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Who's Minding the Store? Motivating and Monitoring Hired Managers at Small, Closely Held Firms: The Case of Commercial Banks

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JEL codes: G34, G21.
Key words: agency costs, commercial banks, corporate governance, profit efficiency, small business.

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Who's Minding the Store? Motivating and Monitoring Hired Managers at Small, Closely Held Firms: The Case of Commercial Banks

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Abstract: We test whether the gains from hiring an outside manager exceed the principal-agent costs of owner-manager separation at 266 small, closely held U.S. commercial banks. Our results suggest that hiring an outside manager can improve a bank's profit efficiency, but that these gains depend on aligning the hired managers with owners *via* managerial shareholdings. We find that over-utilizing this control mechanism results in entrenchment, while under-utilization is costly in terms of foregone profits. This study provides a relatively unfettered test of mitigating principal-agent costs, because these small banks cannot rely on market forces or blocks of outside investors to monitor managers.

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Introduction

The vast majority of U.S. businesses are relatively small, are not actively traded, and face little outside monitoring. In the prototypical small and closely held business, the top manager is generally drawn from the ranks of the firm's primary owners. But as time passes a small business can grow in size or scope, or it can encounter challenging business conditions, that are beyond these owners' capabilities to manage effectively. Alternately, as time passes the owner manager might wish to retire or turn her attention to other business investments, and there may be no other insider or family member qualified to succeed her as manager. Under these or other circumstances, the owners of a closely held firm may decide to relinquish day-to-day control to a professional manager.

While hiring a manager from outside the ownership circle can solve a variety of problems for a closely held business, it can also lead to costly principal-agent problems. Without the incentive to maximize the value of the owners' investment, the hired manager may act to enhance her own utility by consuming excess perquisites (expense preference), pursuing personal prestige and power (empire building), rejecting positive net present value projects that have particularly bad outcomes in some state of nature (risk aversion), or simply expending low amounts of effort (shirking). Thus, the owners must incur the costs of monitoring and motivating the hired manager -- otherwise the expected financial gains from ceding their control over daily operations may never materialize, or these gains may be expropriated by the hired manager.

Mitigating this principal-agent problem may be more difficult at small, closely held firms than at large, widely held firms. At large corporations, individual shareholders typically have too little invested in the firm to justify the expense of directly monitoring management, but they can vote their displeasure with management *ex post* by selling their shares into a liquid market for corporate control. In addition, large corporations can rely on a variety of external claimants and specialized agents (e.g., large institutional shareholders, bond rating agencies) to monitor managers, and can use internal control mechanisms such as stock and stock options to motivate managers to act in a value maximizing way. Closely held firms have fewer tools at their disposal: there is no active market for corporate control, outside claimants are few and small, and there is typically only a single specialized agent (a bank lender) monitoring the firm from the outside. And while the primary owners' large, illiquid equity investments give them an incentive to directly monitor the managers, direct monitoring may not

be particularly effective: in many of these firms, the primary owners have ceded managerial control *precisely because* they no longer have the time, inclination, or ability to run the business themselves.

Thus, observing the performance of small business firms that hire professional outside managers may provide an especially pure test of the classic principal-agent problem. In these small, closely held firms -- where market discipline, institutional oversight, and direct monitoring are either unavailable or ineffective tools for mitigating agency costs -- the owners are left to rely disproportionately on managerial shareholdings to control the principal-agent problem. Ideally, awarding a partial ownership stake to a hired manager will align her preferences with those of the primary owners and create an incentive for her to make value-maximizing decisions. But over-utilization of this control mechanism can backfire if the hired manager compiles so large a stake that she becomes "entrenched," i.e., difficult to remove and thus even more likely to take actions that reduce the value of the firm to the other shareholders. At small, closely held firms the risk of entrenchment may be especially high because, given the lack of complementary control mechanisms, a relatively large ownership share might be needed to provide the hired manager with an adequate performance incentive.

In this paper we test two main hypotheses: Does ceding day-to-day control to a professional manager enhance financial performance at small, closely held firms? Does the financial performance of small, closely held firms that hire outside managers exhibit patterns of alignment and entrenchment that are related to the shareholdings of that hired manager? We test these hypotheses for 266 predominantly small, state-chartered commercial banks in the Tenth Federal Reserve District in 1994.

Focusing on banking firms has a number of advantages. First, bank regulatory agencies systematically collect detailed information on the shareholder identities and managerial responsibilities that is not typically available for small, closely held nonbanks. Second, small commercial banks exhibit a richer variety of management-ownership arrangements than do large, publicly traded corporations -- for example, banks run by hired managers with no ownership stake, banks run by hired managers with partial ownership stakes, and banks run by owner managers with majority ownership stakes. This heterogeneity should help us separate empirically the effect of financial performance of hiring a professional manager from the effect on financial performance of awarding a partial ownership stake to that hired manager. Third, by focusing on firms in a single industry we avoid inter-industry institutional differences that could cloud the relationships in which we are most interested.

Fourth, the vast majority of the over 8,000 commercial banks currently operating in the U.S. are small and closely held, so our findings should be prescriptive well beyond our small sample of 266 banks. Fifth, recent studies of large bank holding companies have found that internal control mechanisms are at least as effective as market forces for disciplining management, and that owner-manager principal-agent problems at these firms are minimal, perhaps because of the wide variety of control mechanisms to which these large corporations have access.[1] Small, closely held banks may provide a better environment for testing the effectiveness of managerial shareholdings in controlling hired bank managers, because these firms have a limited array of alternative control mechanisms at their disposal.

Section 1 reviews some of the relevant literature on ownership and control. Section 2 defines some important terms, describes the testable hypotheses, and presents our general empirical framework. Section 3 describes our unique ownership and management data set, which we constructed from the confidential section of bank examination reports. These reports provide us with detailed information on ownership structure that is normally unavailable for nontraded firms. Section 4 presents the econometric model used to estimate an efficient profit frontier for the population of Tenth District banks, which we use as a "best practices" benchmark to measure the relative financial performance of our sample banks. To our knowledge, this is the first corporate governance study to use profit efficiency as a performance benchmark.

We present the results of our investigation in Section 5, and discuss their implications in Section 6. Our results suggest that ceding day-to-day control to a professional manager can enhance the financial performance of small, closely held commercial banks, but that these performance gains may not materialize unless mechanisms are put in place to monitor and/or motivate the hired managers. Profit efficiency was relatively low at banks run by hired managers with little or no ownership stake; increased substantially and became significantly greater than average as hired managers accumulated shareholdings; but eventually declined again as hired managers' shareholdings mounted and managers presumably became entrenched. A large percentage of the hired-manager banks in our sample badly under-utilized this control mechanism -- foregoing potential reductions in profit inefficiency of nearly 30 percent -- but only a small percentage of the banks over-utilized managerial shareholdings to the point of entrenchment. In sharp contrast to the results for hired-manager banks, we find no statistical relationship between managerial shareholdings and profit efficiency at banks run by their primary

owners. Finally, we find no evidence that outside shareholders or non-managerial insiders can effectively monitor the performance of managers at these banks, a result that underscores the importance of managerial shareholdings as a control mechanism at small, closely held firms.

1. Literature Review

Research that explores the interplay between owners, managers, and firm value has a long history. Berle and Means (1932) were the first to emphasize that control is separated from ownership in the modern corporation. This separation gives rise to the well-known principal-agent problem in which the manager seeks to maximize her own utility rather than the value of the firm. As defined by Jensen and Meckling (1976), reductions in the value of the firm caused by such behavior, as well as the expenses necessary to prevent them, are called agency costs. The potential for agency costs creates a need for owners to monitor, and perhaps discipline, the managers that they hire. Fama (1980) argued that the capital market performs this function for actively traded firms by sending signals about manager performance to the labor market, where managers know they will be judged in the future. Alchian and Demsetz (1972) pointed out that monitoring is a costly activity, so minority stockholders who receive a small portion of the benefits produced by monitoring will free ride on the efforts of majority owners. As the firm grows and the ownership structure becomes more fragmented, free riding becomes endemic and managers go unmonitored.

One substitute for active monitoring is to give the managers an ownership stake in the firm, thereby linking the managers' financial well-being to the value of the firm. Stulz (1988), however, demonstrated that giving managers too large a share of the firm can reduce firm value. In Stulz's model, the value of the firm at first increases as the manager's ownership stake grows. But as this ownership stake continues to increase, the manager eventually becomes entrenched, making takeover more difficult and reducing firm value. In this theoretical model, the decline in value stops once management owns 50% of the firm, at which point the manager becomes the majority owner and additional insider shareholdings have no effect on firm value.

Two empirical investigations of large corporations produce results that are consistent with the predictions of Stulz's model.[2] Morck, Shleifer, and Vishny (1988) used piecewise linear regressions to test the relationship between insider shareholdings and firm value at 371 large non-financial firms in 1980. Using Tobin's *q* as a proxy for firm value, they concluded that firm value increases between 0% and 5% insider

ownership as manager preferences become aligned with those of owners; decreases between 5% and 25% as entrenched managers pursue their own objectives at the expense of other owners; but then increases again beyond 25% as managers become the primary owners of the firm. Gorton and Rosen (1995) developed a model in which the association between bank manager shareholdings and the riskiness of bank loan portfolios is conditional on economic conditions. In this model, "good" lending opportunities diminish during an economic downturn, and the typical bank manager attempts to sustain loan growth by writing increasingly risky loans. On average, non-performing loans will increase and bank managers will lose their jobs, but managers with large shareholdings will be difficult to fire and/or discipline and will continue to write risky loans. The authors tested this hypothesis using data from 458 large banking companies between 1984 and 1990, a period during which good loan opportunities were often in short supply for banks. They found that relatively risky commercial real estate loans decreased as insider ownership grew from 0% to 15% (and shareholdings presumably aligned the interests of managers and owners); these loans increased as insider ownership grew from 15% to 27% (and managers presumably became entrenched); and these loans gradually decreased as insider ownership grew beyond 27% (and managers presumably became primary owners).

Stulz's proposition has not been broadly tested for small, closely held corporations, because insider ownership data is not typically available for such firms. However, insider ownership data is usually collected at regulated financial institutions, and a number of previous studies have used these data to examine the relationship between ownership structure and financial institution performance. One set of studies found that the profitability of financial institutions improves with concentrated ownership (less incentive to free-ride); with greater ownership stake by outside investors (motivated monitors); and with larger insider shareholdings (alignment of owners' and managers' interests).[3] Another set of studies used these data to test for associations between insider shareholdings and risk-taking at financial institutions, but found mixed results, perhaps because of the inherent difficulty of defining and measuring risk.[4] However, none of these studies focused specifically on small or untraded firms, and none of these studies identified empirically the three distinct regions of insider ownership predicted by Stulz.

2. An overview of our experimental design

The conventional gauge of corporate performance is the price of a firm's equity shares. Unfortunately, market-based performance measures are unavailable to us, because only a handful of the banks in our sample

issue stock that is actively traded. We measure financial performance by estimating the relative profit efficiency *EFF* of the banks in our sample. Profit efficiency is an X-efficiency concept that expresses a bank's actual earnings as a percentage of its potential best practices earnings. We explain this estimation procedure in detail in Section 4 below. Kwan and Eisenbeis (1996) have shown that measures of X-efficiency are statistically correlated to stock returns for banking firms.

Measuring the degree of insider ownership in banks is more straightforward. Insider ownership is the percentage of the bank owned by officers, board members, and their immediate family members. Of these inside shareholdings, we focus most closely on the percentage of total shares held by the bank's daily managing officer (DMO) and her family. The DMO is the person responsible for the daily operations of the bank, and is typically the bank's chief executive officer. Because many of the closely held banks in our sample are essentially family-run businesses, we measure insider ownership by the variable *DMOFAMSH*, which equals the aggregate shareholdings of the DMO and her immediate family.[5] We describe the construction of *DMOFAMSH* in detail in Section 3 below.

Given that banks in our sample tend to be small and closely held, it is not unusual for the DMO to be either the bank's largest shareholder or a member of a group of owners that controls the largest proportion of the bank's voting stock.[6] If the DMO is a member of this controlling shareholder group we refer to her as an *owner manager*, and if the DMO is not a member of this group we refer to her as a *hired manager*. Some hired DMOs own only a trivial amount of qualifying shares in the bank (*DMOFAMSH* = 0), and hence their compensation is not linked to the performance of the bank through either stock dividends or price appreciation.[7] Other hired DMOs hold nontrivial stakes in the bank (*DMOFAMSH* > 0), so their personal wealth is tied to the performance of the bank. If her ownership share is large enough, the hired DMO may become an *entrenched manager*, i.e., difficult and/or expensive for the other owners to remove.

2.1 Testable hypotheses

The first of our two main hypotheses is: Does ceding day-to-day control to a professional manager enhance financial performance at small, closely held firms? Most small and closely held business start out being run by an owner manager. As the business grows or as market conditions change, running the business effectively may exceed the owner manager's capabilities, and the firm may decide to hire an outside professional manager

with the expertise or experience necessary to meet these challenges. Under these circumstances, *and in the absence of principal-agent problems that diminish the performance of the hired manager*, we would expect *EFF* at hired-manager banks on average to be at least as high, and perhaps higher, than *EFF* at owner-manager banks. Owner-manager firms may also relinquish day-to-day control of the firm to an outside professional manager because the owner manager wants to retire or turn her attentions to other business matters, but there are no other insiders qualified to succeed her as manager. Under these second best circumstances, we would expect *EFF* at hired-manager banks on average to be no higher, and perhaps lower, than *EFF* at owner-manager banks. Thus, depending on which of these scenarios dominates the data, we may find that hired-manager banks are either more, less, or equally efficient relative to owner-manager banks on average.

The second of our two main hypotheses is: Does the financial performance of small, closely held firms that hire outside managers exhibit patterns of alignment and entrenchment that are related to the shareholdings of that hired manager? Testing this hypothesis requires a framework that relates the firm's performance to a variety of management, ownership, and corporate governance conditions. In the absence of effective monitoring, finance theory suggests the following relationships between *EFF* and *DMOFAMSH* at banks that are run by hired managers:

- If *DMOFAMSH* is zero, then the manager's interests are likely to diverge from those of the owners. This is a principal-agent problem: because the benefits of the hired manager's efforts largely accrue to the owners of the firm, the manager may behave in a fashion (shirking, expense preference, empire building, or risk aversion) that does not maximize the value of the bank. Thus, *EFF* will be relatively low when *DMOFAMSH* equals zero.

- If *DMOFAMSH* is small but greater than zero, then the interests of the hired manager are at least partially linked to the interests of the owners. To the extent that this ownership arrangement mitigates the principal-agent problem, the manager will exert greater effort toward maximizing the value of the firm. Thus, *EFF* should increase, at least initially, with increases in *DMOFAMSH*.

- If *DMOFAMSH* is large, then a hired manager may become an entrenched manager. The manager will be able to engage in utility maximizing behavior with less fear of reprisal, and may feel less compelled to compromise with the other owners, leading to conflicts and inaction during crucial times for the bank.[8] Thus, at some point *EFF* may decrease with increases in *DMOFAMSH*.

Thus, we expect an inverted U-shape relationship between *DMOFAMSH* and *EFF* at hired-manager banks.

The relationship between *EFF* and *DMOFAMSH* is likely to be different at owner-manager banks. At these banks, a marginal increase in the shareholdings of the owner manager is unlikely to materially affect the

firm's value. Unlike a hired manager, whose influence on the bank's agenda grows as she becomes entrenched, an owner manager by definition already holds enough shares to control the bank's agenda. Furthermore, relative to the typical hired manager, the owner manager's large ownership stake gives her a greater incentive to maximize the value of the bank. Hence, although an owner manager may have an incentive to exploit minority shareholders, this principal-agent problem is more likely to manifest itself as a wealth transfer (e.g., substituting manager salaries for dividends) than as an action that reduces the value of the owner manager's large stake (e.g., shirking).

C If the DMO is the majority owner, or is a member of the majority ownership group, then her interests will tend to be aligned with those of the general shareholders. Principal-agent problems will be less severe, or nonexistent, at these banks.

Thus, we expect no relationship between *DMOFAMSH* and *EFF* at owner-manager banks.

In situations where the potential for agency costs is high (i.e., at hired-manager banks), the presence of a motivated monitor can enhance bank performance. Because monitoring is costly, it is more likely to occur at banks with large outside shareholders for whom the benefits of monitoring the DMO's activities are substantial. McConnell and Servaes (1990) found that increases in institutional shareholdings had a positive impact on firm value at large non-financial firms, and some studies of outside shareholdings at financial institutions have found similar results.[9] Non-manager insiders can also monitor the DMO by retaining some policy making authority, rather than granting unilateral authority to the hired DMO.

C Agency costs are likely to be smaller when outside shareholders own a large enough stake to overcome free-rider incentives, and when inside shareholders retain some decision-making authority.

Thus, we expect a positive relationship between *EFF* and the ownership share and decision-making authority held by the non-DMO stakeholders, especially at hired-manager banks where (as discussed above) principal-agent problems are more likely to occur.

2.2 General empirical framework

We employ the following general framework to test for the expected relationships among *EFF* and *DMOFAMSH* described above:

$$EFF = f(DMOFAMSH, manager\ status, monitor/control) \qquad (1)$$

where *manager status* distinguishes hired-manager banks and owner-manager banks, and *monitor/control* refers to conditions determining the effectiveness of monitoring by non-DMO insiders and by outside shareholders. We use a variety of specifications to estimate this general model. Regardless of the specification employed, we make the explicit assumption that the corporate governance structure characterized by the right-hand-side variables is exogenous and stable, and that this structure determines bank performance measured by *EFF*. As explained below, we design our sampling procedures to be consistent with this assumption.

3. Ownership and Management Data

Bank examination reports contain a variety of detailed information about the bank's managers, directors, and major shareholders, including: the responsibilities of bank officers; the tenure and compensation of officers and directors; the net worth of directors; the family relationships among bank stockholders and managers; and various other financial and demographic data. This information is contained in a confidential portion of the examination report, which is used for supervisory purposes only. We gained access to a portion of this information, and used it to measure *DMOFAMSH*, *manager status*, and *monitor/control*. Extracting this information from the reports was labor intensive, so we limited our investigation to a random sample of 266 state-chartered banks in the Tenth Federal Reserve District, excluding from this sample any banks that experienced a significant ownership change in the period from 1991 to 1994.[10] Requiring at least three years of stable ownership ensures that each bank's 1994 performance was not part of a transition period following an ownership change, which is consistent with our assumption that a bank's financial performance is endogenous to its ownership structure.

Descriptive statistics displayed in Tables 1 and 2 indicate that the sample is dominated by small, closely held, rural banks. The average bank held only about $50 million in assets. The average DMO earned about $78,000 in salary and bonus, and held about 17 percent of the bank's voting stock (*DMOSH*). In many banks, persons related to the DMO by birth or marriage also owned stock, and including these family shareholdings increased the average DMO's stake in the bank to about 28 percent (*DMOFAMSH*). The combined shareholdings of the board of directors (*BOARD*) averaged about 61 percent, and the combined board shareholdings *excluding*

those held by DMOs that sat of the board (*BOARDEXDMO*) averaged about 44 percent. The large majority of the sample banks were free-standing (independent) banks or were the single banking affiliates in one-bank holding companies (OBHCs). Just one-in-five banks were affiliates in multi-bank holding companies (MBHCs), and just one-in-four were headquartered in urban metropolitan statistical areas (MSAs).

Given that the banks in our sample tend to be dominated by insiders, effective monitoring by outsiders may be relatively rare. Outsiders who hold only a small stake in a small bank are unlikely to incur the expenses necessary to monitor the DMO, particularly when the price of their thinly traded shares will reliably reflect only large changes in the value of the bank. We proxy the likelihood that outside owners will monitor the DMO with the variable *OUTCONC*, a Herfindahl index of outsider concentration that increases as minority ownership becomes less fragmented. *OUTCONC* equals the sum of the squared ownership shares of minority shareholders that have at least a 5 percent stake, but are not members of the controlling shareholder group. To test whether monitoring by insiders affects the financial performance of the bank, we construct the dummy variable *POLICY*, which equals one when someone in the controlling shareholder group *other than the DMO* retains some policy making authority.[11]

The tables reveal some significant differences between the owner-manager banks and the hired-manager banks. About 40 percent of the sample banks were owner-manager banks. These banks tended to be smaller than hired-manager banks, but on average their DMOs received higher salaries and bonuses. By definition, owner-manager DMOs and their families held substantially larger ownership shares than did hired-manager DMOs and their families, reflected in the significantly larger means for the variables *DMOSH*, *DMOFAMSH*, and *BOARD*.[12] The data suggest a greater capacity for inside monitoring at hired-manager banks, where both *POLICY* and *BOARDEXDMO* were significantly larger than at owner-manager banks.

It is instructive to compare the degree of insider ownership in our sample banks to that found in previous studies of financial institutions. For example, in Allen and Cebenoyan (1991), combined insiders at the average bank holding company owned only 3 percent of the shares. In Brewer and Saidenberg (1996) and Cebenoyan, Cooperman, and Register (1996), combined insiders at the average thrift institution held just 18 percent of the shares. In Gorton and Rosen (1995), combined insiders held as much as 25 percent of the shares in only 23

percent of the commercial banks they examined. In comparison (see Table 2), the ownership of our sample banks is much more concentrated in the hands of insiders, a pattern of ownership which is more representative of the small and closely held firms that comprise the majority of commercial banks in the U.S.

Furthermore, while previous studies typically focus on the aggregate shareholdings of all insiders, we focus our empirical tests on the shareholdings of a single insider: the daily managing officer. The DMO is the primary provider of management services at the typical small bank in our sample, while at the large financial institutions examined in earlier studies management responsibilities were spread unevenly across a team of insiders. Because we can distinguish between the DMO's shareholdings and the collective shareholdings of all insiders, our tests may produce especially accurate estimates of entrenchment and other principal-agent effects.

4. Measuring Bank Performance

Market-based performance measures are not available for the large majority of banks in our sample.[13] We gauge the financial performance of banks by their estimated profit efficiency (*EFF*) relative to the other banks in the 10th Federal Reserve District. Constructing an estimate of *EFF* for each bank requires us to first estimate an efficient, or "best practice," profit frontier for the 10th District. The efficient profit frontier reflects the highest profits earned by 10^{th} District banks of different sizes, output mixes, location, and other characteristics. We assume that the estimated frontier represents *potential profit*, and we calculate *EFF* for each bank based on the percentage of its potential profit that it actually earned (i.e., its relative distance from the frontier).[14] Because *EFF* measures bank profitability after adjusting for size, output, location, etc., it should be a better measure of bank performance than simple accounting ratios such as ROA or ROE.

The standard, neoclassical approach to modeling profits p assumes that firms purchase their inputs at prices *w* in perfectly competitive input markets, and sell their outputs at prices *p* in perfectly competitive output markets, i.e., $p = f(p,w)$. This framework is problematic for banking firms. Banks are likely to be price takers in output markets, but in some instances banks enjoy the ability to set output prices. This can be especially true in rural markets where banks face few competitors, and also for a small business customer whose line of credit depends on her relationship with the bank. Another drawback to the standard approach is that price data are simply unavailable for mutual fund sales, stand-by letters of credit, and other fee-generating services which provide a growing source of revenue for commercial banks. Pulley and Braunstein (1992) and Humphrey and

Pulley (1997) offer the *non-standard* profit function as a solution to these problems. A non-standard profit function assumes that banks have some market power in output markets, and thus can be expressed as p = *f(y,w)*, where *y* is the quantity of output produced by the bank. The non-standard profit function tends to provide a better statistical fit for banking data since output quantities *y* vary across banks more than do output prices *p*.

We estimate our efficient profit frontier using the following non-standard profit function:

$$
\begin{aligned}
p \;=\; & a_0 + \sum_{i}^{3} b_i Y_i + \frac{1}{2}\sum_{i}^{3}\sum_{j}^{3} b_{ij} Y_i * Y_j + \sum_{m}^{3} g_m W_m \\
& + \sum_{i}^{3}\sum_{m}^{3} r_{im} Y_i * W_m + \sum_{i}^{3} w_{i,eq}\, EQ * Y_i + \sum_{m}^{3} w_{m,eq}\, EQ * W_m \\
& + \frac{1}{2}\sum_{m}^{3}\sum_{n}^{3} g_{mn} W_m * W_n + f_{eq}\, EQ + \frac{1}{2} f_{eq2}\, EQ^2 \\
& + \sum_{i=1}^{3} [\, d_i \cos X_i + q_i \sin X_i] + \sum_{i=1}^{3}\sum_{j=i}^{3} [\, d_{ij} \cos(X_i + X_j) + q_{ij} \sin(X_i + X_j)] \\
& + \sum_{i=1}^{3}\sum_{j=i}^{3}\sum_{k=j}^{3} [\, d_{ijk} \cos(X_i + X_j + X_k) + q_{ijk} \sin(X_i + X_j + X_k)] \\
& + l_S\, STATE + e \qquad (2)
\end{aligned}
$$

where p is adjusted net income (net income before taxes, provisions for loan losses, and extraordinary items).[15] *Y* is a vector of outputs that includes loans, transactions deposits (a proxy for transactions and liquidity services), and noninterest income (a proxy for outputs that do not appear on the balance sheet). *W* is a vector of input prices that includes the prices of labor, borrowed funds, and physical capital.[16] *EQ* is equity capital, which we include as a fixed input to control for the differential funding costs faced by different-sized banks. Small banks hold relatively more of this expensive funding source than do large banks, because they have less access to long-term credit markets and therefore use equity capital as a fixed funding source, and also because they face limits to diversification and therefore hold equity capital as a cushion against risk.[17] *STATE* is a vector of dummy variables for each state in the Tenth Federal Reserve District, which we include to control for inter-state

differences in branching restrictions and other regulations.[18]

The specification of equation (2) is a hybrid of the quadratic functional form and the Fourier functional form. The quadratic form has been used elsewhere to estimate bank profit functions, and although it should provide a good fit for banks near the means of the data, it is likely to perform poorly for very large or very small banks.[19] Adding the trigonometric (Fourier) terms adds flexibility to the profit function for observations far from the sample means, while retaining the structural stability of the quadratic specification near the means of the data. We adapt this functional form from Mitchell and Onvural (1996), who show that adding Fourier terms to a standard translog cost function significantly improves the statistical fit of bank cost functions. We base our flexible profit function on a quadratic form rather than a translog form because, unlike costs, profits can be negative.[20] The three *X* variables in (2) are based on the values of the output vector *Y*, but are transformed so that they each fall on the interval between zero and 2p, the natural domain of the sine and cosine functions.[21]

The core of any frontier estimation technique is the manner in which inefficiency is separated from random error. We begin by assuming that the disturbance term e captures both profit inefficiency (the shortfall of actual profit below potential profit due to excess expenses and/or deficient revenues) and random movements in profits. Let $e = u + v$ be a composite disturbance term, where *u* represents dollars of profit inefficiency and is distributed below the efficient frontier as a half normal random variable; *v* represents random error and is distributed normally with a zero mean; and both *u* and *v* are orthogonal to the regressors. We use the stochastic frontier approach (see Jondrow, Lovell, Materov, and Schmidt 1982) to generate separate estimates of *u* and *v* for each bank. Large banks have a larger profit potential than small banks, so we transform estimated profit inefficiency *u* from dollars of inefficiency into a percentage of potential profits:

$$EFF_i = \begin{cases} p_i/(p_i + u_i) & \text{if } p_i \geq 0 \\ 0 & \text{if } p_i < 0 \end{cases} \qquad (3)$$

where p_i+u_i is potential profit, defined as the profit that bank *i* would have earned had it operated on the efficient profit frontier. *EFF* measures percent profit efficiency, is bounded from below at 0 for the most inefficient banks, and approaches 1 for the most efficient banks.[22] The general approach presented in (2) and (3) has been used

elsewhere to produce reasonable estimates of the financial performance of small commercial banks (DeYoung and Hasan 1998).

Given its construction, *EFF* should capture a substantial amount of the *ex post* effects of the four generic types of value-reducing behaviors mentioned in the introduction: expense preference, shirking, empire building, and risk aversion. As described above, EFF_i is based on the error-adjusted difference (u_i) between bank *i*'s actual profits and the profits of a hypothetical, frontier-efficient bank similar to bank *i* in terms of size, output mix, input prices, and regulatory environment. Managerial expenditures (expense preference) over and above those necessary to efficiently produce outputs *Y* will increase *u* and decrease *EFF*. Similarly, foregone revenues or unnecessary costs due to laxity (shirking) in repricing the bank's assets, collecting its loan payments, setting its services charges, or exploiting its cross-selling opportunities will also increase *u* and decrease *EFF*. Costly self-aggrandizing behavior by managers, such as using expensive purchased funds to grow the bank too quickly, hiring an unnecessarily large staff, or making ill-advised acquisitions (empire building), will also increase *u* and decrease *EFF*. Finally, limiting revenues by making only low-risk loans, or performing excess amounts of loan underwriting and monitoring (risk aversion), will increase *u* and decrease *EFF*.[23]

Although *EFF* is not formally a risk-adjusted measure of bank performance, our model does account for risk in a number of ways. By including equity capital as an argument, our model partially controls for insolvency risk, because banks that hold large equity cushions (relative to other similar-sized banks) will be less likely to fail and as a result will have lower funding expenses and higher profits. As mentioned in the preceding paragraph, some manifestations of managerial risk-averse behavior are captured in *EFF*. And to the extent that inter-bank differences in riskiness are related to the output vector *Y*, our model will benchmark banks to efficient banks with similar levels of risk. For example, banks that depend disproportionately on interest-bearing assets that reprice (loans) are more exposed to interest rate risk than banks that depend more on noninterest fee revenue (noninterest income). Similarly, other things equal, banks with large loan portfolios are more exposed to default risk than banks that hold fewer loans but more securities and cash.

5. Results

We estimated equations (2) and (3) using 1994 data for all of the commercial banks in the Tenth Federal Reserve District that were at least five years old and offered a full range of banking services (i.e., that made loans,

held insured deposits, and generated noninterest income). A total of 1,414 banks met these criteria after eliminating a small number of banks for which complete data was not available. Although we are most interested in the ownership and performance characteristics for just a sample of 266 of these banks (see below), we estimated the profit frontier for the entire population of banks in the District in order to improve the efficiency of the estimated parameters. All data used to estimate the profit frontier were taken from the Reports of Condition and Income. We use data from 1994 to estimate bank efficiency because, as stated above, we expect that the ownership in place for the period from 1991 to 1994 would be responsible for bank performance in 1994. The estimation results, along with summary statistics for the regression variables, are displayed in Table 3.

For our population of 1,414 banks, estimated profit efficiency *EFF* ranged from zero to .9988 with a mean of .6661. Thus, the average 10th District bank incurred excess costs and/or revenue shortfalls equal to about 33 percent of its potential profits (1-.6661). In other words, the average bank could have increased its pre-tax profits by about 50 percent ([1-.6661]/.6661) had it operated on the efficient profit frontier. The magnitude of this estimate is similar to previous studies of commercial bank profit efficiency.[24] For the 266 banks in our random sample, *EFF* averaged .6455, not significantly different from the population mean. *EFF* was truncated at zero for only four of the 266 sample banks.

For the subsample of 108 owner-managed banks *EFF* averaged .6131, significantly lower (at the 5 percent level) than the average *EFF* of .6677 for the subsample of 158 hired-manager banks. We suggest three overarching reasons for this difference. First, DMOs at hired-manager banks may be better managers on average than DMOs at owner-manager banks. Many owner-managed banks are family-run enterprises that select their DMOs from a limited labor pool (i.e., the extended family). Furthermore, as we state in the introduction to this article, access to increased managerial expertise may be a prime motivation for owners to cede day-to-day control to an outsider. This simple bivariate comparison suggests that the application of this increased expertise improves bank performance by more than enough to offset any agency costs. The multivariate regression tests reported in the next section shed more light on this issue.

Second, in many of the owner-managed banks in our sample, the DMO may have objectives other than maximizing the value of the bank. For example, community service may be a strong motivation for these bankers, and the DMO may be willing to sacrifice some profit in order to keep marginal businesses operating in

a small community. In addition, owner managers typically have a large portion of their wealth tied up in their banks -- Sullivan and Spong (1998) find that the average owner-manager DMO in the Tenth District has 86% of her personal net worth invested in the bank -- and as a result may be willing to accept lower profits in exchange for less risk exposure.

Finally, owner managers may take actions that simply make their banks appear to be profit inefficient relative to hired-manager banks. An owner-manager DMO has both the ability and the incentive to shift some of her remuneration from dividends to salary and other benefits, thus reducing the double-taxation of her earnings. Although this tax avoidance tactic will increase the value of the bank to the owner manager, it will decrease the accounting profits on which our performance measure *EFF* is based. To test this hypothesis we regressed DMO salary plus bonus (results not shown) on *HIRED*, *lnASSETS*, *URBAN*, DMO age, and a large blockholder variable. Adjusted R^2 = .59 for this regression. Consistent with our hypothesis, the coefficient on *HIRED* equaled -0.19 and was significant at the 1% level. Additional calculations based on this estimated coefficient suggest that DMO salaries and bonuses account for about 20 percent of the efficiency difference between owner-manager banks and hired-manager banks. Hence, tax avoidance behavior is likely one of several contributing factors for the difference in measured profit efficiency between these two groups of banks.

5.1 Regression results

Table 4 displays ordinary least squares estimations of equation (1).[25] Regression [1] specifies financial performance (*EFF*) as a simple quadratic function of the shareholdings of the daily managing officer and her family (*DMOFAMSH* and $DMOFAMSH^2$). As discussed above, we aggregate the shareholdings of the DMO with those of her immediate family because many of the small, closely held banks in our sample are essentially family owned and operated businesses. The coefficients on *DMOFAMSH* and $DMOFAMSH^2$ are both statistically insignificant. Thus, if separate regions of managerial alignment and entrenchment exist for the banks in our sample, DMO ownership does not by itself provide enough information to identify these regions.

Regression [2] is a more complex specification in which the marginal effect of *DMOFAMSH* can vary depending on whether the DMO is a hired manager or an owner manager. The dummy variable *HIRED* equals one for hired-manager banks and zero for owner-manager banks, and is included both by itself and interactively

with *DMOFAMSH* and $DMOFAMSH^2$. The negative coefficient on *HIRED* suggests that banks run by hired managers *with zero ownership share* are relatively inefficient, although this coefficient is statistically different from zero only at the 18 percent confidence level. The coefficients on *DMOFAMSH* and $DMOFAMSH^2$ remain statistically insignificant, which in this regression indicates that bank performance and managerial shareholdings are unrelated at owner-manager banks. However, the coefficients on the interactive terms *HIRED*DMOFAMSH* and $HIRED*DMOFAMSH^2$ are both strongly significant, the sum of the coefficients on the linear terms (*DMOFAMSH* and *HIRED*DMOFAMSH*) is significantly positive, and the sum of the coefficients on the squared terms ($DMOFAMSH^2$ and $HIRED*DMOFAMSH^2$) is significantly negative. These results indicate a statistically significant relationship between bank performance and managerial shareholdings at hired-manager banks. Moreover, the signs on these coefficients are consistent with the inverted U-shape hypothesized above for these banks, as well as with the findings of previous empirical studies of large, publicly traded corporations (e.g., Morck, Shleifer, and Vishny 1988).

To examine how concentrations of ownership or authority in persons other than the DMO will affect the performance of the bank, we added the variables *BOARDEXDMO*, *POLICY*, and *OUTCONC* to the right-hand-side of regressions [3], [4], and [5]. The board of directors is likely to monitor more actively when its members hold a large share of the bank (*BOARDEXDMO*); efforts to monitor the DMO may be more effective when a member of the largest shareholder group *other than the DMO* retains some policy making authority (*POLICY*); and outsiders may be more motivated to monitor the DMO if outside shareholdings are concentrated in only a few hands (*OUTCONC*). Because monitoring may be more necessary to control principal-agent problems at hired-manager banks, we specify each of these variables linearly and interacted with the *HIRED* dummy.[26] Thus, if hired managers exhibit value-reducing behaviors *and* any of these three monitoring channels are effective in mitigating such behaviors, we would expect the sum of the linear and interactive coefficients to be positive. In all three cases, however, we reject the hypothesis that strong and motivated monitors enhance the performance of hired-manager banks -- and suprisingly, we find significant and *negative* marginal effects associated with *BOARDEXDMO* and *POLICY*. As we shall see, further testing suggests that the negative coefficients on *BOARDEXDMO* and *POLICY* are picking up the effects of important variables missing from the Table 4 regressions.

Each of the five regressions specified in Table 4 explains only a small portion of the variation in *EFF*. In Table 5 we augment those regressions by adding variables that control for effects of bank size, location, and organizational form that may influence bank efficiency and/or managerial control. *URBAN* is a dummy variable which equals one for banks headquartered in MSAs. Urban banking markets tend to be less concentrated than rural markets, and the resulting competition is likely to have two separate, and potentially offsetting, effects on profit efficiency: price competition is likely to depress interest margins relative to rural banks, and competitive rivalry is likely to create pressure for managers to run their banks more efficiently. The coefficient on *URBAN* will be negative if the former effect (price competition) dominates, and positive if the latter effect (pressure to eliminate inefficiency) dominates.[27] *lnASSETS* is the natural log of bank assets. We expect the coefficient on *lnASSETS* to be positive. Most existing studies have found that bank profit efficiency is positively related to bank size, perhaps because larger banks face greater amounts of market discipline (from investors, specialized monitors, and/or competitors) and can better afford to attract and retain high-quality managerial talent.[28] *MBHC*, *LBHC*, *HC1*, *HC2*, and *HC3* are dummy variables related to organizational form: *MBHC* identifies subsidiaries of multibank holding companies; *LBHC* identifies lead banks in those organizations; and *HC1*, *HC2*, and *HC3* identify holding companies represented in our sample by more than one subsidiary bank (three banks were subsidiaries of *HC1*, two were subsidiaries of *HC2*, and two were subsidiaries of *HC3*).

Three of these seven control variables are significantly related to bank performance in the Table 5 regressions. Consistent with previous studies of bank profit efficiency, the estimated coefficient on *lnASSETS* is positive and significant. The coefficient on *LBHC* is negative and significant, which is not surprising given that lead banks often provide costly services for their affiliates at transfer prices that are below the marginal economic cost of production. Banks affiliated with *HC2* are significantly less profit efficiency than the average bank. Although the negative coefficient on *URBAN* suggests that the effects of price competition dominate the effects of cost cutting in urban markets, this effect is not statistically different from zero. The coefficients on *MBHC*, *HC1*, and *HC3* are not also not statistically different from zero.

Adding these control variables greatly increases the explanatory power of the regressions, but leaves the significance levels and relative magnitudes of the various DMO ownership coefficients unchanged. In other words, although the control variables together explain the lion's share of the total variation in profit efficiency

across banks, marginal changes in managerial shareholdings are still associated with statistically significant inverted U-shape changes in profit efficiency at hired-manager banks. The coefficients on *BOARDEXDMO* and *POLICY* now have the expected positive signs in regressions [8] and [9], although these coefficients are not statistically significant. (The unexpected negative coefficients were likely due to strong correlations between these variables and asset size, which was unspecified in the Table 4 regressions.[29]) In addition, the coefficients on the outside ownership concentration variables (*OUTCONC*) continue to be insignificant in regression [10]. Thus, we find no evidence that outsiders or non-DMO insiders at these banks can discipline management or otherwise significantly impact bank performance. These results may indicate that the periodic presence of government examiners reduces the incentives for these would-be monitors to scrutinize the DMO, or that outside shareholders (regardless of their concentration) lack the economic motivation to monitor the DMO because they collectively have only a very small stake in these banks.

5.2 Alignment and entrenchment effects

Figure 1 displays the estimated relationship between *EFF*, *DMOFAMSH*, and *HIRED* in a graphical format. The hired manager graph is derived from regression [7] by setting *HIRED*=1; setting *URBAN*, *lnASSETS*, and *MBHC* to their hired-manager bank means; setting the remainder of the regression dummy variables to zero; and allowing *DMOFAMSH* to vary. The owner manager graph is derived similarly after setting *HIRED*=0 and setting *URBAN*, *lnASSETS*, and *MBHC* to their owner-manager bank means. For hired managers, profit efficiency follows an inverted U-shape which peaks when the DMO family owns about 17 percent of the bank. Interpreted within our theoretical framework, increases in management shareholdings up to 17 percent serve to align the DMO with the owners, while increases in shareholdings beyond 17 percent allow the DMO to become entrenched. In contrast, the graph is nearly horizontal for owner managed banks. (Although this effect for owner managers is statistically insignificant in the regression, we display it in Figure 1 to illustrate that it is also economically insignificant.) Thus, the overall picture in Figure 1 is consistent with the predictions of Stulz (1988): financial performance at first improves with increases in the shareholdings of hired managers; declines as additional shareholdings allow the hired manager to become entrenched; and is invariant to additional shareholdings after the hired manager becomes the primary owner. Consistent with the discussion above, the *EFF-DMOFAMSH* locus lies vertically lower for the owner-manager banks than for the hired-manager banks for

most values of *DMOFAMSH*.

On average, increasing the hired DMO family ownership all the way from zero to the optimum 17 percent level is associated with a statistically significant 9.26 percentage point improvement in profit efficiency (from .6819 to .7745). One on hand, the large magnitude of this improvement suggests that this is an economically significant result. A 9 percentage point increase in *EFF* would eliminate approximately 29% of the efficiency shortfall for the average hired-manager bank in our sample, clearly a large improvement in bank performance. Furthermore, the positively sloped part of the inverted U-shape along which this result is measured contains a substantial portion of the hired-manager banks in the sample -- of the 55 hired managers with a non-zero family ownership stake, 45 held less than a 17% stake. (The distribution of *DMOFAMSH* can be seen in Figure 2.) On the other hand, the 17% increase in *DMOFAMSH* needed to generate the full 9 point efficiency improvement is a very large change in owner manager control. Amassing a 17 percent stake from scratch would likely take a number of years, and issuing this much new stock would impose costs on the current owners (dilution of existing shares) that partially offset the benefits from higher expected profits. Theoretically, these difficulties could be solved by giving managers stock options, but this is not a viable alternative for most small banks.[30]

The *EFF-DMOFAMSH* locus traced out in Figure 1 implies that hired manager shareholdings could be manipulated to make banks more profit efficient, holding bank size and other conditions constant. Our regression estimates suggest imply there may be another way to significantly improve bank efficiency. As discussed above, the positive coefficient on *lnASSETS* indicates that larger banks tend to be more profit efficient -- thus, within reason a bank might use growth as a way to achieve greater efficiency, holding managerial shareholdings constant. Using the coefficient estimate from regression [7], the average hired-manager bank with $57 million in assets would have to grow to about $95 million in assets (a 66% increase in size, holding the size of other banks constant) to add 9.26 percentage points to *EFF*.[31] This is a tremendous amount of growth, especially for the slow-growing rural markets which dominate our sample, some of which experienced net population outflow during the 1990s. Thus, for most of our sample banks, growth of this magnitude likely could be accomplished only via merger or acquisition, which of course could also alter the management/ownership structure of the bank. This simple example suggests that a 9 percentage point increase in *EFF* is not easily achieved, and as such a control mechanism with the potential to generate such a performance improvement is a powerful mechanism.

Our results imply that under-utilization of managerial shareholdings is a chronic and expensive problem at small, closely held financial institutions. The 103 pure hired-manager banks with trivial levels of managerial ownership (*DMOFAMSH* < 1%) forewent the entire potential 9 percentage point improvement in profit efficiency associated with this control mechanism. This stands in direct contrast to the results of Demsetz, Saidenberg, and Strahan (1997), who find substantial owner-manager agency problems in only about 4% of the large, publicly traded bank holding companies they study, and furthermore that these firms tend to quickly address such problems by increasing managerial shareholdings. These contrasting results suggest that exposure to market discipline helps dissipate owner-manager agency problems at actively traded firms, but that these problems are more likely to fester uncorrected at closely held firms. Alternatively, over-utilization of managerial shareholdings (i.e., entrenchment) appears to be less of a problem in our sample than does under-utilization. The negatively sloped part of the inverted U-shape in Figure 1 contains only a small portion of the hired-manager banks in the sample -- of the 55 hired managers with a non-zero family ownership stake, only 10 held more than a 17% stake.

Any conclusions drawn from the results displayed in Figure 1 should be interpreted with caution. The graphical shapes are most representative for the average bank or banks in our sample, and any conclusions based on these graphs rest on the assumption that *EFF* is a good proxy for firm value. In addition, there are a number of practical considerations that we have not taken into account in our analysis. First, our results should not be used as a policy prescription for large banks, where a 17% ownership stake would generate dividend streams and wealth effects larger than necessary to discipline hired managers (see Demsetz and Lehn 1985). Second, the result in Figure 1 is based on a regression that holds other control mechanisms constant. In practice, directors might systematically substitute intensive monitoring, or retention of some policy making authority, for manager shareholdings.[32] Third, a bank may have low *EFF* simply because its current manager is mediocre; awarding stock to an incapable manager may change her incentives but it is not likely to improve performance very much. Finally, a manager may have low *DMOFAMSH* because she has not performed well enough in the past to be rewarded with bank stock, or (equivalently) has not been rewarded with a salary high enough to afford stock purchases.

6. Conclusions

Unlike shareholders at large, widely traded corporations, the owners of small, closely held firms cannot rely on external mechanisms (e.g., institutional creditors, bond rating agencies, the market for corporate control) to monitor and discipline hired managers. So when the owners of a small, closely held business determine that their financial interests would be served by relinquishing day-to-day control to a professional manager, they must either directly monitor that manager, or attempt to align her preferences with their own by making her a minority shareholder. Choosing the optimal level of managerial shareholdings is crucial: if under-utilized, the hired manager may be insufficiently motivated and the financial gains expected by the owners will not fully materialize; if over-utilized, the hired manager may accumulate too large a stake in the firm and become entrenched.

In this paper, we examine the relationship between managerial shareholdings and financial performance at 266 predominantly small, state-chartered commercial banks in the Tenth Federal Reserve District. Because only a few of these banks are publicly traded, we measure their financial performances relative to a best-practice profit frontier that we estimate using stochastic frontier techniques and 1994 call report data. We use confidential data from bank examination reports to establish ownership profiles and managerial responsibilities at these banks, and we find that some of these banks are run by hired managers with no ownership stake, some are run by hired managers with minority ownership stakes, and some are run by owner managers. Thus, this data set allows us to test the following two general hypotheses: Does ceding day-to-day control to a professional manager enhance financial performance at small, closely held firms? Does the financial performance of small, closely held firms that hire outside managers exhibit patterns of alignment and entrenchment that are related to the shareholdings of that hired manager?

Our results suggest that ceding day-to-day control to a professional manager can potentially enhance the financial performance of small, closely held commercial banks, and that these potential gains are most likely to materialize when mechanisms (i.e., optimal managerial shareholdings) are in place to monitor and motivate the hired managers. Estimated profit efficiency was relatively low at banks run by hired managers with little or no ownership stake, but improved substantially as managers accumulated shareholdings and presumably became more aligned with the owners. Profit efficiency was highest for hired managers holding about a 17 percent ownership share, but then declined as managers accumulated additional shareholdings and presumably became entrenched. This inverted U-shape is roughly consistent with that found in studies of larger, publicly traded

corporations, which suggests that managerial entrenchment is a phenomenon that transcends firm size and trading status. In contrast, we find that financial performance was unrelated to managerial shareholdings at banks that were managed by a member of the primary ownership group. Overall, our empirical results are consistent with theoretical models of manager entrenchment that predict inverted U-shape associations between financial performance and hired manager shareholdings, but no association between financial performance and owner manager shareholdings (e.g., Stulz 1988).

In contrast to some previous studies of large, actively traded corporations, we find no evidence that non-managerial insiders, or blocks of outside owners, can effectively monitor the hired manager. Because the ownership of our average sample bank is highly concentrated among a small number of insiders, there may simply be little incentive for the remaining fragmented owners to incur the costs of monitoring management. The presence of a government-monitor (bank examiners) at these firms may further reduce the motivation of would-be monitors.

One implication of our results is that under-utilization of managerial shareholdings may be a chronic and expensive problem at small, closely held depository institutions. In the most extreme cases, a static analysis of our results indicates that nearly 30% a bank's existing profit inefficiency could be eliminated by adopting an ownership structure in which hired managers hold a larger amount of stock. These results provide an interesting reflection of a study by Demsetz, Saidenberg, and Strahan (1997), who found that very few large, publicly traded banking firms suffer from owner-manager principal-agent problems. These contrasting results suggest that exposure to market discipline helps dissipate owner-manager agency problems at publicly traded firms, but that these problems are more likely to fester uncorrected at closely held firms.

We believe that the results derived here from our sample of 266 commercial banks are prescriptive for other small financial institutions, in particular the thousands of U.S. commercial banks that are similar to our sample banks in firm size, trading status, ownership structure, and business mix. We more cautiously suggest that these results are prescriptive for tens of thousands of small, non-financial businesses which have concentrated ownership structures similar to those of our sample banks. The obvious corporate governance difference between small banks and small business firms is that the former are periodically monitored by government examiners, while the latter are typically monitored by a bank lender. Whether or not our results can

be extended to small non-banks depends on the extent to which the efforts and the effects of these two external monitors are close substitutes.

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Table 1. Composition of sample banks by ownership, location, and organizational form. Sample contains 266 valid observations from a 20 percent random sample of the population of commercial banks in the Tenth Federal Reserve District in 1994.

	% of sample	% of owner-manager banks	% of hired-manager banks
Owner-manager banks	40.6%	--	--
Hired-manager banks	59.4%	--	--
Urban location	24.8%	19.4%	28.5%
Rural location	75.2%	80.6%	71.5%
MBHC affiliates	20.3%	9.3%	27.9%
OBHC affiliates	56.0%	63.8%	50.6%
Independent banks	23.7%	26.7%	21.5%

Notes: In an owner-manager bank, the daily managing officer (DMO) is a member of the controlling shareholder group. In a hired-manager bank, the DMO is not a member of the controlling shareholder group. Urban banks are headquartered in metropolitan statistical areas (MSAs), while rural banks are not. Our sample banks are either one of several banking affiliates in a multibank holding company (MBHC), the single banking affiliate in a one-bank holding company (OBHC), or are not affiliated with a holding company (Independent).

Table 2. Summary statistics for bank size, insider shareholdings, outsider shareholdings, and managerial salary and bonus. Sample contains 266 valid observations from a 20 percent random sample of the population of commercial banks in the Tenth Federal Reserve District in 1994. All variables are described in Section 3. ***, **, and * indicate that the hired manager means are significantly different from the owner manager means at the 1, 5, and 10 percent levels of significance.

A. All banks	**N**	**Mean**	**Std.**	**Min.**	**Max.**	**Median**
Assets ($ millions)	266	$49.923	70.780	3.245	730.432	28.935
DMOSH	266	.1672	.2485	0.000	1.0000	.0338
DMOFAMSH	266	.2777	.3423	0.000	1.0000	.0802
BOARDEXDMO	266	.4422	.3142	0.000	1.0000	.4240
BOARD	266	.6094	.3129	0.000	1.0000	.6666
OUTCONC	266	.0301	.0485	0.000	.2500	.0060
POLICY	266	.5827	.4940	0.000	1.0000	1.0000
DMO Salary and Bonus	266	$77,784	38,194	23,400	300,000	68,800
B. Owner-manager banks	**N**	**Mean**	**Std.**	**Min.**	**Max.**	**Median**
Assets ($ millions)	108	$39.208	43.175	3.245	295.890	26.734
DMOSH	108	.3648	.3835	0.000	1.0000	.2708
DMOFAMSH	108	.6252	.2723	0.021	1.0000	.6368
BOARDEXDMO	108	.3244	.2607	0.000	1.0000	.3017
BOARD	108	.6892	.2751	0.006	1.0000	.7397
OUTCONC	108	.0265	.0479	0.000	.2500	.0024
POLICY	108	.2407	.4295	0.000	1.0000	0.0000
DMO Salary and Bonus	108	$83,222	42,758	29,100	300,000	73,100
C. Hired-manager banks	**N**	**Mean**	**Std.**	**Min.**	**Max.**	**Median**
Assets ($ millions)	158	$57.246 **	83.980	5.041	730.432	31.040
DMOSH	158	.0322 ***	.0655	0.000	0.3900	.0033
DMOFAMSH	158	.0403 ***	.0863	0.000	0.4326	.0037
BOARDEXDMO	158	.5227 ***	.3228	0.000	1.0000	.5411
BOARD	158	.5549 ***	.3261	0.000	1.0000	.5957
OUTCONC	158	.0327	.0489	0.000	.2309	.0102
POLICY	158	.8165 ***	.3883	0.000	1.0000	1.0000
DMO Salary and Bonus	158	$74,102 *	34,421	23,400	221,510	66,500

Table 3. Data, variables, and results from profit efficiency model. Population contains 1,414 state chartered banks in the Tenth Federal Reserve District in 1994. Sample contains 266 valid observations from a 20 percent random sample of the population of commercial banks in the Tenth Federal Reserve District in 1994. All variables are described in Section 4. Dollar signs ($) refer to thousands of 1994 dollars. EFF is an estimate of the percentage of a bank's potential before-tax profits that is actually captured. ** indicates the EFF is statistically different from the population mean at the at the 5 percent level of significance.

A. Variables Used in Profit Efficiency Model

	N	Mean	Std. Dev.	Min.	Max.	Median
adjusted net income	1414	$1,652	7,303	-4,884	171,494	599
equity	1414	$7,022	22,453	151	565,375	3,324
loans	1414	$44,818	180,784	468	4,617,15	17,498
noninterest income	1414	$768	6,735	1	151,587	68
transactions deposits	1414	$26,424	103,489	901	2,217,98	10,172
price of labor	1414	$33.05	7.47	19.75	56.17	31.94
price of funds	1414	0.0349	0.0049	0.0221	0.0454	0.0352
price of physical capital	1414	0.4541	0.4218	0.0949	2.2143	0.3308
% in Colorado	1414	14.62%	--	--	--	--
% in Kansas	1414	28.04%	--	--	--	--
% in Missouri	1414	10.95%	--	--	--	--
% in Nebraska	1414	20.55%	--	--	--	--
% in New Mexico	1414	2.12%	--	--	--	--
% in Oklahoma	1414	20.48%	--	--	--	--
% in Wyoming	1414	3.25%	--	--	--	--

B. Results from Profit Efficiency Model

	N	Mean	Std. Dev.	Min.	Max.	Median
EFF, population	1414	.6661	.2182	0	.9988	.7038
EFF, random sample	266	.6455	.2140	0	.9933	.6708
EFF, owner-manager banks	108	.6131	.2264	0	.9933	.6431
EFF, hired-manager banks	158	.6677 **	.2033	0	.9707	.6916

Table 4. OLS regressions of *EFF* on ownership and management variables for 266 commercial banks from the Tenth Federal Reserve District in 1994. Standard errors are displayed below coefficient estimates in parentheses. ***, ** and * indicate a significant difference from zero at the 1, 5, and 10 percent levels, respectively, and "n.s." indicates not statistically significant. All variables are described in Section 5.

	[1]	[2]	[3]	[4]	[5]
intercept	0.6746***	0.7841***	0.8066***	0.7697***	0.7880***
	(0.0181)	(0.0648)	(0.3424)	(0.1008)	(0.0953)
DMOFAMSH	-0.0159	-0.3782	-0.3705	-0.3381	-0.3543
	(0.1377)	(0.3482)	(0.3424)	(0.3908)	(0.3531)
$DMOFAMSH^2$	-0.1275	0.1410	0.1323	0.1075	0.1111
	(0.1526)	(0.2851)	(0.2804)	(0.2958)	(0.2946)
HIRED	--	-0.1278	-0.0653	-0.0469	-0.1201
		(0.0968)	(0.1017)	(0.1105)	(0.0977)
HIRED*DMOFAMSH	--	1.6084**	1.6237**	1.2759*	1.7307**
		(0.6654)	(0.6543)	(0.6947)	(0.6765)
$HIRED*DMOFAMSH^2$	--	-4.3563***	-4.5422***	-3.6878**	-4.4962***
		(1.6158)	(1.5899)	(1.6613)	(1.6222)
BOARDEXDMO	--	--	-0.0719	--	--
			(0.0760)		
BOARDEXDMO*HIRED	--	--	-0.0892	--	--
			(0.0914)		
POLICY	--	--	--	0.0202	--
				(0.0486)	
POLICY*HIRED	--	--	--	-0.0942	--
				(0.0664)	
OUTCONC	--	--	--	--	-0.1872
					(0.4645)
OUTCONC*HIRED	--	--	--	--	-0.3046
					(0.5873)
number of observations	266	266	266	266	266
adjusted R-square	0.0361	0.0558	0.0873	0.0588	0.0559
sum of DMOFAMSH coefficients	--	**	**	n.s.	**
sum of $DMOFAMSH^2$ coefficients	--	***	***	**	***
sum of monitoring coefficients	--	--	***	*	n.s.

Table 5. OLS regressions of *EFF* on ownership and management variables for 266 commercial banks from the Tenth Federal Reserve District in 1994. Standard errors are displayed below coefficient estimates in parentheses. ***, ** and * indicate a significant difference from zero at the 1, 5, and 10 percent levels, respectively, and "n.s." indicates not statistically significant. All variables are described in Section 5.

	[6]	[7]	[8]	[9]	[10]
intercept	-1.2175***	-1.2091***	-1.2828***	-1.2416***	-1.2231***
	(0.1112)	(0.1349)	(0.1431)	(0.1390)	(0.1369)
DMOFAMSH	0.0639	0.0766	0.0897	0.0948	0.0379
	(0.0969)	(0.2402)	(0.2401)	(0.2494)	(0.2433)
$DMOFAMSH^2$	-0.1243	-0.1235	-0.1284	-0.1369	-0.0732
	0.1060	(0.1959)	(0.1959)	(0.2037)	(0.2023)
HIRED	--	-0.0046	-0.0235	-0.0306	0.0060
		(0.0670)	(0.0717)	(0.0762)	(0.0678)
HIRED*DMOFAMSH	--	1.0159**	1.0278**	1.1362**	1.0978**
		(0.4647)	(0.4642)	(0.4845)	(0.4725)
$HIRED*DMOFAMSH^2$	--	-3.0975***	-3.0637***	-3.3765***	-3.2006***
		(1.1244)	(1.1235)	(1.1566)	(1.1301)
BOARDEXDMO	--	--	0.0334	--	--
			(0.0535)		
BOARDEXDMO*HIRED	--	--	0.0258	--	--
			(0.0647)		
POLICY	--	--	--	0.0055	--
				(0.0335)	
POLICY*HIRED	--	--	--	0.0302	--
				(0.0466)	
OUTCONC	--	--	--	--	0.3242
					(0.3241)
OUTCONC*HIRED	--	--	--	--	-0.4575
					(0.4048)
URBAN	-0.0329	-0.0311	-0.0293	-0.0329	-0.0321
	(0.0217)	(0.0216)	(0.0216)	(0.0217)	(0.0217)
lnASSETS	0.1840***	0.1827***	0.1885***	0.1854***	0.1835***
	(0.0111)	(0.0111)	(0.0116)	(0.0114)	(0.0112)
MBHC	-0.0283	-0.0269	-0.0227	-0.0274	-0.0271
	(0.0252)	(0.0251)	(0.0252)	(0.0252)	(0.0252)
LBHC	-0.0301	-0.0368*	-0.0409**	-0.0387*	-0.0390*
	(0.0201)	(0.0202)	(0.0203)	(0.0203)	(0.0205)
HC1	0.0584	0.0674	0.0893	0.0618	0.0629
	(0.1044)	(0.1035)	(0.1045)	(0.1038)	(0.1038)
HC2	-0.1782*	-0.1693*	-0.1741*	-0.1733*	-0.1723*
	(0.1052)	(0.1042)	(0.1041)	(0.1044)	(0.1046)
HC3	-0.1122	-0.1024	-0.0855	-0.1109	-0.1066
	(0.0879)	(0.0872)	(0.0881)	(0.0877)	(0.0874)
number of observations	266	266	266	266	266
adjusted R-square	0.5487	0.5573	0.5582	.5560	0.5561
sum of DMOFAMSH coefficients	--	***	***	***	***
sum of $DMOFAMSH^2$ coefficients	--	***	***	***	***
sum of monitoring coefficients	--	--	n.s.	n.s.	n.s.

Figure 1

Predicted Profit Efficiency based on DMO Family Ownership

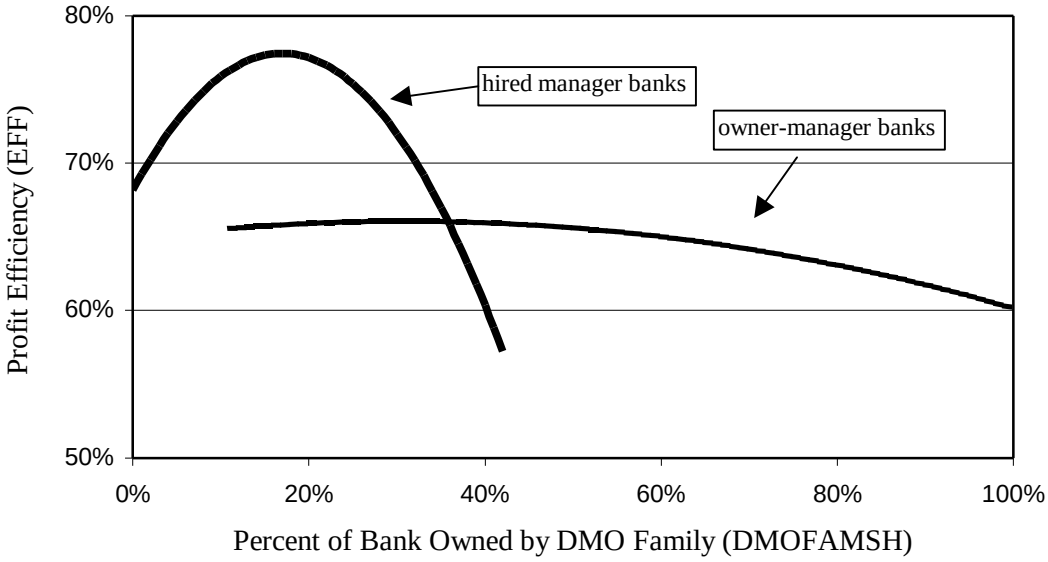
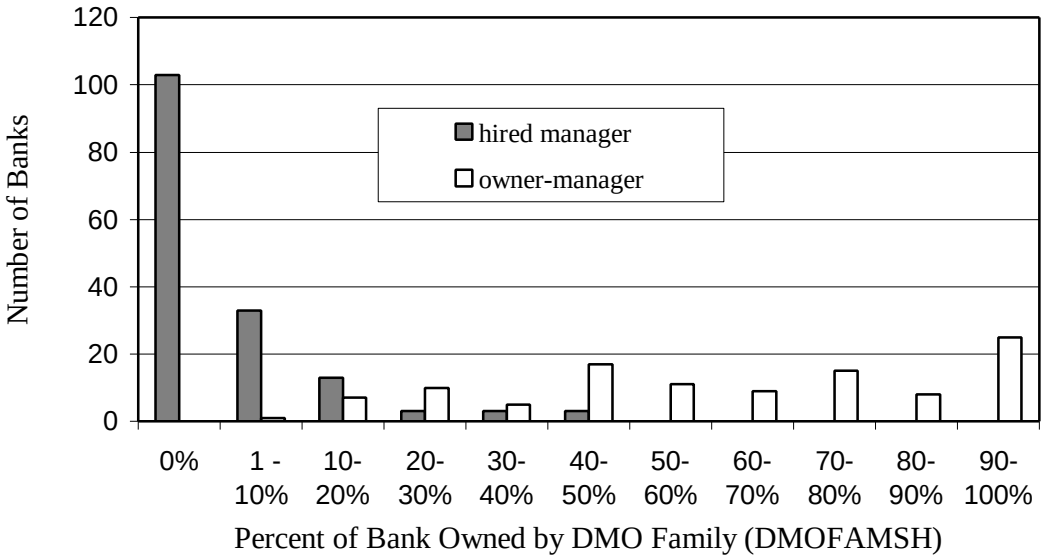


Figure 2

Distribution of Banks by DMO Family Ownership Share



Endnotes

[1] Schranz (1993) found that manager shareholdings and concentrated outsider ownership are partial substitutes for an active takeover market at bank holding companies. Prowse (1997) concludes that monitoring by stockholders and directors is a more effective than the takeover market as a mechanism for disciplining management at large bank holding companies. Howell (1998) found that bank holding companies are more likely to be acquired if a bank director other than the CEO has a large ownership block, which suggests that the effectiveness of the market for corporate control depends on the ownership structure of the potential takeover target. Demsetz, Saidenberg, and Strahan (1997) found that large, publicly traded bank holding companies tend to use increased managerial shareholdings to address owner-manager agency problems, although they also find that this class of agency problem rarely occurs in these firms.

[2] We exclude from this group an oft-cited study by McConnell and Servaes (1990), which examined movements in Tobin's *q* at over 1,000 non-financial firms in 1976 and in 1986. The authors found inverted U-shaped associations between insider shareholdings and *q* that peaked between 37% and 61% insider ownership (depending on the year of observation and the definition of insider shareholdings). These results do not support Stulz's theoretical result, however, because in practice a large firm with over 37% insider shareholdings is being run by its primary owners, not by entrenched managers.

[3] Glassman and Rhoades (1980) found that closely held "owner-controlled" financial institutions earned higher profits than did "manager-controlled" institutions. Hannan and Mavinga (1980) found that widely held banks incurred higher noninterest expenditures than did closely held banks. Allen and Cebenoyan (1991) found that bank holding companies with both high insider ownership and high shareholder concentration were most likely to make acquisitions that enhanced firm value. Pi and Timme (1993) concluded that insider ownership in bank holding companies tends to discourage utility-maximizing behavior by managers and reduces owners' monitoring costs. Gropper and Beard (1995) concluded that the diffuse ownership structure at mutual thrifts created a disincentive to monitor managers of failing thrifts in the late 1980s, and allowed excess spending by managers at those institutions. Spong, Sullivan, and DeYoung (1995) found that high performance banks tend to have active major stockholders and tend to be run by managers with large financial stakes in the bank. Cole and Mehran (1996) found higher stock returns at thrift institutions that had either a large inside shareholder or a large non-institutional outside shareholder.

[4] Saunders, Strock, and Travlos (1990) found a positive relationship between insider ownership and unsystematic (diversifiable) risk, but no relationship between insider ownership and systematic (undiversifiable) risk, at large commercial banks. Demsetz, Saidenberg, and Strahan (1997) found a positive relationship between insider ownership and risk (standard deviation of weekly stock returns) at bank holding companies, but only at low levels of insider shareholdings at banks with low franchise value. Brewer and Saidenberg (1996) found a U-shape relationship between insider shareholdings and risk (standard deviation of equity returns) at thrift institutions that bottomed-out at about 30% insider ownership. Knopf and Teall (1996) found positive correlations between numerous measures of risk-taking and insider ownership at thrifts. Chen, Steiner, and Whyte (1998) found a negative relationship between managerial ownership and several different measures of risk in publicly traded thrifts and commercial banks. Sullivan and Spong (1998) find a negative relationship between several measures of commercial bank risk and the percentage of managerial wealth invested in the bank.

[5] Glassman and Rhoades (1980) found that ownership-performance relationships were particularly strong when ownership was concentrated among large stockholders related to each other by family or business ties.

[6] In identifying the members of the controlling shareholder group, we were careful to look for groups of shareholders who had common ties and were likely to act together. Ties were mainly through extended family, but in one instance a formal control agreement existed among non-related shareholders.

[7] At small closely held banks, year-end cash bonuses for hired managers may be preferable to on-going managerial ownership stakes. In cash bonus arrangements, the hired manager is not guaranteed any particular share of bank earnings; the owners can retain some flexibility in determining the exact bonus amount; and the hired managers may prefer cash over illiquid shares. Conversations with examiners and bankers in the Tenth Federal Reserve District indicate that at least some hired DMOs receive such cash bonus arrangements. To the extent that this practice is wide-spread at hired-manager banks, our results in Section 5 below would imply that cash bonus plans are less effective than managerial shareholdings for motivating hired managers.

[8] An entrenched manager will engage in this behavior as long as the marginal utility gained exceeds the corresponding

marginal reduction in the value of her ownership claim, holding the (low) probability of dismissal constant.

[9] Cole and Mehran (1996) found higher stock returns at thrift institutions with large non-institutional outside shareholders. Cebenoyan, Cooperman, and Register (1996, 1998) found that the presence of large outside investors is associated with reduced risk levels and more cost efficient operations at thrift institutions. Mayers, Shivdasani, and Smith (1997) conclude that mutual insurance companies have relatively low noninterest expenses because they employ more outside directors. Knopf and Teall (1996) found that the presence of large institutional shareholders tends to reduce risk-taking at thrift institutions. In contrast, Brewer and Saidenberg (1996) found no relationship between large outside blockholders and risk at thrift institutions.

[10] The 10th Federal Reserve District comprises all of Colorado, Kansas, Nebraska, Oklahoma, and Wyoming, and portions of Missouri and New Mexico. We drew an initial 20 percent random sample of state-chartered banks from the Tenth District population. From this initial sample of 304 banks, we excluded 27 banks that experienced a significant ownership change (i.e., the majority ownership of the bank changed hands) between 1991 and 1994. Most of the excluded banks (16 out of 27) had earnings that were at or above peer banks near the time when the ownership or management changed. Of the remaining 11 excluded banks, only 5 could be responsibly characterized as having financial difficulties serious enough to require new owners/managers. The changes in ownership/management were typically not linked to poor bank performance, and included retirement, divorce, estate planning, passing the bank on to a younger generation within the family, an aging Board of Directors in a small town, and healthy buy-out offers from larger holding companies. Missing data and other problems reduced the initial sample by an additional 11 banks. We focus exclusively on state-chartered banks because FDIC and Federal Reserve exam reports contained more detailed management and ownership data than did OCC exam reports. We do not believe that this causes a sample bias, because the regulation and supervision of small, established state-chartered banks differs very little from the regulation and supervision of small, established federally chartered banks.

[11] We relied on the judgement of bank examiners to define the *POLICY* variable. In their examination reports, bank examiners identify a dominant policy maker or policy makers who play a role in setting bank policy, making major investment and organizational decisions, and establishing the overall objectives of the bank. This policy making responsibility may be assumed by the DMO, another top officer, a major shareholder, the chairman of the board, a key director, or a combination of such individuals acting together. In cases where the DMO is not the dominant policy maker, or when the DMO shares this task with others, any policy maker other than the DMO could, in part, be viewed as fulfilling an important monitoring function by setting general policies and overseeing the manager's compliance with these policies.

[12] The variable *DMOSH* equals zero at two owner-manager banks in which the DMO's shares were held by other family members. The variable *BOARD* equals zero at four hired-manager banks that were non-lead bank affiliates of multibank holding companies.

[13] Of the bank holding companies with affiliates in our sample, only five had stock that was traded on regional or national exchanges. None of these banks were the lead banks in their holding company.

[14] Akhavein, Berger, and Humphrey (1997), Berger, Hancock, and Humphrey (1993), Berger and Mester (1997), DeYoung and Nolle (1996), Humphrey and Pulley (1997), Akhavein, Swamy, Taubman, and Singamsetti (1997), DeYoung and Hasan (1998), and Berger, DeYoung, Genay, and Udell (1999) have all estimated profit efficiency for banks. In these models, "potential profits" is an empirical measure derived from the observed performance of the best practice banks in the data, and does not represent the theoretical absolute profit potential.

[15] We use adjusted net income to measure bank profits for three reasons. First, this is the profit measure used by Humphrey and Pulley (1997) in the seminal paper on alternative bank profit functions. Second, because loan loss provisions are not cash flows, and because both loan loss provisions and extraordinary items are subject to accounting discretion and smoothing, adjusted net income better reflects the economic performance (rather than the accounting performance) of banks. Third, as we shall see below, negative profits are difficult to deal with in efficiency estimation, and using adjusted net income reduces the number of observations with negative profits, while still maintaining the efficiency ordering across banks.

[16] The prices of labor, borrowed funds, and physical capital were truncated at their 1st and 99th percentiles in order to reduce the influence of outlying values of these artificially constructed input prices. Because the non-standard profit function contains input prices only, the theoretical restriction that input and output prices be homogeneous of degree one does not apply, and hence was not imposed during estimation.

[17] Hughes and Mester (1998) describe the relationship between equity capital, bank size, and the benefits of diversification for commercial banks. Berger and Mester (1997) show that excluding equity capital from frontier cost and profit functions can substantially alter the rank ordering of bank efficiency estimates.

[18] Branching restrictions had not yet been fully phased-out in all of Tenth District states by 1994. Evanoff and Israilevich (1991) have shown that state-level regulations significantly constrain operational efficiency at banks, and it is not unusual for bank efficiency models to include such control variables (e.g., Berger and Humphrey 1991).

[19] Both Berger, Hancock, and Humphrey (1993) and DeYoung and Nolle (1996) modeled profit efficiency using a quadratic profit function, and found that the resulting efficiency estimates were highly sensitive to asset size.

[20] Berger and Mester (1997) and Bauer, Berger, Ferrier, and Humphrey (1998) estimate translog profit functions for banks. They address this problem by transforming all profits to be positive; they simply increase the measured profits of each bank by the absolute value of the largest loss (i.e., negative profit) incurred by any bank in their sample.

[21] See Berger, Leusner, and Mingo (1995) for a detailed description of these transformations.

[22] We set *EFF* = 0 banks with negative p in order to maintain a monotonic efficiency ordering. This was necessary because a small number of banks (less than 2 percent of the Tenth District population) had both negative actual profits p and negative estimated potential profits p+*u*.

[23] Note that some risk averse behaviors that reduce profits, such as substituting safe securities for risky loans, or holding high levels of expensive equity capital, will not be captured in EFF_i , because EFF_i is measured relative to frontier-efficient banks with ratios of loans-to-securities and capital levels similar to bank *i*.

[24] Berger, Hancock and Humphrey (1993), DeYoung and Nolle (1996), DeYoung and Hasan (1997), Akhavein, Swamy, Taubman, and Singamsetti (1997), and Berger, DeYoung, Genay, and Udell (1999) each found that the average bank could at least double its profitability by eliminating all estimated profit inefficiency.

[25] Because *EFF* was truncated for 4 of the sample banks we also estimated equation (1) using Tobit regression techniques. The Tobit results (not shown) were nearly identical to the OLS results reported in the tables.

[26] We estimated a variety of additional regression specifications (not shown) to test further for monitoring effects, including regressions excluded the *HIRED* dummy interaction term, regressions that included only the *HIRED* dummy interaction term, and regressions that used slightly different definitions for the *OUTCONC* and *BOARDEXDMO* variables. The results were robust to these changes.

[27] Note that we include *URBAN* in these second-stage regressions, but we include *STATE* in the first-stage profit frontier regression. *STATE* is meant to control for state-by-state differences in branching and other regulations that force some banks to choose sub-optimal mixes of inputs (e.g., fewer branch locations). Hence, *STATE* controls for exogenous constraints placed on the production technology estimated in the first-stage regression. In contrast, *URBAN* controls, in part, for differences in competitive conditions which determine the prices that small, price-taking banks receive for their products *after* these products have been produced.

[28] Berger, Hancock and Humphrey (1993), DeYoung and Nolle (1996), DeYoung and Hasan (1997), and Akhavein, Swamy, Taubman, and Singamsetti (1997) all found a positive relationship between size and profit efficiency at U.S. banks. Note that the strong correlation between size and profit efficiency does not indicate a misspecification of the profit efficiency equation (2), because that model already includes a number of variables (e.g. total loans, total equity capital) that are strongly correlated with asset size.

[29] The correlation between *ASSETS* and *BOARDEXDMO* is -0.24 for all banks; the correlation between *ASSETS* and *BOARDEXDMO* is -0.36 for hired-manager banks; and the correlation between *ASSETS* and *POLICY* is -0.15 for hired-manager banks. All three correlations are statistically different from zero at the 1% level. Coupled with the well established result that large banks tend to be more profit efficient than small banks, these correlations suggest that the negative coefficients on *BOARDEXDMO* and *POLICY* in regressions [3] and [4] (regressions that contained no controls for asset size) were due to misspecification error.

[30] See "Banks Start to Link Board Members' Pay to Corporate Performance," *American Banker*, March 7, 1997. Houston and James (1995) find that the reticence to use stock options to control managers also extends to large banks.

[31] The result is obtained by solving the equation (.1827)*( ) *lnASSETS*) = .0926, adding the value obtained for) *lnASSETS* to the mean *lnASSETS* of 10.9551 for hired-manager banks, and then taking the antilog.

[32] Agrawal and Knoeber (1996) argue that a firm will choose the mix of internal control mechanisms that maximizes its value, and that there should be no relationship between such internal mechanisms and firm performance after their interdependence is taken into account. They find some support for this argument using a sample of large U.S. firms.