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**Performance of Minnesota Banks:
An Analysis of Strategic Management Choices**

by

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ABSTRACT

The success of various bank management strategies is evaluated using data from banks located in Minnesota during 1988-1994. These strategies are identified using a combination of data from financial statements and survey data. Each strategy is evaluated based on its effect on rate of return on assets and rate of return on equity. The study finds that cost containment strategies are relatively more successful than strategies which emphasize the expansion of services. The implications for the future structure of the Minnesota banking industry are discussed.

Performance of Minnesota Banks: An Analysis of Strategic Management Choices

I. INTRODUCTION

Bankers are navigating through a sea of new product offerings, consolidations, and technological innovation. The financial press has extensively covered the multibillion-dollar bank holding companies and their recent merger activity. Less noticed, but quite important for the emerging structure of the banking industry, are the trends which characterize banks at the lower end of the size distribution. According to recent data, small banks (those with under \$100 million in total assets) represent approximately 90% of all the banks in Minnesota. These small banks have also been consolidating, changing the composition of their loan portfolios, and expanding their services. Each small bank has developed a strategy for competing in an evolving financial marketplace. The objective of this paper is to examine the relationship between the strategies employed by these small banks and their financial performance.

Table 1 reveals several key trends in Minnesota's banking industry during 1988-1994. First, banks have been shifting away from commercial loans toward consumer and real estate loans. Second, the level of fee income in relation to assets has doubled over that seven year interval. This reflects a net growth in the use of fee-generating services. While services and noninterest income grew, average noninterest expense also increased from approximately 3% to 4% of assets. These changes have been taking place in an environment of significant merger, acquisition and consolidation activity which has resulted in fewer, larger banks.

Table 1. Minnesota Bank Industry Trend Indicators

Indicator	Units	1988	1994
Number of Banks		650	563
Average Total Assets	(\$ mil.)	80	110
Commercial Loans/Total Loans	(%)	35.1	26.2
Agricultural Loans/Total Loans	(%)	7.0	8.5
Residential Mortgages/Total Loans	(%)	15.6	26.7
Noninterest Income/Total Assets	(%)	1.1	2.0
Overhead Expenses/Total Assets	(%)	2.9	4.1

Source: Sheshunoff.

The trend indicators in Table 1 are industry aggregates and, therefore, are somewhat weighted by the influence of large banks. For example, most of the decrease in commercial lending took place in the very large commercial banks who compete with the commercial paper market. However, Minnesota banks with a billion dollars or less in assets have also decreased the relative importance of commercial loans in their portfolios. The average percentage of commercial loans/total loans among smaller banks fell from 18.8% in 1988 to 17.4% in 1994. The average proportion of agricultural loans also grew at small banks (FDIC). Though the magnitudes differ slightly, the general trends of shifting loan portfolios, increasing fee income, and consolidation are common across all bank size groups. In this dynamic environment, bankers have some difficult strategic management choices to make if they want to remain competitive.

Objectives

This paper proposes to explore the connection between strategies and performance of Minnesota banks by examining reported financial statements and survey data. Each bank strategy (or combination of strategies) has implications for bank management performance. By comparing the strategies of high-performance and low-performance banks, it is possible to evaluate the effectiveness of those alternative strategies. Specifically, we will examine four questions that relate bank strategy to performance. Have banks with a real estate and consumer lending focus outperformed banks with a commercial lending focus? Have the banks with high levels of fee income tended to generate higher levels of profit? Have banks with stringent expense controls tended to generate higher levels of profit? Is asset size a key factor in determining bank performance?

Studies of Bank Management Strategies

Several previous studies have concluded that bank profitability is affected by the allocation of bank assets. Since a bank can effectively control its asset mix, these studies can be interpreted as evaluations of various asset management strategies. Studies by Bond (1971), Hester and Zoellner (1966), and Kwast and Rose (1982) fall into this category. These studies found that banks should stay "loaned up". In addition these contributed to our understanding of the relative profitability of different asset/liability strategies.

Because most previous studies have used Call Report data, they were limited to evaluating strategies which focus on the balance sheet data. Thus, the objective of this study is to use bank survey data in addition to Call Report data to identify and evaluate a broader scope of bank management strategies. For example, combined Call Report and survey data allows for a more complete evaluation of strategies which emphasize expanding the range of services and increases in fee-based income.

The paper is organized in four sections: a brief discussion of the bank survey data is provided, a descriptive analysis of high- and low-performance banks in Minnesota is presented, an empirical analysis of the relationship between bank performance and management strategies is conducted, and alternative management strategies for low-performance banks in the very small size class are identified.

II. BANK DATA

Two alternative sources of data might be used to evaluate bank performance - individual bank Call Reports of the Federal Reserve System or bank survey data. Call Reports provide a relatively uniform time series of Balance Sheet and Income Statement information to study bank performance longitudinally and in cross-section. Sample surveys can obtain less detailed but similar financial information in cross-section, but may be used to collect information on management strategies and bankers' opinions.

This study uses both of the above sources of bank data in order to evaluate the implications of alternative management strategies on financial performance. A total of 519 Minnesota banks (those with assets under \$5 billion and those which existed in every year during 1988-1994) were identified and financial information was retrieved from their annual Call Reports. A sub-sample of those 519 Minnesota banks was selected for a mail survey. The survey was conducted in early 1995 in order to obtain more detailed information on bank management strategies. It was sent to approximately half of the banks in Minnesota. A total of 112 surveys were correctly completed and comprise the survey data set. A more complete discussion of the sampling procedure and data set are contained in Appendix A.

III. INDICATORS OF BANK PERFORMANCE

The most commonly used measures of bank performance are the ROAA (rate of return on average assets) and the ROAE (rate of return on average equity). Computationally,

$$\text{ROAA} = \text{Net Income (after-tax)} / \text{Average Total Assets, and}$$

$$\text{ROAE} = \text{Net Income (after-tax)} / \text{Average Total Equity.}$$

These measures reflect a bank's ability to generate net income from their asset base and equity base, respectively.

In this study a *high-performance (HP)* bank is defined as a bank with an above average ROAA and ROAE during 1988-1994 when compared with the average ROAA and ROAE of all banks in Minnesota. Similarly, a *low-performance (LP)* bank is one which exhibits below average ROAA and ROAE when compared to all banks in the State. Some banks

exhibit above average ROAA, but due to higher capitalization (larger equity capital positions) they exhibit below average ROAE. Alternatively, they may have an above average ROAE and a below average ROAA due to low capitalization. If either ROAE or ROAA is above average while the other is below average, the bank is classified as a *medium-performance (MP)* bank.

Table 2 provides a comparison of the general characteristics of HP, MP and LP banks in Minnesota for two bank data sets - bank survey respondents and all banks. Generally, HP banks are larger and have portfolios weighted away from agricultural loans and toward other loans (e.g., real estate) than their LP counterparts. Also, HP and MP banks appear more likely to be MBHC members. In contrast, LP banks are frequently smaller and their portfolios reflect more of a dominance of agricultural assets. The LP bank group also exhibits higher levels of noninterest expense and net charge-offs of loans.

In Table 3 the products which banks offer are differentiated according to performance category. Although the percentages reported are based on a small number of survey respondents in each case, HP banks appear more likely to offer services such as telephone banking, ATM machines, mutual funds, annuities, credit cards, and discount brokerage services. LP banks report a higher incidence of insurance services.

When separated into agricultural and nonagricultural banks, the pattern of products offered changes slightly (Table 4). Among HP agricultural banks the use of ATM machines, credit cards and annuities are common characteristics, while LP banks report a higher use of mutual funds and insurance services. A further size breakdown indicates that HP agricultural banks with assets under \$50 million offer ATM services twice as often as LP agricultural banks in that same size group. The pattern which emerges among nonagricultural banks are quite similar to that which is found among agricultural banks. We expect that some of these differences are related to the observed differences in average bank size between HP and LP banks, rather than differences in bank type. By comparing HP and LP banks under \$50 million in assets it is possible to reduce the role of size when interpreting differences in products. With regard to small banks, the indicators in Tables 2-4 raise questions regarding the profitability effects of: changing the proportion of agricultural loans, changing the size of bank to achieve economies of scale, and offering new products and services.

Table 2. Characteristics of Minnesota Banks by Performance Category^{a/}

Characteristic	Units	Survey Respondents ^{b/}			All Banks ^{b/}		
		HP Banks	MP Banks	LP Banks	HP Bank	MP Bank	LP Bank
Number of Banks		53	20	39	231	97	191
Over \$100 mil.		12	0	0	31	4	9
\$50-\$100 mil.		18	2	1	58	13	9
Under \$50 mil.		23	18	38	142	80	173
Average Assets	(\$000)	74,340	26,128	18,451	57,289	36,835	37,684
Assets/Employee	(\$000)	2,046	1,960	1,769	2,041	2,020	1778
Average ROAA	(%)	1.19	1.14	0.54	1.24	1.04	0.59
Average ROAE	(%)	14.30	10.80	5.75	14.59	10.66	5.92
Interest Income/ Total Assets	(%)	8.55	8.42	8.20	8.59	8.39	8.19
Interest Expense/ Total Interest-Bearing Liabilities	(%)	5.33	5.32	5.32	5.31	5.29	5.23
Agric. Loans	(%)	17.84	30.39	42.63	25.21	31.21	33.33
Comm. Loans	(%)	19.90	17.69	16.30	18.05	17.00	18.36
Other Loans	(%)	62.30	52.00	41.07	56.74	51.79	48.31
Loan Charge-offs	(%)	0.26	0.31	0.70	0.27	0.31	0.57
Noninterest Expense/ Total Assets	(%)	3.14	3.09	3.59	3.08	3.16	3.66
Noninterest Income/ Total Assets	(%)	0.80	0.73	0.78	0.77	0.70	0.79
MBHC Member	(%)	39.60	20.00	12.80	NA	NA	NA
City Pop. Growth	(%)	1.13	0.28	0.02	NA	NA	NA

^{a/} HP indicates a high-performance bank; MP indicates a medium-performance bank; LP indicates a low-performance bank.

^{b/} Financial indicators are averages across banks during 1988-1994.

NA Indicates not available.

Table 3. Products Offered by Minnesota Banks According to Performance Category^{a/}

Product Category	Units	HP Banks	MP Banks	LP Banks
Number of Banks		53	20	39
Telephone Banking	(%)	37	20	10
ATM Machine	(%)	87	60	38
Mutual Funds	(%)	55	30	33
Annuities	(%)	73	50	51
Insurance Agency	(%)	52	60	77
Credit Cards	(%)	73	70	46
Discount Brokerage	(%)	38	20	23

^{a/} HP indicates a high-performance bank; MP indicates a medium-performance bank; LP indicates a low-performance bank.

Source: Bank survey.

Table 4. Products Offered by Minnesota Banks by Size and Type^{a/}

	Units	Agricultural ^{b/}			Nonagricultural		
		HP Banks (All)	HP Banks (< \$50 mil.)	LP Banks ^{c/} (All)	HP Banks (All)	HP Banks (< \$50 mil.)	LP Banks (All)
Number of Banks		23	11	31	30	9	8
Average Assets	(\$000)	59,972	27,551	17,076	111,075	33,892	30,386
Agr. Loans/Total Loans	(%)	38	36	54	3	3	8
Telephone Banking	(%)	23	0	12	47	22	0
ATM Machine	(%)	73	60	32	97	89	63
Mutual Fund	(%)	43	22	35	63	44	25
Annuities	(%)	68	60	52	77	55	50
Insurance Agency	(%)	55	50	77	50	33	75
Credit Cards	(%)	59	40	42	83	88	63
Discount Brokerage	(%)	27	10	19	47	56	38

^{a/} HP indicates a high-performance bank; LP indicates a low-performance bank.

^{b/} A bank is considered an agricultural bank if average agricultural loans/total loans are greater than 17.4%.

^{c/} All LP agricultural banks are in the under \$50 million size class.

Source: Bank survey.

IV. MODELING THE PERFORMANCE-STRATEGY LINKAGE

Because a bank management strategy is not easily quantified, the approach is to identify factors which reflect major differences in the underlying strategies. Therefore, we identify and use two approaches to strategy. In the first approach, differences in the type and quantity of "outputs" produced are assumed to reflect differences in bank strategy. An output strategy is measured by observing the asset structure of the bank (cash, loans, securities, and other assets). The limitation with modeling products in the form of assets is that there is often a degree of simultaneity between the selection of assets and the financing of those assets. That is, bankers manage the whole Balance Sheet. Thus, to some degree "products" will reflect the influence of financing choices which may be related to the selection of inputs (such as attracting demand deposits versus selling annuities).

In our second approach, differences in the quality and quantity of "inputs" is used as a proxy for differences in bank strategy. Inputs include general categories such as labor, capital, fixed assets and, of course, management expertise. The input strategy of a bank may be measured by observing indicators such as; the use of human resources, the adoption of new technology and alternative management techniques.

Although other objectives may be influencing the choice of a strategy, we assume that the underlying motivation for adopting an output or an input strategy is to improve the performance of the bank. The relative success of dissimilar strategies which lead to different input or output levels is evaluated in two phases. First, Call Report and survey data are compiled in summary tables to identify which measures of output and input are most likely to differentiate high-performing from low-performing banks. Second, we include those identified variables in a regression analysis to determine how significant the relationship is between bank performance and the implied strategy.

Performance is modeled as a function of what assets a bank chooses to hold and the fee-generating products it chooses to offer. Secondly, we model performance as a function of indicators of input and cost control strategies. The analysis focuses on the relative profitability of different strategies, as opposed to focusing on how efficiently the strategies are executed.

In addition to the important role which asset structure is expected to play in bank performance, capital structure (use of debt in proportion to equity) may also have a potentially significant effect on bank performance indicators. Therefore, when ROAE is being modeled we control for variations in the ROAE by including the "equity multiplier" ratio (Total Assets/Total Equity) in the set of explanatory variables. Also, since it is anticipated that there is a high correlation between the factors which explain performance differences between banks, the relationship between a strategy and bank performance will

need to be tested using a multi-variable regression to isolate the effects of individual strategies.

Asset Allocation Strategies

The banking literature suggests that resource allocation strategies employed by management (agents) are selected in such a way as to approximate the investment (return and risk) objectives of the owners (principals) of the bank. This framework suggests that numerous potential asset allocations are possible when different sizes and types of banks are evaluated.

To test the relative profitability of various asset allocation strategies, bank performance is modeled as a linear function of asset size and asset structure ratios. Asset size and asset structure ratios reflect some of the basic strategic management choices each bank has to make. To capture the effect of asset allocations, performance is measured as the deviation of the bank's ROAE (DROAE) from the average ROAE of all banks in Minnesota. Since small banks may choose to remain independent or merge into larger organizations, asset size is included as a control variable. Moreover, the asset size variable makes it possible to separate the effects of asset size from related factors such as the level agricultural loans. We define the simple asset structure model as

$$\text{DROAE} = f(\text{AVETA}, \text{COM/TA}, \text{AGR/TA}, \text{OTL/TA}, \text{FIX/TA}, \text{OTA/TA}, \text{DD/TL}, \text{TA/EQ}, \text{D})$$

where AVETA is average total assets, COM/TA is commercial loans/total assets, AGR/TA is agricultural loans/total assets, OTL/TA is other loans and leases/total assets, FIX/TA is fixed assets/total assets, OTA/TA is other assets/total assets, DD/TL is demand deposits/total liabilities, TA/EQ is total assets/total equity, and D represents dummy variables for each year in the data set. The level of securities is left out of the regression to prevent perfect collinearity among right-hand side variables. In addition, DD/TL is included as a control variable to represent a funding strategy decision. If interest paid on savings deposits outweighs the operational costs of operating checking accounts, we expect a positive relationship between DROAE and this variable.

Regression results for the pooled data model are reported in Table 5. Year dummies (D1988 through D1993) are added to reflect the economic conditions of each particular year.

The regression indicates that a significant, positive relationship exists between the level of lending and bank performance. Generally, banks that are willing to accept the risk of carrying more loans tend to generate higher levels of performance. In particular, there is a strong correlation between performance and the level of other loans (OTL/TA) in the portfolio. Other loans consist primarily of residential real estate loans and consumer loans.

We conclude that the banks which are "loaned-up" tend to be higher performers. This result is consistent with the conclusions of Hester and Zoellner as well as Kwast and Rose.

Table 5. Effects of Asset Allocation on ROAE, 1988-1994^{a/}

Dependent Variable: Average DSYROAE (1988-1994)^{b/}

Variable	Coefficient	T-Statistic	Probability
AVETA	3.05E-8	2.31	.021
COM/TA	.035	2.07	.039
AGR/TA	.042	4.27	.000
OTL/TA	.109	11.40	.000
OTA/TA	-.108	-7.26	.000
FIX/TA	-.977	-9.68	.000
TA/EQ	.004	13.70	.000
DD/TL	.045	2.43	.015
D1988	-.007	-2.13	.033
D1989	-.003	-.78	.433
D1990	-.008	-2.48	.013
D1991	-.007	-2.26	.024
D1992	.015	4.52	.000
D1993	.012	3.58	.000
CONSTANT	-.059	-9.71	.000

R-square = .181
F-statistic = 56.25

^{a/} Regression results are based on data for 519 Minnesota banks during 1988-1994.

^{b/} Average DSYROAE is the deviation of the average ROAE of an individual bank from the average ROAE of all Minnesota banks during 1988-1994.

The negative parameter on the fixed assets/total assets ratio implies that a strategy which emphasizes higher levels of physical assets tends to result in lower performance. The positive coefficient on the DD/TL variable suggests that banks with more demand deposits and smaller time and savings deposits tend to be HP banks. One rationale for this result is

that the interest expense associated with maintaining savings deposits is larger than the additional overhead expense associated with administering checking accounts.

Risk and Asset Allocation

It is not surprising to find that HP banks tend to carry a higher proportion of loans and securities on their Balance Sheets (as opposed to fixed assets, federal funds and other nonstrategic assets). However, it is not clear which types of loans are most profitable or whether the shift from commercial and industrial loans to other loans was justified by an anticipated increase in profitability.

In Tables 6 and 7 the relative risks and returns for different types of loans are modeled. In Table 6 the role of asset risk management is evaluated by regressing the variance of ROAA on the proportions of assets during 1988-1994. The formal equation is:

$$\text{ROAA} = f(\text{SYCOM/L\&S}, \text{SYAG/L\&S}, \text{SYOTHLN/L\&S}, \text{and SYSEC/L\&S})$$

where SYCOM/L&S is average total commercial loans divided by the average sum of loans and securities, SYAGLN/L&S is average total agricultural loans divided by the average sum of loans and securities, SYOTHLN/L&S is average total other loans divided by the average sum of loans and securities, and SYSECLN/L&S is average total securities divided by the average sum of loans and securities.

The regression results shown in Table 6 indicate that agricultural lending and commercial lending tend to result in a larger variance in returns than the "other loans" category (e.g., residential real estate loans). Holding securities decreases the variance of returns as expected.

While these results are plausible and consistent with earlier banking studies, the next question we ask is whether the loans that generated higher levels of variance also generated higher profitability to compensate for the additional risk.

We hypothesize that higher-risk asset structures will correspond with higher rates of return on bank assets. To measure higher-than-average bank performance we use the seven-year average deviation of ROAE for the individual bank from the seven-year average ROAE of all banks (SYDROAE) as the performance indicator. The logic of this measure is that banks which are willing to assume more asset risk should expect to be compensated with higher returns over their planning horizon. The formal model used is:

$$\text{SYDROAE} = f(\text{SYCOM/L\&S}, \text{SYAGR/L\&S}, \text{SYOTH/L\&S}, \text{SYL\&S/TA}, \\ \text{SYTA/EQ}, \text{SYFIX/TA}, \text{SYAVETA})$$

where SYCOM/L&S is the seven-year average of commercial loans divided by the sum of loans and securities, SYAGR/L&S is average agricultural loans divided by loans plus securities, SYOTH/L&S is average other loans divided by loans plus

securities, SYL&S/TA is average loans and securities divided by average total assets, SYTA/EQ is the average equity multiplier, SYFIX/TA is the average level of fixed assets divided by average total assets, and SYAVETA is average total assets over the seven-year period.

Table 6. Effects of Loan Portfolio Structure on Variability of ROAA^{a/}

Dependent Variable: Variance of ROAA

Variable	Coefficient	T-Statistic	Probability
COM/L&S	1.45E-4	4.06	.0001
AGR/L&S	3.37E-5	2.37	.0174
OTH/L&S	1.57E-5	1.09	.2745
SEC/L&S	-2.18E-5	-1.64	.1016
R ² = .037			
F = 6.69			

^{a/} Regression results are based on data for 517 Minnesota banks during 1988-1994.

Table 7. Effects of Loan Portfolio and Asset Structure on ROAE^{a/}

Dependent Variable: Average DSYROAE (1988-1994)^{b/}

Variable	Coefficient	T-Statistic	Probability
SYCOM/L&S	.023	.65	.515
SYAGR/L&S	.049	2.36	.018
SYOTH/L&S	.110	5.14	.000
SYL&S/TA	.240	6.53	.000
SYAVETA	7.77E-8	2.41	.016
SYFIX/TA	-.516	-1.93	.054
SYTA/EQ	.0004	.58	.561
CONSTANT	-.253	-7.28	.000
R ² = .175			
F = 15.39			

^{a/} Regression results are based on data for 517 Minnesota banks during 1988-1994.

^{b/} Average DSYROAE is the deviation of the average ROAA of an individual bank from the average ROAE of all Minnesota banks during 1988-1994.

The estimated coefficients in Table 7 indicate that the category of other loans (SYOTH/L&S) has been more profitable than commercial and industrial loans (SYCOM/L&S). Though agricultural banks have tended to be relatively low performing institutions in recent years, the regression results in Table 7 indicate that agricultural loans are still significantly more profitable than holding securities. While small, rural banks are justified in their continued lending to agriculture, the rural banker's dilemma is quite often that there is a lack of opportunities to make additional residential real estate and consumer loans. Aside from the lack of profitable investment alternatives, small banks may also suffer from diseconomies of scale.

Table 6 and 7 results jointly indicate that there is weak evidence that portfolios weighted toward commercial loans would have done better than portfolios weighted toward securities. Thus, on a risk/return basis these results indicate that the shift to residential real estate loans and other loans appears to be justified.

The category of "other loans" is primarily composed of consumer-oriented loans such as residential real estate loans, home equity loans, credit card loans and other personal loans. The strong performance of real estate loans is partially a function of changing market conditions in recent years. Banks have benefitted from falling interest rates which generated significant opportunities for new mortgage lending and for low-risk mortgage refinancing. Credit card loans have also been highly profitable in this climate of slow economic growth, modest inflation and falling interest rates. There is currently some concern that lending standards have weakened with consumers taking on more debt (including home equity loans). Thus, there is concern that the recent performance of real estate and credit card loans may not continue in a climate of rising interest rates and economic contraction.

Noninterest Income Maximizing Strategies

Our analysis of output strategies is extended by including information on the types of bank services offered and rates of growth in community population and county income. The population and income variables are included to control for different economic environments within which rural and urban banks operate.

Survey data on bank services and fee-generating products is summarized in Table 8 by bank size and performance level. As expected, larger banks characteristically offer more services than smaller banks. This is reflected by the higher percentages of use for banks over \$50 million in assets. This was true in 1990 and continued to be true in 1994. The survey data suggest also that the types of fee-generating strategies can influence the performance level of small banks, as reflected by a comparison of HP and LP banks under \$50 million in assets. For example, there appears to be a strong connection between technology-driven services (e.g., ATM machines and telephone banking) and overall bank performance. The survey data suggest that ATM machines and telephone banking save

noninterest expense as they reduce the need for bank tellers and, therefore, employee expense. During 1988-1994, banks that focused on technology-driven, as opposed to labor-driven, services appear to have performed better.

Table 8. Use of Fee-generating Services by Bank Performance Category and Size

Indicator	Units	HP Banks >\$50 mil.	HP Banks <\$50 mil.	LP Banks <\$50 mil.
Number of Banks		30	23	38
Type of Service:				
Telephone Banking (in 1990)	(%)	20.69	4.54	8.11
Annuities (in 1990)	(%)	33.33	5.55	8.33
Telephone Banking (in 1994)	(%)	53.33	13.64	10.52
ATM (in 1994)	(%)	96.66	72.72	36.84
Annuities (in 1994)	(%)	80.00	63.64	50.00
Mutual Funds (in 1994)	(%)	66.67	38.09	31.58
Discount Brokerage (in 1994)	(%)	43.33	31.81	21.05
Travel Agency (in 1994)	(%)	0.00	9.09	7.89
Full Insurance Agency (in 1994)	(%)	53.33	50.00	76.31
Financial Characteristics:				
Average Assets	(\$000)	108,650	29,589	17,293
Noninterest Income/Assets	(%)	.78	0.83	0.58
Noninterest Expense/Assets	(%)	3.04	3.29	3.42

Source: Bank survey.

Services and Profitability Effects

Regression is used to measure the effect of services on bank profitability. Financial and product offering data are used as proxies for output strategies. Since the survey data does not contain information on year-to-year changes in the services offered, the regression model in Table 9 uses the seven-year average deviation from the mean ROAE of all banks in the survey (DSYROAE) as the dependent variable and the seven-year average asset and liability levels as independent variables. The new independent variables are: CTYPOPGR is the average city population growth rate during 1983-1993; CNYINCGR is the average county income growth rate; service type variables are binary (0,1) and include TELEBNK, ATM, ANNUIT, MUTFUND, FULLINS, CREDITCRD, DISCBROK, TRAVEL, and TRUST which indicate if those services were offered in 1994.

Table 9. Effects of Product Strategies on Bank Performance^{a/}Dependent Variable: Average DSYROAE (1988-94)^{b/}

Variable	Coefficient	T-Statistic	Probability
SYAVETA	2.64E-7	2.67	.009
SYCOM/TA	.234	2.41	.018
SYAGR/TA	.041	.74	.458
SYOTL/TA	.159	2.67	.009
SYOTH/TA	-.114	-1.31	.193
SYFIX/TA	-.611	-.93	.353
SYDD/TL	.077	.77	.441
SYTA/EQ	-.005	-2.71	.008
CTYPOPGR	-.002	-.09	.922
CNYINCGR	-.030	-1.36	.178
ATM	.024	2.36	.020
TELEBNK	.006	.64	.525
ANNUIT	.004	.44	.662
CREDITCRD	-.012	-1.25	.216
DISCBROK	-.004	-.36	.723
FULLINS	-.014	-1.64	.105
TRAVEL	.017	.84	.406
TRUST	-.026	-1.64	.105
MUTFUND	-.008	-.695	.489
CONSTANT	.011	.317	.752

R² = .487

F = 4.49

^{a/} Regression is based on 110 responding Minnesota banks.^{b/} Average DSYROAE is the deviation of the average ROAE of an individual bank from the average ROAE of all Minnesota banks during 1988-1994.

The regression results in Table 9 indicate that other loans (SYOTL/TA) continue to generate above average returns and that large banks tend to perform better than smaller banks (as reflected by SYAVETA) during 1988-1994. There is some evidence also that automation (through installing ATM machines) improves profitability. However, it is not clear whether this is primarily due to the convenience offered to clients or due to the potential reduction in salary expense. Although the results are not strong, the model suggests that insurance and trust services actually reduced bank profitability. There is no evidence that offering more services have a positive effect on bank profits. This is reflected by the lack of significant coefficients on the other service variables in the model. One reason for this may be that the noninterest expense generated by those services outweighs the noninterest income the services generate. Thus, increasing noninterest revenues may not be the most effective way to maximize net noninterest income. We turn next to that strategic issue.

Bank data indicate that a strong positive relationship exists between profitability and net noninterest income (noninterest income less noninterest expense). The strong correlation between ROAA and net noninterest income is no surprise to bankers who have been focusing on noninterest income and expenses.

One strategy for increasing noninterest income is to transform a bank into a broad-based financial service company. Under this model banks are managed as financial service businesses where bankers know their customers and use this knowledge to "cross-sell" products. An alternative path to improving net noninterest income is to focus on reducing costs. Under this model, minimizing product delivery costs is a primary concern. It is not immediately clear which of these alternative strategies will generate the greatest degree of success.

Net Noninterest Income Trade-offs

Clearly, banks must balance their desire to increase noninterest income with the need to reduce noninterest expenses. Although some opportunities for a trade-off exist, it is difficult to aggressively raise noninterest income without raising noninterest expenses. This is reflected by the fact that the correlation between the noninterest income/assets ratio and the noninterest expense/assets ratio among Minnesota banks was both positive and very high. Thus, bankers are frequently left with the strategic choice between focusing on noninterest revenue or noninterest expenses.

Do noninterest income-oriented banks tend to generate higher returns? To answer this question, we first regressed net noninterest income on noninterest income during 1988-1994. If noninterest income strategies are profitable enough to compensate for their expenses, the result should be positive coefficients on the estimated noninterest income coefficient. The results in Table 10 demonstrates that net noninterest income is negatively associated with noninterest income for banks with under \$50 million in total assets. That

is, as noninterest income is increased net noninterest income tends to erode for banks under \$50 million. The relationship is less clear-cut for banks with assets over \$50 million, since the estimated coefficients change sign. Given all the attention which noninterest income has received in the popular banking literature in recent years, it is somewhat surprising to see the difficulty that small banks have had in realizing income from aggressive fee-generating strategies.

Table 10. Regression of Net Noninterest Income on Noninterest Income^{a/}

	Banks Over \$50 million		Banks Under \$50 million	
	Coefficient ^{b/}	T-Statistic	Coefficient ^{b/}	T-Statistic
1994	-.006	-.11	-.258 *	-3.53
1993	.014	.31	-.115	-1.95
1992	.008	.13	-.247 *	-3.56
1991	-.046	-.66	-.323 *	-4.71
1990	-.045	-.63	-.394 *	-5.02
1989	-.069	-.64	-.488 *	-6.34
1988	-.253	-1.88	-.447 *	-5.94

^{a/} Regressions are based on 519 Minnesota Banks.

^{b/} A (*) indicates the variable is significant at the .01 level.

Next, net noninterest income data was regressed on the noninterest expense data (Table 11). Although all banks tend to improve their net noninterest income by cutting expenses, the relative sizes of the estimated coefficients indicate that banks with under \$50 million in total assets derive relatively more benefit from the reduction of noninterest expenses. The R-squared statistic indicates that the variations in net noninterest income were a primary factor in explaining variations in noninterest expense. The combined results in Tables 10 and 11 indicate that very small banks should consider more emphasis on limiting their noninterest expense rather than emphasizing noninterest income-generating activities. Finally, net noninterest income was regressed on the services offered by the banks. The rationale for this model is that services which make favorable contributions to net noninterest income will carry positive estimated coefficients. That regression failed to produce any statistically significant results. Although evidence on the relationship between services offered and the generation of net noninterest income is difficult to show, our findings do confirm that small banks who tried to raise their fee-based income also tended as a result to increase their noninterest expense. The overall result is that banks

which generated higher gross noninterest income were not the most successful in generating net noninterest income.

Table 11. Regression of Net Noninterest Income on Noninterest Expense^{a/}

Dependent Variable: Net Noninterest Income

Independent Variable: Noninterest Expense

	Banks Over \$50 million			Banks Under \$50 million		
	Coefficient ^{b/}	T-Statistic	R ²	Coefficient ^{b/}	T-Statistic	R ²
1994	-.312 *	-8.40	.32	-.642 *	-30.91	.73
1993	-.237 *	-6.54	.23	-.561 *	-24.04	.61
1992	-.300 *	-7.49	.29	-.633 *	-30.94	.72
1991	-.390 *	-9.61	.42	-.629 *	-32.76	.74
1990	-.373 *	-8.71	.40	-.685 *	-38.55	.79
1989	-.305 *	-7.35	.36	-.683 *	-41.62	.81
1988	-.606 *	-14.32	.70	-.679 *	-40.66	.80

^{a/} Regressions results are based on data for 519 Minnesota banks.

^{b/} A (*) indicates the variable is significant at the .01 level.

Noninterest Expense Control Strategies

The empirical evidence at this stage suggests that aggressive fee-generating strategies have not been highly successful for small banks. Cost containment and human resource management policies which focus on limiting personnel expenses may provide an alternative profit strategy for that segment of the banking industry. In this regard, a relatively profitable lending area may be to pursue real estate and consumer lending. Those loans tend to be more standardized with lower overhead expenses and less requirements of sophisticated personnel than comparable commercial and industrial loans.

To determine if human resource management strategies have an effect on bank performance, we formulated a model to determine if above average levels of staffing, compensation and physical assets generate sufficient additional revenue to justify their cost. The regression equation is:

$$\text{SYDROAE} = f(\text{SYTA/EMP}, \text{SYSAL/EMP}, \text{SYFIX/EMP}, \text{SYTA/EQ}, \text{SYAVETA})$$

where SYDROAE is the deviation of the average ROAE of an individual bank during 1988-1994 from the corresponding average ROAE of all banks; SYTA/EMP is average total assets per employee, SYSAL/EMP is the average salary per employee, and SYFIX/EMP is the average level of fixed assets per employee.

Results reported in Table 12 are based on Call Report data. They indicate that lower staff levels relative to assets and lower average salaries tend to generate higher profits. The significant coefficients on average assets (SYTA/EMP) and average salary (SYSAL/EMP) per employee are strong evidence that these strategies worked to increase bank profitability during that era.

Table 12. Effects of Expense Control Strategies on DSYROAE^{a/}

Dependent Variable: DSYROAE^{b/}

Independent Variable	Coefficient	T-Statistic	Probability
SYTA/EMP	2.27E-5	5.83	.0000
SYSAL/EMP	-.0017	-6.60	.0000
SYFIX/EMP	.0382	.15	.8811
SYTA/EQ	.0006	1.12	.2608
SYAVETA	1.15E-07	3.75	.0002
R ² = .121			
F = 17.71			

a/ Regression results are based on cross-section data for 517 Minnesota banks.

b/ DSYROAE is the 7-year average deviation of the ROAE of an individual bank from the 7-year average ROAE of all Minnesota banks.

Survey data summarized in Table 13 reinforces our regression results. With respect to human resources, HP banks tend to have fewer employees in relation to their assets. They also tend to be larger banks. However, large differences are not apparent in the average salary per employee. It does appear that the small HP banks tend to pay their loan officers significantly more than their LP bank counterparts. Loan officer bonus payments for increasing loan volume and limiting loan losses are also more common in the HP bank group regardless of bank size. Commercial lending may be one area

Table 13. Human Resources, Employee Compensation and Use of Technology by Size and Performance Category^{a/}

Category/Indicator	Units	Over \$50 million	Under \$50 million	
		HP Banks	HP Banks	LP Banks
Number of Banks		30	23	38
Average Assets	(\$000)	108,650	29,589	17,293
Average ROAE	(%)	14.5	14.0	5.7
Average ROAA	(%)	1.2	1.2	0.5
Human Resources and Compensation:				
Tenure of Bank President	(years)	10.27	12.04	12.29
Tenure of Bank Officers	(years)	10.50	12.26	14.10
Commercial Loan Officer Salary	(\$)	47,267	43,174	38,031
Total Assets Per Bank Officer	(\$ mil.)	7.95	5.91	4.08
Total Compensation/Employee	(\$)	31,700	30,917	31,866
Total Assets/Employee	(\$000)	2,140	1,924	1,789
Officer Salary Increase in 1994	(%)	4.4	3.9	4.2
Loan Officer Salary Increase 1990-93	(%)	4.5	3.9	5.1
Banks Paying Loan Volume Bonuses	(%)	33.3	17.4	7.9
Banks Paying Loan Loss Bonuses	(%)	33.3	30.4	10.5
Use of Technology:				
Unified MIS	(%)	57.1	34.8	32.4
Use FRB Cost Analysis	(%)	26.7	30.4	5.3
Internal Formal Cost Analysis	(%)	26.7	26.1	13.2
Evaluate Costs Separately	(%)	36.7	56.5	42.1
Use Formal Credit Scoring of Loans	(%)	66.3	65.2	68.4
Computerized Rate Analysis	(%)	96.6	73.9	68.4

^{a/} HP indicates a high-performance bank; LP indicates a low-performance bank.

where it pays to offer higher salaries and incentive payments to obtain higher quality staff. If loan officers with higher salaries are expected to manage larger loan portfolios, the net cost in relation to assets managed may not be any higher among banks that pay higher salaries than among banks with lower paid loan officers. High loan volume per officer is one possible explanation why the higher performing banks tend to have fewer officers in relation to assets, tend to pay their loan officers more, and have lower noninterest expense in relation to total assets.

Table 13 indicates that HP banks are more likely to have developed a unified management information system and tend to use computer models to test the interest rate sensitivity of their asset portfolios. However, those differences are modest. These results should not be used to conclude that technology-driven banks will be higher-performing banks. HP banks tend to be larger and tend to employ more technology. However, it is difficult to separate the effects of technology from the effects of size on performance. When regression analysis is used to control for bank size differences, none of the "technology" indicators were found to significantly affect profitability - other than the use of ATMs and participation in the Federal Reserve Board's Functional Cost Analysis program. These two factors may be more reflective of cost control attitudes than the use of technology.

V. BANK SIZE AND PERFORMANCE RELATIONSHIPS

In our explorations of asset allocation strategies, fee-generating strategies and expense control strategies, differences in bank size (average total assets) continued to be an important factor in explaining performance. Bankers responding to the mail survey frequently indicated that banks need a minimum size of \$25-\$50 million in total assets to remain competitive. Part of the rationale for a minimum bank size is that regulatory, data management, and other overhead expenses must be spread out over a fairly large asset base to maintain profitability. Economies of scale are generally believed to exist up to at least the \$100 million asset range (Spindt and Tarhan; Gropper).

Thirty nine of the 112 banks responding to the survey had a below average ROAA and a below average ROAE during 1988-1994, and 32 of those banks had less than \$25 million in total assets. Only 17% of the banks with assets under \$25 million were HP banks, while 90% of the banks with total assets over \$50 million were HP banks. For comparison about 83% of all Minnesota banks over \$50 million in assets were considered HP banks while only 35% of the banks under \$25 million in assets were considered HP banks.

About 25% of the responding bankers estimated that the minimum asset size to remain competitive was greater than their current size. For several of these banks, the only way to achieve their targeted minimum asset size is to merge with another bank. Even among the eight HP banks with assets under \$25 million, two bankers stated that the minimum asset level they could achieve would only be through a merger.

Small towns and their surrounding farm communities are not expected to create the deposits that are needed for a bank to reach a minimum competitive size through internal growth alone. Thus, the existing alternatives to small bank size are to become a branch of a larger bank or to join a bank holding company (BHC). In the process it is possible to combine several of the overhead expenses such as regulatory compliance and "backroom operations" within a larger organization. In support of this strategy Ellinger and Barry found some evidence that small banks in BHCs are more efficient than nonBHC banks.

Table 14 illustrates some of the differences in expense structure between BHC and nonBHC banks according to performance category. We observe that HP banks generally exhibit better expense control than LP banks, regardless of BHC status, in terms of both lower fixed operating expense ratios and total noninterest expense ratios. While these statistics provide some indication that there are slightly higher costs for banks outside of BHCs, the level of assets per employee and the allocation of assets reveal that HP-BHC banks look more like HP-nonBHC banks than like LP-BHC banks. The more important differences between banks appear to be primarily along performance, not BHC-status, lines.

Most BHC banks reported sharing data processing, treasury, and compliance functions. However, some BHCs centralized their review of client financial statements. Some bankers indicated that the loss of local control over lending decisions would result in the loss of customers. The implied question is whether the efficiency gains from centralizing these review activities are sufficient to compensate for the potential loss of borrowers and loan volume. Just five banks indicated that the holding company reviewed client financial statements and helped to set the interest rates on their loans. All five banks were classified as HP banks according to our criterion. While five banks is too few to draw firm conclusions about the net gains from centralizing banking activities, it suggests that there is room for selective centralization of banking functions in Minnesota's banking industry. The observed trend in banks contracting for information services is consistent with this basic finding. The other conclusion we draw at this point is that centralization of certain banking functions is highly compatible with improved performance.

Table 14. Efficiency Indicators by Bank Holding Company Status and Performance Category^{a/}

Indicator	Units	Holding Co.		Nonholding Co.	
		HP Banks	LP Banks	HP Banks	LP Banks
Number of Banks		21	5	32	34
Fixed Expenses/Total Assets	(%)	0.38	0.69	0.45	0.42
Noninterest Expense/Total Assets	(%)	3.00	3.70	3.24	3.58
Noninterest Income/Total Assets	(%)	0.78	0.76	0.82	0.78
Loan Loss Provision/Total Assets	(%)	0.28	0.70	0.24	0.70
Total Assets/Employee	(\$000)	2,149	1,811	1,978	1,763

^{a/} HP indicates a high-performance bank; LP indicates a low-performance bank.

A Small Bank Performance Profile

We focus next on a comparison of the eight HP banks with under \$25 million in assets in Table 15 with the 32 LP banks in the same very small size class. Our objective is to identify the strategic management profile of those HP banks.

The asset structure of the HP banks is more heavily weighted toward commercial and industrial loans and "other" loans and less weighted toward agricultural loans. This suggests that the HP banks may be located in larger, faster-growing communities. Additional evidence of this situation is found in the difference in the annual rates of growth of the population in the cities where they are located. While the HP banks are located in growing communities, the LP banks are in communities which actually lost population during 1983-1993. Additionally, the HP banks have higher interest margins on their assets and sharply lower loan charge-offs than their LP bank peers. These factors jointly suggest that very small HP banks have pursued relatively more successful asset management strategies during 1988-1994, and that those strategies were made possible in part by growth in their local communities. In economic terms, the differences in their asset management strategies represent the "necessary conditions" for their success, while population growth in their local communities and effective implementation of those management strategies are representative of the "sufficient conditions" for those strategies to yield superior financial performance.

Table 15. Indicators by Asset Structure, Products Offered, Size and Performance^{a/}

Indicator	Units	Under \$25 million		Over \$50 million
		LP Banks	HP Banks	HP Banks
Number of Banks		32	8	30
Average Total Assets	(\$000)	14,271	16,480	108,650
Total Assets/Employee	(\$000)	1,726	1,879	2,140
Average ROAA	(%)	0.51	1.28	1.19
Average ROAE	(%)	5.29	14.72	14.53
Agric. Loans/Total Loans	(%)	46.59	31.00	14.26
Com. Loans/Total Loans	(%)	15.20	19.88	21.04
Other Loans/Total Loans	(%)	38.21	49.12	64.70
Charge-offs/Total Loans	(%)	0.71	0.23	0.31
Noninterest Income/Total Assets	(%)	0.57	0.87	0.78
Noninterest Expense/Total Assets	(%)	3.47	3.34	3.04
MBHC Member	(%)	12.50	9.40	46.67
City Pop. Growth	(%)	-0.03	0.79	1.03
County Income Growth	(%)	5.30	5.78	5.52
Products Offered in 1990:				
Telephone Banking	(%)	9.7	0.0	20.6
Annuities	(%)	6.7	0.0	33.3
Products Currently Offered:				
Telephone Banking	(%)	12.5	14.3	53.3
ATM Machine	(%)	28.1	71.4	96.7
Mutual Funds	(%)	14.3	28.1	66.7
Annuities	(%)	46.9	57.1	80.0
Insurance Agency	(%)	78.1	42.9	53.3
Credit Cards	(%)	37.5	42.9	83.3
Net Interest Income:				
Interest Expense/Interest-bearing Liab.	(%)	5.4	5.3	5.3
Interest Income/Total Assets	(%)	8.3	8.6	8.5

^{a/} HP indicates a high-performance bank; LP indicates a low-performance bank.

We observe also that small LP banks (with under \$25 million in total assets) have loan portfolios weighted toward agricultural loans, as opposed to commercial and other loans. Since the category of "other loans" is weighted toward real estate and consumer loans, the lack of these loans in the LP bank portfolios may reflect a limiting local economy, rather than a conscious bank management decision.

Table 15 data indicates the number of services offered by very small LP and HP banks is fairly similar. The significant differences are that HP banks tend to offer ATM machines more frequently, while insurance agencies tend to be more prominent in LP banks. The other strategic differences between HP and LP banks in this size category appear to be rather minor. Since there are few small HP banks in the sample, it is difficult to draw stronger conclusions about differences between banks.

Data in Table 15 also indicate that small HP banks (with assets under \$25 million) still have higher average percentages of noninterest expense/total assets than their larger HP bank competitors (with 3.34% and 3.04%, respectively). Small Minnesota banks responding to the survey indicated that they found it difficult to effectively spread the regulatory and "backroom" costs of banking over a small asset base. Yet, eight of the small banks were able to achieve returns on equity that were equal to the returns earned by larger HP banks. The keys to the success of these small HP banks appear to be: lower loan losses, higher interest income, and slightly higher noninterest income. We conclude that the small banks can overcome their lack of scale economies, but that they will need to execute their strategies more adeptly to do so.

Some of the identifiable strategies pursued by successful large HP banks can be emulated by small LP banks, since they are also characteristics of small HP banks. The challenge to small LP banks is to identify those elements of an overall management strategy which best fit their economic, financial and community situation and their management objectives.

V. CONCLUSIONS

There is no management strategy that will guarantee that a bank will be a high performance bank or a low performance bank. Even with hindsight, it is often not even clear whether a particular strategy was the best choice. However, there are a few strategies that provide clear signals of their past success. The evidence from 1988-94 points to five main observations concerning the relationship between management strategies and bank performance.

- Small banks with a strong strategic focus on generating fee income tended to exhibit lower than average profitability.

- Banks with tighter controls on employee expenses tended to realize higher than average profitability.
- Banks who shifted their loan portfolios away from commercial and industrial loans toward other loans have tended to be high performing banks. The other loans category consists primarily of residential real estate and consumer loans.
- Banks with assets under \$50 million have predominately generated below average returns. Very small banks will continue to generate positive returns, but due to a lack of scale, their average returns are expected to remain below their larger bank competitors.
- Agricultural lending has been relatively profitable in recent years, but agricultural banks have performed poorly due to a lack of other lending opportunities in rural areas. Many agricultural banks also lack economies of scale.

These five findings should be viewed in the light of small caveat. The time frame of the study, 1988-1994, was a period of falling interest rates, expanding margins, securities gains, and low loan losses. There is no guarantee that the strategies that were successful in recent years will be successful in a period of economic contraction and higher interest rates. For example, if interest rates rise, the residential real estate loan market may become very competitive and lose its apparent profitability edge that it exhibited in recent years. The future may alter any one of the above findings to a degree, however taken together they do point to a common direction for the future of the banking industry in Minnesota.

Banking can be viewed as resting somewhere on a continuum between a pure "commodity" business and a pure "service" business. The commodity approach of banking involves taking a commodity (money), and processing the commodity from a block of deposits into a block of loans and securities. The loans and securities will have different time, size and risk dimensions than the block of deposits. A commodity oriented strategy would be to standardize the products and minimize the costs and risks of transforming deposits into securities and loans. The high service side of banking involves tailoring deposit products to match customer needs, providing a wide spectrum of fee generating services and making loans that require special provisions or extra monitoring. A high level of service requires significant human resources that generate high levels of noninterest expense.

Our findings suggest that bankers who have viewed banking primarily as a service business and pushed most rapidly into fee generating services have tended to end up on the lower half of the performance charts. The increase in services and employees may have been

good for many local economies, but it often has not paid off in terms of a return on investment.

Small banks have had a difficult time competing with their larger competitors based on cost and scope of services. While there has been some speculation that small, independent community banks will gradually disappear from the banking landscape through continued mergers and consolidations, we find that this prediction is premature and the result not inevitable. While small banks have tended to be low performers, they are almost all generate some level of profits. Even the subset of smallest low performing banks in our sample had an average return on equity of 5%. If the owners of these small banks are willing to accept a lower return on their equity in exchange for continuing their life style as an independent banker, there is no reason that small independent banks cannot continue to represent a significant share of the banking industry in this region. The future of banking in small towns across Minnesota will rest in the personal decisions of small town bankers, as much as it rests on the reality of economies of scale in banking.

Further Research

There is a need to extend this research in several directions. First there could be a further breakdown of noninterest income into income from services and fee income from deposit accounts. This more detailed data coupled with more detailed information on how banks are delivering their services could improve our knowledge on the relative successes of differing fee generating strategies.

There also needs to be a further breakdown of consumer lending, specifically residential real estate loans, home equity loans, credit card loans, and other consumer lending. Our analysis grouped these categories together. Their strong correlation with profitability in recent years justifies a closer look into these categories of loans.

Lastly, it would be beneficial to study specific banks as they convert from one strategy to another. We know very little about how banks shift strategies and the costs involved in shifting personnel from one function to another. A dynamic model of strategic change is a logical extension of our analysis.

APPENDIX A

Description of the Bank Survey

The initial data set consisted of all Minnesota banks that were in existence during 1988-1994. The lead banks for Norwest Bank and First Bank System were deleted from the data sets because of their size (over \$5 billion) and recent structural changes which limit the usefulness of comparisons with small- and medium-sized banks. Banks formed by holding companies to serve limited niche markets were also excluded, since their operations would not be comparable to other banks. The additional exclusions are Norwest's international banks as well as IDS Bank and Trust.

The sample was stratified according to bank type (agricultural and nonagricultural) and size (total assets). Nonagricultural banks are those with an above-average percentage of agricultural loans and agricultural banks are those a below average percentage of agricultural loans. The average level of agricultural loans/total loans in the United States banks was approximately 17.4% in 1994. A total of 202 banks were selected. The bank asset-size categories selected for this study are: under \$25 million, \$25-50 million, \$50-100 million, and over \$100 million.

The survey sample was augmented in two ways. The number of very small banks was increased so that we could evaluate their viability. A list of very small banks (those with assets under \$10 million in assets) was assembled and every other bank was selected in rank order of their estimated ROAA in 1992. Secondly, we selectively created paired banks in small communities. These paired banks were included so that we could evaluate the effects of competition on performance. This sample of paired banks was drawn from towns with populations under 50,000. The process of augmenting the sample with very small banks and paired banks added 89 banks to the sample and resulted in a potential sample of 291 banks. Since 42 banks merged or dissolved prior to 1995, a total of 249 banks were sent mail surveys.

Characteristics of Survey Respondents

The survey response rate was 46% (117 banks). Five of the 117 banks in the survey had undergone very recent ownership and management changes and were removed from the sample resulting in a data set of 112 banks. Since there is a potential bias (due to augmenting the sample with additional small and paired banks), the resulting survey data was checked to determine if it is representative of small- and medium-sized banks in Minnesota. The comparison of surveyed banks to all banks in Minnesota (nonniche banks with under \$5 billion) indicates that the survey data is representative of the Minnesota banking industry (see Tables 1a and 2a).

While the average statistics for our sample and all Minnesota banks are similar, there is a slightly disproportionate weighing in the survey bank data set toward medium and large, high-performance banks (Table 3a).

Table 1a. Comparison of Survey Banks with All Banks in Minnesota

Characteristic	Units	All Banks	Survey Respondents
Number of banks		519	112
Average Assets	(\$ mil.)	46.3	46.7
Average ROAA	(%)	.96	.94
Average ROAE	(%)	10.7	10.6
Total Loans/Total Assets	(%)	54.1	55.2
Agric. Loans/Total Loans	(%)	20.9	20.6

Table 2a. All Banks and Survey Respondents by Average Size of Bank, 1988-94

Size Class	Units	All Minnesota Banks		Survey Respondents	
		Number	Percent	Number	Percent
Less than \$25	(\$ mil.)	240	46	47	42
\$25 to \$50	(\$ mil.)	155	30	32	29
\$50 to \$100	(\$ mil.)	80	15	21	19
Over \$100	(\$ mil.)	44	8	12	11

Table 3a. Distribution of Minnesota Banks by Asset Size and Performance Category^{a/}

	Units	Over \$100 Million	\$100-50 Million	\$50-25 Million	Under \$25 Million
<u>HP Banks:</u>					
HP Banks	(#)	31	58	73	69
HP Banks/All Banks	(%)	6.0	11.2	14.1	13.3
Survey HP Banks	(#)	12	18	15	8
Survey HP Banks/ Survey Banks	(%)	10.7	16.1	13.4	7.1
<u>MP Banks:</u>					
MP Banks	(#)	4	13	36	44
MP Banks/All Banks	(%)	.8	2.5	6.9	8.5
Survey MP Banks	(#)	0	2	11	7
Survey MP Banks/ Survey Banks	(%)	.0	1.8	9.8	6.3
<u>LP Banks:</u>					
LP Banks	(#)	9	9	46	127
LP Banks/All Banks	(%)	1.7	1.7	8.9	24.5
Survey LP Banks	(#)	0	1	6	32
Survey LP Banks/ Survey Banks	(%)	0.0	0.9	5.4	28.6

^{a/} HP indicates a high-performance bank; MP indicates a medium-performance bank; LP indicates a low-performance bank.

The survey sample lacks low-performing, large banks. For this reason, the effect of bank size on performance will be evaluated for larger Minnesota banks using the Call Report data instead of the survey data. The survey data is used for more in-depth comparisons of banking strategies. There is a sufficient number of banks to compare the strategies of high-performance, larger banks with those of high and low-performance banks of smaller size.

As Table 1a and 2a indicate, our sample of banks is representative of the general population of Minnesota banks except for the low-performing banks with assets over \$50 million. For this reason, analysis of banks with assets over \$50 million primarily relied on data from the larger Call Report data set.

For purposes of least-squares regression analysis, we removed any observations exhibiting a return on equity above .40 or below -.30. These cut-off points were chosen to screen for extreme results that would reflect low capitalization and an unusual event, as opposed to the long-term results of management strategies.

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