products rather than better performing products." (reverse scored) $r = .116$, $p < .05$

Based on these results, it appears that older clients may have a more positive view of their broker's trustworthiness and concern with client interests.

Results further suggested that women tended to agree more with the following statements:

"My brokerage firm recommendations outperform my own investment choices." $r=.143$, $p < .01$
"My brokerage firm is equally interested in small investment accounts and large investment accounts." $r = .083$, $p < .05$
"If an available no-load fund outperforms a load fund that is offered by the broker, the broker will recommend the better performing product." $r = .156$, $p < .01$
"My broker recommends using defensive assets such as money market funds to diversify my portfolio." $r = .125$, $p < .01$

Findings seem to indicate that women clients see the broker as more competent than they are at investing. Based on these correlations, perceived broker trustworthiness, concern with client interests, and competence all appear to be more evident among the women than the men in the sample.

Those with higher levels of education tended to agree less with the following statements:

"My brokerage firm is equally interested in small investment accounts and large investment accounts." $r = -.076$, $p < .05$
"If an available no-load fund outperforms a load fund that is offered by the broker, the broker will recommend the better performing product." $r = -.094$, $p < .05$
"My broker recommends a fully invested posture." $r = -.100$, $p < .01$

Based on the correlation results, a higher level of investment was evident for men ($r = -.19$, $p < .01$), older respondents ($r = .36$, $p < .01$), and those with higher education ($r = .16$, $p < .01$).

HIERARCHICAL REGRESSION ANALYSES

In addition to the correlational analyses, hierarchical multiple regressions were computed in order to address possible interactive effects of the demographic variables. Exploration of interactive effects permits investigation of more complex relationships that may exist between the dependent variables and the various demographic variable predictors.

The regressions were computed using each of the twenty perceptual items as dependent variables and the demographic variables as predictors. The same procedures were used with investment level and client satisfaction as dependent variables. Age, gender, and education were entered on the first step of the regressions and two-way interaction terms on the second step. A three-way term for each dependent variable was also tested but none were statistically significant. Five of the full equations yielded a statistically significant final multiple R. Full equations included main effects and two-way interactions. Each of these equations and their statistically significant predictors are discussed below.

Statistically significant interaction terms were graphed on the basis of dependent variable means for subgroups. Graphical representation allows for easier interpretation of interactions. Specifically, one standard deviation was subtracted from the mean of each quantitative predictor variable that was involved in the interaction term. All individuals scoring below that level became the "low scoring" group. One standard deviation was added to a given variable's mean to establish a cut-off for the "high scoring" group. Means were computed for the low scoring and high scoring groups on each dependent variable. These means were then plotted and connecting lines drawn to summarize the nature of the interactive relationships.

Findings for the dependent variable of level of investment were as follows. On the first step of the regression equation, age, gender, and education evinced statistically significant main effects. This is consistent with the correlation results. On the second step, the age x education interaction term emerged as significant, but the main effects were no longer evident. This suggests that much of these predictors' effects are interactive. Results appear in Table 3 and the interaction is graphed in Figure 1. Not surprisingly, highly educated, older respondents seemed to have the highest level of investment.

Various statistically significant results emerged for the broker behavior questionnaire items. Results were detected for the questionnaire item: "My brokerage firm recommendations outperform my own investment choices." The multiple R and the age x gender interaction term were statistically significant when this item was treated as the dependent variable. Older women seemed

most in agreement with the above statement. Table 4 shows the regression results and Figure 2 displays the graph of the significant interaction.

Table 3: Hierarchical Regression Results, Dependent Variable = Level of Investment				
Variable	Beta	t	R	R^2
Step 1:				
Age	.186	1.383		
Sex	-.077	-.532		
Education	-.108	-.726	.421**	.177
Step 2:				
Age x gender	-.087	-.647		
Age x education	.346	2.347*		
Gender x education	.018	.132		
Constant		2.362	.429**	.184
*p < .05 **p < .01				

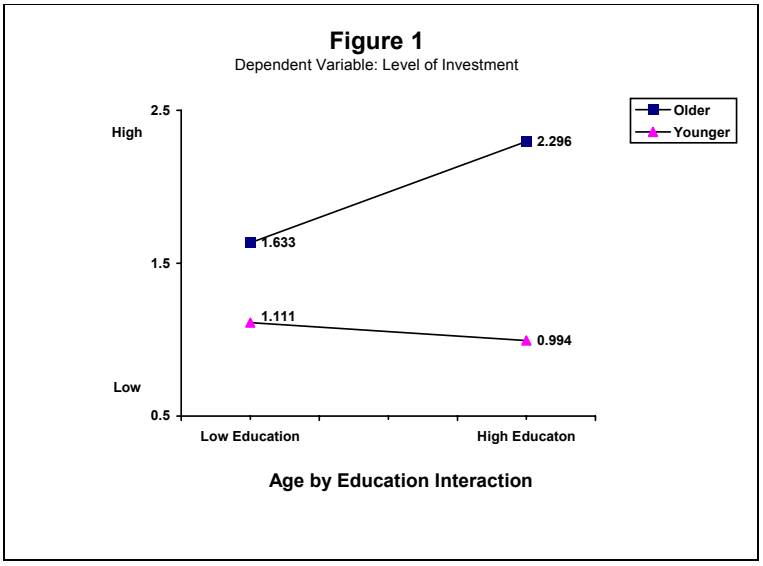
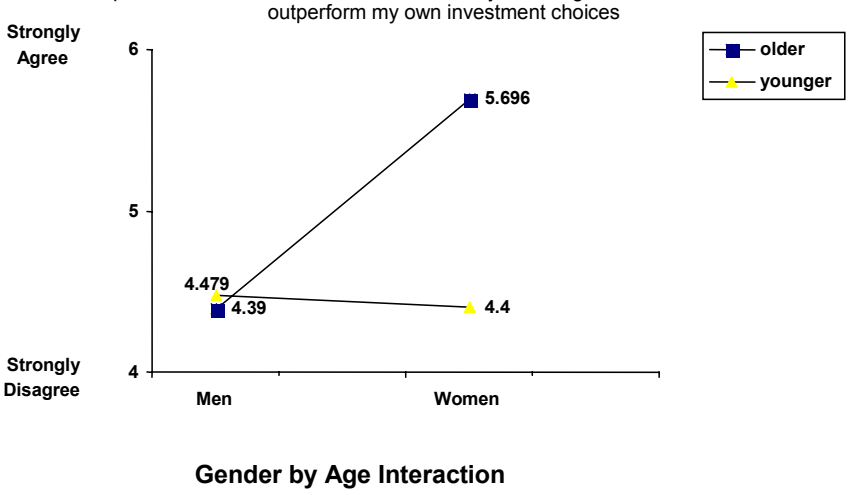


Table 4: Hierarchical Regression Results				
Dependent Variable = Questionnaire item: My brokerage firm recommendations outperform my own investment choices.				
Variable	Beta	t	R	R^2
Step 1:				
Age	-.153	-1.018		
Gender	-.213	-1.319		
Education	.045	.280	.161**	.026
Step 2:				
Age x gender	.441	2.889**		
Age x education	-.118	-.723		
Gender x education	.033	.217		
Constant		5.876	198**	.039

Figure 2

Dependent Variable – Questionnaire item: My brokerage firm recommendations outperform my own investment choices



Gender by Age Interaction

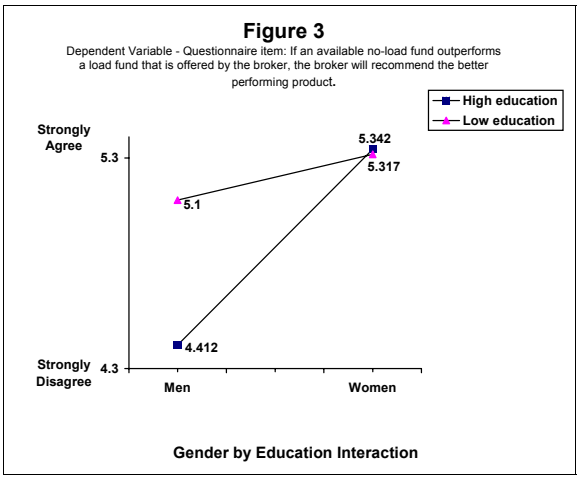
Exploratory regression analyses involving the level of education variable revealed several significant relationships. This included the questionnaire item: "If an available no-load fund outperforms a load fund that is offered by the broker, the broker will recommend the better

performing product." Statistically significant results for this dependent variable item were the multiple R, a main effect for education, and a gender x education interaction. The regression weight for education is negative which suggests that those with lower educational levels tended to agree more with the statement. The interaction seems to indicate that highly educated men agreed with the statement least. The regression results appear in Table 5 and the interaction is graphed in Figure 3.

Table 5: Hierarchical Regression Results

Dependent Variable = Questionnaire item: If an available no-load fund outperforms a load fund that is offered by the broker, the broker will recommend the better performing product.

Variable	Beta	t	R	R^2
Step 1:				
Age	-.085	-.553		
Gender	-.062	-.371		
Education	-.423	-2.465**	.185**	.034
Step 2:				
Age x gender	.016	.103		
Age x education	.161	.940		
Gender x education	.303	1.926*		
Constant		6.661	.205**	.042

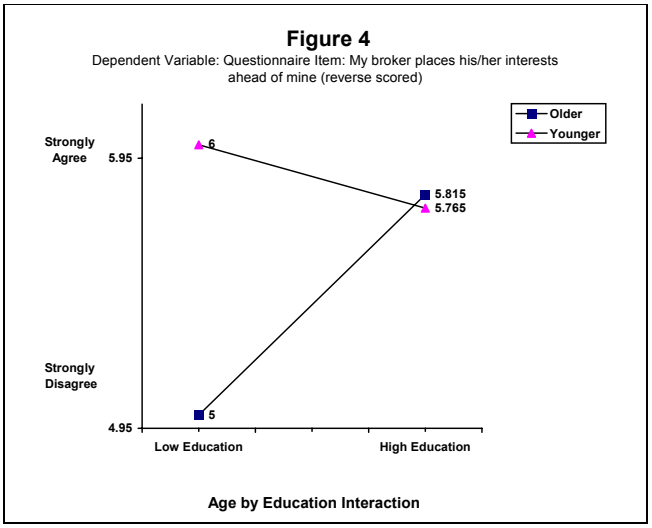


When the following questionnaire item, "My broker places his/her interests ahead of mine." (reverse scored) was used as a dependent variable, findings included a statistically significant overall multiple R, as well as a main effect for age and an age x education interaction. The results appear in Table 6. The interaction is graphed in Figure 4. Results suggest that younger people of lower education agreed most strongly that the broker will place client interests first.

Table 6: Hierarchical Regression Results

Dependent Variable = Questionnaire item: My broker places his/her interests ahead of mine. (reverse scored)

Variable	Beta	t	R	R^2
Step 1:				
Age	-.329	-2.195*		
Gender	-.146	-.909		
Education	-.213	-1.319	.093	.009
Step 2:				
Age x gender	.256	1.701		
Age x education	.381	2.352*		
Gender x education	-.059	-.397		
Constant		7.213	.145*	.021



The questionnaire item, "My broker recommends using defensive assets such as money market funds to diversify my portfolio." was associated with a statistically significant overall regression ($R = .162$, $p<.01$) but none of the individual predictors reached significance.

DISCUSSION

A different view of investment client perceptions developed on the basis of the regression results as opposed to the correlational findings and past reports. Results of the correlation analyses concerning various questionnaire items supported hypotheses 1 and 2, suggesting that older investors and women tended to perceive their brokers as being trustworthy and competent. Hypotheses 3,4, and 5 were also supported by the correlations suggesting that investment levels were higher for men, older investors, and those with more education. These findings are consistent with previous literature. However, a completely different picture emerged as a result of the interactive effects tested in the multiple regression analyses. In fact, support for hypotheses 1 to 5 completely disappeared in the interactive regression results. None of the expected main effects were manifest when the interaction terms entered the regression equations. The statistically significant interactions found among these predictors revealed that their effects might be more complex than the correlational results and the previous literature have suggested. An examination of the interplay of the demographic variables provides a more detailed and comprehensive view of their joint effects on the dependent variables of client perceptions and level of investment. Results are discussed below with regard to each of the dependent variables.

HYPOTHESES CONCERNING CLIENT PERCEPTIONS

On the basis of the regression analyses, hypotheses 1 and 2 were not supported. A negative main effect was detected for age for the item regarding the broker's putting client interests first. This suggests that the sign of the relationship changed when the other demographic variables and the interactions were taken into account.

For the item that concerned the superiority of broker recommendations to the investor's own choices, age interacted with gender. Men, regardless of age, and younger women appeared to score similarly on this item. Older women, however, seemed to have higher agreement scores. This provides support for hypothesis 7 in that the older women tended to perceive their brokers as competent. Because the older women may have been traditionally socialized, they may feel less confidence in their investment ability. Their education (or lack thereof) and possible inexperience in money management may have resulted in insufficient preparation to make such decisions.

EXPLORATORY ANALYSES CONCERNING EDUCATION LEVEL AND CLIENT PERCEPTIONS

Also concerning the item regarding the broker's putting client interests first, education interacted with age such that those in the high education group scored virtually the same across age levels. But those in the low education group exhibited an age difference: the younger individuals appeared to believe that the broker would put client interests first while the older group seemed to put less confidence in the broker as advocate of their interests. A possible explanation for this finding might be that educated investors tend to participate in investment decisions regardless of age. Those who are young and have less education might place uncritical faith in their broker, abdicating all of their decision responsibility. Their lack of involvement might create the potential for unethical broker practices. Alternatively, they may feel disappointment that the broker's performance did not meet their expectations, which they may not have communicated. These experiences could lead aging, less educated investors to feel decreased trust in their brokers.

There was an education x gender interaction for the dependent variable item concerning the broker's recommendation of a no-load fund that outperforms his/her own load fund. This item pertains to client interests as the broker's first priority. The difference between genders was greater in the high education group. Men in the high education group appeared to have less faith in the broker. The education main effect in this equation may have been caused by the disagreement responses for highly educated men. These findings seem consistent with the contentions of Greco (1991) and West (1996) that women want to trust and remain loyal to their financial advisor. A possible explanation for the present finding is that men are more skeptical of the broker's motives when making recommendations. These men may subscribe to the belief that self-interest characterizes the free market economy as well as the traditional male role, leading them to attribute broker behavior to self-interest.

HYPOTHESES AND EXPLORATORY ANALYSES CONCERNING LEVEL OF INVESTMENTS

In support of hypothesis 6, an interaction was detected between age and education. Older investors who had more education appeared to have the highest level of investment. Somewhat surprisingly, gender did not reach statistical significance in the regression analysis. This contrasts with the correlation results and previous findings that suggest men hold a higher level of investment than women. Likewise, age and educational level did not have main effects. On the basis of the regression results then, hypotheses 3, 4, and 5 were not supported. The effects of age and education on level of investment appear to be interactive. This finding further suggests that the older, educated women in the present sample held a dollar level of investment that was similar to that of men.

An examination of the age x education interaction reveals that there is a relatively smaller difference in level of investment across age groups for those with low education. Likewise across education levels, younger respondents appeared to differ relatively little with regard to level of investment. Given the method for establishing the age groups for the interaction graphs, the younger investors were age 28 and below. This means that they were members of generation X. Those with higher education may have only recently completed their schooling and thus had little time to build an asset base. The older investors were age 54 and up. The data suggest that both time and education are needed to build a larger portfolio.

CONCLUSIONS

The interaction effects revealed that the influences of client gender, age, and education on perceptions of the broker appear to be more complex than simple correlational analyses or the previous literature would suggest. Interactions were also apparent with regard to level of investment. None of the hypotheses for main effects (H1 to H5) were supported. However the hypotheses concerning interactive effects (H6 and H7) did receive support from the data. Based on the present study's findings, several recommendations for brokers were derived:

1.	Older women appeared to have the least confidence in their own investment choices. They tended to believe that the broker's investment decisions are superior to their own. Thus, brokers may need to use a more directive style with these clients than with younger women or with men.
2.	Results suggested that older, well-educated clients had the highest level of investment. This appeared to be the case regardless of gender. Therefore, the broker who devotes less time and effort to older, highly educated women clients (Wang, 1994) may be risking the loss of potentially lucrative accounts.
3.	Older investors with lower educational levels may have less confidence in the broker as an advocate of their interests. This means that the broker may need to spend additional time and effort building trust with such individuals.
4.	Men with higher levels of education tended to be skeptical that the broker would recommend the best performing fund when it conflicted with the broker's self interests. Brokers may need to clearly explain to clients the methods by which they make fund recommendations. Offering clients supporting data for fund recommendations could be useful.

DIRECTIONS FOR FUTURE RESEARCH

Further investigations might continue to explore the role of client demographic variables in perceptions of broker behaviors. In order to expand generalizability of the present study's findings, future research might employ an even more geographically diverse sample. Furthermore, although present study's multiple R's were statistically significant, the corresponding R 2 values for client perceptions were generally low. This suggests that while demographic variables may play a role in client perceptions and outcomes, there are also other variables that may have substantial influence. These should be identified and explored in future research. Finally, further studies might expand the present findings in order to investigate investment behaviors and decision processes in addition to perceptions.

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THE EFFECT OF EXPENSING STOCK OPTIONS ON CORPORATE EARNINGS

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ABSTRACT

The increase in stock option grants is becoming increasingly controversial as disclosures emerge that senior executives of companies such as Enron Corp. have abused the exercising of their stock options. Currently, the SEC does not require that compensation expenses be reported on the income statement for stock option plans, allowing stock options, unlike other forms of compensation, to not be considered a business expense, meaning that they are not deducted from earnings. This policy creates an accounting incentive to pay executives with stock option compensation, which potentially allows companies to over-value their reported earnings. To examine if current accounting standards encourage firms to issue stock options as a form of CEO compensation to over inflate earnings, we use repeated cross-sectional data from Standard & Poor's ExecuComp annual data set on 2,412 firms from 1992 to 2000 on the CEO of a firm. We find that the extent to which reported earnings are exaggerated increased during the 1990s. This is true for absolute dollar figures as well as relative to a firm's net earnings. We also determine the degree to which firm size plays into the effects. Results suggest that firms, on average, over-inflated reported earnings by 5.1 percent. However, earnings can be over-inflated by as much as 13.6 percent for small companies.

INTRODUCTION

The 1990s increase in stock option grants is becoming increasingly controversial as disclosures emerge that CEOs of companies such as Enron Corp. and Global Crossing reaped millions of dollars in profit by exercising their stock options as the public held onto stock that became worthless. In 2000, the Enron Chairman, Kenneth Lay realized 123.4 million in exercised stock options. Similarly, the CEO of Global Crossing, Mr. Annunziata, received 182 million dollars worth of stock options, while the company reported a negative net income of $10,500,000. If Enron and Global Crossing had incorporated stock options as a business expense it would have greatly reduced their operating profit for the year; reducing Enron earnings by close to 10%. Similarly, if Oracle and Citicorp had incorporated stock options as a business expense in 2000, it would have reduced their operating profit by over $900 million. In fact, if firms reported stock options as a

business expense the following companies are just a few of the firms that would not have reported a profit in 2000: Broadcom, Parametric Technology, Novell, Yahoo, BMC Software, Network Appliance, Conexant Systems, Citrix Systems, Mercury Interactive, Peoplesoft, Sapient, Siebel Systems, McKesson and Quintiles Transnational (see Bear Stearns, Wall Street Journal, March 26, 2002.)

In addressing the current scandals of Enron and Global Crossing, Federal Reserve Chairman, Greenspan stated to the House and the Senate in March 2002 that "..companies should be required to treat grants of stock options as any other expense, reducing the profits they report to shareholders when they issue options just as they do when they pay executives in cash." Greenspan, as well as several members of Congress, suggests that counting stock options as a business expense generates income neutrality between all forms of compensation. Similarly, Senator Carl Levin recently suggested that stock option pay encourages firms to push the accounting rules to the limit, which might have severe consequences for the stability of our economy. In contrast, President Bush opposes this view and believes that stock options should not be treated as a corporate expense. He, along with many businesses, believe that counting options as a business expense would confuse corporate earnings figures, take away an employee's stake in the company, and limit young, smaller companies' ability to raise capital.

In response to this heated debate, the Financial Accounting Standard Board (FASB) is requesting comment on whether all companies should be made to expense stock options.

> "With *institutional investors and policymakers urging them on, dozens of companies have decided to sign on to the reform movement and begin deducting the cost of stock options from their reported earnings…. So far, 176 companies are expensing options, … up from just 16 as of last June.*"
>
> Henry & Lavelle, 2003

While this number is growing, it is still small to the relative number of firms that have not chosen to expense stock options.

In this paper, we examine if accounting standards and the size of a firm encourage companies to issue stock options as a form of CEO compensation to increase reported earnings. Specifically, this study uses annual data from Standard & Poor's ExecuComp database, which includes information on 2,412 firms from 1992 to 2000. We examine the magnitude that earnings would fall by if stock options were treated as a business expense for different size firms. Results will help determine to what extent the current accounting standards encourage firms to pay CEOs in stock options to generate higher reported earnings and if this is disproportionate among different size firms.

STOCK OPTIONS ACCOUNTING STANDARDS

Ever since 1972, accounting standards have not required companies to count stock options as a business expense. Thus, currently the SEC does not require that compensation expenses be reported on the income statement for stock option plans. Therefore, stock options, unlike other forms of compensation, are not considered a business expense, meaning that they are not deducted from earnings, thus allowing companies to potentially over-value their reported earnings. S&P officials suggest that the average earnings on the S&P 500 index firms is overstated by 10% due to stock options not being reported as a business expense.

While the FASB in 1993 considered making stock options a business expense, the Silicon Valley coalition along with Sen. Lieberman introduced a bill blocking this move. In December of 1994, the FASB dropped the proposed requirement, and required companies to disclose options costs in a footnote. Unlike salary and bonus compensation, which are expensed, stock options are not expensed at any time, regardless if they are nonqualified or qualified options. Hall and Liebman (2000) suggest that this makes stock options the only form of compensation that is free from an accounting perspective.

While stock options may be used to over-value the retained earnings of a firm, they may also help motivate CEOs to act within the stakeholders best interest. According to agency theorists such as Jensen and Meckling (1976), Rosen (1990), and Brookfield and Phillip (2000) the growing number of stock option compensation is due to stock options improving employee performance by evading the potential principal-agent dilemma. In other words, by increasing the investment share of CEOs in the company, some companies may create an incentive for them to maximize shareholder wealth instead of their own private income, fringe benefits, and perks. Thus, stock options may increase productivity by better connecting the shareholder (or principal) with the CEOs (or agents), increasing the value of the firm and the earnings. As suggested by President Bush, this may be especially crucial for small, younger firms.

EMPIRICAL ANALYSIS

To empirically investigate if the current accounting standards have altered stock option pay and the reported earnings to shareholders, we examine the difference between earnings before and after stock options are included as a business expense. We also form the ratio of this difference to reported earnings to determine the degree that earnings would be altered if firms expense stock options. Since we suspect a priori that the size of a firm may influence their use of stock options, we determine the reduction in reported earnings if stock options are expensed by dividing firms by their sales into deciles.

We collect annual compensation data from Standard and Poor's ExecuComp database from 1992 to 2000. One advantage of the ExecuComp database is its large size. It follows a total of 2,412 companies over time, which are or were a member of the S&P 1,500 (consisting of the S&P 500, the S&P MidCap 400, or the S&P SmallCap 600). Since each company must provide information about the CEOs each year, the overall number of records is substantial. To determine if a firm's size influences their decision to expense stock options and its effects on retained earnings, we break the firms into deciles based on firms sales. Thus, the first decile would incorporate firms with the lowest 10 percent of sales.

RESULTS

The numbers in Table 1 show by how much reported earnings are inflated during the 1990s due to the non-reporting of stock options granted to a firm's CEO. There is a rather remarkable increase during the time period in our data set. The difference between the two earnings measures increases from approximately $700,000 to more than five times that value by the end of the decade. Table 2 shows the mean difference between the two earnings figures based on the size of firms (measured by sales). Not surprisingly, the mean difference in dollars is largest among the large companies. In fact, with the exception of two deciles, the average difference is strictly monotonically increasing in firm size. It is noteworthy that firms in the top decile are substantially different from all other firms: While the mean by decile increases from approximately $885,000 in the bottom decile to approximately $2.9 million in the 9th decile (a roughly twofold increase), the value for the top decile is close to twice as high as the respective value for the next-lowest decile. To name an extreme example, Cendant reported a net income of -217 million in 1997, average CEO salary of 1.6 million, with each CEO receiving close to 256 million in stock options. If stock options had been reported as a business expense, Cendant earnings would have fallen by over twice as much, to a $473 million loss. Furthermore, it must be noted that a number of companies reporting positive net income would have lost money during some of the years if stock options had been expensed.

Table 3 adds an alternative viewpoint: When the difference between the two earnings measures (without stock options expensed minus with stock options expensed) is divided by net earnings, the resulting ratio shows what share of earnings the-non-expensed-stock options made up. Put differently, the variable in Table 3 is a measure for the percentage by which earnings are overstated due to the non-expensing of issued stock options. (In the calculation of this variable, the ratio becomes negative whenever a firm reports a loss. In those cases, we used the absolute value of the ratio since the non-expensing of stock options always goes in the same direction: It always overstates earnings.)

While the mean ratio is less than one percent in 1992, it is more than 8 percent in 2000, i.e., by the end of the decade, the average firm issues stock options to their CEO valued at more than 8

percent of net income. We consider this to be a rather large number. Table 4 shows how the ratio of stock options to net earnings varies across different-sized firms. The largest 30 percent of firms issue stock options approximately worth 1-3 percent of their net earnings to their CEOs. The value for 2nd to the 7th decile ranges from approximately 4-7 percent. The number, which is most noticeable in this case is the value for the lowest decile, i.e., the 10 percent of firms with the smallest sales figures. This group of firms issues stock options to their CEOs valued at more than 13 percent of their net earnings. This ratio is almost exactly twice as high as the second-highest ratio (for the 5th decile). We feel that this result deserves some attention because mandatory expensing of stock options would lead to the largest percentage decrease in reported earnings for the smallest ten percent of firms.

In summary, it is clear from Table 2 that, in absolute terms, large firms issue more stock options to their CEOs than smaller firms. However, Table 4 shows that the opposite is true once stock option grants to CEOs are examined relative to a company's sales. This suggests that smaller firms may actually be hardest hit if they expensed their stock options since it would, on average, reduce their earnings by close to 14 percent.

CONCLUSIONS AND POLICY IMPLICATIONS

There has been a tremendous increase in CEO stock option compensation during the 1990s. During the same time period, stock options were not reported as a business expense while salary and bonuses were expensed. If stock option pay artificially props up earnings, creating uncertainty and risk, the U.S. may want to alter our current accounting standards. Results show that firms overestimate reported earnings by 4,275.2 thousand dollars and the earnings per share by an average of close to 14%. While an CEO may not represent the general public, their response to current accounting standards may be interesting in its own right, especially considering the magnitude of their effects. While it is unclear whether the U.S. may want to strengthen or reduce the incentives for stock option compensation, this study points out the importance of current accounting standards and their incentives for CEOs to be paid in stock options to avoid and defer tax payments.

In August of 1999, Federal Reserve Chairman, Greenspan warned that the accounting laws regarding options "has overstated growth of reported profits." On February 13, 2002 Senators Levin and McCain introduced a bill to force companies to expense options or pay taxes on them. While many companies have not been abusing stock options, the perception today is that not expensing stock options is wrong. As AIG Chairman, Maurice Greenberg said, "The perception is more important than the substance". This may be why several companies, as well as the S&P 500 stock index, have already stated that they are willing to report stock options as a quarterly expense. These companies include, but are not limited to, AIG, General Electric, Bank One Corp., Coca-Cola Co. and Procter and Gamble Co., which have all publicly announced that they will expense stock

options. While S&P officials stated that the new stock options standard will reduce estimated earnings by 10%, our results suggest that it will reduce reported earnings by much more, especially for smaller firms and thus lower companies' earnings per share.

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APPENDIX 1: Tables

Table 1: Mean Difference between Earnings and Earnings w/Stock Options Expensed	
Year	Earnings-Earnings (Expensed) in ($ millions)
1992	0.707
1993	0.744
1994	0.909
1995	0.915
1996	1.413
1997	2.007
1998	2.211
1999	3.274
2000	4.048
Total	1.967

Table 2: Mean Difference between Earnings and Earnings w/Stock Options Expensed (Based on Deciles)	
10 Deciles of Sales	Earnings-Earnings (Expensed) in ($ millions)
1	0.885
2	0.960
3	0.998
4	1.548
5	1.471
6	2.096
7	1.762
8	2.023
9	2.922
10	5.018
Total	1.968

Table 3: Mean Ratio of Stock Options to Earnings	
Year	Ratio
1992	0.009
1993	0.037
1994	0.043
1995	0.034
1996	0.033
1997	0.057
1998	0.051
1999	0.077
2000	0.082
Total	0.051

Table 4: Mean Ratio of Stock Options to Earnings (Based on Deciles)	
10 Deciles of Sales	Ratio
1	0.136
2	0.066
3	0.048
4	0.046
5	0.069
6	0.046
7	0.041
8	0.012
9	0.015
10	0.032
Total	0.051

USING DISCRIMINANT ANALYSIS TO PREDICT THE MARKET REACTION TO OPEN-MARKET STOCK REPURCHASE ANNOUNCEMENTS

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ABSTRACT

It has been well documented that although there is a substantial positive stock price reaction to stock repurchase announcements, about thirty per cent of the firms that announce open market stock repurchases experience negative abnormal returns at announcement. This paper examines the apparent heterogeneity in the stock price reaction to stock repurchase announcements and tries to determine whether the sign of the stock market reaction can be predicted from ex ante firm specific variable. I find that the discriminant analysis can be used to predict the signs of the announcement reaction to open market stock repurchase announcements with a high degree of accuracy and that the percentage of shares owned by institutions, the firm's earnings volatility, the firm size, and the earnings growth prospects are important factors determining the signs of market reaction. The discriminant analysis model yields an accuracy rate of 92% in predicting positive announcement reactions and 74% in predicting predicted negative reactions.

INTRODUCTION

It has been well documented in the finance literature that the stock market reacts positively to open-market repurchase announcements. The abnormal announcement returns are in the range of 2 - 4%. However, several studies, such as Tsestekos (1993), Erwin and Miller (1998), and Liu and Ziebart (1997), also report that while the average market reaction is positive, there are about 30% of the repurchasing firms in each of their study samples experiencing negative announcement returns. So far, studies on market reaction to open market stock repurchase announcements have focused on the positive average market reaction to stock repurchase announcements. This paper focuses on the apparent heterogeneity in the stock price reaction to stock repurchase announcements and tries to identify the firm specific factors that cause the different market reactions and to test whether it is possible to use these variables to predict the signs of the stock market reaction to repurchase announcements. The results of the study show that Discriminant analysis can be used to predict the signs of the announcement reaction with a high degree of accuracy and that the

percentage of shares owned by institutions, the firm's earnings volatility, the firm size, and the earnings growth prospects are important factors determining the signs of market reaction.

The paper proceeds as follows. In section one, I will present a literature review and provide some theoretical background for the models used in this paper. Section two presents the hypotheses, data and empirical methodology. Section three presents and discusses the test results. Section four summarizes the study and provides a conclusion.

LITERATURE REVIEW AND THEORETICAL BACKGROUND

Many studies have documented the positive market reaction to stock repurchase announcements (Masulis 1980; Dann 1981; Bradley and Wakeman 1983; Tsestekos 1993; Erwin and Miller 1998; Liu and Ziebart 1997). Information content and signaling effects of repurchase announcements are often cited as reasons to explain the positive valuation effects. Dann, Masulis and Mayers (1991) find evidence that stock repurchases often signal future increases in earnings and a reduction of systematic risk around repurchase announcements. They also provide evidence that investors actually revise earnings estimates upwards following repurchase announcements. Bartov (1991) studies repurchases as signals for earnings and risk changes and finds that there are unexpected positive earnings in the announcement year and that there are upward revisions of earnings forecasts by analysts. He also reports that repurchase announcements are followed by decline in the repurchasing firms' common stock risk and that repurchase announcement returns are positively related with the earnings changes conveyed by these announcements. Healy and Palepu (1993) argue that managers in undervalued firms use dividend increase or stock repurchase to signal confidence to the market. Agency cost reduction as a result of stock repurchases can also potentially explain the positive market reaction. Jensen (1986) argues that corporate dividend payments reduce the agency cost arising from managers' incentives to use free cash flow to invest in negative NPV projects. Repurchasing stocks significantly reduces the cash available to managers for potential investments in negative NPV projects. Easterbrook (1994) posits that corporate payout today increases the probability that the firm will need to seek external financing in the future. Therefore, there is a higher probability of managers being exposed to the monitoring associated with external financing. This higher probability of future monitoring reduces the extent to which managers will deviate from stockholder wealth maximization, thus reducing the cost of the agency conflict between managers and stockholders.

Both the information content/signaling and agency cost arguments identify potential benefits of stock repurchase programs. However, the actual economic impact of a stock repurchase will consist of these benefits netted against the potential costs associated with the repurchase program. These costs include the increase in expected financing costs (due to the higher probability of external financing) and any costs associated with the reduction in financial slack (Black, 1976;

Bhattacharya, 1979; Myers & Majluf, 1984). Thus, for a particular firm, if the market judges the benefits of repurchase to be smaller than the costs, the announcement returns should be negative. At the same time, if the repurchase announcement is interpreted by the market as a signal of deterioration in future investment opportunities, the announcement effect could also be negative.

Furthermore, abnormal returns will reflect only the unanticipated component of the announcement. If the repurchase is fully anticipated, or the percentage of shares to be repurchased is less than expected, the announcement effect could also be non-positive or negative.

The economic variables used in this paper are based on the theories discussed above. The central issues of the paper are to determine whether differential market reactions to dividend initiation announcements are caused by firm specific factors and whether these firm specific factors can be used to predict the sign of the market reaction.

DATA AND METHODOLOGY

The Data

The data set consists of firms that announced open-market stock repurchases during the second half of 2000. The repurchase announcements are obtained from buybackletter.com. These events are then verified by checking the Wall Street Journal Index. The firms in the sample also pass the following screens:

1.	Common stock daily returns starting from 300 days before the repurchase announcement are available.
2.	There are no significant confounding announcements such as earnings reports within five days of the repurchasing announcement. This measure is taken to avoid compounding market reaction to repurchase announcement with that of the earnings announcement.
3.	There are no major corporate restructuring within the 300 days before the repurchase announcement that would significantly change the nature or risk level of the firm, such as a merger or acquisition.
4.	The analysts' consensus estimates for the firm's current and next years' earnings are available from First Call Earnings Estimates.
175 firms pass the screens.	

Estimation of Repurchase Announcement Returns

Abnormal returns at repurchase announcement are estimated by employing an expanded market model, including an industry index. The coefficients are estimated using 300 days' return data prior to two days before the announcement. In particular, the abnormal return of firm K at time *t* (AR_{kt}) is defined as:

$$AR_{kt} = R_{kt} - (\alpha_k + \beta_k R_{mt} + \beta_{2k} R_{ind,t}), \quad (1)$$

where,

R_{kt} is the observed return of firm k on day t.
R_{mt} is the return on the index of the exchange this firm is listed
$R_{ind,t}$ is the return on an equally-weighted portfolio of firms in the same industry as firm k on day t. Firms are considered to be in the same industry if the first three digits of the four-digit Standard Industry Classification Code (SIC) are the same.

Following previous studies, the market reaction to firm k's repurchase announcement is defined as the two-day cumulative abnormal return (CAR_k). It is the sum of firm k's abnormal return from day *t*-1 to day *t*. Day *t* is the day that the repurchase announcement appeared in the *Wall Street Journal*. Thus, the two-day CAR is computed as the sum of firm K's abnormal return on days *t*-1 and *t*. The basic assumption here is that the market immediately reassesses the company following the announcement of the stock repurchase program and reacts to it. Of the 175 firms in the sample, 118 firms (67.4%) have positive cumulative abnormal returns and 57 firms (32.6%) have negative abnormal returns. The average two-day CAR for the whole sample is 2.37%. The average CAR for the 118 firms that have positive returns is 5.4%. The average CAR for the 57 firms that have negative returns is -4.0%.

DISCRIMINANT ANALYSIS

A multiple discriminant analysis is a statistical procedure that is frequently used to distinguish (discriminate) between two or more populations on the basis of observations on several variables. The populations are defined a priori and a sample of individuals are selected from each population. The objective of this procedure is to develop a rule, or a discriminant function, based on the observed variables on each of the individuals that can help assign a new individual to the correct population when it is not known from which of the populations it is from (Kleinbum, Kupper

and Muller, 1988). The first step of the discriminant procedure is to develop a linear combination L of the p variables such as

$$L = \beta_1 X_1 + \beta_2 X_2 + ... + \beta_p X_p \quad (2)$$

with the values for β_1, β_2, ..., β_p chosen so as to provide the maximum discrimination between the two groups in the sense that the variation in L between groups is much greater than the variation within groups. This is similar to the analysis of variance procedure for detecting differences in population means. The second step is to use the estimated β coefficients to calculate the value of *L* for each sample. For instance, for the *k*th (k = 1, 2, ..., n_i) sample selected from Group i (i = 1,2), the value of L is

$$L_{ik} = \beta_1 X_{i1k} + \beta_2 X_{i2k} +..., + \beta_p X_{i\,pk} \quad (3)$$

where $X_{i\,pk}$ is the value of variable p taken by firm k in group i. Thus, for each sample, a set of P variables can be transformed into a single univariate score, which is used to classify the sample into groups. A discriminant function is said to be effective if the average *L*s across groups are significantly different.

Multiple discriminant analysis has been widely used in business, finance and economics. Altman (1968) builds a model that uses financial ratios to predict corporate bankruptcy and the model yields an accuracy rate of about 95 percent. Eisenbeis (1976) lists some problems that researchers usually encounter when using the procedure. The most serious problem is related to prior probabilities. If the researcher assumes equal prior probability while in fact it is not, it could cause an under-assessment of the overall classification accuracy.

In this paper, the two populations are determined based on positive or negative CARs. As I am interested in identifying the variables that can be used to predict the sign of the observed announcement reaction, a stepwise discriminant analysis is also conducted. Essentially, the discriminant analysis takes the original classification, based on the sign of the observed announcement CARs, and uses the pattern of inter-group differences in the specified set of economic variables to reclassify firms based on the expected economic impact of initiation. The proxies I employ are as follows:

(1) *Firm Size* (SIZE):	The firm size is measured as the natural log of the market value of equity as of two days before the announcement. Zeghal (1983), Eddy and Seifert (1988), and Mitra and Owers (1990) argue that firm size is a good proxy for the degree of publicly available information about a firm; the larger the firm, the greater the availability of information. Thus, the value of repurchase announcements conveying information to the market may be greater for small firms than for large firms. The sign of the coefficient is expected to be negative.

(2) *Earnings Volatility* (EARNVOL):	Earnings volatility is estimated as the standard deviation of earnings per share over the 16 quarters immediately preceding the repurchase announcement. Bartov (1991) finds evidence of positive unexpected annual earnings in the announcement year. Hertzel and Jain (1991) believe that repurchase announcements convey good information about the level and riskiness of future earnings. If part of the benefit of a stock repurchase program is to convey managerial information to the market, then the information provided will be more valuable for firms with less predictable earnings. On the other hand, for firms with stable earnings, the value of the additional information from the repurchase announcement may not be as significant. The sign is expected to be positive.
(3) *Institutional holdings* (INST):	The fraction of outstanding shares held by institutions is used as a proxy for the intensity of monitoring that the firm is subjected to by institutions. Doukas, Kim, and Pantzalis (2000) suggest that security analysts play a monitoring role and tend to reduce agency costs. It is hypothesized that the agency costs arising from the manager-stockholder conflict are smaller when institutions monitor the firm more closely. Thus, the benefit of agency cost reduction may be smaller for firms with large institutional holdings. An alternative interpretation of this variable is that heavy institutional holdings are associated with greater information availability about the firm, reducing the signaling benefit from repurchase announcements. Both interpretations predict a negative coefficient.
(4) *Insider Ownership* (INSIDER):	The percentage of shares owned by directors and senior officers, and someone who owns more than 5% of the shares of the company. It is used here as a proxy of the amount of monitoring activities. Han and Suk (1998) study whether investors regard the level of insider ownership of a firm as useful when evaluating such major corporate events as a stock split. Their results show that the levels of insider ownership are related to announcement returns. Higher insider ownership should result in more intensive monitoring by the board, less serious agency problems, less benefit from the reduction of agency costs, and thus a greater likelihood of repurchase program being value-decreasing. The sign is expected to be negative.
(5) *Percent of Repurchase* (Rep):	It is calculated as a percent of the repurchase of the total shares outstanding at the time of the repurchase announcement. Jin (2000) studies the market reaction to dividend initiation announcements and finds that for the group with positive market reaction, the size of the initial dividend is positively related to the announcement return. But, for the group with negative market reactions, the size of the initial dividend is negatively related to the announcement returns. To the extent that the repurchase announcement is unanticipated, both the signaling and agency cost arguments predict that the abnormal return at announcement should be positively related to the relative size of the repurchase.
(6) Pre-Announcement CAR (PRECAR):	The CAR for each firm, from day -20 through day -2, is used to control for market anticipation of the repurchase announcement. Jin (2000) finds that the market anticipation is significantly related to announcement returns. If observed negative abnormal returns result from market anticipation, PRECAR should be positive, and negatively related to the two-day announcement CAR.

(7) *Projected Earnings* Growth Change (PEARN):	This is a dummy variable, taking on a value of 1 if the projected earnings growth for the next fiscal year is greater than the current year, as reported by the First Call Earnings Estimates and 0 otherwise. Bartov (1991), Hertzel and Jain (1991) provide evidence that analysts revise earnings estimates after the announcements. This variable is used as a proxy for future growth to test whether market response to repurchase announcement is related to projected future earnings and growth prospects prior to the announcements.

EMPIRICAL RESULTS

Preliminary Analysis

Table 1 reports the mean of the variables used in the discriminant analysis for the entire sample and separately for firms that experience a positive CAR at announcement (Group P), and those that experience a negative CAR (Group N). A comparison across the two groups gives a preliminary indication regarding the extent to which firms with negative CARs differ from those with positive CARs, in terms of *ex ante* characteristics.

Table 1: The means of the variables for the full sample, and the subgroups based on whether the CAR at announcement is positive (Positive Group), or negative CAR (Negative Group).

Variable	Full Sample	Group P Car > 0	Group N Car < 0
	(N=175)	(N=118)	(N=57)
SIZE	2,209 m	1,577 m	3,497m**
EARNVOL	0.22	0.26	0.13**
INST	13.48	8.16	21.76**
INSIDER	35.0	34.7	36.0
REP	0.08	0.09	0.07
PRECAR	-4.60	-4.00	-5.00
PEARN	0.65	0.74	0.47**
CAR	2.37	5.40	-4.03**

* P = .05. Group P vs. Group N
** P = .01 Group P vs. Group N

The comparison indicates that the two groups are significantly different with respect to several variables, such as firm size, earnings volatility, institutional holdings, and projected earnings growth. The directions of the differences are consistent with the theoretical predictions and tend to

explain the difference in announcement CARs. For instance, announcement CARs tend to be negative for larger firms (with greater availability of public information), and those with less volatile earnings. In both cases, the value of future information releases is likely to be low. Negative announcement CAR firms are also characterized by large institutional holdings. Thus, these are firms where agency costs are likely to be low to begin with because of closer institutional monitoring. Overall, negative announcement CARs tend to occur when the benefits of stock repurchase are likely to be small. The economic impact of the stock repurchase announcement reflects the market assessment of the benefits and costs associated with the repurchase program.

The above results are suggestive of factors that determine the magnitude of CARs at the announcement of a stock repurchase program, and explain the incidence of negative CARs.

DISCRIMINANT ANALYSIS

The results of the discriminant analysis are reported in Table 2. Out of the 57 firms with negative CARs (the Negative Group), 42 were correctly classified by the model and 15 firms were incorrectly classified into the Positive Group. Out of the 118 firms with positive CARs (the Positive Group), 108 firms were correctly classified and 10 firms were incorrectly classified into the Negative Group. The model successfully predicts 73.68 per cent of the firms with negative CARs and 91.53 per cent of the firms with positive CARs.

I then perform a cross-validation procedure to ensure the validity of the prediction. This procedure uses 174 firms from the total sample of 175 firms and the remaining firm is then classified into either the Positive Group or the Negative Group based on the firm specific variables. This is done for each of the 175 firms. The results from cross-validation procedures are very similar and are also reported in Table 2.

The stepwise selection procedure shows that the percentage of shares owned by institutions, the firm's earnings volatility, the firm size and the projected earnings growth change are important factors separating the two groups of firms. The results, reported in Table 3, support the hypothesis that the market reaction to a firm's initiation announcement is based on some firm specific factors.

For the firms with large institutional holdings, agency problems should be less severe due to greater monitoring. At the same time, large institutional holdings also means greater information availability to the market. Therefore, the benefit of reducing agency costs and providing additional information to the market is lower for these firms, increasing the likelihood that the CAR is negative. The new information releasing mechanism is also expected to be more valuable for smaller firms than for larger firms. The reason for this is that there is usually more information available about larger firms, so the incremental value of the new information releasing mechanism is diminished.

When earnings are volatile, it is difficult for investors to use current and past earnings to predict future earnings. Therefore, the information conveyed by the repurchase announcement is more valuable to investors. As a result, CAR is more likely to be positive when earnings volatility is high. At the same time, repurchasing stocks may also send a signal to the stockholders that the current price of the stock may be undervalued because repurchasing its stock is purely voluntary. As expected, the changes in projected earnings growth is also important in separating the two groups. Investors tend to react positively to the announcement if the expected future earnings growth is promising. These results are consistent with the theoretical predictions, and provided some explanation as to why the market reacts differently to different firm's stock repurchase announcements.

Table 2: Discriminant Analysis Based on CAR

Of the 175 firms in the sample, 118 with positive estimated CARs are pre-classified positive firms and the remaining 57 with negative CARs are pre-classified negative firms.
Overall F-statistic* 19.23 (P-value 0.01)

	No. of firms predicted to be negative	No. of firms predicted to be positive	Total
From			
Negative Group	42 (73.68)**	15 (26.32)	57 (100%)
From			
Positive Group	10 (8.47)	108 (91.53)	118 (100%)
Total	52	123	175
Cross-Validation Results			
	No. of firms predicted to be negative	No. of firms predicted to be positive	Total
From			
Negative Group	40 (70.17)	17 (29.83)	57 (100%)
From			
Positive Group	12 (10.17)	106 (89.83)	118 (100%)
Total	52	123	175

* The F-statistic tests the hypothesis that the means of the discriminant scores form the two groups are equal.
** Numbers in parentheses are percentages of the firms that is predicted by the model to be in this particular group from their original groups.

Table 3: Step-wise Selection Summary			
	P-value	Group P	Group N
		Mean	Mean
FINST	0.003	8.16	21.76
EARNVOL	0.009	0.26	0.13
SIZE	0.010	1.57(billion)	3.49
PEARN	0.017	0.74	0.47

The overall F-statistic for the procedure is highly significant, establishing that there are, indeed, two heterogeneous groups (based entirely on ex ante firm characteristics).

CONCLUSION AND SUMMARY

The basic issue addressed by this paper is to identify the firm specific factors that cause the apparent heterogeneity of the market reaction to stock repurchase announcements and to test whether these firm specific factors can be used to predict the sign of the market reaction ex ante. The results of the tests indicate that the discriminant analysis can be used to predict the signs of the announcement reaction to stock repurchase with high degrees of accuracy. I also find that the proportion of shares owned by institutions, earnings volatility prior to initiation announcement, firm size, and the projected earnings growth are important variables determining the sign of the announcement returns.

This paper addresses the issue of heterogeneous market reactions to stock repurchase announcements and develops a model to predict the possible market reaction. If offers empirical evidence that a discriminant analysis model can be used to predict how market will react to the stock repurchase announcements. The practical application of the paper is that the results may be helpful for the managers of the firms contemplating an open-market stock repurchase program to forecast how market will react to such a program based on their firm specific factors.

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