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Earnings Management to Avoid Earnings Declines across Publicly and Privately Held Banks

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ABSTRACT: This study compares samples of publicly and privately held bank holding companies to examine whether the high frequency of small earnings increases relative to small earnings decreases reported by public firms is attributable to earnings management. We expect public banks' shareholders to be more likely than private banks' shareholders to rely on simple earnings-based heuristics in evaluating firm performance, so we expect public banks to have more incentives to report steadily increasing earnings. Consistent with this expectation, we find that relative to private banks, public banks: (1) report fewer small earnings declines, (2) are more likely to use the loan loss provision and security gain realizations to eliminate small earnings decreases, and (3) report longer strings of consecutive earnings increases. These results suggest that the asymmetric pattern of more small earnings increases than decreases, first documented by Burgstahler and Dichev (1997), is attributable to earnings management and is not simply a reflection of the underlying distribution of earnings changes.

Keywords: *earnings management; private vs. public firms; financial institutions*.

Data Availability: *All data are available from public sources*.

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I. INTRODUCTION

Burgstahler and Dichev (1997) and Degeorge et al. (1999) document that publicly held firms report small declines in earnings less often than small increases in earnings. Although this pattern is consistent with managers using accounting discretion to avoid small earnings declines, an alternative explanation is that this pattern simply reflects the underlying distribution of earnings changes.

Our study investigates the validity of the earnings management explanation by examining the stream of earnings changes and the components of these changes for publicly vs. privately held bank holding companies (banks) during 1988–1998.[1] We focus on the public vs. private distinction because we argue that shareholders of public banks are more likely than those of private banks to rely on simple earnings-based heuristics, such as comparisons of current vs. prior period earnings, in evaluating bank performance. Therefore, we expect public bank managers to face more pressure to report consistently increasing earnings.

We focus on the banking industry because it provides comparable earnings data for a large number of both public and private firms. Data for private firms are rarely available in other industries. In addition, by focusing on the banking industry we can use industry-specific models of accounting discretion in the loan loss provision and realized security gains and losses (e.g., Beatty et al. 1995; Collins et al. 1995) to develop powerful tests of earnings management associated with small earnings changes.

We begin by replicating the analysis of small earnings changes that Burgstahler and Dichev (1997) conducted on a heterogeneous sample of public nonfinancial firms, to ascertain whether their inferences also hold in our samples of banks. We find that public banks report more small increases and fewer small decreases in earnings than expected. We find only weak evidence that private banks report fewer small decreases in earnings than expected. Furthermore, we find that public banks report more small increases and fewer small declines in earnings than private banks, even after controlling for differences in the operations of public vs. private banks, measured by bank size, asset growth, cash flows, loan characteristics, and geographic region.

If public banks' lower incidence of small declines in earnings is attributable to earnings management, then public banks should be more likely than private banks to use discretionary accounting choices to avoid reporting small declines in earnings. Consistent with this prediction, we find that public banks are more likely than private banks to use income-increasing discretionary loan loss provisions and realized security gains and losses to transform small declines in earnings before discretion to small increases in reported earnings.

Finally, if public banks are more likely than private banks to manage earnings to avoid reporting small decreases in earnings, then public banks, on average, should enjoy longer strings of consecutive earnings increases. Our tests confirm this expectation, even after controlling for differences in operating characteristics.

This study's results are important because we exploit a powerful setting to provide more direct and compelling evidence that the unusual pattern of small earnings increases of publicly held firms observed by prior research is due to earnings management and not to the underlying characteristics of the distribution of earnings changes. Our findings should be of interest to the SEC in its ongoing initiative against earnings management. In addition, our finding that private banks do not exhibit an abundance of small increases in earnings

[1] Burgstahler and Dichev (1997), Degeorge et al. (1999), and Hayn (1995) report evidence suggesting that firms report fewer small losses than expected. Furthermore, in concurrent research, Beaver et al. (2000) find that both stock and mutual property-casualty insurers avoid reporting small losses by understating loss reserve accruals. We focus on changes in, rather than levels of, earnings because few banks report losses.

adds to our understanding of earnings management in private firms. Investors and auditors of private firms should be interested to learn that private firms are not as strongly inclined to report consistently increasing earnings.

We have organized the paper as follows. Section II compares public and private banks' incentives to manage earnings to achieve simple earnings-based benchmarks. Section III describes the research design, while Section IV describes the sample and provides descriptive statistics. Section V presents the results of the empirical tests, and conclusions appear in Section VI.

II. EARNINGS-BASED BENCHMARKS

Ownership of publicly traded firms in the United States is diffuse (Shleifer and Vishny 1997). Black (1992) argues that diffuse owners only obtain a small fraction of the benefits from monitoring firms' activities due to their small shareholdings. These benefits likely fall short of the costs of storing, retrieving, and processing all information available to assess financial performance. As a result, Burgstahler and Dichev (1997) conjecture that investors in publicly held firms rely on simple low-cost heuristics, such as earnings-based benchmarks, in firm valuation.[2]

Empirical evidence suggests that investors in publicly traded firms use simple earnings-based benchmarks in making firm valuation decisions.[3] Barth et al. (1999) demonstrate that firms with longer strings of consecutive earnings increases are priced at a premium, and that, when these firms experience declines in earnings, the premiums fall substantially. Similarly, DeAngelo et al. (1996) find that a break in a pattern of consistent earnings growth is associated with a substantial decline in stock price. The stock price penalties for falling short of prior earnings combined with the effect of stock price on manager's wealth (Core et al. 2000), gives managers of publicly held firms an incentive to report a pattern of increasing earnings.[4]

In contrast to publicly held firms, ownership of privately held firms is concentrated. Privately held firms usually have a small number of shareholders and substantial majority shareholder participation in the management, directions, and operations of the firm. For example, Nagar et al. (2001) find more than 84 percent of their sample of 2,776 privately held, small, nonfarm, nonfinancial corporations as of year-end 1992 have four or fewer owners. In addition, for nearly 75 percent of the firms, the manager is an owner. Shareholders of private firms, therefore, have a relatively low marginal cost of acquiring and disseminating information and reap a large share of the benefits. In addition, shares of private companies are rarely traded, leaving private shareholders with little incentive to assess firm value continuously. As a result, private investors are likely to use a fairly rich information set, rather than relying on simple earnings-based heuristics. Consistent with this argument, results in Ke et al. (1999) suggest that shareholders in private companies

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[2] Burgstahler and Dichev (1997) also suggest that prospect theory provides an alternative related explanation. Prospect theory (Kahneman and Tversky 1979) suggests that individuals' value functions are concave in gains and convex in losses. Therefore, if zero is a natural reference point for change in earnings, then managers will manipulate earnings so the change is positive.

[3] Evidence in Bhattacharya (2001) suggests that at least one segment of the public market relies on a simple earnings-based benchmark. Specifically, small traders in small publicly held firms with little-to-moderate analyst following appear to use a simple seasonal random-walk model to form earnings expectations.

[4] Ke (2001) examines how these earnings management incentives vary within a sample of publicly held firms drawn from Execucomp. Specifically, he finds that the frequency of small earnings increases and the duration of strings of consecutive earnings are both increasing in the market-to-book ratio and CEO equity incentives from stock and exercisable stock options.

directly monitor management rather than rely on explicit earnings-based compensation contracts to determine compensation.

Relatedly, Beatty and Harris (1999) argue that private firms have both less information asymmetry and a greater proportion of long-run investors than public firms and, therefore, less incentive to manage earnings. Beatty and Harris (1999) provide evidence that private firms manage earnings less aggressively, but they do not consider the use of simple earnings-based heuristics and therefore do not examine small changes in earnings and the duration of consecutive earnings increases.

Based on these arguments, we predict that private banks report more small declines in earnings, fewer small increases in earnings, and shorter strings of consecutive earnings increases than do public banks. We test these predictions by comparing the distribution of changes in earnings around zero and the duration of strings of consecutive earnings increases for public and private banks.

Our analysis should not be affected by other incentives for earnings management. For example, regulators and depositors provide additional incentives for banks to manage earnings. However, FDIC insurance protects most depositors of public and private banks, and explicit regulatory reporting and capital requirements are the same for public and private banks. Incentives to manage earnings for these stakeholders should be similar across public and private banks, and therefore should not explain observed differences in earnings management.

Banks may have an incentive to manage earnings to minimize taxes, but we see no reason for taxation to increase the incentive to avoid small declines in earnings. In addition, tax rules are generally the same for public and private banks during our sample period. The one notable exception is that banks with less than \$500 million in assets were allowed to take a tax deduction for the loan loss provision, while banks with more than \$500 million in assets tax deduct their loan losses on a cash basis. Because private banks are likely to be smaller, this difference may confound our analysis of differential earnings management. To address this difference, we perform sensitivity tests of our loan loss provision analysis on both large and small private banks.

Public and private banks differ in their access to equity markets. Because public banks have more access to external equity financing, they are likely to be larger, to grow faster, and to be more profitable. Our empirical tests control for these differences by including measures of size, asset growth, and cash from operations. These controls should help mitigate concerns that the differences between public and private banks that we document are driven by differential economic performance, rather than by differences in earnings management incentives.

III. RESEARCH DESIGN

Univariate Analysis of Small Earnings Changes

Our first set of tests examines small changes in earnings for public and private banks. Similar to Burgstahler and Dichev (1997), we first examine histograms of the change in return on assets (ΔROA), which we calculate as the current year's net income less the previous year's net income, divided by total assets at the beginning of the previous year. In constructing our histograms we use a bin width of twice the interquartile range of the variable multiplied by the negative cube root of the sample size, as Degeorge et al. (1999) recommend. Based on this formula, the bin width we apply in the histograms is 0.0004.

To test whether the distribution of earnings changes around the zero threshold is smooth, we next replicate Burgstahler and Dichev's (1997) primary analysis by calculating the standardized difference for the two intervals adjacent to zero for our public and private banks. The standardized difference for an interval is the difference between the observed and expected number of observations in the interval, standardized by the estimated standard deviation of the difference. For this analysis we consider ΔROA as small if the absolute value is less than 0.0008; we therefore analyze ΔROA within two intervals, one that lies between -0.0008 and 0, and one that lies between 0 and 0.0008. The interval size, which is twice the bin width used in the histograms of ΔROA, results from a trade-off between sample size and feasible earnings management amounts. Using interval sizes that are one and three times the bin width does not affect our results. The expected number of observations in each interval is the average of the number of observations in the two immediately adjacent intervals. We calculate the standard deviation of the standardized difference using the entire distribution of earnings changes. If the intervals around zero are smooth, then the standardized differences will be distributed approximately normal, with a 0 mean and standard deviation of 1.

Probit Analysis of Small Earnings Changes for Public vs. Private Banks

To test for differences in the management of small earnings changes between public and private banks, we next conduct a probit regression of the sign of small earnings changes on an indicator variable for public vs. private banks, controlling for differences between these two types of banks that may affect the sign of the change in premanaged earnings (i.e., the nondiscretionary changes in earnings). Specifically, we estimate the following year and regional fixed-effects model on all bank-years with earnings changes near zero (i.e., with the absolute value of ΔROA less than or equal to 0.0008):

$$\begin{aligned}\Delta\mathrm{ROAPOS}_{it} = {} & \alpha_{tr} + \beta_1\mathrm{PUBLIC}_i + \beta_2\Delta\mathrm{ASSET}_{it} + \beta_3\mathrm{LASSET}_{it} + \beta_4\Delta\mathrm{CF}_{it} \\ & + \beta_5\Delta^2\mathrm{NPL}_{it} + \beta_6\Delta\mathrm{LOANR}_{it} + \beta_7\Delta\mathrm{LOANC}_{it} \\ & + \beta_8\Delta\mathrm{LOAND}_{it} + \beta_9\Delta\mathrm{LOANA}_{it} + \beta_{10}\Delta\mathrm{LOANI}_{it} \\ & + \beta_{11}\Delta\mathrm{LOANF}_{it} + \varepsilon_{it},\end{aligned} \tag{1}$$

where:

i = bank holding company index;
t = year index for 1988–1998;
r = geographic region index for the eight regions defined by the U.S. Department of Commerce;
ΔROAPOS = dummy variable, taking the value 1 if the bank has ΔROA in the interval between 0 (exclusive) and 0.0008 (inclusive), and 0 otherwise; and
PUBLIC = dummy variable, taking the value 1 if the bank is publicly held, and 0 otherwise.

The control variables are the following:

ΔASSET = first difference in total assets, divided by total assets at the end of the previous year;
LASSET = natural log of total assets;
ΔCF = first difference in cash flows, divided by total assets at the end of the previous year, where cash flow is defined as net income plus the loan loss provision and non-interest expenses associated with fixed assets;

Δ^2NPL = change in the first difference in nonperforming loans, divided by the average of beginning and ending total loans;
ΔLOANR = first difference in loans secured by real estate as a percentage of total loans;
ΔLOANC = first difference in commercial and industrial loans as a percentage of total loans;
ΔLOAND = first difference in loans to depository institutions as a percentage of total loans;
ΔLOANA = first difference in loans to finance agricultural production as a percentage of total loans;
ΔLOANI = first difference in loans to individuals as a percentage of total loans;
ΔLOANF = first difference in loans to foreign governments as a percentage of total loans; and
ε = error term.

ΔASSET controls for growth and LASSET controls for bank size. If larger and higher-growth banks are increasingly more profitable or more likely to manage earnings to avoid reporting a decline in earnings, then the coefficients on ΔASSET and LASSET should be positive. ΔCF controls for changes in profitability. We expect banks with more positive changes in cash flows to be more likely to report small increases in earnings rather than small decreases; therefore we expect the coefficient on ΔCF to be positive. Δ^2NPL controls for the effect of changes in the quality of the loan portfolio on nondiscretionary changes in earnings. The change in nonperforming loans (ΔNPL) is an important predictor of the loan loss provision, which is a major component of earnings. We use the Δ^2NPL because our dependent variable is the change in earnings. An increase in nonperforming loans should lead to an increase in the loan loss provision and a decrease in earnings; therefore we predict a negative coefficient on Δ^2NPL.

The other variables (ΔLOANR, ΔLOANC, ΔLOAND, ΔLOANA, ΔLOANI, and ΔLOANF) control for changes in the characteristics of the loans in each bank's portfolio because these characteristics may affect nondiscretionary changes in earnings. We do not predict how these variables are likely to affect the sign of small changes in earnings.

After controlling for these differences in bank characteristics, the change in earnings should not differ significantly across public vs. private banks, absent earnings management. PUBLIC is the explanatory variable we use to test our hypothesis that public banks are more likely than private banks to manage small changes in earnings above the threshold of zero. Thus, we predict that the coefficient on PUBLIC will be positive.

Controlling for all important differences between public and private banks is essential to interpret the coefficient on PUBLIC as (albeit indirect) evidence that the previously documented pattern of earnings changes in publicly held firms reflects earnings management rather than the underlying distribution of earnings changes. Essentially, if private banks have little incentive to manage earnings changes around zero, then the distribution of their earnings changes around zero can serve as a benchmark for assessing the distribution of small earnings changes in public banks. If the asymmetry of small earnings changes around zero arises only for public banks, then earnings management becomes a more plausible explanation.

Discretionary Accounting Choices

To provide more direct evidence of earnings management, we examine two components of banks' earnings that researchers have shown are subject to manipulation: loan loss provisions and realized security gains and losses (e.g., Moyer 1990; Beatty et al. 1995; Collins et al. 1995; Ahmed et al. 1999). Bank managers can potentially avoid reporting small declines in earnings by underestimating the loan loss provision. Bank managers may also be able to avoid a small decline in earnings by realizing more security gains or fewer security losses.

We use the following regression model, similar to that of Beatty et al. (1995), to estimate the nondiscretionary portion of the loan loss provision:

$$\begin{aligned} LOSS_{it} = {} & \alpha_{tr} + \beta_1 LASSET_{it} + \beta_2 \Delta NPL_{it} + \beta_3 LLR_{it} + \beta_4 LOANR_{it} + \beta_5 LOANC_{it} \\ & + \beta_6 LOAND_{it} + \beta_7 LOANA_{it} + \beta_8 LOANI_{it} + \beta_9 LOANF_{it} + \varepsilon_{it}, \end{aligned} \tag{2}$$

where:

LOSS = loan loss provision as a percentage of the average of beginning and ending total loans;
ΔNPL = change in nonperforming loans as a percentage of the average of beginning and ending total loans;
LLR = loan loss reserve as a percentage of total loans at the beginning of the year;
LOANR = loans secured by real estate as a percentage of total loans;
LOANC = commercial and industrial loans as a percentage of total loans;
LOAND = loans to depository institutions as a percentage of total loans;
LOANA = loans to finance agricultural production as a percentage of total loans;
LOANI = loans to individuals as a percentage of total loans; and
LOANF = loans to foreign governments as a percentage of total loans.

We control for region effects and loan characteristics because we expect both to affect the loan loss provision. We expect the loan loss provision to be higher when there is an increase in nonperforming loans and when the beginning loan loss reserve is high, so we predict that the coefficients on ΔNPL and LLR will be positive. We make no prediction for the other variables.

We use the following regression model, similar to that of Beatty and Harris (1999), to estimate the nondiscretionary portion of the realized security gains and losses:

$$RSGL_{it} = \alpha_t + \beta_1 LASSET_{it} + \beta_2 UNGL_{it} + \varepsilon_{it}, \tag{3}$$

where:

RSGL = realized security gains and losses as a percentage of total assets at the beginning of the year; and
UNGL = unrealized security gains and losses at the beginning of the year as a percentage of total assets at the beginning of the year.

We expect realized security gains and losses to be higher when there are higher unrealized security gains and losses, so we predict that the coefficient on UNGL will be positive.[5]

To estimate the two models, we pool across all bank-years with available data. We then use the residuals from the regression models as our estimates of *abnormal accruals.* We compute the change in earnings before the abnormal loan loss provision and the change in

[5] We do not control for regional effects in the realized security gains and losses model because banks' investments are largely in U.S. government bonds, so investment market values should not vary by region.

earnings before abnormal realized security gains and losses for each bank-year, and refer to these earnings changes as *premanaged*.

We identify bank-years with premanaged changes in return on assets that lie in the interval just below zero (i.e., between -0.0008 and 0) or in the interval just above zero (i.e., between 0 and 0.0008). We conduct tests on the abnormal accruals across the two intervals and across bank type. If public banks manage earnings to avoid reporting small declines in earnings more so than private banks, then we expect the abnormal loan loss provision and security gains and losses to be more income-increasing for the public bank-years with premanaged earnings in the interval just below zero than for the private bank-years with premanaged earnings in the interval just below zero. We make no prediction about the sign of the abnormal accruals for banks with small increases in premanaged earnings because we have no theory of earnings management behavior for these observations.

Differences in the Duration of the String of Consecutive Earnings Increases

Our final analysis examines whether the duration of the string of consecutive earnings increases differs between public and private banks. If public banks have a stronger incentive to avoid declines in reported earnings, then we predict they will have longer strings of consecutive earnings increases than private banks. This test is distinct in two respects from the regression-based test of small earnings changes for public vis-à-vis private banks. First, the pooled cross-sectional regression-based test of small earnings changes does not directly consider the time-series pattern of earnings for the same firm. Second, the test of small earnings changes includes only bank-years with earnings changes close to the zero threshold. In contrast, our test of the duration of strings of consecutive earnings increases includes all eligible bank-year observations.

To test for differences in duration, we adopt an event history analysis approach. Although not widely used in accounting, researchers in labor economics, biomedical sciences, industrial engineering, political science, and sociology have used event history analysis to analyze the length of time that elapses between two specific events.[6]

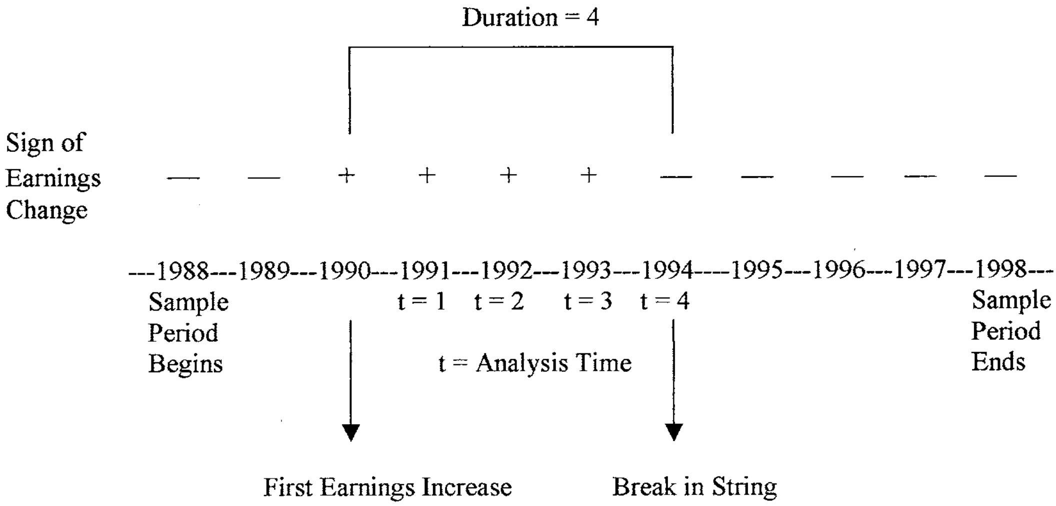
Because event history analysis is relatively new in the accounting literature, we illustrate the basic concepts in our setting. Figure 1 depicts the time line of a hypothetical firm that entered our sample in 1987 and exited in 1998. We cannot observe the change in earnings until 1988. The hypothetical firm reported positive earnings changes in 1990, 1991, 1992, and 1993, but the consecutive string of earnings increases broke in 1994.[7] The firm did not report any earnings increases after 1994. In our context, the failure event is a break in the string of consecutive earnings increases. Thus, the sample firm first faced the risk of the failure event in 1991 and remained at risk until the failure in 1994. If a firm-year does not report an earnings increase in the prior period, then the current firm-year is not at risk of the failure event and thus is excluded from the analysis. Therefore, the event history analysis would use only the observations from 1991 to 1994 for our hypothetical firm.

Although firms that report negative earnings (losses) could also have consecutive earnings increases, it is unclear whether such strings would convey the same message to investors as would strings of consecutive earnings increases from profitable firms. Prior research (Hayn 1995) indicates that losses convey less information than positive earnings.

[6] Allison (1984) and Kiefer (1988) provide excellent reviews of event history analysis, which is also called survival analysis or hazards analysis.

[7] A firm can have more than one string of consecutive earnings increases; the maximum number of possible earnings increase strings over our sample period is five.

FIGURE 1
A Hypothetical Firm's Time Line for an Event History Analysis of a String of Consecutive Earnings Increases



Degeorge et al. (1999) argue that firms reporting negative earnings have no incentive to manage earnings upward. For this reason, our measure of earnings increases considers only those firm-years with positive current earnings.

An important concept in event history analysis is the hazard rate (denoted h(t)), which, in discrete time, is the probability that an at-risk firm experiences a failure event at time t. Thus, in our context, h(t) is the probability that a bank breaks a string of earnings increases in year t. We refer to time t as analysis time and measure it relative to the year when the bank first became at risk of the failure event (i.e., the beginning of 1991 for our hypothetical firm in Figure 1). Thus, for our sample firm, in 1992, analysis time $t = 2$. The duration, to which we refer as T or DURATION, is the maximum analysis time, which is almost always the number of consecutive earnings increases ($T = 4$ for our hypothetical firm).[8] Duration is right-censored if an earnings string is ongoing at the end of our sample period.

Event history analysis examines how the hazard rate h(t) evolves over time as a function of time t and other explanatory variables. To examine the effect of time t and other explanatory variables on the probability of breaking a string of earnings increases, i.e., the hazard rate h(t), this study adopts the parametric Weibull hazard model, which takes the following form:

$$h(t|x(t)) = h_o(t)\ \exp[x(t)'\beta], \tag{4}$$

where x(t) is a vector of time-varying explanatory variables; β is a vector of unknown

[8] DURATION equals the number of consecutive earnings increases unless an initial earnings increase is the last observation for the bank. In this case, we do not include this string with one consecutive earnings increase in DURATION because there are no analysis time observations related to this earnings increase (i.e., the maximum analysis time is 0).

parameters to be estimated; and $h_o(t)$, called the baseline hazard rate, is pt^{p-1} (called Weibull) with shape parameter p that we estimate from the data. When $p > 1$ the hazard model exhibits positive duration dependence, meaning that the hazard rate h(t) increases over time t. When $p < 1$, the hazard rate is a decreasing function of t; and when $p = 1$, the hazard rate is constant over time and the hazard model is exponential.[9] To compare the duration of consecutive earnings increases for public and private banks, we rewrite Equation (4) (see Kiefer 1988, 665) as follows:

$$\ln(T) = x(t)'\ \beta^* + e, \tag{5}$$

where ln(T) is the log of the observed duration of a string of consecutive increases in earnings; e is the error term that is independent of x(t) and is scaled by 1/p; and $\beta^* = -\beta/p$. We estimate Model (5) using maximum likelihood. Coefficients β^* measure the percentage change in the expected duration of consecutive earnings increases T for a one-unit change in an explanatory variable. A positive coefficient on an explanatory variable means that the duration of consecutive earnings increases is an increasing function of the explanatory variable. The independent variables in Equation (5) are the same variables we include in our probit model of ΔROAPOS.

Hazard models offer advantages relative to traditional regression for analyzing breaks in strings of consecutive earnings increases.[10] First, hazard models incorporate both the occurrence and timing of breaks in strings of consecutive earnings increases, which provides more insights about the phenomenon of earnings declines. Second, these models correct for any right-censoring of the strings of consecutive earnings increases (i.e., our inability to observe the length of the strings of consecutive earnings increases that are still running when the firm exits the sample period). Finally, they allow time-varying explanatory variables, which are important in studying the dynamics of declines in earnings.

IV. SAMPLE AND DESCRIPTIVE ANALYSES

Sample

To compile our sample we start with all annual bank holding company information filed with the Federal Reserve System on form FR Y-9 C. The accounting data reported on this form are based on generally accepted accounting principles. Beginning in 1986, all top-tier bank holding companies with at least $150 million in total consolidated assets and all bank holding companies with more than one subsidiary must file this form. We obtained these data from two sources: For 1986–1990 we used the data from the Chicago Federal Reserve Bank web site, whereas, for 1991–1998 we used data purchased from Sheshenoff.[11] Only the Sheshenoff database provides information on the trading status of the bank holding companies, so we assume that trading status does not change during 1986–1990. This assumption seems reasonable, given the low rate of change in trading status during 1991–1998.

The original sample contained 2,838 bank holding companies. We omitted 205 banks that were 100 percent owned by another bank, 426 banks without ownership information

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[9] Our results are similar using the Cox proportional hazards model. The Cox model is similar to Equation (4) except that it does not impose structure on the baseline hazard rate, and therefore is immune from misspecification of the baseline hazard rate. We use the Weibull model because it enables us to calculate the difference in the expected duration of consecutive earnings increases for public and private banks, whereas the Cox model can give us only the relative hazard rates for public vs. private banks.

[10] See Peterson (1991) for a general discussion of the advantages of hazard models.

[11] To verify the validity of the regulatory data, we estimated the correlation between net income from our regulatory data and from Compustat for banks included in both data sets during 1986–1992. On average, there were 135 observations per year and the average correlation was 99.34 percent.

in the Sheshenoff database, 69 banks with ownership changes during 1991–1998, and 271 banks missing data for at least one variable used in the later analysis. The final sample had 707 public banks and 1,160 private banks, for a total of 1,867 banks. Because we scale earnings by lagged assets, our change variables include observations from 1988–1998.

Descriptive Statistics

Panel A of Table 1 provides descriptive data about our sample of privately held and publicly held banks and two-sample Wilcoxon rank-sum tests for differences across these two groups. As expected, the public banks are significantly larger than the private banks. The mean and median assets of the 5,504 public bank-years are $5,066 million and $487

TABLE 1
Descriptive Statistics by Bank Type, 1988–1998
Mean (Median) [Standard Deviation] {Bank-Years}

Panel A: Descriptive Statistics for all Bank-Years

Variable Name[a]	*707 Public Banks*	*1,160 Private Banks*	*Rank-Sum Z for Difference between Public and Private Banks (two-tailed p-value)*
ASSETS	5,066	307	58.93
(millions)	(487)	(200)	(0.001)
	[21,594]	[607]	
	{5,504}	{6,202}	
ΔASSET	0.122	0.090	14.35
	(0.081)	(0.061)	(0.001)
	[0.194]	[0.216]	
	{5,504}	{6,202}	
ROA	0.011	0.010	9.10
	(0.011)	(0.011)	(0.001)
	[0.008]	[0.009]	
	{5,504}	{6,202}	
ΔROA	0.002	0.001	6.55
	(0.002)	(0.001)	(0.001)
	[0.007]	[0.007]	
	{4,762}	{4,940}	
ΔCF	0.003	0.002	10.33
	(0.002)	(0.002)	(0.001)
	[0.006]	[0.007]	
	{4,762}	{4,940}	
Δ^2NPL	−0.0003	−0.0001	1.03
	(0.0004)	(0.0005)	(0.304)
	[0.014]	[0.031]	
	{4,762}	{4,940}	
DURATION	3.281	2.282	9.64
	(2)	(2)	(0.001)
	[2.484]	[1.677]	
	{949}	{1,113}	

(*Continued on next page*)

TABLE 1 (Continued)

Panel B: Descriptive Statistics for the Bank-Years used in the Probit Regressions of Table 3

Variable Name[a]	*413 Public Banks*	*559 Private Banks*	*Rank-Sum Z for Difference between Public and Private Banks (two-tailed p-value)*
ASSETS (millions)	3,655 (411) [19,865] {878}	305 (208) [561] {985}	22.66 (0.001)
ΔASSET	0.088 (0.065) [0.098] {878}	0.074 (0.059) [0.096] {985}	3.14 (0.002)
ROA	0.0107 (0.0108) [0.0035] {878}	0.0102 (0.0103) [0.0041] {985}	3.53 (0.001)
ΔROA	0.0002 (0.0003) [0.0004] {878}	0.0001 (0.0001) [0.0005] {985}	5.80 (0.001)
ΔCF	0.0010 (0.0010) [0.0020] {878}	0.0006 (0.0006) [0.0023] {985}	5.69 (0.001)
Δ^2NPL	0.0007 (0.0006) [0.0011] {878}	−0.000 (0.0006) [0.0013] {985}	0.79 (0.430)
ΔROAPOS	0.730 {878}	0.596 {985}	6.10 (0.001)

[a] Variable definitions:

ASSETS = total assets;
ΔASSET = first difference in total assets, divided by total assets at the end of the previous year;
ROA = net income divided by total assets at the beginning of the year;
ΔROA = current year's net income less previous year's net income, divided by total assets at the beginning of the previous year;
ΔCF = first difference in cash flows, divided by total assets at the end of the previous year, where cash flow is defined as net income plus loan loss provisions and non-interest expenses associated with fixed assets;
Δ^2NPL = change in the first difference of nonperforming loans, divided by the average of beginning and ending total loans;
ΔROAPOS = dummy variable, taking the value 1 if the bank has ΔROA in the interval between 0 (exclusive) and 0.0008 (inclusive), and 0 otherwise; and
DURATION = number of years in a string of consecutive increases in earnings for banks with at least three consecutive years of nonnegative earnings.

million, respectively, whereas the mean and median assets for the 6,202 private bank-years are only \$307 million and \$200 million, respectively. Public banks also have higher asset growth than private banks. The mean growth in assets for public banks is 12.2 percent per year, while the mean growth for private banks is 9 percent. The public banks have significantly higher return on assets (ROA) and change in return on assets (ΔROA). Consistent with public banks' higher profitability, the change in cash flows (ΔCF) is significantly more positive for public banks.

Since, on average, public banks perform better than private banks, it is critical to our interpretation of the incidence of small earnings increases that our tests adequately control for differences in economic performance. Our tests include controls for asset growth, size, cash flow, loan portfolio characteristics, year, and geographic region. To assess the adequacy of these controls we regressed ROA and ΔROA on all of these variables. The overall distributions of the residuals from the two regressions (i.e., the unexpected ROA and ΔROA) are not significantly different across the public and private banks. This suggests that our controls are successful in explaining differences in overall economic performance between public and private banks.

Public banks report longer strings of consecutive positive earnings changes than do private banks, as measured by DURATION. A string may range from one increase in earnings to 11 increases. We measure DURATION only for banks with at least three consecutive years of nonnegative earnings. The mean DURATION of strings of consecutive earnings increases is 3.3 years for public banks and 2.3 years for private banks. This difference is significant, which we expected because public banks have higher ROA and ΔROA. DURATION is censored, however, so one should interpret it cautiously. There are 768 right-censored earnings strings that were still running when the bank exited the sample period. Similarly, there are 970 left-censored earnings strings that began before the first year of the sample period.

Panel B of Table 1 reports descriptive statistics for the subsample of bank-years with small earnings changes that we use in our probit analysis. Differences across bank type are similar to those for the full sample. Again, as expected, public banks report small positive earnings changes more frequently than private banks. Specifically, 73 percent of public bank-years with small ΔROA have a positive ΔROA, compared to 59.6 percent for private banks. This difference is significant at $p < 0.001$. Since the differential profitability of public vs. private banks is not controlled in this univariate comparison, reliable inferences on differences in the incidence of small increases in earnings across public vs. private banks cannot be drawn until completion of the probit analysis that includes controls for profitability.

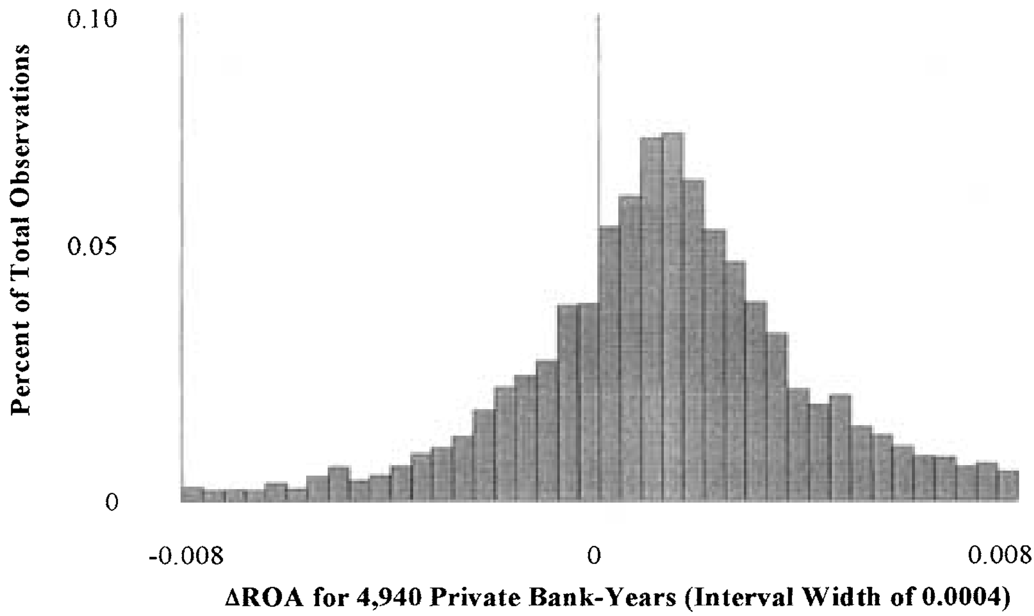
V. RESULTS

Univariate Tests of Differences of Small Earnings Changes

Figure 2 plots ΔROA for private and public banks. In both cases there is a large increase in the percentage of observations just above zero. This increase is much more dramatic for public banks, suggesting that public and private banks differ in their reporting of small earnings declines.

In Table 2 we report the results of our Burgstahler and Dichev (1997) analysis. As predicted, public banks report fewer small declines in earnings than expected (standardized difference of −10.07). It is inappropriate to interpret the standardized difference as a t-statistic for assessing significance because the distributions of our earnings changes are not smooth (i.e., the assumption that the earnings changes are normally distributed is rejected

FIGURE 2
Current Year's Net Income Less Previous Year's Net Income Divided by Total Assets at the Beginning of the Previous Year (ΔROA) for Public and Private Banks, 1988–1998



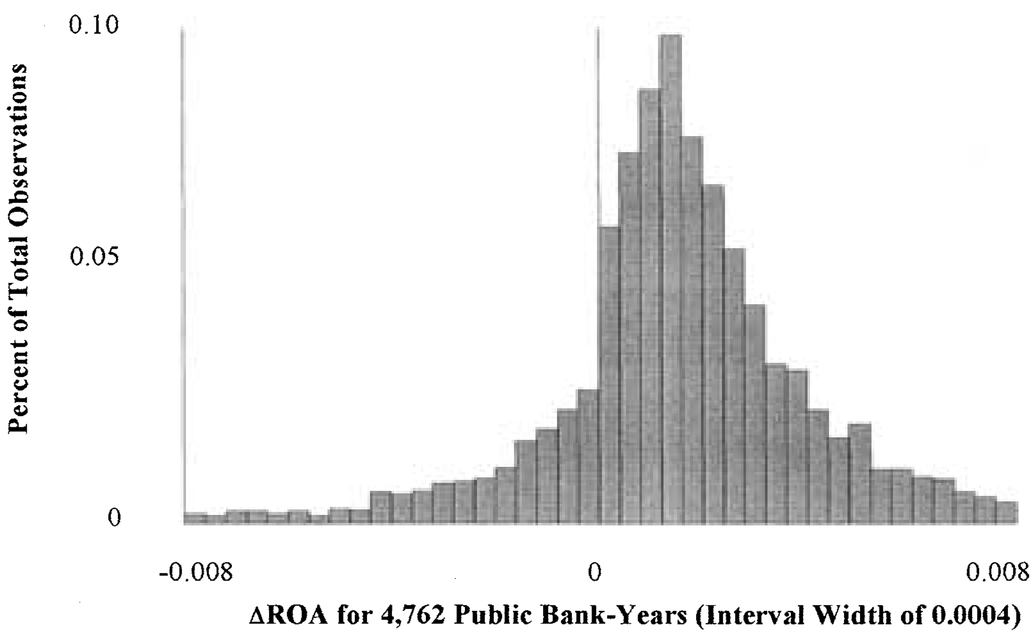


TABLE 2
Bank-Years with Changes in Return on Assets in the Interval Just Below Zero and Just Above Zero by Bank Type, 1988–1998

	Standardized Difference[a] (Actual Number of Bank-Years in Interval) [Expected Number of Bank-Years in Interval]	
(Total Observations)	*Interval Just Below Zero (ΔROA[b] between 0 and −0.0008)*	*Interval Just Above Zero (ΔROA between 0 and 0.0008)*
Public Banks (4,762)	−10.07 (238) [404.5]	4.72 (640) [562]
Private Banks (4,940)	−2.08 (403) [425.5]	0.92 (582) [572]

[a] The standardized difference is the difference between the observed and expected number of bank-years in an interval, standardized by the estimated standard deviation of the difference.
[b] ΔROA is current year's net income less previous year's net income, divided by total assets at the beginning of the previous year.

at the 0.001 level for both samples).[12] However, this standardized difference is the most negative of the standardized differences across all 316 public bank bins. This increases our confidence that the number of public bank-years with small declines in earnings is significantly smaller than expected. Consistent with the presence of few small declines in earnings, we also find more small increases in earnings than expected (standardized difference of 4.72, which is the second largest across all 316 bins).

We find weak evidence that private banks also report fewer small decreases in earnings than expected (standardized difference of −2.08). This standardized difference is the fifth most negative across all 248 private bank bins. Because this result appears only marginally significant, we are reluctant to draw the conclusion that private banks avoid reporting small decreases in earnings. In addition, we do not find significantly more small increases in earnings than expected (standardized difference of 0.92). Differences in sample sizes prevent us from comparing the standardized differences of the public vs. private banks (Burgstahler and Dichev 1997, 110–111), but recall that in Panel B of Table 1, we report that the proportion of small earnings increases relative to small earnings decreases is significantly greater at $p < 0.001$ for public banks than for private banks.

Probit Tests of Differences in Small Earnings Changes

Table 3 reports the probit results for the differential likelihood of reporting small increases in earnings vs. small declines, across the public/private dichotomy. The analysis includes all 1,863 bank-years for 972 different banks with absolute ΔROA no greater than 0.0008.[13] The coefficient on PUBLIC is significantly positive at less than the 0.001 level (we report two-sided statistics throughout the paper). Thus, public banks report significantly

[12] The assumption of a smooth distribution was more reasonable for Burgstahler and Dichev (1997) because their sample size was at least five times larger than ours.
[13] Regulatory capital requirements for banks changed in 1990 (see Ahmed et al. 1999). To assess whether this is confounding our analysis, we re-estimated the probit model including only observations from 1991–1998, and found results nearly identical to those based on the full sample period.

TABLE 3
Probit Model of Earnings Management for Banks with Small Earnings Changes, 1988–1998[a] (n = 1,863)[b]

$$\Delta ROAPOS_{it} = \alpha_{tr} + \beta_1 PUBLIC_i + \beta_2 \Delta ASSET_{it} + \beta_3 LASSET_{it} + \beta_4 \Delta CF_{it} + \beta_5 \Delta^2 NPL_{it} + \beta_6 \Delta LOANR_{it} + \beta_7 \Delta LOANC_{it} + \beta_8 \Delta LOAND_{it} + \beta_9 \Delta LOANA_{it} + \beta_{10} \Delta LOANI_{it} + \beta_{11} \Delta LOANF_{it} + \varepsilon_{it}$$

Independent Variable[c]	*Coefficient Estimate*	*Two-Tailed p-value*
PUBLIC	0.307	0.000
ΔASSET	−0.486	0.154
LASSET	0.051	0.119
ΔCF	76.553	0.001
Δ^2NPL	−5.468	0.045
ΔLOANR	2.970	0.090
ΔLOANC	3.043	0.098
ΔLOAND	1.226	0.586
ΔLOANA	1.522	0.542
ΔLOANI	1.110	0.538
ΔLOANF	−25.038	0.274

[a] Variable Definitions:

i = bank holding company index;
t = year index for 1988–1998;
r = geographic region index for the eight regions defined by the U.S. Department of Commerce;
ΔROAPOS = dummy variable, taking the value 1 if the bank has ΔROA in the interval between 0 (exclusive) and 0.0008 (inclusive), and 0 otherwise;
PUBLIC = dummy variable, taking the value 1 if the bank is publicly held, and 0 otherwise;
ΔASSET = first difference in total assets, divided by total assets at the end of the previous year;
LASSET = natural log of total assets;
ΔCF = first difference in cash flows, divided by total assets at the end of the previous year, where cash flow is defined as net income plus loan loss provision and non-interest expenses associated with fixed assets;
Δ^2NPL = change in the first difference of nonperforming loans, divided by the average of beginning and ending total loans;
ΔLOANR = first difference in loans secured by real estate as a percentage of total loans;
ΔLOANC = first difference in commercial and industrial loans as a percentage of total loans;
ΔLOAND = first difference in loans to depository institutions as a percentage of total loans;
ΔLOANA = first difference in loans to finance agricultural production as a percentage of total loans;
ΔLOANI = first difference in loans to individuals as a percentage of total loans;
ΔLOANF = first difference in loans to foreign governments as a percentage of total loans; and
ε = error term.

[b] The estimation sample includes only bank-years with the absolute value of ΔROA less than or equal to 0.0008.
[c] Year and region intercepts are untabulated.

more small increases and fewer small decreases in earnings than private banks do; even after controlling for bank size, asset growth, cash flows, loan characteristics, and geographic regions. Bank size and growth do not provide explanatory power. As expected, banks with increases in cash flows are more likely to report small increases in earnings, evidenced by a positive significant coefficient on ΔCF. In addition, a significant negative coefficient on Δ^2NPL suggests that increases in the change in nonperforming loans are associated with declines in earnings.[14]

Discretionary Accounting Choices

Table 4 reports results of our estimation of the abnormal loan loss provision and abnormal security gains and losses models.[15] The loan loss provision and security gains and losses models have an R^2 of 21 percent and 10 percent, respectively. The results for the loan loss provision regression are generally consistent with prior research (e.g., Moyer 1990; Wahlen 1994; Beatty et al. 1995; Collins et al. 1995; Ahmed et al. 1999). The significant positive coefficients on LLR and ΔNPL indicate that the loan loss provision is increasing as the bank's problem loans increase and in the amount of the loan loss reserve at the beginning of the year. In addition, the provision increases in the proportion of commercial and individual loans and the provision decreases in loans to other depository institutions. In the security gains and losses regression, the significant positive coefficient on UNGL indicates that realized security gains and losses are increasing in unrealized gains and losses as of the beginning of the year, consistent with Scholes et al. (1990) and Beatty and Harris (1999). We estimate the abnormal components as the residuals from the regressions and, for brevity, refer to these as abnormal provisions and abnormal security gains.

Table 5, Panel A reports the abnormal provisions for bank-years with small changes in *premanaged* earnings. For the 505 public bank-years with small declines in premanaged ROA (i.e., between 0 and -0.0008), the mean (median) abnormal provision is -0.0017 (-0.0019). For the 535 public bank-years with a small increase in premanaged ROA (i.e., between 0 and 0.0008), the mean (median) abnormal provision is -0.0009 (-0.0012). A reduction in the loan loss provision expense increases reported income, therefore, the significantly more negative abnormal provision for bank-years with premanaged ΔROA in the interval below zero vs. those in the interval above zero ($p = 0.001$) is consistent with public banks using the loan loss provision to avoid reporting small declines in income. Further analysis reveals that this manipulation was successfully used to avoid an earnings decline for 84.4 percent of our public banks that had small declines in earnings before the abnormal provision.

These results are consistent with public banks using accounting discretion to transform small declines in ROA into small increases. However, this test is biased in favor of rejecting the null if measurement error in the abnormal component of the loan loss provision is correlated with the classification of premanaged ΔROA into the intervals just below or just above zero. This is likely since premanaged ΔROA is determined using an estimate of the abnormal provision. However, to the extent that such measurement error exists equally for

[14] To provide further evidence that these results are not confounded by size, we also re-estimate the probit model on a size-matched subset of our sample. Specifically, we include only those public banks with average total assets over the 1988–1998 period that are less than the public sample median, and only those private banks with total assets that are above their sample median. This subset includes 933 bank-years with median assets of 275 for the public banks, and 286 million for private banks. The coefficient on PUBLIC is positive and highly significant. We perform a similar analysis on a growth-matched sample and also find similar results.

[15] Conclusions are unaltered if we estimate the nondiscretionary amounts using separate models for private and public banks.

TABLE 4
OLS Regression Models of the Loan Loss Provision and Realized Security Gains and Losses, 1988–1998[a]

$$LOSS_{it} = \alpha_t + \beta_1 LASSET_{it} + \beta_2 \Delta NPL_{it} + \beta_3 LLR_{it} + \beta_4 LOANR_{it} + \beta_5 LOANC_{it} + \beta_6 LOAND_{it} + \beta_7 LOANA_{it} + \beta_8 LOANI_{it} + \beta_9 LOANF_{it} + \varepsilon_{it}$$

$$RSGL_{it} = \alpha_t + \beta_1 LASSET_{it} + \beta_2 UNGL_{it} + \varepsilon_{it}$$

Independent Variable[b]	*Loan Loss Provision Coefficient Estimate (two-tailed p-value)*	*Realized Security Gains and Losses Coefficient Estimate (two-tailed p-value)*
LASSET	0.0003 (0.000)	0.00005 (0.000)
ΔNPL	0.048 (0.000)	
LLR	0.072 (0.000)	
LOANR	0.001 (0.708)	
LOANC	0.005 (0.004)	
LOAND	−0.012 (0.001)	
LOANA	−0.003 (0.120)	
LOANI	0.003 (0.066)	
LOANF	0.049 (0.388)	
UNGL		0.004 (0.000)
Bank-Years[c]	9,160	9,247
Adjusted R^2	0.21	0.10

[a] Variable Definitions:
LOSS = loan loss provision as a percentage of the average of beginning and ending total loans;
LASSET = natural log of total assets;
ΔNPL = change in nonperforming loans as a percentage of the average of beginning and ending total loans;
LLR = loan loss reserve as a percentage of total loans at the beginning of the year;
LOANR = loans secured by real estate as a percentage of total loans;
LOANC = commercial and industrial loans as a percentage of total loans;
LOAND = loans to depository institutions as a percentage of total loans;
LOANA = loans to finance agricultural production as a percentage of total loans;
LOANI = loans to individuals as a percentage of total loans;
LOANF = loans to foreign governments as a percentage of total loans;
RSGL = realized security gains and losses as a percentage of total assets at the beginning of the year; and
UNGL = unrealized security gains and losses at the beginning of the year as a percentage of total assets at the beginning of the year.

[b] Year intercepts are untabulated.

[c] Influential observations are deleted using Cook's (1977) distance criteria.

TABLE 5
Abnormal Accruals for Banks with Small Premanaged Changes in Return on Assets across Bank Type, 1988–1998[a]

Panel A: Abnormal Loan Loss Provision (mean (median) [standard deviation])

	Premanaged ΔROA in the Interval Just Below Zero	*Premanaged ΔROA in the Interval Just Above Zero*	*Mean Difference across Intervals {two-tailed p-value}[b]*
Public Banks	−0.0017 (−0.0019) [0.0025] n = 505	−0.0009 (−0.0012) [0.0027] n = 535	−0.0008 {0.001}
Private Banks	−0.0011 (−0.0015) [0.0031] n = 434	−0.0007 (−0.0010) [0.0028] n = 531	−0.0004 {0.090}
Mean Difference between Public and Private Banks {p-value}	−0.0006 {0.002}	−0.0002 {0.353}	−0.0004 {0.088}

Panel B: Abnormal Realized Security Gains and Losses (mean (median) [standard deviation])

	Premanaged ΔROA in the Interval Just Below Zero	*Premanaged ΔROA in the Interval Just Above Zero*	*Mean Difference across Intervals {two-tailed p-value}*
Public Banks	0.0003 (0.0001) [0.0007] n = 291	0.0001 (0) [0.0005] n = 544	0.0002 {0.001}
Private Banks	0 (−0.0001) [0.0007] n = 382	0 (−0.0001) [0.0005] n = 518	0 {0.579}
Mean Difference between Public and Private Banks {p-value}	0.0003 {0.001}	0.0001 {0.023}	0.0002 {0.001}

[a] Premanaged ΔROA is ΔROA before the abnormal loan loss provision in Panel A and before the abnormal security gains and losses in Panel B. The abnormal accruals are the residuals from the regressions reported in Table 4. Changes in Premanaged ΔROA are small if they are less than or equal to 0.0008 in magnitude.

[b] The p-values are adjusted for serial correlation across bank-years for each bank and heteroskedasticity as described by Rogers (1993).

both public and private banks, it will not affect a comparison of differences across public and private banks. Thus, we focus on whether these findings are more pronounced for public banks than for private banks.

Similar to public banks, the abnormal loan loss provisions for private banks with small decreases in premanaged ROA are more income-increasing than the abnormal provisions for private banks with small increases in premanaged ROA.[16] However, the magnitude of the difference across the two intervals is, at best, marginally significant ($p = 0.09$) and is only half the magnitude of the difference observed for public banks. In addition, the abnormal provision for private banks with a small decline in premanaged ROA is significantly less income-increasing than that of public banks with a similar decline in premanaged ROA ($p = 0.002$). Furthermore, only 64.3 percent of the private banks with small declines in earnings before the abnormal provision successfully manipulated the loan loss provision to ultimately report an increase in ROA. This percentage is significantly less than the corresponding 84.4 percent for the public banks ($p < 0.001$). These differences between public and private banks suggest that the results for public banks are not simply attributable to bias in the measurement of the abnormal component of the loan loss provision.

Panel B of Table 5 repeats the analysis for realized gains and losses from security transactions. The mean (median) abnormal security gain for public bank-years with small declines in premanaged ROA in the interval just below zero is 0.0003 (0.0001). This is significantly more income-increasing than for public bank-years with small increases in premanaged ROA ($p < 0.001$). Again, this is consistent with public banks using discretion to make income-increasing choices to avoid reporting a small decline in ROA. The mean abnormal security gain is essentially zero for private banks regardless of the sign of premanaged ΔROA. This suggests that private banks do not use security transactions to manage small earnings changes.

The abnormal security gains for banks with small decreases in premanaged ROA are significantly more income-increasing for public banks than for private banks ($p < 0.001$). There is also evidence that the abnormal security gains for public banks with small *increase*s in premanaged ROA are more income-increasing than for private banks ($p = 0.023$). However, the difference in the abnormal security gain between banks with small declines vs. small increases in pre-managed ROA is significantly greater for public banks than for private banks ($p < 0.001$). Consistent with only public banks using security transactions to avoid small declines in earnings, we find that 42.3 percent of public banks vs. 18.8 percent of private banks with small earnings declines before the abnormal security gains ultimately report an earnings increase. This difference in the proportion of bank-years that successfully use security transactions to report an increase in ROA across public and private banks is significant ($p < 0.001$).[17]

Differences in the Duration of Consecutive Earnings Increases

Table 6 reports the maximum likelihood estimates of our Weibull hazard Model (5), with the log of DURATION as the dependent variable. DURATION represents 2,062 strings of consecutive earnings increases for 1,261 banks. Within these strings are 5,654 analysis

[16] To determine whether differences in taxation of the loan loss provision for small vs. large banks confounds our analysis, we compare abnormal provisions of private banks having more than \$500 million in assets with those having less. The abnormal provisions do not differ significantly across the two samples, so differences in taxation are not likely to confound our analysis.

[17] If our public (private) banks with small declines in premanaged earnings before both the abnormal loan loss provision and abnormal security gains, 82.3 percent (61.6 percent) ultimately reported increases in earnings. The difference across bank type is significant ($p < 0.001$).

TABLE 6
Weibull Hazard Model Estimation of the Determinants of the Duration of Strings of Consecutive Earnings Increases, 1989–1998 (n = 2,062)[a]

Independent Variable[b]	*Coefficient*	*Robust Two-Tailed p-value*[c]
PUBLIC	0.369	(0.000)
ΔASSET	0.216	(0.188)
LASSET	0.076	(0.000)
ΔCF	26.583	(0.000)
Δ^2NPL	−0.139	(0.770)
ΔLOANR	1.731	(0.019)
ΔLOANC	2.353	(0.003)
ΔLOAND	0.512	(0.682)
ΔLOANA	2.514	(0.016)
ΔLOANI	0.219	(0.808)
ΔLOANF	6.974	(0.128)
Shape parameter p	1.66	
Log likelihood	−1,935	
Model χ^2	928	

[a] The sample includes all bank-years after an increase in nonnegative earnings and with at least three years of data.
[b] The dependent variable is the log of the observed duration of a string of consecutive earnings increases. Other variable definitions are in Table 3. Year and region intercepts are untabulated.
[c] The p-values are robust as described by Lin and Wei (1989).

time bank-years (i.e., bank-years at risk of a failure event). We calculate the standard errors for the coefficients using a robust estimation procedure (Lin and Wei 1989). One may interpret the regression coefficients like ordinary regression coefficients. The coefficients for calendar-year and region dummies are untabulated for brevity, although most are significant. The Weibull hazard model shape parameter p is greater than 1 and highly significant, suggesting that the likelihood of breaking a string of consecutive increases in earnings escalates as analysis time t increases.

The positive LASSET and ΔCF coefficients indicate that larger firms and those with increases in cash flows enjoy longer strings of consecutive earnings increases. The coefficient on ΔASSET is not significant.

As expected, the coefficient on PUBLIC is significantly positive, indicating that the duration of consecutive earnings increases is longer for public banks even after controlling for other determinants of bank profitability (e.g., growth, size, loan characteristics, and geographic region).[18] Holding everything else constant, the expected duration of a string of

[18] We performed several sensitivity tests. We obtain similar results for size-matched and growth-matched samples, and for samples that omit the 970 left-censored earnings strings and banks with incomplete panels of data.

consecutive earnings increases is 45 percent ($e^{0.369} - 1$) longer for public banks. Given a median expected duration of approximately 3.86 years for private banks, this suggests that the duration of earnings increases would be about 1.7 years greater for public banks.[19]

VI. CONCLUSIONS

This paper compares small changes in earnings for public vs. private banks during 1988–1998 to increase our understanding of why public firms' reported earnings changes are asymmetric around zero, with more small increases than decreases in reported earnings. We argue that shareholders of public banks are more likely than shareholders of private banks to rely on simple earnings-based heuristics in making firm valuation decisions. Thus, we predict that public banks are more likely than private banks to manage earnings to achieve simple benchmarks, such as increases in earnings.

Our results support this hypothesis. We find that public banks report fewer small declines in earnings and more small increases in earnings than expected. In contrast, we find that private banks report only marginally fewer small declines in earnings than expected. Even after controlling for potential differences between the operations of public and private banks, we find that public banks are significantly less likely than private banks to report small declines in earnings. Further analysis suggests that public banks use discretion in their loan loss provisions and in their recognition of security gains and losses to avoid reporting small declines in earnings. We find that private banks have a lesser propensity than public banks to use discretion in their loan loss provisions to avoid reporting small declines in earnings, and we find no evidence that private banks use discretionary security gains and losses to avoid reporting small declines in earnings. Furthermore, we find that, on average, the duration of strings of consecutive earnings increases is greater for public banks.

Documenting differences in the earnings streams of private vs. public banks achieves three goals. First, it helps validate that the lower-than-expected incidence of small decreases in earnings of public firms is not primarily attributable to some unidentified underlying economic condition, but rather to earnings management. Second, our results are consistent with public shareholders' reliance on simple earnings-based heuristics serving as a driver of earnings management. Third, it increases our understanding of the role of accounting in private firms. Specifically, it demonstrates that private firms appear less apt to manage earnings toward a simple earnings-based benchmark.

This study has several limitations. First, because we focus on only one highly regulated industry, the results may not generalize to other industries. Second, our tests of the discretionary components of the loan loss provision and security gains and losses are biased toward finding earnings management for both public and private banks. To the extent that these tests are not more biased for public than for private banks, however, we can still draw inferences based on the observed *differences* between the two groups. Tests on the differences in the abnormal loan loss provision and the abnormal security gains and losses both support the hypothesis that public banks are more likely than private banks to engage in earnings management to transform small decreases in ROA into small increases. Third, other unidentified (and therefore uncontrolled) differences between public and private banks may affect the observed differences in the asymmetry of earnings changes around zero, as well as differences in the duration of the strings of consecutive earnings increases.

Finally, we argue that the differences we have documented in the frequency of small earnings increases result from variation in the reliance on simple earnings-based heuristics

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19 The expected median exceeds the observed median reported in Table 1, because the expected median accounts for right-censoring of the data.

by public vs. private investors; however, our tests document only an association. We do not directly examine whether investors' reliance on heuristics causes differential earnings management.

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