

Loss underreporting and the auditing role of bank exams

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Abstract

Using a unique set of banking data containing both originally-reported and subsequently-revised financial variables, we study accounting restatements. Our results indicate the worse a bank's financial condition, the more likely it is for originally-reported data to understate financial losses. Also, we find supervisory exams have an important role in uncovering financial problems and prompting accounting restatements to correct loss underreporting. While revisions are directly related to financial difficulties, exam-based restatements are evident at even the earliest stages of deterioration, indicating substantial accounting misstatements—at both banks and other types of companies—can occur well outside severe business circumstances.

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1. Introduction

A growing number of high-profile US companies have had to restate their earnings at substantially lower levels, thereby correcting the prior use of “aggressive” and even fraudulent accounting practices. The severity of these scandals has rattled investors and resulted ultimately in new legislation instituting a number of reforms, including the creation of the Public Company Accounting Oversight Board, which together with the Securities and Exchange Commission (SEC) is to investigate perceived lapses in accounting practices.

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In addition to policymakers, the accounting profession itself is mounting reform efforts designed to bolster investor confidence in audited financial statements as being free from material misstatement, whether caused by error or outright fraud. The increasing emphasis on the reliability of financial reporting has underlined the need for a better understanding of the factors contributing to accounting inaccuracies and the methods by which such misstatements might be detected and corrected.

Regulated industries, and banking in particular, may provide fertile ground for investigations seeking to illuminate the factors contributing to accounting misstatements. Accurate information on the financial condition of individual banks is necessary for regulatory and market discipline to circumscribe bank behavior effectively. Regulatory devices, such as prompt corrective action, together with market-based solutions to supervisory concerns, all depend on the ability of regulators and market participants to respond to changes in a bank's financial condition. However, a bank's true condition may be more readily apparent to its managers than to outsiders, including regulators and investors. In this study, we analyze supervisory efforts to bridge this information gap, with the purpose of gaining a better understanding of the circumstances surrounding accounting misstatements at both banks and other types of companies as well.

Efforts to enhance financial transparency in the banking sector have a long history. In the early 1800s, some states required banks to file reports of condition with the governor or legislature, arguing the state was a shareholder in the banks and therefore entitled to the information (Robertson, 1995). However, the reports contained only broad breakdowns of assets and liabilities and no information bank directors did not wish to disclose. In 1869, Congress empowered the Comptroller of the Currency to "call" for a full statement of condition from national banks several times a year. Supervisors since have made many changes to the resulting call report, but its purpose remains the same—to provide timely information regarding banks' financial condition.

The modern call report, or Report of Condition and Income, is filed quarterly by US banks and contains hundreds of accounting items. Because call reports are filed quarterly, whereas banks are typically examined about once every twelve to eighteen months, call report data potentially provide a more up-to-date picture of a bank's condition than supervisory exams alone. Both supervisors and private-sector analysts use call report data in a variety of efforts to monitor banks. The effectiveness of these monitoring efforts depends to a large degree on the accuracy of the reported information. If the call report data are subject to substantial revision, the report's usefulness in tracking financial developments in real time might be compromised, as conjectured by Cole and Gunther (1998). In addition, the prompt corrective action mandates contained in the Federal Deposit Insurance Corporation Improvement Act of 1991 tie the supervisory treatment of a bank to its financial condition, as portrayed in the call report. As a result, the degree to which a bank's supervisory treatment is aligned with its financial condition depends critically on the accuracy of the call report data.

These considerations raise two important and related questions about the complementarity of financial reporting and supervisory exams. First, how accurately do banks report financial information? Our null hypothesis is that financial reporting is accurate, so that examiners can implement regulatory rules, such as prompt corrective action, based on the originally-filed call report data. Second, if banks do not report accurately, is there a role

for exams in improving the accuracy of bank financial statements? If the answer to the first question is that the null cannot be rejected, the second question is obviously moot. But if call report data are inaccurate and subject to significant exam-based revisions, the role of exams extends beyond the implementation of regulatory rules to include improvements in the quality of bank financial information, albeit with a lag.

We approach these questions by analyzing a unique set of data that includes the originally-reported values of key financial variables, along with their values as reported at a later point in time, reflecting any revisions that occurred subsequent to the initial reports. In most cases, we lack specific information on the underlying cause of a data revision. We must then statistically assess the degree to which the revisions are associated with exams. Defining accuracy in financial reporting as correctly portraying the information available as of a report date, we should note our analysis assumes exam-driven revisions generally reflect corrections to reporting inaccuracies, as opposed to post-reporting shocks to the information set. The data on call report revisions are available only for 1996–1998, which as shown in Fig. 1 was a fairly tranquil period for banking, characterized by low levels of asset quality problems. As a result, we would not *a priori* expect significant revisions to bank financial statements based on post-reporting shocks to the information set during the relatively short period between a report date and the subsequent exam.

Our results are striking. First, the statistical findings indicate supervisory exams precipitated a significant number of adverse revisions to financial statements during the sample

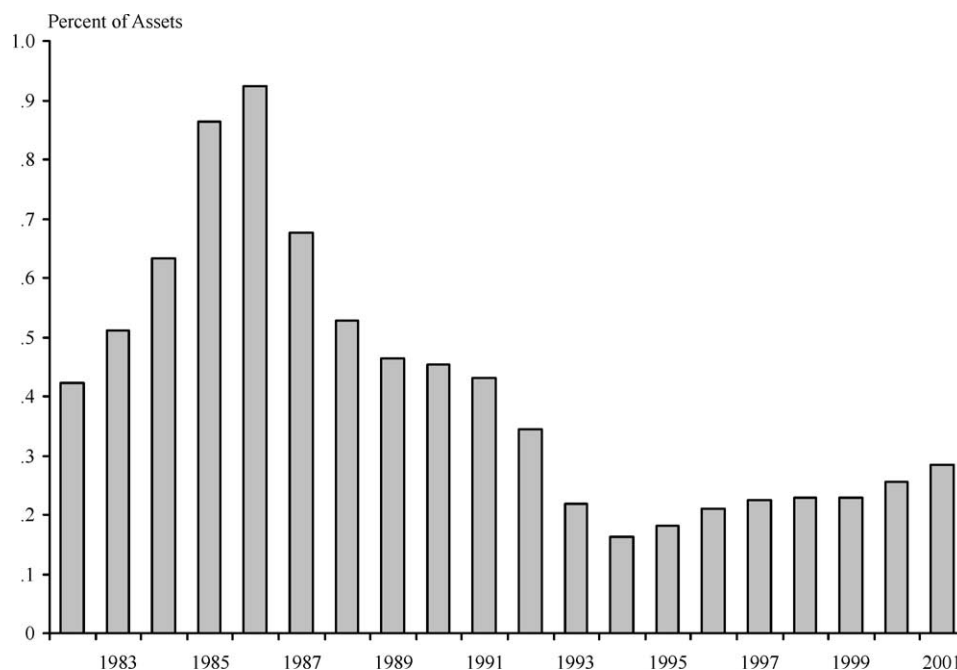


Fig. 1. Average ratio of loan-loss provisions to average assets for US commercial banks (excluding credit card banks, nonbank banks, cooperative banks, industrial banks, and banks less than four years old).

period. We thus provide evidence that exams have an important role in uncovering financial problems and ensuring bank accounting statements reflect them. Based on several different specifications, our results indicate exams often lead to a restatement of financial results to reflect a greater degree of financial difficulty than originally reported. By correcting loss underreporting, exams effectively force bad news into the call report numbers.¹ Second, a study of the revisions to bank financial statements indicates the worse a bank's financial condition, the more likely it is for the originally-reported data to understate financial losses. Third, and more remarkably, despite the direct relationship between revisions and the depth of financial difficulty, exam-based restatements are *evident not only* at institutions previously identified as supervisory concerns, but also at highly-rated banks, where financial problems may be just emerging.

We believe our empirical findings based on bank accounting restatements have important implications, beyond documenting the auditing role of exams. Most notably, the finding that exams play an important role in uncovering financial misstatements at highly-rated institutions points to the value of stepping up exam activity at banks of all ratings during periods of banking difficulties, not just at banks already in problem status. More broadly, the finding of exam-based restatements at even the earliest stages of financial deterioration indicates substantial accounting misstatements—at both banks and other types of companies—can occur well outside severe business circumstances.

The remainder of this study is organized as follows. The next section provides background regarding the potential relationship between supervisory exams and financial reporting, particularly in the context of asset quality problems. We then describe the data, present our empirical results, and conclude.

2. Background

2.1. Loan-loss accounting

Deterioration in loan portfolios typically has been the primary proximate cause of downturns in the banking sector. Through provision for loan and lease losses, banks add funds to the allowance for loan and lease losses (ALLL). These provisions are an expense item and reduce a bank's net income. The ALLL balance is subtracted from total loans, so loans on the balance sheet are reported net of ALLL. When loans are charged off, total loans are reduced by the amount of the losses, but the losses are charged against ALLL, leaving net loans unaffected. As a result, timely disclosure of information on credit quality and its impact on overall operating results depends on the degree to which provisions are made in anticipation of, or concurrent with, actual impairment in the loan portfolio. If adequate provisions are made only after the impairment occurs, profitability prior to the provisions is overstated.

¹ While call report revisions provide a unique window through which to view the results of exam activity, in many cases exam findings may simply be reflected in a bank's current, or upcoming, call report, as opposed to revisions to previously reported figures. As a result, call report revisions alone clearly would not be expected to reflect the full extent of the auditing role of exams.

One factor that might prompt banks to set an insufficient level of ALLL and provision expense involves regulatory or market-based penalties for deterioration in financial condition. Risk-based capital requirements allow banks to count ALLL only in Tier-2 capital and only up to 1.25 percent of risk-weighted assets. By not making the necessary provisions, banks with asset-quality problems can raise reported net income and retained earnings, thereby boosting Tier-1 capital and potentially avoiding the restrictions supervisors typically place on troubled banks.² Similarly, if bank managers can conceal deterioration from investors, they may be able to prevent or delay adverse market reactions.

2.2. Supervisory assessment of ALLL

Given the current institutional framework, which assigns supervisors a large role in the monitoring and disciplining of banks, the incentive to underreport provisions provides a particularly strong reason for supervisory exams.³ The Commercial Bank Examination Manual states that “the examiner’s responsibility to determine the adequacy of a bank’s ALLL is one of the most important functions of any examination” (Federal Reserve Board of Governors, 1999).

The supervisory assessment of ALLL occurs in the context of the CAMELS rating system used in safety and soundness exams.⁴ The CAMELS overall, or composite, rating has five levels:

- 1: basically sound in every respect;
- 2: fundamentally sound but with modest weaknesses;
- 3: financial, operational, or compliance weaknesses that cause supervisory concern;
- 4: serious financial weaknesses that could impair future viability; and
- 5: critical financial weaknesses that render the probability of near-term failure extremely high.

In verifying the adequacy of ALLL, examiners consider information obtained during the current and prior exams, loan quality trends and peer group data, processes for internal

² Also, because the amount of Tier-2 capital is restricted to be no greater than the amount of Tier-1 capital, banks raising Tier-1 capital by making fewer provisions than necessary may in some cases be able to boost Tier-2 capital as well.

³ Besides examiner review, a bank’s loan-loss accounting may also be reviewed by independent auditors. While all commercial banks are subject to exams, not all are subject to external audits. The Federal Reserve requires bank holding companies with consolidated assets of \$500 million or more to have an annual external audit. New banks are also required to have external audits. The SEC requires audits for publicly-traded companies, including bank holding companies. Finally, the Federal Deposit Insurance Corporation Improvement Act of 1991 requires annual external audits for any bank insured by the Federal Deposit Insurance Corporation with assets greater than \$500 million (Federal Reserve Board of Governors, 2000b).

⁴ Under the Uniform Financial Institutions Rating System adopted in 1979, a bank’s overall safety and soundness rating was derived from the on-site evaluation and rating of five separate factors: capital adequacy (C), asset quality (A), management (M), earnings (E), and liquidity (L). The CAMEL rating system was amended on January 1, 1997, to include a sixth component. The new S component focuses on sensitivity to market risk, such as the risk arising from changes in interest rates. For simplicity, we apply the term CAMELS to both CAMEL and CAMELS ratings.

credit review, past-due and restructured loans, and economic conditions. If after considering these factors an examiner finds that a bank's ALLL is too low, the institution normally is required to increase its provision expense and raise ALLL to an appropriate level. Such changes can trigger revisions to previously-issued financial statements.⁵

2.3. *Previous research on exams and ALLL*

Several studies support the view that troubled banks often have insufficient ALLL and exams are important in correcting the problem. The General Accounting Office (1990, 1991) finds troubled or failing banks frequently have insufficient ALLL. Similarly, Berger et al. (1991) discuss the potential for insufficient ALLL, particularly when a bank has not been examined recently. Gilbert (1993) finds abnormally large reductions in capital ratios occur when supervisors downgrade troubled banks. Dahl et al. (1998) conclude that exams influence the recognition of losses on commercial and industrial loans. And Curry et al. (1999) find banks that supervisors have downgraded or subjected to regulatory enforcement actions increase their provision expense.

Setting provisions requires detailed information about a bank's loan portfolio. Bank managers are more likely than outsiders to have such knowledge. However, supervisors may gain knowledge about the adequacy of ALLL through exams. If an exam aligns provision expense and ALLL with credit quality, it may facilitate the public communication of important bank-specific information and thereby enhance banking system transparency. Consistent with this view, Docking et al. (1997) find a bank's announcement of loan-loss provisions adversely affects both that bank's stock price and sometimes the stock price of other banks as well. Berger and Davies (1998) provide evidence that quarterly financial statements act as a conduit for transmitting exam findings to financial markets. And Flannery and Houston (1999) find exams affect the relationship between a bank holding company's market and book value, possibly reflecting the improved accuracy of financial statements following an exam or a certification effect whereby exams serve as a stamp of approval on published financial statements.

Other researchers have reached a different conclusion, however, arguing essentially that outsiders can see through a bank's loan-loss accounting and discern the true quality of its loans, even when provisions and ALLL are lower than necessary. Bruner and Simms (1987), Musumeci and Sinkey (1990a, 1990b), and Beaver and Engel (1996) suggest investors effectively estimate the extent of deterioration in bank loan portfolios. If outsiders accurately estimate losses in a bank's loan portfolio on the basis of other information, the benefits of exams in assessing loan quality and the sufficiency of ALLL may be limited mostly to the supervisory process itself, as opposed to the promotion of financial transparency in general.

⁵ Currently, CAMELS ratings are assigned using the "risk-focused" approach to exams. The risk-focused approach relies on examiner discretion to determine the scope and emphasis of a particular exam, but certain procedures are normally included in every exam, including steps to address the adequacy of a bank's ALLL and the reliability of its financial statements.

3. Data

3.1. Revisions and sample design

The annual data this study uses are limited to US commercial banks for the period from 1996 through 1998.⁶ Banks less than four years old are excluded, since young banks typically exhibit unique financial characteristics and are not directly comparable to more mature banks. The resulting sample contains 25,514 end-of-year call reports.

The originally-reported data are from files transmitted from the Federal Reserve Board, seventy to eighty days following the report dates. The revised data are for the same report dates but were transmitted from the Board in May 2000. Any differences between the original data and the data obtained in May reflect revisions made sometime after the data were published as “final,” which typically occurs about sixty-five days after a report date.

3.2. Financial variables

Our background discussion highlights the potential need for increases in loan-loss provisions, and our empirical analysis focuses on this type of revision.⁷ Such revisions provide a convenient focal point for the analysis, given the central role of loan-loss provisions and ALLL in accounting for asset quality problems.

We also use twelve financial ratios to assess the degree to which banks with financial problems have a relatively high incidence of adverse accounting restatements in the form of upward revisions to provision expense. For these twelve ratios, balance-sheet variables are scaled by end-of-period gross assets, while income-statement variables are expressed relative to average assets for the period.⁸

Total equity capital (*CAPITAL*) is a measure of capital adequacy. High values for this variable indicate financial strength and should reduce the chances of an upward revision to provision expense. A similar effect should be associated with high levels of loan-loss reserves (*RESERVES*), all else equal. However, reserves may represent coverage for loan losses that have not yet been taken but are nevertheless expected and embedded in the current portfolio. As a result, we might estimate a negative effect of reserves on upward revisions to provision expense only to the extent that the embedded losses themselves are fully represented by other variables included in the regressions. Otherwise, by reflecting the presence of problem assets, *RESERVES* could be positively associated with upward revisions to provision expense.

Asset quality problems are captured in six variables, each of which is expected to increase the chances of an upward revision to provision expense. Problem assets them-

⁶ To establish a homogeneous sample, we exclude credit card banks, nonbank banks, cooperative banks, and industrial banks.

⁷ In most cases, a revision to provisions carries through to revisions in associated variables, such as net income and capital. In some cases, though, a revision to provisions might be offset by changes in seemingly unrelated variables, so that accounting consistency is maintained, even though net income is unaffected. Also, other types of revisions do not involve provision expense at all.

⁸ Gross assets are total assets, before netting loan-loss and allocated transfer risk reserves from total loans.

selves are represented by loans past due 90 days or more and still accruing (*PAST-DUE 90*), nonaccrual loans (*NONACCRUAL*), and other real estate owned (*OTHER REAL ESTATE*), which consists primarily of foreclosed real estate.⁹ In addition, net loan charge-offs (*CHARGE-OFFS*) and provision for loan losses (*PROVISIONS*) are also included in the regressions. The final variable included to capture asset quality problems is income earned on loans but not collected (*INC NOT COLLECTED*). This latter variable represents interest payments that are still accruing, even though they have not been collected.

Measures of earnings and liquidity complete our list of financial ratios. Earnings are represented by net income (*RETURN ON ASSETS*) and as a signal of financial strength are expected to reduce the chances of an upward revision to provision expense. As a measure of liquidity, investment securities (*SECURITIES*) should reduce the chances of an upward revision to provision expense, as should high holdings of cash and net fed funds sold (*CASH*).¹⁰ In contrast, by subjecting a bank to higher costs and a potentially less stable funding base, a high reliance on large CDs (*LARGE CDs*) might have the opposite effect on revisions to provision expense.

4. Results

While we focus on exam-driven revisions, not all of the call report revisions we observe are attributable to exams. Other types of revisions are also likely to occur, reflecting the combined effect of numerous and varied influences. In some cases, the findings of internal or external auditors might lead to upward revisions to provision expense. Unfortunately, there is no indicator to identify the specific source of each revision we observe.¹¹ We are left then with the challenge of identifying statistically the degree to which the revisions are associated with exam activity.

4.1. Exams and the incidence of revisions

In this section, we document the incidence of positive and negative revisions to both loan-loss provisions and the ratio of loan-loss provisions to average assets. The results show that the majority of these revisions are positive, or adverse. In addition, the adverse revisions are correlated with exam activity and supervisory downgrades. These findings support the view that exam findings force bad news into the call report numbers.

The upper panel of Table 1 separates the observations into five groups corresponding to a bank's exam status in the year immediately following a year-end call report date. The

⁹ Loans are reported in nonaccrual status if they are maintained on a cash basis because of deterioration in the financial condition of the borrower, payment in full of principal or interest is not expected, or principal or interest has been in default for 90 days or more. An exception to this last condition occurs if a loan is both well secured and in the process of collection.

¹⁰ Investment securities tend to be more liquid than loans. In addition, they typically carry lower credit risk. Given the strong negative correlation that exists between the holdings of these two interest-bearing assets, we include only one in the analysis.

¹¹ While a host of unknown factors may play various roles in the revisions, upon inspection none stand out as being merger related, as percentage shifts in the broadest variables, such as gross assets, are uniformly small.

Table 1

Percentage of bank financial statements with revisions^a to loan-loss provisions and the ratio of loan-loss provisions to average assets, grouped by quarter of exam^b and supervisory downgrade^c in the subsequent year

		Quarter of exam ^b				No exam	<i>p</i> -value ^f
		First	Second	Third	Fourth		
Revisions to provisions ^d	Positive	2.69	1.36	1.08	0.68	0.72	<i>0.001</i>
	Negative	0.31	0.25	0.26	0.06	0.17	
	<i>p</i> -value ^g	<i>0.001</i>	<i>0.001</i>	<i>0.001</i>	<i>0.001</i>	<i>0.001</i>	
Revisions to ratio ^e	Positive	5.14	3.72	2.60	2.16	1.96	<i>0.001</i>
	Negative	2.14	2.55	2.07	1.76	1.70	
	<i>p</i> -value ^g	<i>0.001</i>	<i>0.001</i>	<i>0.057</i>	<i>0.134</i>	<i>0.134</i>	
Observations		5,426	4,780	4,542	3,514	7,252	
		Quarter of supervisory downgrade ^c				Exam, but no downgrade	<i>p</i> -value ^f
		First	Second	Third	Fourth		
Revisions to provisions ^d	Positive	13.46	4.37	2.55	0.86	1.12	<i>0.001</i>
	Negative	0.41	0.46	0.46	0.57	0.21	
	<i>p</i> -value ^g	<i>0.001</i>	<i>0.001</i>	<i>0.011</i>	<i>0.500</i>	<i>0.001</i>	
Revisions to ratio ^e	Positive	18.22	8.74	4.17	2.29	3.01	<i>0.001</i>
	Negative	2.69	3.45	2.08	3.72	2.08	
	<i>p</i> -value ^g	<i>0.001</i>	<i>0.001</i>	<i>0.061</i>	<i>0.192</i>	<i>0.001</i>	
Observations		483	435	432	349	16,563	

^a Revisions are identified as the difference between the financial data as obtained in May 2000, and the original values of these data obtained when the data were first published as “final,” about 65 days after year-end report dates in the 1996–1998 period. Listed are the percentages of observations in each group for which provisions were revised upward and downward, respectively. Bank financial data are obtained from the Federal Reserve Board.

^b Quarter of the first safety and soundness exam occurring in the year immediately following a year-end financial statement.

^c Supervisory downgrades associated with the first exam occurring in the year immediately following a year-end financial statement. Composite safety and soundness ratings have five levels. A downgrade occurs when a bank receives a worse rating on its current exam than on its previous one. Safety and soundness ratings are obtained from the Federal Reserve Board.

^d Revisions to provision expense, the numerator of the ratio of loan-loss provisions to average assets, irrespective of whether the denominator was also revised.

^e Revisions to the ratio of loan-loss provisions to average assets, resulting from changes to the numerator, denominator, or both. Changes to average assets for the period are limited to those involving changes to the year-end financial statement.

^f Significance levels (italics) are based on the Pearson chi-square test for the null hypothesis of no association between the incidence of revisions (positive, negative, or none) and the incidence of exams (first, second, third, fourth quarter, or none) and supervisory downgrades (first, second, third, fourth quarter, or none). The alternative is general association.

^g Significance levels (italics) are for the sign test based on the binomial distribution, under the assumption that upward and downward revisions are equally likely. Let x correspond to the number of either upward or downward revisions, whichever is lower, and let y be the total number of revisions. The significance level shown is the probability of observing x or a lower value, given y .

first group contains banks for which an exam was opened in the first quarter, the second group contains banks not examined until the second quarter, and so on for the third and fourth groups. The fifth group contains banks that were not examined in the year following a call report date. For each of the five groups, we calculate the percentage of observations for which a positive revision occurred and also the percentage with a negative revision. Revisions are identified first based on changes to loan-loss provisions and then based on changes in the ratio of loan-loss provisions to average assets.

As shown in the upper panel of Table 1, the incidence of revisions suggests a significant auditing role for supervisory exams. Looking first at the results for loan-loss provisions, about 2.7 percent of the banks examined in the first quarter revised their previously reported level of provisions upward. The incidence of positive revisions then tends to drop for the groups corresponding to more distant exams, falling to 0.72 percent for the banks not examined at all. In contrast, the incidence of downward revisions to provision expense is relatively low for each of the five groups of banks. A sign test indicates the observed differences between the incidence of positive and negative revisions to provision expense are statistically significant. These patterns conform closely to the notion that because examiners focus on downside risk, they are more prone to require call report revisions when exam findings are adverse. A Pearson chi-square test rejects the null hypothesis of no association between the incidence of revisions (positive, negative, or none) and the incidence of exams (first, second, third, fourth quarter, or none). Similar results are obtained when revisions are identified based on changes in the ratio of loan-loss provisions to average assets.

The finding that adverse revisions to financial statements are associated with exam activity points to a role for exams in uncovering financial problems and ensuring bank accounting statements reflect them. As noted, an important aspect of the analysis is that the period from which the financial statements are drawn, 1996–1998, was a relatively tranquil one. Because financial problems were few, any need for increases in provisions could be expected to have been low. The relatively benign operating environment most likely helped hold to a minimum the number of data revisions in our sample, as the vast majority of exams merely confirmed that individual banks remained financially sound. We would expect both the percentage of banks with adverse revisions and the difference in the incidence of revisions between examined and unexamined banks to increase with banking difficulties.

If exams lead banks to correct the underreporting of financial losses, then adverse revisions to financial statements might be especially prevalent in cases where examiners find that a bank's financial condition has deteriorated to a sufficient degree to warrant a downgrade in its safety and soundness rating. In this regard, the incidence of revisions at downgraded banks provides further evidence of a significant auditing role for supervisory exams, as the pattern of adverse revisions shown in the upper panel of Table 1 is even more pronounced when the examined banks are grouped according to whether a supervisory downgrade occurred.

The lower panel of Table 1 separates the observations according to supervisory downgrades associated with the first exam occurring in the year immediately following a year-end financial statement. The first group contains banks for which a downgrade occurred as the result of an exam opened in the first quarter, the second group contains banks downgraded in the second quarter, and so on for the third and fourth groups. The fifth group

contains banks that were examined in the year following a call report date, but not downgraded. Among the banks downgraded in the first quarter, about 13.5 percent revised their previously reported level of provisions upward. This high rate of revision falls to 0.86 percent for banks downgraded in the fourth quarter and 1.1 percent for banks that were examined, but not downgraded. Similar results are obtained when revisions are identified based on changes in the ratio of loan-loss provisions to average assets.

4.2. Controlling for financial condition

If exam activity happens to be centered on banks with financial problems, then the correlation observed in Table 1 between exams and call report revisions might simply reflect a greater tendency for troubled banks to revise their financial statements, as opposed to a direct revision effect of exams themselves. However, to the extent the twelve financial ratios described earlier effectively capture the financial condition of individual banks, then holding these variables constant in a regression can eliminate the associated omitted-variables bias. Toward this end, we now regress the incidence of revisions on not only indicators of exam activity, but also a set of control variables: the twelve financial ratios, the log of gross assets as of the end of the previous year (*SIZE*), and the rating assigned during a bank's most recent prior safety and soundness exam (*CAMELS-1*). The dependent variable, *REVISION*, is equal to one if provision expense was revised upward, and zero otherwise.

Before turning to the regression results, Table 2 shows the means of the control variables for banks categorized according to whether they revised their provision expense upward. Based on these comparisons, the financial condition of revising banks differs substantially from the condition of banks without a revision. With the exception of *SIZE* and *RESERVES*, each of the variables is correlated with the incidence of revisions, for both the originally-reported and revised data. There is no evidence of a location shift in the distribution of *SIZE* between banks that revised and those that did not. Based on the revised data only, the incidence of revisions is associated with high *RESERVES*. With regard to the other variables, revising banks tend to be financially weaker than non-revising banks (worse *CAMELS-1*; lower *CAPITAL*; higher *PAST-DUE 90*, *NONACCRUAL*, *OTHER REAL ESTATE*, *CHARGE-OFFS*, *PROVISIONS*, and *INC NOT COLLECTED*; lower *RETURN ON ASSETS* and *SECURITIES*; and higher *LARGE CDs*). An apparent exception occurs with *CASH*, which is higher for the revising banks.

Comparing the means for the revising banks based on the original and revised data, it is interesting to note that while *CHARGE-OFFS* is revised upward almost 30 basis points, on average, the upward revision to *PROVISIONS* is twice that, at almost 60 basis points. To the extent the revisions reflect exam findings, these figures are consistent with the view that exams impact two major components of provision expense: one part reflecting the need to cover current charge-offs, and a second part associated with loan difficulties expected to generate increased charge-offs in the future.¹²

¹² As suggested earlier, it is not necessary for the revisions observed in two related variables to match, or add up. For example, *PROVISIONS* is revised upward about 60 basis points, on average, whereas *RETURN ON ASSETS* is lowered only 47 basis points. While provision expense reduces net income dollar-for-dollar, in many cases other variables are also revised, so that only when all the changes are considered is the adding-up constraint

Table 2

Sample means of control variables^a for bank financial statements with and without an upward revision to loan-loss provisions

	Original data			Revised data		
	No upward revision	Upward revision	<i>p</i> -value ^b	No upward revision	Upward revision	<i>p</i> -value ^b
<i>CAMELS-1</i>	1.56	2.23	0.001	1.56	2.23	0.001
<i>SIZE</i>	11.32	11.16	0.151	11.32	11.16	0.144
<i>CAPITAL</i>	10.17	9.48	0.001	10.17	9.02	0.001
<i>RESERVES</i>	0.87	0.95	0.316	0.87	1.25	0.001
<i>PAST-DUE 90</i>	0.21	0.52	0.001	0.21	0.46	0.001
<i>NONACCRUAL</i>	0.37	0.90	0.001	0.37	0.91	0.001
<i>OTHER REAL ESTATE</i>	0.13	0.32	0.001	0.13	0.36	0.001
<i>CHARGE-OFFS</i>	0.16	0.51	0.001	0.16	0.80	0.001
<i>PROVISIONS</i>	0.21	0.61	0.001	0.21	1.20	0.001
<i>INC NOT COLLECTED</i>	0.67	0.72	0.018	0.67	0.72	0.047
<i>RETURN ON ASSETS</i>	1.21	0.67	0.001	1.20	0.20	0.001
<i>SECURITIES</i>	27.99	21.51	0.001	27.99	21.53	0.001
<i>CASH</i>	8.85	10.61	0.001	8.85	10.62	0.001
<i>LARGE CDs</i>	10.05	12.17	0.001	10.06	12.17	0.001
Observations	25,178	336		25,178	336	

^a *CAMELS-1*, previous safety and soundness rating; *SIZE*, log of gross assets; *CAPITAL*, equity capital; *RESERVES*, loan-loss reserves; *PAST-DUE 90*, loans past-due 90 days or more and still accruing; *NONACCRUAL*, nonaccrual loans; *OTHER REAL ESTATE*, other real estate owned; *CHARGE-OFFS*, loan charge-offs less recoveries; *PROVISIONS*, provision for loan and lease losses; *INC NOT COLLECTED*, income earned but not collected; *RETURN ON ASSETS*, net income; *SECURITIES*, investment securities; *CASH*, cash plus net fed funds sold; *LARGE CDs*, certificates of deposit of \$100,000 or more. *CAPITAL*, *RESERVES*, *PAST-DUE 90*, *NONACCRUAL*, *OTHER REAL ESTATE*, *INC NOT COLLECTED*, *SECURITIES*, *CASH*, and *LARGE CDs* are end-of-period values, scaled by end-of-period assets. *CHARGE-OFFS*, *PROVISIONS*, and *RETURN ON ASSETS* are annual values, divided by average assets for the year. Each of the twelve financial ratios is multiplied by 100.

^b For *CAMELS-1*, significance levels are based on the Pearson chi-square test for the null hypothesis of no association with upward revisions to loan-loss provisions. Significance levels for the remaining variables are based on the Wilcoxon test for a shift in location parameter.

In Table 3, we report linear (OLS) and probit regressions for the incidence of upward revisions to provision expense.¹³ Two versions of each regression are estimated, one where the explanatory variables are based on the originally-reported data and one using the revised data. Since the control variables are intended to characterize the financial condition

satisfied in levels. Moreover, the ratios' denominators are also often revised, so that adding up should not even be expected for the ratios. As another example, the majority of the observations with upward revisions to provision expense also have revisions to gross assets: 38 percent of the time gross assets is revised upward and 43 percent downward. The net effect of these revisions, in terms of the average logarithmic change in gross assets, is small, at -0.1 percent. In only 5.6 percent of these cases do the revisions to gross assets correspond exactly to the revisions in net charge-offs. For the remaining cases, other variables are revised.

¹³ It is well known that the linear regression model suffers from several fundamental weaknesses when applied to a binary dependent variable. We nevertheless include the OLS results, partly as a basis for comparison with the probit model, and partly in anticipation of our further use of the linear specification in a later section dealing with instrumental variables.

Table 3

Regressions^a of the incidence of upward revisions to loan-loss provisions on the control variables and exam activity^b in the subsequent year

	OLS		Probit	
	Original data	Revised data	Original data	Revised data
Constant	0.0105 (0.0098)	0.0142 (0.0096)	−2.324* (0.3245)	−2.187* (0.3348)
<i>EXAM1</i> ^b	0.0174* (0.0020)	0.0163* (0.0020)	0.4935* (0.0662)	0.4705* (0.0674)
<i>EXAM2</i> ^b	0.0044† (0.0021)	0.0038 (0.0021)	0.1851† (0.0756)	0.1622† (0.0776)
<i>EXAM3</i> ^b	0.0022 (0.0021)	0.0022 (0.0021)	0.1190 (0.0798)	0.1259 (0.0809)
<i>EXAM4</i> ^b	−0.0013 (0.0023)	−0.0011 (0.0023)	−0.0639 (0.0969)	−0.0641 (0.0991)
<i>CAMELS-1</i>	0.0131* (0.0014)	0.0067* (0.0014)	0.3682* (0.0418)	0.2204* (0.0429)
<i>SIZE</i>	−0.0013 (0.0007)	−0.0019* (0.0007)	−0.0284 (0.0228)	−0.0324 (0.0236)
<i>CAPITAL</i>	0.0219 (0.0181)	0.0078 (0.0177)	0.5534 (0.4806)	0.2031 (0.5624)
<i>RESERVES</i>	−1.291* (0.1808)	−0.3189 (0.1764)	−41.88* (6.534)	−25.21* (6.141)
<i>PAST-DUE 90</i>	1.184* (0.1693)	0.0565 (0.1699)	10.77* (3.287)	0.8720 (3.824)
<i>NONACCRUAL</i>	0.9799* (0.1329)	0.4635* (0.1291)	13.06* (2.865)	8.375* (2.931)
<i>OTHER REAL ESTATE</i>	0.4822† (0.2061)	1.195* (0.1954)	0.6274 (4.308)	8.768† (3.872)
<i>CHARGE-OFFS</i>	0.7068† (0.3356)	−3.136* (0.3262)	4.117 (7.671)	−36.76* (8.601)
<i>PROVISIONS</i>	1.120* (0.3039)	7.345* (0.2939)	17.30† (7.014)	62.18* (8.120)
<i>INC NOT COLLECTED</i>	−0.4130† (0.1742)	−0.4883* (0.1714)	−6.833 (5.390)	−6.386 (5.507)
<i>RETURN ON ASSETS</i>	−0.2185* (0.0729)	−0.4660* (0.0702)	−3.681 (2.522)	−10.25* (2.674)
<i>SECURITIES</i>	−0.0266* (0.0061)	−0.0030 (0.0059)	−1.138* (0.2114)	−0.8145* (0.2126)
<i>CASH</i>	−0.0005 (0.0092)	0.0181† (0.0091)	−0.3183 (0.2864)	−0.0690 (0.2936)
<i>LARGE CDs</i>	0.0281† (0.0113)	0.0153 (0.0110)	0.8937* (0.3216)	0.8831* (0.3327)
<i>F/χ^{2c}</i>	46.4*	107.5*	526.3*	681.1*

^a There are 25,514 observations, including 336 with an upward revision to provision expense. Standard errors are in parentheses.

^b *EXAM1* is a binary indicator for whether a bank's first exam in the year immediately following a year-end financial statement occurred in the first quarter, *EXAM2* is a binary indicator for banks examined in the second quarter, and so on for *EXAM3* and *EXAM4*. Data on the occurrence of exams are obtained from the Federal Reserve Board.

^c *F* and χ^2 statistics for the null hypothesis of zero slope coefficients in the OLS and probit regressions, respectively.

* Significant at the 1-percent level.

† Significant at the 5-percent level.

of banks, the revised data, which presumably are more accurate, may be most appropriate. On the other hand, for a practical assessment of the predictability of revisions, it may be better to use the originally-reported data, since they represent real-time information. In addition to the control variables, four indicators of exam activity are included in the regressions. *EXAM1* is an indicator for whether a bank's first exam in the year immediately following a year-end call report occurred in the first quarter, *EXAM2* is an indicator for banks examined in the second quarter, and so on for *EXAM3* and *EXAM4*. In explaining upward revisions to provision expense, we use the occurrence of an exam, rather than a supervisory downgrade, as our measure of exam activity. Because downgrades reflect exam findings, they may be as much the result of financial statement revisions as the other way around. In this sense, revisions and downgrades are viewed as a joint result of exams.

While there are some differences between the estimates based on the originally-reported data and those based on revised data, overall the results indicate banks become more likely to underreport financial losses, as suggested by subsequent upward revisions to provision expense, as their financial condition deteriorates. In at least two of the four regressions, the probability of revision is associated with worse *CAMELS-1*; lower *RESERVES*; higher *PAST-DUE 90*, *NONACCRUAL*, *OTHER REAL ESTATE*, and *PROVISIONS*; lower *RETURN ON ASSETS* and *SECURITIES*; and higher *LARGE CDs*. The coefficient estimates for *PROVISIONS* are substantially larger in the regressions using revised data than in those based on original data, presumably reflecting the tendency for the revising banks to stand out in terms of having high provision expense after revising provisions upward.

Of particular interest are the results for the variables based on exam activity. As shown in Table 3, the coefficient on *EXAM1* is positive and significant in each of the four regressions, and *EXAM2* is positive and significant in three cases.¹⁴ Moreover, inclusion of the control variables does not materially alter the magnitude of the estimated exam effects. The OLS estimate for *EXAM1* of 1.74 percent (using the original data) is only slightly lower than the 1.97 percentage-point difference in the incidence of positive revisions to provision expense between banks examined in the first quarter and banks not examined at all, as shown in Table 1. A similar comparison holds for *EXAM2*. These findings, after controlling for the financial condition of individual banks, point to an auditing role for exams in leading to the restatement of financial results to reflect a greater degree of financial difficulty than originally reported.

Because the probit model is nonlinear, the magnitude of the coefficient estimates is not directly comparable to the OLS results. To gauge the exam effects estimated using the probit model, we calculate an average exam effect, as $(1/N) \sum_i [\Phi(X_i\beta + \delta) - \Phi(X_i\beta)]$,

¹⁴ We also interact time (quarters) since the last exam with a single indicator variable for exams conducted in the first and second quarters, to see if a relatively long length of time since the last exam might heighten the tendency for the current exam to result in revisions. However, the interaction term is insignificant in both OLS regressions and in the probit regression based on originally-reported data. In the probit regression using revised data, this term possesses the expected positive sign and is significant, but only at the 5-percent level. The other results are unaffected by inclusion of the interaction term. Overall, after controlling for a bank's financial condition, we are unable to find convincing evidence for the notion that an exam conducted following a relatively lengthy period of no exam activity is more likely to result in revisions.

where N is the number of observations, $\Phi(\cdot)$ is the standard normal cumulative distribution function, β is the estimated coefficient vector outside the exam variable of interest, and δ is the estimated coefficient for the exam variable. For *EXAM1*, the estimated average exam effect is 0.0185 based on the original data and 0.0165 for the revised data, falling very close to the OLS estimates. The standard errors, calculated using the “delta” method, are 0.0032 and 0.0030, respectively. Similar comparisons hold for *EXAM2*.

4.3. Controlling for external audits

While we may not be able to account for all the factors affecting revisions, some limited data are available with regard to the potential influence of external auditors. In the March call report, banks are asked to identify the most comprehensive level of external audit work that occurred on any financial statements related to the previous year. From this information, we are able to construct a binary indicator (*AUDIT*) for whether a bank or its parent holding company received an independent audit conducted in accordance with generally accepted auditing standards by a certified public accounting firm. Unfortunately, because this information is not provided until the March call report is issued, it is not available for all the banks that submitted a December report for the previous year, as some had merged with other institutions or otherwise ceased to exist. This variable is available for 25,152 of the 25,514 observations in our sample, including 333 with an upward revision to provision expense. In addition, because this information on external audits is derived from a comparison of all audit work related to the previous year, we cannot be certain that a bank's year-end financial statement actually received the level of audit work indicated. But despite its limited nature, inclusion of *AUDIT* in the regressions should provide a reasonable indication of whether the revisions we observe partly reflect the findings of external auditors and whether the exam-related audit effects we have identified are independent of external audit effects.

As shown in Table 4, the estimated exam effects are robust with respect to the inclusion of *AUDIT*. To conserve space, the results for the control variables are not displayed, as they are highly similar to those reported in Table 3. The coefficient on *AUDIT* is itself positive and significant in each of the four regressions, suggesting external auditors also prompt upward revisions to provision expense.

4.4. Instrumental variables

The regression analyses conducted so far may not eliminate the potential for omitted variables bias, since our list of explanatory variables may not include all the factors that help determine revisions, and some of these omitted factors may be correlated with exam activity. To control more fully for omitted variables bias, we now consider explicitly the potential determinants of exam activity. More specifically, we attempt to identify an instrument that is correlated with exams, but otherwise unrelated to revisions. A good instrument should be uncorrelated with any variables that may have been omitted from the revisions regression and the regression error. Such an instrument would allow us to use the exogenous variation in exam activity to form a consistent estimate of the relationship between exams and revisions, irrespective of any omitted variables.

Table 4

Regressions^a of the incidence of upward revisions to loan-loss provisions on the control variables, exam activity in the subsequent year, and an indicator for independent audits conducted in accordance with generally accepted auditing standards by a certified public accounting firm^b

	OLS		Probit	
	Original data	Revised data	Original data	Revised data
<i>EXAM1</i>	0.0172* (0.0020)	0.0158* (0.0020)	0.4988* (0.0682)	0.4672* (0.0691)
<i>EXAM2</i>	0.0042† (0.0021)	0.0034 (0.0021)	0.1817† (0.0775)	0.1498 (0.0794)
<i>EXAM3</i>	0.0020 (0.0022)	0.0017 (0.0021)	0.1189 (0.0816)	0.1168 (0.0825)
<i>EXAM4</i>	−0.0015 (0.0023)	−0.0016 (0.0023)	−0.0738 (0.0989)	−0.0826 (0.1009)
<i>AUDIT</i> ^b	0.0078* (0.0017)	0.0070* (0.0016)	0.2947* (0.0590)	0.2947* (0.0606)

^a To conserve space, the estimates for the constant and the control variables are not shown. They are highly similar to the results reported in Table 3. Based on the availability of *AUDIT*, there are 25,152 observations, including 333 with an upward revision to provision expense. Standard errors are in parentheses.

^b *AUDIT* is a binary indicator for whether a bank or its parent holding company received an independent audit conducted in accordance with generally accepted auditing standards by a certified public accounting firm. Data for *AUDIT* are obtained from the Federal Reserve Board.

* Significant at the 1-percent level.

† Significant at the 5-percent level.

In the instrumental variables analysis, we focus on exam activity in the first two quarters of the year immediately following a year-end call report, as suggested by the regression results in Table 3, which point to these exams as having a potentially significant effect on revisions to the year-end data. The first stage involves estimation of a linear regression for *EXAM*, a binary indicator for whether a bank's first exam in the year immediately following a year-end call report occurred in the first half. A linear specification for the first-stage regression is motivated by the fact that two-stage least squares (2SLS) estimates based on a linear probability model are consistent, whether or not the first-stage conditional expectation function is actually linear, whereas a nonlinear specification for the first stage (such as logit or probit) generates consistent second-stage estimates only if the nonlinear specification chosen for the first stage is exactly right (Angrist, 2001; Angrist and Krueger, 2001). Regarding the second stage, even if the underlying relationship is nonlinear, linear instrumental variables estimates generally are successful in identifying average treatment effects, and the 2SLS estimates of such effects are typically similar to the estimates produced by alternative estimation strategies. Evans et al. (1999) provide a nice example of the linear instrumental variables technique when the outcome of interest and the endogenous regressor are both discrete, as is the case here.

To obtain consistent estimates of the impact of exams on financial statement revisions in the 2SLS regressions, we must identify a variable that induces revisions only through the occurrence of exams. In this regard, the supervisory agencies operate under frequency guidelines dictating that banks be examined at least once every 18 months. More specifically, the guidelines allow an 18-month exam cycle for 1- and 2-rated banks with total

Table 5

Sample means for bank financial statements with and without an exam in the first half of the subsequent year^a

	Original data			Revised data		
	No exam	Exam	<i>p</i> -value ^b	No exam	Exam	<i>p</i> -value ^b
<i>FREQUENCY</i> ^c	4.16	2.22	0.001	4.16	2.22	0.001
<i>CAMELS-1</i>	1.55	1.61	0.001	1.55	1.61	0.001
<i>SIZE</i>	11.32	11.32	0.368	11.32	11.32	0.367
<i>CAPITAL</i>	10.19	10.11	0.892	10.19	10.10	0.925
<i>RESERVES</i>	0.86	0.88	0.001	0.86	0.89	0.001
<i>PAST-DUE 90</i>	0.21	0.23	0.046	0.21	0.23	0.043
<i>NONACCRUAL</i>	0.36	0.40	0.001	0.36	0.40	0.001
<i>OTHER REAL ESTATE</i>	0.14	0.14	0.454	0.14	0.14	0.414
<i>CHARGE-OFFS</i>	0.16	0.17	0.203	0.16	0.18	0.097
<i>PROVISIONS</i>	0.21	0.23	0.001	0.21	0.24	0.001
<i>INC NOT COLLECTED</i>	0.67	0.68	0.035	0.67	0.68	0.037
<i>RETURN ON ASSETS</i>	1.22	1.17	0.019	1.21	1.16	0.004
<i>SECURITIES</i>	27.95	27.84	0.761	27.96	27.83	0.748
<i>CASH</i>	8.94	8.76	0.109	8.94	8.76	0.108
<i>LARGE CDs</i>	10.03	10.16	0.484	10.03	10.16	0.479
Observations	15,308	10,206		15,308	10,206	

^a Observations are categorized according to whether an exam occurred in the first half of the year immediately following a year-end financial statement.

^b For *FREQUENCY* and *CAMELS-1*, significance levels are based on the Pearson chi-square test for the null hypothesis of no association with exams. Significance levels for the remaining variables are based on the Wilcoxon test for a shift in location parameter.

^c *FREQUENCY* is the number of quarters remaining in the exam frequency guidelines. Data used in constructing *FREQUENCY* are from the Federal Reserve Board.

assets less than or equal to \$250 million, while other banks are required to be examined at least once every 12 months (Federal Reserve Board of Governors, 2000a).¹⁵ These guidelines appear to provide a reasonable basis for the required instrument, since they have a substantial influence on the timing of exams, but absent the actual occurrence of an exam, where a bank stands in its exam cycle would not be expected to influence whether or not it revises a previous call report. We use as an instrument the number of quarters left in a bank's exam cycle, as of the call report date (*FREQUENCY*).

Table 5 shows the variable means for banks according to whether they were examined in the first two quarters of the year immediately following a year-end call report, using both the original and revised data. The occurrence of an exam is associated with a low amount of time remaining in a bank's exam cycle (*FREQUENCY*). Examined banks also have worse values of *CAMELS-1* than unexamined banks, suggesting examiners direct increased attention to known supervisory problems. Also, in several cases the differences in means provide further indication that exam activity is directed at financially troubled banks. Us-

¹⁵ The guidelines also include a few other requirements banks must meet to be eligible for the 18-month exam cycle. Banks must also be well capitalized, well managed, free from formal enforcement actions, and free from a change in control during the preceding 12-month period. The vast majority of 1- and 2-rated banks meet these additional requirements. The qualifying asset size was raised from \$100 million to \$250 million in February 1997, just after the start of our sample period, year-end 1996.

ing either the original or revised data, exams are associated with higher *PAST-DUE 90*, *NONACCRUAL*, *PROVISIONS*, and *INC NOT COLLECTED*; and lower *RETURN ON ASSETS*.

The 2SLS regression results are shown in Table 6. The first two columns contain the results for *EXAM*, using original and revised data, respectively. The less time remaining in the exam frequency guidelines, the more likely is an exam, as indicated by the negative and highly significant estimated effect of *FREQUENCY*. In addition, *EXAM* is associated with a poor supervisory rating (*CAMELS-1*), a small asset base (*SIZE*), and low liquidity (*CASH*). The results also include the unexpected finding that high levels of foreclosed real estate (*OTHER REAL ESTATE*) reduce the chances of an exam.

The 2SLS results for *REVISION* are shown in the third and fourth columns of Table 6. Most importantly, the coefficient on *EXAM* is positive and significant, using either original or revised data.¹⁶ In addition, the estimates are similar in size to the OLS estimates for *EXAM1* shown in Table 3.¹⁷ The 2SLS estimates for the remaining variables are also highly similar to the single-equation OLS estimates presented earlier.¹⁸

As a final check, we also use the bivariate probit to estimate our two-equation system. While laden with distributional assumptions, the bivariate probit is an appropriate model for our problem, as the outcome of interest and the endogenous regressor are both binary. As reported in the third and fourth columns of Table 7, the coefficient on *EXAM* is again positive and significant, using either original or revised data, and the inferences for the remaining variables are also highly similar to the single-equation probit results shown in Table 3 and discussed in the related text. The estimated correlation coefficient for the error terms in the exam and revision equations is insignificant, using either original or revised data.

The finding of a significant auditing role for exams in leading to the restatement of financial results to reflect a greater degree of financial difficulty than originally reported is robust with respect to all our attempts to control for omitted variables bias.

¹⁶ The coefficient on *EXAM* is also positive and significant in 2SLS regressions for which the dependent variable is equal to the size of revisions, scaled by gross assets, for cases where an upward revision occurred, and zero otherwise.

¹⁷ The 2SLS estimates for *EXAM* are slightly lower than the OLS estimates for *EXAM1*; however, this should be expected, since *EXAM* represents the combination of *EXAM1* and *EXAM2*, and the OLS estimates for *EXAM2* are comparatively low. OLS estimates for *EXAM* are 0.0109 and 0.0101, using the original and revised data, respectively. At 0.0164 and 0.0153, the 2SLS estimates are actually higher. In any case, as noted earlier, we expect the effect of exams in driving revisions to vary over time, rising in periods of banking difficulties. Because our sample covers a relatively tranquil banking period, we are more concerned with the sign and significance of the estimated exam effect, as opposed to its magnitude.

¹⁸ To determine whether pooling affects the results, we also estimate the 2SLS regressions separately for each of the three year-end call report dates included in the analysis. The resulting coefficient estimates for *EXAM* are positive and significant in each of the three years. The estimates and their standard errors are as follows: for 1996, the original data yield 0.0142 (0.0045) and the revised data give 0.0132 (0.0044); for 1997, the original data give 0.0150 (0.0044) and the revised 0.0138 (0.0042); for 1998, the corresponding estimates are 0.0209 (0.0043) and 0.0196 (0.0042).

Table 6

Two-stage least squares regressions^a of the incidence of upward revisions to loan-loss provisions on the control variables and exam activity^b in the subsequent year

	Incidence of exam activity		Incidence of upward revisions to provision expense	
	Original data	Revised data	Original data	Revised data
Constant	1.522* (0.0370)	1.526* (0.0370)	0.0085 (0.0099)	0.0124 (0.0097)
<i>FREQUENCY</i>	−0.1657* (0.0015)	−0.1657* (0.0015)	—	—
<i>EXAM</i> ^b	—	—	0.0164* (0.0025)	0.0153* (0.0025)
<i>CAMELS-1</i>	0.0170* (0.0050)	0.0150* (0.0050)	0.0130* (0.0014)	0.0066* (0.0014)
<i>SIZE</i>	−0.0505* (0.0024)	−0.0507* (0.0024)	−0.0012 (0.0007)	−0.0019* (0.0007)
<i>CAPITAL</i>	−0.1184 (0.0650)	−0.1186 (0.0650)	0.0219 (0.0181)	0.0078 (0.0177)
<i>RESERVES</i>	0.8675 (0.6496)	0.8083 (0.6468)	−1.300* (0.1810)	−0.3271 (0.1766)
<i>PAST-DUE 90</i>	0.2409 (0.6082)	0.2674 (0.6230)	1.193* (0.1694)	0.0624 (0.1700)
<i>NONACCRUAL</i>	0.3420 (0.4777)	0.3244 (0.4736)	0.9692* (0.1331)	0.4544* (0.1293)
<i>OTHER REAL ESTATE</i>	−2.162* (0.7404)	−1.740† (0.7162)	0.4913† (0.2063)	1.203* (0.1955)
<i>CHARGE-OFFS</i>	−1.827 (1.206)	−2.393† (1.196)	0.7202† (0.3359)	−3.126* (0.3266)
<i>PROVISIONS</i>	0.9727 (1.092)	1.993 (1.078)	1.111* (0.3042)	7.341* (0.2942)
<i>INC NOT COLLECTED</i>	0.6035 (0.6257)	0.5959 (0.6284)	−0.4265† (0.1743)	−0.5010* (0.1715)
<i>RETURN ON ASSETS</i>	−0.1492 (0.2619)	−0.1826 (0.2574)	−0.2178* (0.0730)	−0.4652* (0.0703)
<i>SECURITIES</i>	0.0178 (0.0218)	0.0190 (0.0217)	−0.0268* (0.0061)	−0.0032 (0.0059)
<i>CASH</i>	−0.2356* (0.0332)	−0.2350* (0.0332)	−0.0001 (0.0092)	0.0186† (0.0091)
<i>LARGE CDs</i>	0.0416 (0.0404)	0.0393 (0.0404)	0.0278† (0.0113)	0.0150 (0.0110)
<i>F</i> ^c	811.1*	811.2*	52.1*	125.5*

^a There are 25,514 observations, including 10,206 with an exam in the first half of the year immediately following a year-end financial statement and 336 with an upward revision to provision expense. Standard errors are in parentheses.

^b Binary indicator for the occurrence of an exam in the first half of the year immediately following a year-end financial statement.

^c *F*-statistic for the null hypothesis of zero slope coefficients.

* Significant at the 1-percent level.

† Significant at the 5-percent level.

Table 7

Bivariate probit regressions of the incidence of upward revisions to loan-loss provisions on the control variables and exam activity in the subsequent year^a

	Incidence of exam activity		Incidence of upward revisions to provision expense	
	Original data	Revised data	Original data	Revised data
Constant	3.257* (0.131)	3.273* (0.1302)	−2.349* (0.3477)	−2.176* (0.3566)
<i>FREQUENCY</i>	−0.5338* (0.0057)	−0.5337* (0.0057)	—	—
<i>EXAM</i>	—	—	0.4691* (0.0842)	0.3191* (0.0886)
<i>CAMELS-1</i>	0.0641* (0.0175)	0.0567* (0.0173)	0.3576* (0.0374)	0.2180* (0.0399)
<i>SIZE</i>	−0.1637* (0.0086)	−0.1641* (0.0086)	−0.0259 (0.0261)	−0.0301 (0.0273)
<i>CAPITAL</i>	−0.4099† (0.1728)	−0.4025† (0.1728)	0.5803 (0.6648)	0.2417 (0.6756)
<i>RESERVES</i>	4.082 (2.276)	3.829 (2.244)	−41.50* (5.351)	−24.96* (5.794)
<i>PAST-DUE 90</i>	0.7864 (2.337)	1.031 (2.333)	11.43* (2.722)	1.638 (3.484)
<i>NONACCRUAL</i>	0.7894 (1.667)	0.6679 (1.653)	12.58* (2.674)	8.266* (2.798)
<i>OTHER REAL ESTATE</i>	−7.276† (2.830)	−5.876† (2.662)	0.8378 (4.027)	8.805* (3.258)
<i>CHARGE-OFFS</i>	−5.132 (4.298)	−7.444 (4.338)	4.842 (6.606)	−37.41* (5.919)
<i>PROVISIONS</i>	1.535 (3.749)	5.380 (3.895)	16.38* (5.923)	62.39* (5.035)
<i>INC NOT COLLECTED</i>	3.120 (2.344)	3.011 (2.339)	−7.413 (4.048)	−6.604 (4.592)
<i>RETURN ON ASSETS</i>	−0.8706 (1.230)	−1.145 (1.212)	−3.800 (2.514)	−10.40* (2.354)
<i>SECURITIES</i>	0.1009 (0.0778)	0.1030 (0.0774)	−1.133* (0.2045)	−0.8046* (0.2127)
<i>CASH</i>	−0.8084* (0.1148)	−0.8098* (0.1147)	−0.3120 (0.3110)	−0.0678 (0.3261)
<i>LARGE CDs</i>	0.1259 (0.1445)	0.1166 (0.1436)	0.8598* (0.3267)	0.8439† (0.3401)
ρ^b	−0.1058 (0.0585)	−0.0014 (0.0623)	—	—

^a Standard errors are in parentheses.

^b Estimated correlation coefficient for the error terms in the exam and revision equations.

* Significant at the 1-percent level.

† Significant at the 5-percent level.

4.5. Financial significance of revisions

While we have found substantial evidence that exams are effective in uncovering financial problems and ensuring financial statements reflect them, are the revisions financially significant? Table 2 compared the means of the control variables, using both the original and revised data, for banks that revised their provision expense upward and those that did not. As shown in the columns for the revising banks, revisions resulted in substantial increases in *PROVISIONS* of about 60 basis points, on average, and large reductions in *RETURN ON ASSETS* and *CAPITAL*. From a safety and soundness standpoint, these changes are significant. In a separate study (Gunther and Moore, forthcoming) we find the relationship between accounting data and safety and soundness ratings is significantly stronger for the revised data than for the data as originally reported. The originally-reported data often understate emerging financial weaknesses, to the extent that the capacity of the original data to distinguish problem from nonproblem banks, as viewed from a supervisory perspective, is compromised.

The financial significance of the revisions is also apparent in a comparison of the distribution of *RETURN ON ASSETS*, before and after revisions. In Fig. 2, we show the proportion of observations within 50 basis points of each value of profitability for banks

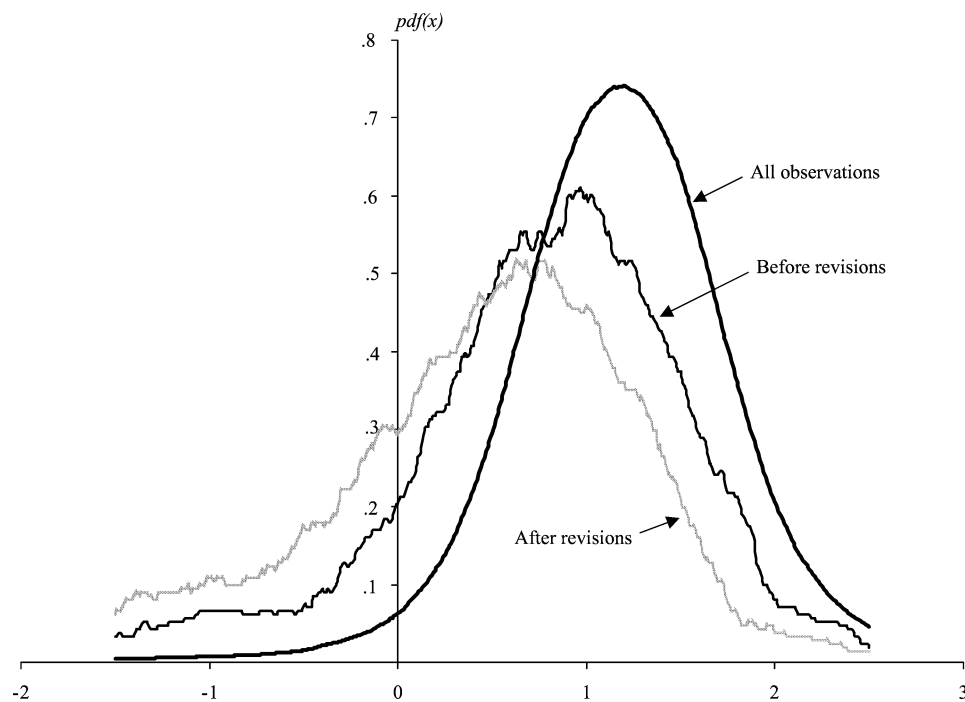


Fig. 2. Distribution of the ratio of net income to average assets for all banks and for banks that were examined in the first half of the following year and revised loan-loss provisions upward. Distributions are based on a kernel density estimator, $pdf(x_0) = (1/N) \sum_i K(x_i - x_0)$, where $K(x) = 1$ if $|x| < 0.5$ and zero otherwise, N is the number of observations, and x_i is $100 \cdot \text{RETURN ON ASSETS}$.

with $EXAM = 1$ and $REVISION = 1$, first using the originally-reported data and then the revised data. For purposes of further comparison, we also show the same type of distribution for all observations, using the revised data. Banks that were examined and revised provision expense upward were not as profitable as banks on average, even before revising provisions to reflect the actual extent of their financial difficulty, as shown in Fig. 2. And once the additional provisions were made, the profitability of these banks was reduced substantially further.¹⁹

4.6. Exams and revisions at highly-rated banks

The results above document the role of exams in identifying financial losses and ensuring bank accounting statements reflect them. In this section, we estimate the 2SLS regressions again, using all the explanatory variables, except this time we obtain separate estimates for nonproblem banks ($CAMELS-1 = 1$ or 2) and problem banks ($CAMELS-1 = 3, 4$, or 5). There are 24,519 observations for the nonproblem banks, including 9,643 with $EXAM = 1$ and 245 with $REVISION = 1$. There are 995 problem-bank observations, including 563 with $EXAM = 1$ and 91 with $REVISION = 1$.

Our objective is to determine whether the auditing role of exams is important only for banks with known problems, or if exam-based revisions to financial statements occur also at highly-rated institutions. Banks with a composite rating of 4 or 5 are obviously problems, and 3-rated banks are sometimes referred to as problems as well. Recall that a 2-rating is for banks that are fundamentally sound but with modest weaknesses, whereas a 3-rating corresponds to financial, operational, or compliance weaknesses that cause supervisory concern. In this sense, a rating of 3 brings a bank into transitional status, from which point further deterioration is not uncommon. Once a bank moves to a 3-rating, supervisors tend to increase direct inspection efforts relative to off-site efforts based on call report data. This tendency is embodied in the exam frequency guidelines themselves, which allow a longer exam cycle for certain 1- and 2-rated banks, as discussed earlier. As a result, a finding of significant accounting revisions at 1- and 2-rated banks would have important supervisory implications, since supervisors typically rely heavily on financial reports in monitoring changes in the financial condition of highly-rated banks. Such a finding would indicate the call report data may be in question exactly at the point at which they are relied upon the most.

For banks with a prior safety and soundness rating of 1 or 2, the 2SLS coefficient estimate for $EXAM$ is 0.0136 using the original data and 0.0128 for the revised data. Both estimates are significant at the 1-percent level, with a standard error of 0.0023 using the original data and 0.0022 for the revised data. These estimates of exam effects at nonproblem banks are similar to those shown in Table 6 for the full sample (0.0164 and 0.0153, respectively). To conserve space, the results for the control variables are not shown, as they also are similar to those reported in Table 6. The financially weakest of the highly-rated banks are the most likely to require revisions.

¹⁹ Among the 211 banks with $EXAM = 1$ and $REVISION = 1$, $RETURN ON ASSETS$ was revised in 204 cases. For these banks, Student's t -value is 10.46 for the hypothesis of zero mean difference between $RETURN ON ASSETS$ calculated using the originally-reported and subsequently-revised data.

For banks with a prior safety and soundness rating of 3, 4, or 5, the 2SLS coefficient estimate for *EXAM* is 0.0507 using the original data and 0.0824 for the revised data. However, *EXAM* is significant (5-percent level) only in the regression estimated using revised data, as the standard errors are 0.0421 and 0.0412, respectively. Significance levels in general are lower for the subset of banks previously identified as supervisory problems, perhaps reflecting the smaller sample size.

4.7. Revisions at publicly-traded institutions

A final issue of some interest involves the extent to which the auditing role of exams in correcting the underreporting of financial losses occurs for the banking sector as a whole, including large publicly-traded organizations, or instead is limited to smaller banks. Because our sample covers only a short period of relatively favorable banking conditions, we are not able to address this issue fully, since few moderate- or large-sized institutions faced substantial difficulties. Nevertheless, the observations available to us include some relevant cases.

Within our sample there are six instances where a bank with over \$500 million in assets was examined in the first half of the year and revised upward the provision expense stated in its previous year-end call report.²⁰ Of these six, we identify four as belonging to publicly-traded companies that filed quarterly and annual financial statements with the SEC.

To obtain an indication of the auditing role of exams at publicly-traded institutions, we have searched the documents these companies filed with the SEC for direct evidence of an exam effect in precipitating the observed revisions. In two of the four cases, the public documents do not directly mention an impact of exam findings on financial statements. However, in each of the other two cases, the entity filed form NT 10-K near the end of March, notifying the SEC that it would be late in filing its financial statement (10-K) for the previous year. In each case, the stated reason for the late filing was that an ongoing bank exam indicated preliminarily that the institution's allowance for loan losses was too low and that the prior year's provision for loan losses should be substantially increased. Given that banks are required to file their call report within 30 days of the report date, by the end of March these institutions presumably had already filed their year-end report, so that the ongoing exam-based assessment of the appropriate level of loan-loss reserves for the previous year can explain the call report revisions observed for these entities. While from the standpoint of our empirical investigation we could wish for a greater number of troubled banks to analyze, the data available to us already show that exam-based revisions to financial statements are important at publicly-traded banks, although we lack observations for the very largest institutions.

²⁰ For the observations with *EXAM* = 1 and *REVISION* = 1, six out of 211, or 2.8 percent, have assets greater than \$500 million, compared with 7.3 percent for the entire sample.

5. Conclusion

Evidence from a unique set of data containing both originally-reported and subsequently-revised financial variables indicates the worse a bank's financial condition, the more likely it is for the originally-reported data to understate financial losses. In addition, our analysis documents an important role for supervisory exams in uncovering financial problems and ensuring bank accounting statements reflect them.

Interestingly, despite the direct relationship between loss underreporting and the depth of financial difficulty, the auditing role of exams is evident not only for institutions previously identified as supervisory concerns, but is also apparent at highly-rated banks, where financial problems are only just emerging. The finding of exam-based restatements at even the earliest stages of financial deterioration suggests substantial accounting misstatements can occur well outside severe business circumstances. This result highlights a risk of relying on reported financial statements in monitoring changes in the financial condition of 1- and 2-rated banks. Mitigating this risk is the finding that indicators of financial weakness can be used to identify those banks that are most likely to require accounting adjustments. In this regard, it may be in the interest of supervisors to devote special attention to those highly-rated banks that appear the weakest based on the call report data, even to the point of moving up a scheduled exam visit.

One implication of our findings that we wish to emphasize concerns the efficacy of the supervisory process during a banking downturn. Our results indicate the incidence of loss underreporting would increase as financial conditions worsened. But because an increasing number of troubled institutions would demand additional supervisory attention, fewer resources might then be left for routine exams. Based on our finding that exams play an important role in uncovering financial misstatements, even at highly-rated institutions, we would expect any reduction in supervisory resources available for routine exams to delay the correction of a rising number of underreported losses. The resulting deterioration in the quality of financial data could then impede the operation of supervisory and market discipline. These considerations point to the value of stepping up exam activity, to the extent possible, at banks of all ratings during periods of banking difficulties.

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