

**MANAGER'S OPPORTUNISTIC TRADING OF THEIR FIRMS' SHARES:  
A Case Study of Executives in the Banking Industry**

John S. Jordan\*

---

\* Economist, Federal Reserve Bank of Boston  
Research Department, T-8, 600 Atlantic Ave., Boston, MA 02106  
phone: 617-973-3644                      email: John.S.Jordan@bos.frb.org

The author thanks Joe Peek, Eric Rosengren, Don Cox, Kit Baum, and Betty Strock-Bagnani for helpful comments. Valuable research assistance was provided by Margaret Enis. The views expressed are those of the author, and do not necessarily reflect the official positions of the Federal Reserve Bank of Boston or the Federal Reserve System.

# **MANAGERS' OPPORTUNISTIC TRADING OF THEIR FIRMS' SHARES: A Case Study of Executives in the Banking Industry**

## **Abstract**

Providing managers with stock in the firm may help ensure that managers act in the shareholders' interest. The level of managerial stock ownership, however, is not generally controlled by the firm's compensation committee. Rather, managers themselves determine the level of their stock holdings. To date, though, little evidence exists on managers' personal transactions and how these trades affect their overall equity holdings. This analysis provides insight on the trading practices of bank managers.

I find that managers do not rely solely on the actions of a compensation committee to set their stock holdings. The assumption that managerial stock holdings are determined solely by the firm's compensation committee is shown to be inaccurate. I provide evidence that managerial open market purchases and sales are both primary determinants of the level of managerial stock holdings. I also show that managers alter their holdings in an opportunistic manner. In general, managers alter their stock holdings when their firm's prospects change. Managers consistently take advantage of private firm-specific information, earning positive abnormal returns on open market purchases while avoiding negative abnormal returns by making open market sales.

Evidence suggests that opportunistic trading is most prevalent among managers who face the greatest exposure to their firm's nonsystematic risk. In general, managers appear to "fine tune" the proportion of their wealth that is sensitive to changes in firm value. In effect, this trading increases the rate of return and reduces the riskiness of holding those shares. This increased return/risk trade-off, available to managers who trade shares in their firms, may help explain why many managers are willing to hold what appears to be an undiversified stake in their firm.

## **I. Introduction**

Evidence from Murphy (1985) and Benston (1985) suggests managers' wealth is highly sensitive to nonsystematic risk. These authors show that year-to-year changes in the value of managers' stock holdings often far exceed the managers' annual remuneration. Why managers are willing to expose much of their wealth to firm-specific risk is an open question. The conjecture of this paper is that managers alter their share holdings in response to changes in the firm's prospects. By opportunistically trading their firms' shares, managers mitigate the adverse effects of such undiversified positions in their firm. The cost of poor diversification is lower for managers who can accurately predict share price changes and reallocate their portfolio weights in response to such expected share price changes. In this paper, I examine the extent to which top executives in the banking industry alter their share holdings such that they reduce their exposure to nonsystematic risk of their firms.

Examining this issue is important since managerial stock ownership is the primary means through which managers' wealth is linked to firm value (Murphy 1985 and Benston 1985). Linking managerial wealth to firm value limits the agency costs that arise from separating ownership and control and thus helps to ensure that managers act in the shareholders' interest. Despite the pivotal role of managerial stock ownership, however, little evidence exists on how managers come to have such large holdings and to what extent managers personally alter these stock holdings. Some recent evidence by Yermack (1997) shows that CEOs do influence the timing of their stock option awards and thus the terms of their own compensation. By examining the role managers play in determining their stock holdings in their firm and the extent to which managers alter these stock holdings, this study provides further evidence on corporate managers'

ability to influence their terms of compensation.

Most existing studies examining managerial stock ownership use data from a firm's proxy statement. Managerial holdings are defined as the total number of shares held by management as of the proxy statement date. This data source has two deficiencies. First, intra-year changes in managerial holdings cannot be ascertained from proxy data. Since timely trades can significantly alter managers' financial ties to their firms, it is important to examine intra-year transactions. Second, year-to-year changes in stock holdings obtained from proxy data cannot identify the sources of these changes. Whether managers are individually deciding to increase/decrease their holdings via open market transactions or accumulating shares via a company compensation plan is not generally addressed in studies using proxy data. To overcome these deficiencies, I use an alternative data source: the Security and Exchange Commission's (SEC) *Official Summary of Security Transactions and Holdings*. These data track individual managers' transactions throughout the year and allow one to differentiate between managerial discretionary trades and shares acquired via a company plan.

I isolate my analysis to executives in the banking industry to assure data accuracy. Since the SEC data were not gathered for purposes of tracking a manager's trades through time but rather for disclosure of contemporaneous trades, concentrating the analysis to a specific industry, where I could verify data accuracy, was imperative. By cross-checking the SEC data with available banking industry reports (such as SNL Securities' *Quarterly Bank Digest*) I am confident the data are accurate. Thus, this analysis provides a *case study* of managers' influence over their stock holdings in the firms they manage.

In addition, managerial stock ownership is particularly important in the banking industry

because of the current regulatory environment. Fixed-rate deposit insurance has been recognized as providing an incentive for bank shareholders to prefer a riskier banking institution than they would in the absence of this insurance (Merton 1977; Marcus and Shaked 1984; Ronn and Verma 1986). Whether banks fully exploit the risk-taking incentives will depend in part on the incentives bank managers have to operate a risky institution (Benston et al. 1986).<sup>1</sup> Managers who hold poorly diversified portfolios, consisting primarily of shares in the firm they manage, are not likely to operate an excessively risky institution because of the high downside costs of such operating decisions. In contrast, managers who opportunistically alter their stock holdings in the firm can limit the downside costs of risky activities while taking advantage of the upside benefits. Therefore, in addition to providing insights into managers' ability to personally influence their stock holdings, this analysis provides further evidence on whether bank managers' compensation encourages them to exploit the risk-taking incentives associated with fixed-rate deposit insurance.

I find evidence that managers do not rely solely on the actions of a compensation committee to set their stock holdings. Of the managers in my sample who had been with their firm for at least two years, 40 percent made open market transactions that contributed to an increase in their stock holdings between 1989 and 1993. Of these managers, the median manager increased his initial stock holdings by 30 percent with open market purchases. Twenty-five percent of the

---

<sup>1</sup> Other factors that affect the bank's risk-taking decisions include the charter value of the bank (Keely 1990) and capitalization of the bank (Kane 1985), as well as regulatory constraints placed on certain banking activities (Buser, Chen, and Kane 1981). It is commonly accepted that when a bank is close to insolvency, managers have an incentive to increase the riskiness of the bank's portfolio in a last chance attempt to save the firm and their jobs.

A recent paper by Houston and James (1995) examines the relationship between managerial compensation policies and risk-taking in the banking industry. They find no evidence that such policies promote risk-taking. Other recent studies of managerial compensation in the industry include Hubbard and Palia (1995) and Crawford, Ezzell, and Miles (1995). These studies examine managerial stock holdings as part of overall compensation. In contrast to these studies, I examine the extent to which managers personally influence their level of stock holdings.

managers who had been with their firm for at least two years had open market transactions that reduced their holdings during the sample period. Of these managers, open market sales would have decreased the median manager's initial stock holdings by 47 percent if they had not acquired shares via other means (for example, shares acquired via a compensation plan). Thus, for 65 percent of the managers in my sample, open market transactions played a vital role in the determination of managerial stock holdings.

In addition, I find that managers alter their holdings when the firm's prospects change. Managers consistently take advantage of private firm-specific information, earning positive abnormal returns on open market purchases while avoiding negative abnormal returns on open market sales. This type of opportunistic trading is consistent with managers shielding their wealth from poor firm performance while exploiting opportunities to increase their exposure to strong firm performance. Managers appear to "fine tune" the proportion of their wealth that is sensitive to changes in firm value. Interpreted this way, managers in effect increase the rate of return on their holdings while reducing the riskiness of holding those shares. This increased return/risk trade-off, available to managers who trade shares in their firm, may help explain why many managers are willing to hold what appears to be an undiversified stake in their firm.

## **II. Factors Influencing Managerial Stock Ownership**

### *2.1 Managerial Stock Ownership*

For many senior managers, the dollar value of their stock holdings in their firm is large. Benston (1985) and Murphy (1985) show that year-to-year changes in the value of these holdings often far exceed a manager's annual remuneration. These conditions, along with the fact that most

managers' human capital is primarily in firm-specific form, open up the possibility that managers' personal wealth is highly sensitive to nonsystematic risk.<sup>2</sup> Why are managers willing to hold what appear to be poorly diversified portfolios? A possible explanation is high agency costs (see Fama 1980; and Jensen and Meckling 1976; Demsetz and Lehn 1985). If the benefits of maintaining close control of the decisions of the firm exceed the costs of poor diversification, owners are willing to hold a large dollar value of stock holdings and manage the firm themselves; as the manager/owner distinction disappears, by definition, so do the agency costs. This is true, however, only if a high dollar-value in stock holdings translates into a large percentage of the firm's outstanding shares. For many firms, managers have large dollar holdings but only a small percentage of the outstanding shares. In these cases, portfolio selection theory suggests that the return/risk trade-off of the firm's shares would have to be quite high to justify such holdings. Conventional return/risk trade-off of shares of publicly traded firms would not seem to justify management's willingness to have large holdings.

One explanation of large managerial holdings is that these large dollar-value positions stem from an optimal contracting process between management and compensation committees. Pay packages must be designed so that managers' certainty-equivalent wage exceeds managers' reservation wages. Many packages include stock ownership, because of the beneficial incentive effects of linking managerial pay to firm performance. However, since the value of shares is uncertain, packages that include stock ownership need a large dollar-value position if the entire pay package is to produce a high enough certainty-equivalent wage to exceed managers'

---

<sup>2</sup> The existence of large dollar holdings does not of itself indicate poor diversification. For very wealthy managers, holdings in their firm may only account for a small percentage of their portfolio and thus they may in fact hold well-diversified portfolios. However, since the value of managers' equity holdings often dwarfs annual remuneration (Benston 1985), it is unlikely that the majority of managers are wealthy enough to hold well-diversified portfolios.

reservation wages. This explanation relies on the compensation committee providing management with shares via a compensation plan and possibly placing restrictions on management's ability to alter its holdings. Under this explanation, managers themselves play little role in determining the level of their stock holdings.

Alternatively, managers themselves may determine the level of their stock holdings in the firm and choose a level of holdings that corresponds to their expectations regarding the firm's prospects. The relationship between firm performance and managerial wealth, one of the primary motivations for managerial stock ownership, is not as clear when managers determine the level of their share holdings. Managers who have private information regarding poor performance may decide to acquire fewer shares or sell off some of their holdings prior to the public release of this information. Managers with private information that firm performance will be strong may purchase additional shares to increase their holdings. Managers who alter their holdings in this manner do not have the same expected risk/return trade-off that non-insiders have regarding the benefits of holding the firm's shares. Managers who have a more accurate expectation regarding the firm's return and riskiness may be justified in holding a large proportion of their portfolio in the firm's shares.

Examining how managers acquire and dispose of shares in their firm is important, because the ability to alter one's share holdings may affect managerial operating decisions. Theoretical research on insider trading has examined these incentive effects (Bebchuk and Fershtman 1994; Bagnoli and Khanna 1992). In general, these studies show that insider trading benefits shareholders if trading profits induce risk-averse managers to abandon an overly conservative investment policy. On the other hand, insider trading imposes costs on shareholders when trading



profits induce managers to make operating decisions that increase the volatility of their firm's return but fail to maximize the firm's value.

To clarify how managers' altering their stock holdings could affect their operating decisions, consider the following example. It is an alternative interpretation of the analytical model of Bebchuk and Fershtman (1994). Management's ability to buy or sell shares at the current share price, the price not incorporating their private information, can be interpreted as providing both call-like and put-like options for the managers. When a manager is hired, access to private firm-specific information provides call-like options, since managers have the ability to purchase shares at times when the firm's share price undervalues the firm's true worth. The call-like feature stems from the ability to purchase shares at current prices instead of those that eventually prevail when the private information becomes public knowledge. After obtaining shares in the firm, managers with access to private, firm-specific information also receive a put-like option for each share owned, since managers can sell shares at times when the share price overvalues the true worth of the firm instead of at the price that eventually prevails when the private information becomes public.

Holding both a call and a put option with the same exercise price, in this case the share price that does not incorporate their private information, resembles a strategy known as a long straddle.<sup>3</sup> Holding a straddle is a useful strategy for investors who expect the share price to move

---

<sup>3</sup> Since securities law restrict managers from selling their firm's shares short, managers only have put-like options for the shares they own. Conversely, there are no restrictions on the number of shares a manager can purchase and thus fewer limits on the call-like options. Therefore, since managers hold more call-like options than put-like options, technically, a long straddle is not a perfect description of the value of managers' ability to purchase and sell shares in the firm using private information. However, since a more accurate specification would increase the complexity of the analysis without providing much additional value to the descriptive nature of the analysis, I use the long straddle analogy.

a lot but are uncertain as to the direction. Higher volatility in the share price translates to an increased value of the straddle. In this context, the implicit straddle, whose value increases with the volatility of the firm's share price, may induce managers to increase the riskiness of the firm. However, if the percentage of shares the managers are willing to trade is small in comparison to their stock holdings, it is unlikely this trading strategy would induce increased risk-taking. Whether or not managers trade enough shares for this issue to be a concern is an empirical question this paper helps address.

Using detailed data on managers' stock holdings, I attempt in this paper to answer the following questions: What role do managers play in the determination of their own stock holdings in their firm? How active are managers in the trading of their firm's shares? What are the determinants of managers' decisions to trade? Is the decision of managers to purchase or sell shares in their firm affected by whether they are receiving shares via a compensation plan? Do these discretionary trades contribute significantly to their equity holdings?

## 2.2 *Insider Trading Laws and Their Impact on Managerial Trading*

The Securities and Exchange Act of 1934 was the first legislation attempting to deter insider trading. Section 16a of the Securities Exchange Act of 1934 requires officers and directors of publicly traded firms to report their trades to the Securities and Exchange Commission and restricts managers from short-selling shares in the firm they manage. In 1942, Rule 10b-5 made trading on a nonpublic "material fact" illegal. The Insider Trading Sanctions Act of 1984 and the Insider Trading and Securities Fraud Enforcement Act of 1988 increased fines and jail sentences for insider trading convictions. The insider trading regulations aim to prevent insiders from trading

on the basis of material, nonpublic corporate information.

Empirical evidence, however, unanimously concludes that current legislation does not prevent insiders from profitably trading shares in their firm. Studies by Jaffe (1974), Seyhun (1986), and Rozeff and Zaman (1988) show that, on average, insiders earn positive abnormal returns from their trades. Seyhun (1992) provides evidence that the additional statutory sanctions of the 1980s did not deter most insiders from profitably participating in trading. Trading volume and profitability both increased during that period.

### **III. Managerial Personal Trading of Their Firm's Shares: Evidence**

#### *3.1 The Data*

The population of interest consists of managers of all publicly traded firms. I chose a sample of managers from publicly traded bank holding companies because several data sources were available to verify data accuracy. The primary data source, the Securities and Exchange Commission's (SEC) *Official Summary of Security Transactions and Holdings*, consists of all stock transactions by officers, directors, and beneficial owners of 10 percent of the common stock of a firm. The data set, going back to 1980, consists of several million observations. The SEC data were gathered not for purposes of tracking a manager's trades through time, but rather for disclosure of contemporaneous trades, so verification of data accuracy was imperative. The difficulty arises when one attempts to track an individual manager's stock transactions through time. Reporting procedures changed several times over this time period and so much care was given to assuring that a manager was consistently identified through the sample period. Limiting the analysis to the banking industry allows for data verification, since it dramatically reduces the

sample size and since several other data sources were available to verify the SEC data.

Stock transaction and holdings data were collected for managers of bank holding companies that were publicly traded in 1984 and still in existence in 1989. Banking holding companies that were later acquired or failed between 1989 and 1993 are included up to the point when they ceased to be a publicly traded company. Managerial stock transactions were obtained from the National Archives reproduction of the SEC's (SEC) *Official Summary of Security Transactions and Holdings*. These data were verified using various issues of the SNL *Quarterly Bank Digest* and the bank holding company's annual reports and proxy statements. SNL *Quarterly Bank Digest* was also the source of firm-level data such as institutional stock holdings and total managerial stock holdings. Daily stock return, price, and volume data were obtained from *CRSP* as were data on shares outstanding and distributions. The Federal Reserve's *Y9 reports* and *NIC database* were also used to obtain bank holding company data. Finally, interest rate data were obtained from Data Resources Incorporated's (DRI) *Daily Interest Rate Series*.

In compliance with the Securities and Exchange Act of 1934, officers, directors, and owners of more than 10 percent of the common stock of a firm must disclose any personal security transaction associated with their firm. Insiders must file "Form 4 - Statement of Changes in Beneficial Ownership of Securities" with the SEC on or before the 10th day after the end of each month in which any change in beneficial ownership has occurred. I define bank managers as officers and directors of the firm, and I examine the trading of Class A common shares (or the firm's equivalent). I consider shares directly owned as well as those indirectly owned. Of the information that insiders report, I use data on the type of transaction, the number of shares involved in the transaction, the date the transaction took place and the number of shares held by

the manager. In addition, I proxy a manager's starting date with the firm as the date when he or she first was required to disclose trades of firm shares to the SEC. Each manager has an observation in the SEC data set, with the transaction type variable coded as "3" to indicate the date the manager starts reporting trades to the SEC and their initial holdings. This date corresponds to the date a top executive is hired by the firm, recently promoted to a position in the firm where he or she is now required to disclose his or her trades, or first acquired shares in the firm.

The analysis concentrates on managerial stock transactions over the five-year period between 1989 and 1993. Managers, from the population of publicly traded bank holding companies as of 1984, who have stock transactions sometime between 1989 and 1993 are included in the sample. This starting date allows me to differentiate managers who are "mature" from those who are "new." It is important to differentiate between "new" and "mature" managers, since many compensation committees require officers and directors to build their ownership stake in the firm to a certain level within one or two years of joining the firm. Since I am examining the role managers' discretionary transactions play in their share holdings, it is important to separate transactions of managers who have just begun with the firm from transactions of managers who have been with their firm for some time. This differentiation is made by determining the date when a manager is first required to disclose his or her trades with the SEC.

A "new" manager, in the context of stock transactions from 1989 through 1993, is a manager whose reporting requirements begin in 1987 or 1988. Managers required to report trades prior to 1987 are classified as "mature" managers. If the cutoff date for a bank holding company was later, say 1989, a firm that went public in 1988 would have all of its managers classified as

“new,” since all of them would have an initial reporting date in 1988. By requiring the firm to be publicly traded prior to 1984, and concentrating on managerial stock transactions between 1989 and 1993, I can differentiate those managers who have been disclosing trades for a number of years from those just recently required to disclose trades. In addition, only managers who disclosed trades prior to 1989 are included in the sample. Managers beginning after 1988 are excluded since my goal is to track stock transactions over a number of years. The final sample consists of 2,854 managers from 177 bank holding companies.

Panel A of Table 1 presents the level of share holdings of managers in the sample. The average manager, as of the BHC’s proxy date in 1989, holds over \$900,000 in his or her firm’s shares, with the median manager holding \$133,620. This represents 0.39 percent of the firm, on average, while the median manager holds 0.02 percent of the firm. As one might expect, the median “mature” manager holds more than three times the value of shares held by the median “new” manager.

Because my source of managerial stock holdings is the SEC *Official Summary of Security Transactions and Holdings*, sample selection requires a manager to have at least one transaction during the sample period to be included in the study. Potentially this could create a sample selection bias, since only managers who have transactions are included in the sample. Fortunately, however, this is not likely to be a major issue, since virtually all large firms employ some type of compensation package that includes stock grants. In addition, the SEC data set includes managers reporting their initial stock ownership, managers whose firms issue stock dividends, and managers whose firms have a stock split, even if these managers have no other stock transaction. Thus, any sample selection bias is likely to be minimal. Panel B of Table 1 presents evidence by which to

evaluate this assumption. It compares the aggregate share holdings of the sampled managers within each BHC with the managerial share holdings as reported in each BHC's proxy statement (reported by SNL *Quarterly Bank Digest*). For most BHCs, the proxy statement presents the percentage of the firm's shares held by officers and directors including their stock options. The holdings presented in this analysis represents managers' holdings of shares excluding stock options. Thus, the stock holdings of the sampled managers should be less than those listed on the firm's proxy; however, non-option stock holdings should still represent a significant portion of managerial stock holdings.

Panel B of Table 1 shows that the managers in this sample hold close to 8 percent of the outstanding shares, on average, of the firms they manage. According to the BHCs' proxy statements, the average is 11 percent. The difference can, potentially, be explained by option holdings. For those few firms that reported managerial holdings excluding options on their proxy statements, I compared the proxy statement percentages to those obtained from the sampled managers. In these cases, the two measures were closer than those reported in Table 1. For example, Citicorp's proxy in 1989 reports officers and directors holding 1.50 percent of the outstanding shares in the firm, excluding options. Aggregating the Citicorp managers in my sample, these managers own 1.45 percent of the shares outstanding. Thus, with the recent trend toward equity-based compensation plans, it is unlikely that my data source and sample selection criteria present a significant sample selection bias. However, when interpreting the results of this paper, one should keep this possibility in mind.

### 3.2 *Frequency and Size of Trades*

To what extent do bank managers alter their holdings in their firm's shares? Table 2 presents descriptive statistics for managers from 177 bank holding companies during the period 1989 to 1993. There are 28,001 transactions, broken down into nine categories. The dollar value of these transactions is calculated as the number of shares in the transaction multiplied by the closing share price on the day of the transaction. The most common transaction are shares acquired through a company compensation plan: 7,037 transactions with an average dollar value of \$30,319; the median is \$1,674. The second most common transaction, open market purchases, has an average transaction size over 2 ½ times that of shares acquired via a company plan. On average, the dollar value of these transactions is \$82,583; the median is \$8,730. Open market sales are less common, with 2,338 transactions; however, the average amount transacted is almost three times larger than the average open market purchase and over 7 ½ times larger than shares acquired via a plan, at \$232,197; the median is \$62,978.

Managers also acquire more shares when they exercise options they hold in their firm, although these transactions are less common than open market transactions and shares accrued through a compensation plan. The median dollar value of shares acquired at the close of the day the manager exercised the options was \$367,869; the median is \$118,500. Acquisition of shares acquired via reinvestment of dividends is also common with 4,023 transactions, but relative to other types of transactions, the amount transacted is low. The average is \$5,472 while the median is the lowest of all transactions at \$817. If a manager's transaction does not fit into one of the transactions specified by the SEC, the transaction is categorized as "other". The individual must specify a description of this transaction. Unfortunately, the data tapes do not contain this information. These "other" transactions are common, with a few very large transactions falling



into this category. The average dollar value of the 3,072 “other” acquisitions is \$436,518; however, the median is only \$15,478. The average size of the 2,288 “other” dispositions is \$439,864 with a median of \$59,252. Finally, the least common transactions are acquisitions or disposition via a gift; 372 transactions for acquisition, 1,132 for dispositions.

This table emphasizes the importance of documenting managerial influence over their personal share holdings. It is clear that managers do not rely solely on the actions of a compensation committee to set their equity holdings. Open market purchases and sales represent almost 30 percent of managerial transactions. In the next two tables I take a closer look at the extent to which managerial open market purchases and sales influence their share holdings in the firms they manage.

### *The Importance of Managerial Open Market Transactions*

How important are managerial open market trades in the context of total managerial stock holdings? How important are these managerial transactions in the context of changes in managerial stock holdings? Table 3 and Table 4 provide greater detail of the role open market purchases and sales play in determining a manager’s share holdings.

Table 3 examines the effect of open market purchases and sales on “mature” managers’ stock holdings. The sample of managers as of January 1, 1989 consists of 2,212 managers from 177 BHCs. To judge the role of open market transactions, the sample is then split into three groups. The first group (Panel A) includes all managers who sold more shares in the open market than they acquired in the open market between the years 1989 and 1993. The second group (Panel B) consists of managers who did not have any open market purchases or sales during the sample

period. And finally, the third group (Panel C) consists of those who acquired more shares on the open market than they sold on the open market. Managers of BHCs that were acquired (49 BHCs) or failed (8 BHCs) during the sample period are included up to the point when their firm is no longer publicly traded.<sup>4</sup>

The first point to note is that 66 percent of the sampled “mature” managers had either an open market purchase, an open market sale or both during the sample period. The second point is that these transactions are large enough to significantly alter managerial stock holdings. For example, for managers who were net sellers of shares, the median size of their open market sales equaled 47 percent of their holdings as of the beginning of 1989 (table 3, panel A). For these same managers, the median total change in stock holdings increased by only 5 percent during this time period.<sup>5</sup> It appears these managers were unloading shares on the open market that they were acquiring from other sources. Those managers who were net purchasers of shares increased their January 1989 stock holdings by 30 percent by making open market purchases over the sample period (table 3, panel C). In comparison, the total percent change in these managers’ stock holdings was 54 percent. Thus, open market purchases were the primary contributor to the

---

<sup>4</sup> To check if the inclusion of these acquired and failed BHCs significantly influence my results, I compared the propensity to make open market transactions across all three type of institutions (survived, acquired, and failed). I found that managers of failing BHCs had very few open market transactions and managers of acquired BHCs had relatively fewer transactions than surviving BHCs. A possible explanation for such results is that insider trading laws effectively deter trades that the SEC could easily determine were based on private information. Seyhun (1992) states that the majority of cases brought against corporate insiders were trades made immediately prior to a merger or acquisition announcement. He suggests case law effectively defined illegal insider trading as trades based on merger or acquisition information. Thus, inclusion of failed and acquired institutions makes it more difficult to find open market purchases and sales having a significant role in the determination of managerial stock holdings.

<sup>5</sup> The change in a manager’s total stock holdings is calculated as shares acquired via open market purchases, a company plan, reinvestment of dividends, exercising options, gift, and “other” acquisitions less shares disposed of via open market sales, gift, and “other” dispositions over the sample period. For more detail on the size and frequency of these transactions, see Table 2.

changes in these managers' stock holdings. Those who were net sellers on the open market increased their share holdings the least (median increase of 5 percent), those who were net purchasers on the open market increased their holdings the most (median increase of 54 percent), while those with no open market purchases were between these two other groups (median increase of 17 percent). These results suggest that the majority of managers actively participate in the determination of their stock holdings and do not merely rely on their firm's compensation committee to determine their stock holdings.

Table 3 also separates managers according to the size of their initial stock holdings in 1989. Managers are split into quintiles and then separated according to whether they are net open market sellers, net open market purchasers, or make no open market transactions at all. Those managers in the lowest quintile of stock holdings are the least likely to purchase or sell shares on the open market (58 percent, 68 sellers plus 190 purchasers out of 442 managers), while those with the largest stock holdings are the most likely to make open market transactions (74 percent, 156 sellers plus 172 purchasers out of 442 managers).

Looking at the size of open market purchases across quintiles, managers with higher initial holdings, while more likely to purchase shares in the open market, increase their holdings by a smaller percentage. For example, net open market purchasers in the top quintile increase their holdings by 7 percent. In contrast, open market purchases by managers in the lowest quintile increase their holdings by 131 percent. Similar results hold for net open market sellers. Of course, the dollar value of transactions is higher for those managers in the highest quintile, but the effect on their overall stock holdings is less since they started out with much higher holdings.

Table 4 presents evidence on open market transactions by "new" managers. Specifically,

this table shows the role open market transactions play in managerial stock holdings in the two years after their initial reporting date. I isolate the first two years of transactions, since many compensation committees require officers and directors to build their ownership stake in the firm to a certain level within one or two years of joining the firm.

Since many “new” managers have small or no stock holdings, it is meaningless to calculate the percentage change in managerial holdings. Therefore, for these managers, I examine the dollar value of open market transactions and compare it to the total *change* in stock holdings over the managers’ first two years. Panels A, B and C of Table 4 considers the 257 managers whose initial stock holdings are in the lowest two quintiles of “new” managers’ stock holdings. Forty-five percent of them had open market purchases in the two years after their initial statement of stock ownership. Panel C shows that for the median manager, almost all of the change in the managers’ first two years comes from open market purchases. In comparison, managers with no open market transactions or those who were net open market sellers (only 8 of 257 managers were net sellers) have virtually no change in their share holdings. Thus, the primary way in which new managers acquire their initial shares in their firm is through open market purchases.

Panels D, E and F of Table 4 examine those managers whose initial holdings are in the upper three quintiles. Since these managers have significant initial stock holdings, these panels show the percentage that their open market transactions are of initial stock holdings (the same analysis found in Table 3).<sup>6</sup> The results show that these managers behave similarly to “mature” managers. Forty-eight percent participate in open market transactions in the two years after initial

---

<sup>6</sup> Possible reasons why many “new” managers have non-zero initial stock holdings include: 1) a manager with very large holdings recently became a member of the board of directors; 2) the “new” manager had been with the firm for a number of years but was recently promoted to a position where he was required to disclose all trades; 3) the “new” manager was brought in from the outside and just happened to hold shares in the firm.

ownership. Of those managers who are net open market purchasers (Panel F), the median manager increases his initial share holdings by 49 percent by open market purchases. Managers who are net open market sellers (Panel D) decrease their initial holdings by 27 percent by making open market sales.

This evidence strongly suggests managers play a significant role in the determination of their stock holdings in the firms they manage. For those in the middle to low quintiles of initial stock holdings, open market transactions are large in comparison to initial holdings and make up the majority of the change in share holdings of the sample period. For those managers in the upper quintile of holdings, open market transactions make up a significant percentage of the change in managerial stock holdings, but for these managers these changes seem to “fine tune” their initial holdings.

### *3.3 Abnormal Returns from Managerial Trades*

I have suggested that bank managers are willing to add shares via the open market to their already large holdings in their firm if they expect, with high probability, a strong stock price performance. Similarly, managers will sell at least part of their holdings on the open market when they expect the firm’s share price has reached its peak. To test whether managers trade in this manner, I use an event study methodology to examine whether these transactions earn returns above what is considered “normal,” given an assumed return-generating process. Earlier studies have found that insider traders, on average, earn abnormal returns on their open market transactions. To verify if this holds for my sample of managers, I examine the abnormal returns associated with non-open market transactions, and isolate open market purchases by “new”

managers to examine whether their initial stock purchases are profitable.

“Mature” managers determine the timing and size of open market purchases and sales. Therefore, if managers are trading opportunistically, open market purchases should earn positive abnormal returns, whereas open market sales should avoid negative abnormal returns. Managers also decide the timing and size of shares they give away as gifts. Thus, these transactions should have return properties similar to open market sales and thus help the manager avoid negative abnormal returns. The final type of discretionary transaction is the exercising of options, although how discretionary these transactions are depends on whether the options are about to expire. If managers routinely dispose of shares (for example, by selling shares on the open market) around the time of exercising of options, and if managers’ exercising of options is profit-motivated, these transactions should also avoid negative abnormal returns. For all other transactions, managers do not determine the timing of the transaction and, therefore, are not expected to earn abnormal returns on these transactions. However, if firms issue shares to managers at opportunistic times, non-discretionary acquisition transactions should have positive abnormal returns.

To calculate abnormal returns one must assume a return-generating process of individual firm securities. Studies examining the return-generating process of financial intermediaries suggest the use of a two-index model. See Flannery and James (1984), Kane and Unal (1988) and Saunders, Strock and Travlos (1990) for details. This asset-pricing model adds an interest rate index to the market model. I use two alternative interest rate series, DRI’s 3-month Treasury bill yield or DRI’s 10-year note yield series. The two-index model takes the form:

$$r_{j,t} = \alpha + \beta_m r_{m,t} + \beta_i r_{i,t} + \epsilon_{j,t} \quad (1)$$

where  $r_{j,t} \equiv$  the simple with-dividend return to security  $j$  on day  $t$ ,

$r_{m,t} \equiv$  the simple with-dividend return to the value-weighted portfolio of all New York Stock Exchange and American Stock Exchange stocks on day  $t$ ,

$r_{i,t} \equiv$  the change in daily yields of one of two alternative interest rate series: DRI's 3-month Treasury bill (bond equivalent) yield or DRI's 10-year note yield series,

$\epsilon_{j,t} \equiv$  the security-specific component of the return.

To check the robustness of the model specification, I also estimate the standard market model as well as a version of the market model that corrects for the possibility of nonsynchronous trading (see Scholes and Williams 1977). The results of all specifications are qualitatively similar. Therefore, to make the presentation of results manageable, I present only the findings for the two-index model that specifies the interest factor as the change in the daily yield on the 3-month Treasury bill.

To be included in the analysis, a managerial transaction had to satisfy the data requirements for the following estimation technique. I estimate the parameters of all models using 242 daily returns, from day -252 to day -11. The abnormal return,  $AR_{j,t}$ , earned by manager  $j$  on day  $\tau$  is calculated for each model as the out-of-estimation-period prediction error:

$$AR_{j,\tau} = r_{j,\tau} - (\alpha + \beta_m r_{m,\tau} + \beta_i r_{i,\tau}) \quad (2)$$

The cumulative abnormal return for manager  $j$ ,  $CAR_j$ , is calculated as the sum of daily abnormal returns for various intervals around the event date:

$$CAR_j = \sum_{\tau} AR_{j,\tau} \quad . \quad (3)$$

To examine managerial use of private information in their trades, I compute mean CARs as the simple average of individual manager CARs. The test-statistic for a CAR over an interval of  $N$  days is the ratio of the mean cumulative abnormal return to its estimated standard error. The estimated standard error is computed from the time series of mean abnormal returns from the estimation period for each transaction type. This test statistic is assumed unit normal in the absence of abnormal performance. For details of this test statistic, see Brown and Warner (1985).

The results presented in Table 5 provide evidence of significant differences between transactions where managers have discretion over the timing of the trade and those where they do not. Panel A of Table 5 presents the results for discretionary trades. All returns have the expected sign and the 3-, 6-, and 12-month returns are all significantly different from zero at the 5 percent level. For all other transactions, shown in panels B and C, the abnormal returns are not significantly different from zero or are of the wrong sign. These results provide strong evidence in favor of managerial opportunistic trading of shares in their firm.

Managers avoid significant negative abnormal returns in the five days before open market purchases. These returns turn positive for all time periods after the transaction date, with the 3-, 6-, and 12-month returns significantly greater than zero. On average, the abnormal return for the 12-month period (252 trading days) after open market purchases was 6.98 percent (t-stat of 9.27). For open market sales, the return pattern is the mirror image of open market purchases. The average returns are positive just prior to the sale and then turn negative after the transaction date (the 3-, 6- and 12-month returns are significant). The average one-year abnormal return for these sales was -6.40 percent (t-stat of -7.77).

Shares that managers give away as gifts have a return pattern similar to that of open



market sales, as do shares that managers acquire when exercising options. To check to see if managers disposed of shares around the time of exercising options, I examined the time period starting three months before the exercising of options and extending to the three after exercising options for open market sales. I find that more than half of the option transactions are around the same time as open market sales. Since these “cash-less” exercises of options (raising cash via sales to exercise options) avoid negative abnormal returns, managers tend to time the exercising of their options opportunistically. The data suggest managers time the exercise of their “in the money” options to coincide with a peak in their firm’s share price.

The results for non-discretionary transactions are informative in that they are either statistically insignificant or of the wrong expected sign. The returns earned by managers when they acquire shares through a compensation plan are on average 0.52 percent (t-stat of 0.43) in the year following the date of acquisition. Shares acquired via the receipt of a gift or through a dividend reinvestment plan earn, on average, negative returns. As for “other” transactions, only the one-year return for “other” sales is significant; all other returns do not significantly differ from zero.

Figures 1 through 3 show the contrasting results between trades where managers have discretion and trades where they do not. Figure 1 plots the average cumulative abnormal return for open market purchases in the year following the transaction. Figures 2 and 3 show the same returns for open market sales and for shares accrued via a compensation plan. The return pattern of discretionary purchases suggests managers purchase shares after unfavorable information is fully reflected in the share price and the prospects of the firm are about to improve. The return pattern on discretionary sales (and the exercising of options as long as they are accompanied by

sales) suggests managers are unloading shares just prior to unfavorable information being released. In contrast, returns earned on all other transactions have no such patterns. Thus, the frequency (Table 2), the size (Tables 3 and 4), and the profitability (Table 5) of managerial discretionary transactions provide strong evidence that managers opportunistically trade shares in their firms.

As discussed earlier, “new” managers may be required to purchase shares in order to build their ownership stake in the firm to a certain level. The above analysis included transactions by all managers. Therefore, some of the initial open market purchases by “new” managers that I have described as discretionary may actually have been required. One would not expect to find abnormal returns from these trades. To check this, I examined abnormal returns around open market purchases within two years of the initial reporting date of a “new” manager. As expected, no abnormal performance was found for these transactions.

### *3.4 Determinants of Managers' Decisions to Trade Shares*

I have shown that, on average, managers earn abnormal profits on their discretionary trades and that these transactions constitute a significant proportion of stock holdings. However, this analysis is conditional on a trade occurring. It is possible that managers miss opportune times to trade. This section addresses the question of whether managers consistently take advantage of opportunities to trade and also the question of what other factors influence management's participation in the trading of their firm's shares. Are managers who hold large undiversified stakes in their firm more likely to trade? Does the presence of liquidity traders in the firm's shares increase the likelihood of trading? Does the presence of other market participants such as

institutional investors affect management's decision to trade shares? In this section I use multivariate analysis to explore the determinants of managerial trading. Using yearly observations on managerial trading practices, I use a probit analysis to model managers' decisions to alter their stock holdings in the firms they manage.

I have hypothesized that the decision to trade depends primarily on how well the firm's shares have done in the recent past and how well the manager expects the share price will do in the near future. If the firm's share price has increased recently but the manager expects the return to slow, the likelihood of a sale increases. If the share price has done poorly recently but managers expect the share price to turn around, the likelihood of a purchase will increase. In both cases, it is the firm's recent performance and the managers' expectations concerning future performance that determine their participation in the trading of shares. Managers are also likely to consider variability in their firm's stock return. Risk-averse managers would likely be less inclined to hold shares that have large price fluctuations and thus high variability of returns is likely to dissuade purchases and encourage sales. Findings consistent with these types of trading practices will support the hypothesis that managers determine the level of their personal holdings based on the benefits of holding such shares. In contrast, if purchases and sales are prompted primarily by reasons other than those proposed by this hypothesis, I should find no relationship between changes in a firm's return and managerial propensity to trade.

The level of managerial holdings is also an important factor in managers' decisions to trade. As managers hold more of their wealth in the form of their firm's stock, they are increasing their exposure to possibly non-diversified risk. As discussed above, however, managers opportunistically participating in the trading of their firm's shares can reduce their exposure to

this risk. In contrast, managers who enjoy the control benefits of holding a large percentage of the firm's shares may not be interested in trading shares at all. Also, as the percentage of shares owned by managers increases, the number of possible traders to take the position opposite the manager falls. This may lower the likelihood of managerial trading. To examine the effects of these factors, I include the natural logarithm of the dollar value of stock holdings or the percentage of shares outstanding held by the manager, depending on the model specification. Also, to control for transactions made by "new" managers that may be required by the compensation committee, I include a variable that measures the number of years since the manager was first required to disclose his trading of shares in his own firm.

In addition to the shares managers already hold, compensation plans that include shares in the firm increase managers' exposure to firm-specific risk. One would expect, after controlling for other factors, that the more shares managers receive via a compensation plan the less likely it is that they will purchase additional shares and the more likely they will sell shares. To control for these factors, I include the natural logarithm of the dollar value of shares accrued via a plan or the percentage of shares outstanding that were acquired via a plan, depending on the model specification.

However, since managers who belong to a plan regularly receive shares, these managers may be more likely to participate in the opportunistic trading of their firm's shares. That is, given that part of managers' compensation will be exposed to the nonsystematic risk of the firm, they may be more likely to purchase shares at opportune times as well as sell shares at opportune times. To test this conjecture, I create a (1,0) dummy variable for whether a manager receives shares through a compensation plan and interact it with the return variable. If managers receiving

shares via a plan tend to participate more in the opportunistic trading of shares, one would expect them to be more sensitive to changes in the firm's stock return.

I develop the motivation for trading in terms of managers' reactions to their possibly un-diversified holdings in their firms. However, additional factors influence the trading practices of bank managers. For example, firms whose shares are traded infrequently may have large bid-ask spreads that make the cost of trading too high for managers to earn profits. In contrast, managers of firms whose shares are traded frequently may have ample profit opportunities since they may be able to trade on the "noise" generated by liquidity traders. To control for these factors, I include as a variable the number of days within the year that the firm's shares have zero trading volume.

Another factor that may influence managerial trading is the role of outside monitors. There is evidence that shareholders who own large blocks of shares have a greater incentive to monitor the firm than shareholders who own smaller blocks. If this monitoring produces valuable firm-specific information, then as the percentage of institutional ownership increases so does the percentage of shareholders who have accurate information regarding the financial soundness of the firm. In this environment, a manager has fewer price-insensitive liquidity traders with whom to trade shares. As discussed above, this will lower management's ability to profitably trade shares. To control for these factors, I include as a variable the percentage of shares owned by institutions. The one additional control variable controls for firm size effects and is measured by the natural logarithm of the BHC's assets.

In this analysis, I examine managerial discretionary trading on a yearly basis for the period 1989 through 1993. My primary concern is examining the motives behind managers' decisions to increase or decrease their stock holdings in a particular year via open market transactions. A

manager is considered to have a “purchase year” if in a particular year the number of shares acquired via open market purchases exceeds the number of shares disposed of via the open market. A manager has a “sale year” if the number of shares acquired via open market purchases is less than the number of shares disposed of via open market sales. Finally, if no open market transactions are made in a year, the manager is said to have a “no trading year.”

Indexing managers by  $i$  and years by  $t$  and adding a stochastic component, I express the latent variable,  $Y_{i,t}^*$ , determining whether a manager trades shares in his firm as:

$$Y_{i,t}^* = \alpha Ret_{i,t-1} + \varphi Ret_{i,t} + \beta Z_{i,t} + \epsilon_{i,t} \quad (1)$$

where  $Y_{i,t}^*$  determines whether manager  $i$  participates in insider trading in year  $t$ . Depending on the level of  $Y_{i,t}^*$ , we observe  $y_{i,t}$ :

$$\begin{aligned} y_{i,t} &> 0 && \text{if } Y_{i,t}^* > 0 \\ y_{i,t} &= 0 && \text{otherwise} \end{aligned}$$

When  $Y_{i,t}^*$ , crosses the threshold 0, managers’ trading of shares,  $y_{i,t}$ , becomes positive. Otherwise it is zero. The variable  $Ret_{i,t}$  is the manager’s firm’s contemporaneous stock return (measured as the one-year raw return) while  $Ret_{i,t-1}$  is the manager’s firm’s lagged return (measured as the lagged one-year raw return).  $Z_{i,t}$  is the vector of additional explanatory variables discussed above.

Since some of the factors in  $Z_{i,t}$  may affect managerial purchases and sales differently, I model the two transactions separately. Four different specifications are used for each model. These specifications differ in the way they measure a manager’s stock holdings: either as the natural logarithm of the dollar value of shares held by the manager or as the percentage of firm’s shares

held by the manager. The specifications also differ in that some include an interactive variable of the current stock return multiplied by a dummy indicating whether the manager receives shares from a compensation plan.

Table 6 presents the results for open market purchases. Both the current year's stock return and the lagged year's return are inversely related to the probability of purchasing. The coefficients are significant at the 5 percent level. This suggests that managers are purchasing shares after their firm's share price has fallen. If I change the current year's return from 0.15 to -0.15, the probability of purchasing shares increases by 24 percent (assuming specification 1 in Table 6 and all other variables are at sample means). These findings, along with the results from Table 5 showing positive abnormal returns earned by managers, are consistent with managerial opportunistic trading. Managers are more likely to purchase shares at low share prices in the hope of capturing profits from a price recovery.

Table 7 presents the results for open market sales. Interestingly, the decision to make an open market sale is the mirror image of the decision to make an open market purchase, in terms of the effects of changes in share prices. The coefficient on the current year's return and the lagged year's return are both positive and significant at the 5 percent level. Increasing this return from -0.15 to 0.15 increases the probability of selling shares by 28 percent (assuming specification 1 on Table 7 and all other variables are at sample means). This suggests managers sell after their firm's share price has risen. Taken together, the return coefficients in both the purchase and sale probits provide strong evidence that managers consistently take advantage of opportune times to trade their firms' shares.

Managers' concerns regarding the riskiness of holding shares are highlighted by the

negative and significant coefficient on the return variance variable in the purchase probit (Table 6). Managers of firms whose share price is highly variable are less likely to purchase additional shares. However, the coefficient on this variable is insignificant in the sale probit. There is also evidence that managers who are likely to face greater non-diversified risk are more likely to participate in the trading of shares. In both the purchase probit and the sale probit, the coefficient on the dollar value of managerial holdings is positive and significant. Similar results are found when managerial stock holdings are measured as the percentage of shares held. A quadratic is included in these specifications to account for a nonlinear relation. Again, in both the purchase probit and the sale probit, the coefficients on these variables suggest that managers with more exposure are more likely to participate in trading. However, the negative coefficient on the squared term suggests that managers who own a large percentage of the firm are less likely to participate. This could be indicating the benefits of control. Once managers own a significant percentage of a firm, the benefits of control may outweigh any other incentive to alter one's holdings.

How do managers react to receiving shares via a company compensation plan? Table 6 shows that receiving shares via a plan has no significant effect on the decision to purchase shares. Regardless of the specification, all the compensation plan variables are insignificant. However, as evidence from the sale probit in Table 7 shows, the more shares acquired by a manager via a compensation plan, the more likely the manager is to sell shares. In addition, the variable that interacts the current year's stock return with a dummy indicating the manager received shares via a compensation plan is positive and significant (Table 7, specifications 2 and 4). This shows that a manager who acquires shares via a compensation plan is more likely to sell shares for a given



change in the firm's share price than a manager who is not part of a formal stock compensation plan, additional evidence that managers do not rely solely on the compensation committee to determine their stock holdings. In fact, the evidence suggests that managers may act to offset a compensation committee's goals regarding managerial stock ownership.<sup>7</sup>

Managers also seem to respond to their ability to earn abnormal returns. Consistent with the hypothesis that insiders need liquidity traders in order to exploit their private information, managers of firms whose shares are traded less frequently (a possible indicator of the lack of "uninformed" liquidity traders) are less likely to purchase shares as well as sell shares. The more days in a year that the manager's firm's shares are not traded at all, the less likely a manager is to either purchase or sell shares in the open market. Along the same lines, the higher the percentage of institutional ownership in the firm (and thus possibly fewer "un-informed" traders in the firm's shares) the less likely managers are to purchase or sell shares.

Evidence from this section suggests managers consistently respond to changes in their firm's share price by altering their equity holdings in the firm. Managers who likely face the greatest exposure to the nonsystematic risk of their firms are also more likely to make discretionary purchases as well as discretionary sales.

#### **IV. Discussion and Conclusion**

The assumption that managerial stock holdings are determined by the firm's compensation committee is shown to be inaccurate. I provide evidence that managerial open market purchases

---

<sup>7</sup>However, a compensation committee may anticipate such trades by managers and take this into account when they determine their compensation policy.

and sales are as important to their overall stock holdings. I also show that managers alter their holdings in an opportunistic manner. In general, managers alter their stock holdings when their firm's prospects change. Managers consistently take advantage of private firm-specific information, earning positive abnormal returns on open market purchases while avoiding negative abnormal returns by making open market sales. This trading activity is also found to be most prevalent among managers who likely have the greatest exposure to the nonsystematic risk of their firm. Managers with large share holdings appear to "fine-tune" the proportion of their wealth that is sensitive to changes in firm value, which in effect increases the rate of return and reduces the riskiness of holding those shares. This increased return/risk trade-off, available to managers who trade shares in their firm, may help explain why many managers are willing to hold what appears to be an undiversified stake in their firm.

These trading patterns suggest that studies examining the link between managerial compensation and firm performance should take account of managerial trading of shares. Ignoring the timely purchases and sales by top executives may distort any measure of management's financial ties to the firm's share price. For example, trading profits from a purchase of a large number of shares, in a year when the share price increases significantly, could dwarf a manager's annual salary. Studies that fail to take these trading profits into account may miss an important connection between managerial wealth and firm performance.

Finally, the trading patterns found provide insights as to the concerns bank managers place on preserving their personal wealth. Managers who consistently make alterations to their personal holdings, effectively "fine-tuning" the return they receive on their total portfolio, suggest that they are willing to take actions to avert downward fluctuations in the value of their shares. This is

inconsistent with a type of manager who would be willing to make excessively risky operating decisions for his or her firm that would make a personal financial portfolio very risky. This has implications in the debate regarding the risk-taking incentives of deposit insurance. Since the incentives bank managers have to operate a risky institution will determine whether banks fully exploit the risk-taking incentives of deposit insurance, it is unlikely that managers who make the effort to “fine-tune” their personal holdings would also be willing to take excessive risks in the firms they manage that would also increase the riskiness of their personal holdings. Of course, this assumes a healthy banking institution. Managers of banks whose market value of equity has dropped to the point where the firm is close to insolvency will have incentives to increase the riskiness of their institution in a last effort to rescue the firm, since the cost of this increased riskiness will be incurred primarily by the deposit insurer. Nevertheless, the evidence provided in this analysis suggests that these managers are very concerned with preserving the value of their wealth. Such behavior is inconsistent with managers taking excessive risks to exploit the risk-taking incentives of deposit insurance.

## References

- Bagnoli, M. and N. Khanna, "Insider Trading in Financial Signaling Models," *Journal of Finance*, (1992), pp. 1905-1934.
- Bebchuk, L. A. and C. Fershtman, "Insider Trading and the Managerial Choice among Risky Projects," *Journal of Financial and Quantitative Analysis*, (1994), pp. 1-14.
- Benston, G., "The Self-Serving Management Hypothesis, Some Evidence," *The Journal of Accounting and Economics*, (1985) 67-84.
- Benston, G., R. Eisenbeis, P. Horvitz, E. Kane, and G. Kaufman, 1986, *Perspectives on Safe and Sound Banking: Past, Present, and Future*, (MIT Press, Cambridge, MA).
- Brown, S. and J. Warner, "Using Daily Stock Returns: The Case of Event Studies," *Journal of Financial Economics*, (1985), pp. 3-31.
- Buser, S. A., A. H. Chen, and E. J. Kane, "Federal Deposit Insurance, Regulatory Policy and Optimal Bank Capital," *Journal of Finance*, (1981), pp. 51-60.
- Crawford, A. J., J. R. Ezzell, and J. A. Miles, "Bank CEO Pay-Performance Relations and the Effects of Deregulation" *Journal of Business*, (1995), pp. 231-256.
- Demsetz, H., and K. Lehn "The Structure of Corporate Ownership: Causes and Consequences," *Journal of Political Economy*, (1985), pp. 1155-1177.
- Fama, E., "Agency Problems and the Theory of the Firm," *Journal of Political Economy*, (1980), pp. 288-307.
- Flannery, M. and C. James, "The Effect of Interest Rate Changes on the Common Stock Returns of Financial Institutions," *Journal of Finance*, (1984), pp. 1141-1153.
- Houston, J. and C. James, "CEO Compensation and Bank Risk, Is Compensation in Banking Structured to Promote Risk-taking," *Journal of Monetary Economics*, 36, (1995), pp. 405-431.
- Hubbard, R. G. and D. Palia, "Executive Pay And Performance: Evidence From The US Banking Industry," *Journal of Financial Economics*, 39, (1995), pp. 105-130.
- Jaffe, J., "Special Information and Insider Trading," *Journal of Business*, (1974), pp. 410-428.
- Jensen, M. and H. Meckling, "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," *Journal of Financial Economics*, (1976), pp. 305-360.

Kane, E. J., 1985, *The Gathering Crisis in Federal Deposit Insurance*, (MIT Press, Cambridge, MA).

Kane, E. and H. Unal, "Change in Market Assessment of Deposit-Institution Riskiness," *Journal of Financial Services Research*, (1988), pp. 207-229.

Keely, M., "Deposit Insurance, Risk, and Market Power in Banking," *American Economic Review*, (1990), pp. 1183-1199.

Marcus, A. J. and I. Shaked, "The Valuation of FDIC Deposit Insurance Using Option-Pricing Estimates," *Journal of Money, Credit and Banking*, (1984), pp. 557-565.

Merton, R. C., "An Analytic Derivation of the Cost of Deposit Insurance and Loan Guarantees: An Application of Modern Option Pricing Theory," *Journal of Banking and Finance*, (1977), pp. 3-11.

Murphy, K., "Corporate Performance and Managerial Remuneration: An Empirical Analysis," *The Journal of Accounting and Economics*, (1985) 11-42.

Ronn, E. I. and A. K. Verma, "Pricing Risk Adjusted Deposit Insurance: An Option-Based Model," *Journal of Finance*, (1986), pp. 189-201.

Rozeff, M., and M. Zaman, , "Market Efficiency and Insider Trading: New Evidence," *Journal of Business*, (1988) pp. 25-44.

Saunders, A., E. Strock, and N. G. Travlos, "Ownership Structure, Deregulation, and Bank Risk-taking," *Journal of Finance*, (1990) pp. 643-654.

Scholes, M. and J. Williams, "Estimating Betas from Nonsynchronous Data," *Journal of Financial Economics*, (1977), pp. 309-328.

Seyhun, H. N., "Insiders Profits, Costs of Trading, and Market Efficiency," *Journal of Financial Economics*, (1986), pp. 189-212.

Seyhun, H. N., "The Effectiveness of the Insider Trading Sanctions," *Journal of Law and Economics*, (1992), pp. 149-182.

Yermack, D., "Good Timing: CEO Stock Option Awards and Company News Announcements," *Journal of Finance*, (1997), pp. 449-476.

**Table 1****Managerial stock holdings**

Sample: 2,854 managers of 177 publicly traded BHCs, 1989 to 1993

Note: "Mature" managers are defined as managers whose initial statement of stock ownership in their firm is prior to 1987.

"New" managers are defined as managers whose initial statement of stock ownership in their firm is in 1987 or 1988.

Panel A: Percent of firm owned by manager and \$ value of holdings as of the BHC's proxy date in 1989

	Number of Managers	Median % of firm owned	Mean % of firm owned	Median \$ value of holdings	Mean \$ value of holdings
Sampled Managers	2854	0.020%	0.39%	133,620	975,464
"Mature"	2212	0.030%	0.46%	176,133	1,092,090
"New"	642	0.007%	0.15%	35,875	573,635

Panel B: Percent of firm owned by all managers within each BHC, as of the firm's proxy date in 1989

	Number of BHCs	Median % of firm owned	Mean % of firm owned	Median \$ value of firm owned	Mean \$ value of firm owned
Managerial stock holdings as measured from a sample of managers obtained from SEC insider trading tapes using this study's sample selection.	177	4.70%	7.98%	12,138,760	20,021,600
Managerial stock holdings as measured by SNL Securities whose primary source of data is the BHC's proxy statement.	177	7.70%	11.67%	19,427,920	31,779,600

**Table 2**  
**Managers' Personal Stock Transactions, 1989 to 1993**  
 Sample: 2,854 managers from 177 publicly traded BHCs

Transaction type	Number of transactions	Average dollar value of shares transacted	Median dollar value of shares transacted
Open market purchase	5,523	82,583.03	8,730.00
Open market sale	2,338	232,196.77	62,978.19
Acquisition of shares via exercise of options	2,216	367,869.19	118,500.00
Acquisition of shares via a company plan	7,037	30,319.25	1,674.00
Acquisition of shares via reinvestment of dividends	4,023	5,472.03	816.50
Acquisition of shares via receipt of a gift	372	113,253.29	16,375.50
Disposition of shares via gift	1,132	101,356.44	14,403.50
Other acquisitions	3,072	436,518.10	15,477.88
Other dispositions	2,288	439,907.78	59,252.25
Total	28,001	162,630.20	7,375.00

**Table 3****The effect of open market purchases and sales on "mature" managers' stockholdings, 1989 to 1993**

Sample: 2,212 managers from 177 publicly traded BHCs

Note: "Mature" managers are defined as managers whose initial statement of stock ownership in their firm is prior to 1987.

Quintile rankings of managerial stockholdings are based on the entire sample of 2,112 managers.

"Mature" managers of all 177 BHCs are included even if their firm ceases to exist during the sample period.

For BHCs that were acquired or failed during the sample period, all transactions up to the day the BHC no longer is publicly traded are included in these transactions (with the exception of stock transactions directly related to an acquisition).

Panel A: Managers whose open market sales exceeded open market purchases during the period, 1989 to 1993

Managers with net open market sales, whose \$ value of stockholdings on Jan. 1, 1989 is in quintile:	Number of Managers	Median \$ Value of Stockholdings Jan. 1, 1989	Median percent open market sales between 1989-1993 are of Jan. 1, 1989 stockholdings	Median percent change in total stockholding from 1989 to 1993
1	68	14,866	352%	86%
2	66	63,238	108%	64%
3	124	189,723	56%	19%
4	138	546,096	28%	7%
5	156	831,082	26%	-7%
Total	552	345,695	47%	5%

Note: Even though these managers are net open market sellers, many of them increase their total holdings during the time period because they are acquiring shares via a compensation plan, dividend reinvestment, etc. that offset their open market sales

Panel B: Managers who did not make any open market purchases or sales during the period, 1989 to 1993

Managers with no open market transactions whose \$ value of stockholdings on Jan. 1, 1989 is in quintile:	Number of Managers	Median \$ Value of Stockholdings Jan. 1, 1989	Median percent open market transactions between 1989-1993 are of Jan. 1, 1989 stockholdings	Median percent change in total stockholding from 1989 to 1993
1	184	15,565	0%	45%
2	168	71,075	0%	24%
3	157	180,288	0%	18%
4	140	543,374	0%	11%
5	114	1,737,122	0%	3%
Total	763	135,090	0%	17%

Panel C: Managers whose open market purchases exceeded open market sales during the period, 1989 to 1993

Managers with net open market purchases whose \$ value of stockholdings on Jan. 1, 1989 is in quintile:	Number of Managers	Median \$ Value of Stockholdings Jan. 1, 1989	Median percent open market purchases between 1989-1993 are of Jan. 1, 1989 stockholdings	Median percent change in total stockholding from 1989 to 1993
1	190	17,397	131%	167%
2	209	67,500	52%	86%
3	161	187,000	28%	52%
4	165	505,720	19%	43%
5	172	2,248,586	7%	15%
Total	897	149,789	30%	54%



**Table 4****The effect of open market purchases and sales on "new" managers' stockholdings, 1989 to 1993**

Sample: 642 managers from 177 publicly traded BHCs

Note: "New" managers are defined as managers whose initial statement of stock ownership in their firm is in 1987 or 1988

Quintile rankings of managerial stockholdings are based on the entire sample of 642 managers.

"New" managers of all 177 BHCs are included even if their firm ceases to exist during the sample period.

For BHCs that were acquired or failed during the sample period, all transactions up to the day the BHC no longer is publicly traded are included in these transactions (with the exception of stock transactions directly related to an acquisition).

Panel A: Managers whose open market sales exceeded open market purchases during the period starting from their initial stock transaction and ending two years after this transaction, and whose initial stockholdings are in the lowest 2 quintiles

Managers with net open market sales, whose \$ value of stockholdings just prior to their initial statement of stock ownership is in quintile:	Number of Managers	Median \$ value of stockholdings just prior to their initial statement of stock ownership	Median number of shares sold on the open market in the 2 years after initial ownership	Median change in total shares owned in the 2 years after initial ownership
1	5	0	14,279	0
2	3	328	2,000	57

Panel B: Managers who had no open market transactions during the period starting from their initial stock transaction and ending two years after this transaction, and whose initial stockholdings are in the lowest 2 quintiles

Managers with no open market transactions whose \$ value of stockholdings just prior to their initial statement of stock ownership is in quintile:	Number of Managers	Median \$ value of stockholdings just prior to their initial statement of stock ownership	Median number of shares sold or purchased on the open market in the 2 years after initial ownership	Median change in total shares owned in the 2 years after initial ownership
1	91	0	0	0
2	42	2,187	0	0

Panel C: Managers whose open market purchases exceeded open market sales during the period starting from their initial stock transaction and ending two years after this transaction, and whose initial stockholdings are in the lowest 2 quintiles

Managers with net open market purchases whose \$ value of stockholdings on Jan. 1, 1989 is in quintile:	Number of Managers	Median \$ Value of Stockholdings Jan. 1, 1989	Median number of shares purchased on the open market in the 2 years after initial ownership	Median change in total shares owned in the 2 years after initial ownership
1	74	0	1,035	1,469
2	42	2,733	651	655

**Table 4, continued****The effect of open market purchases and sales on "new" managers' stockholdings, 1989-1993**

Sample: 642 managers from 177 publicly traded BHCs

Note: "New" managers are defined as managers whose initial statement of stock ownership in their firm is in 1987 or 1988

Quintile rankings of managerial stockholdings are based on the entire sample of 642 managers.

"New" managers of all 177 BHCs are included even if their firm ceases to exist during the sample period.

For BHCs that were acquired or failed during the sample period, all transactions up to the day the BHC no longer is publicly traded are included in these transactions (with the exception of stock transactions directly related to an acquisition).

Panel D: Managers whose open market sales exceeded open market purchases during the period starting from their initial stock transaction and ending two years after this transaction, and whose initial stockholdings are in the upper 3 quintiles

Managers with net open market sales, whose \$ value of stockholdings just prior to their initial statement of stock ownership is in quintile:	Number of Managers	Median \$ value of stockholdings just prior to their initial statement of stock ownership	Median percent open market sales in the 2 years after initial ownership are of stockholdings at initial ownership	Median percent change in total stockholding in the 2 years after initial ownership
3	5	16,373	85%	-31%
4	15	124,480	14%	13%
5	24	824,418	26%	-9%
Total	44	253,242	27%	-4%

Panel E: Managers who had no open market transactions during the period starting from their initial stock transaction and ending two years after this transaction, and whose initial stockholdings are in the upper 3 quintiles

Managers with no open market transactions whose \$ value of stockholdings just prior to their initial statement of stock ownership is in quintile:	Number of Managers	Median \$ value of stockholdings just prior to their initial statement of stock ownership	Median percent open market transactions in the 2 years after initial ownership are of stockholdings at initial ownership	Median percent change in total stockholding in the 2 years after initial ownership
3	77	17,715	0%	0%
4	65	87,204	0%	0%
5	59	573,680	0%	0%
Total	201	65,750	0%	0%

Panel F: Managers whose open market purchases exceeded open market sales during the period starting from their initial stock transaction and ending two years after this transaction, and whose initial stockholdings are in the upper 3 quintiles

Managers with net open market purchases whose \$ value of stockholdings on Jan. 1, 1989 is in quintile:	Number of Managers	Median \$ Value of Stockholdings Jan. 1, 1989	Median percent open market purchases in the 2 years after initial ownership are of stockholdings at initial ownership	Median percent change in total stockholding in the 2 years after initial ownership
3	46	16,438	108%	140%
4	49	80,850	43%	86%
5	45	452,260	10%	25%
Total	140	79,911	49%	83%

**Table 5****Average cumulative abnormal returns, selected periods around transaction day (day 0)**

Sample: transactions for 2,854 managers from 177 bank-holding companies, between 1989 and 1993

Transactions by "new" managers in the first two years after their initial transaction are omitted

**Panel A: Transactions where the manager has some discretion of the size and timing of the trade**

	Open market purchases	Open market sales	Exercise of options	Disposition via gift
Days -5 to -1	-0.85% (-8.05)	0.37% (3.20)	0.53% (3.73)	0.17% (1.04)
Days 1 to 5	0.10% (0.96)	-0.09% (-0.80)	-0.04% (-0.26)	-0.02% (-0.11)
Days 1 to 63	1.58% (4.20)	-2.45% (-5.96)	-2.29% (-4.57)	-3.04% (-5.20)
Days 1 to 126	3.16% (5.93)	-3.55% (-6.10)	-4.75% (-6.71)	-4.04% (-4.89)
Days 1 to 252	6.98% (9.27)	-6.40% (-7.77)	-10.63% (-10.61)	-8.19% (-7.01)
Transactions	5,036	2,210	2,138	1,105

**Panel B: Transactions where the manager has no discretion over the timing or size of the trade**

	Shares accrued through a company plan	Shares accrued via reinvestment of dividends	Shares accrued via receipt of a gift
Days -5 to -1	-0.27% (-1.58)	0.13% (0.62)	-0.32% (-1.22)
Days 1 to 5	0.08% (0.46)	0.36% (1.67)	-0.03% (-0.10)
Days 1 to 63	0.11% (0.18)	-1.64% (-2.15)	-2.13% (-2.31)
Days 1 to 126	1.31% (1.54)	-3.93% (-3.64)	-1.93% (-1.48)
Days 1 to 252	0.52% (0.43)	-10.06% (-6.59)	-4.11% (-2.22)
Transactions	6,145	3,751	364

**Panel C: Other transactions**

	Other acquisitions	Other dispositions
Days -5 to -1	-0.11% (-0.43)	0.15% (0.64)
Days 1 to 5	0.23% (0.92)	0.15% (0.62)
Days 1 to 63	-0.68% (-1.88)	-1.55% (-1.84)
Days 1 to 126	-1.44% (-1.13)	-2.17% (-1.83)
Days 1 to 252	-2.78% (-1.54)	-4.82% (-2.86)
Transactions	2,928	2,188

Note: t-values in parentheses. Calculated as in Brown and Warner (1986).