Income Smoothing over the Business Cycle: Changes in Banks' Coordinated Management of Provisions for Loan Losses and Loan Charge-Offs from the Pre-1990 Bust to the 1990s Boom

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ABSTRACT: Prior research shows that during the pre-1990 bust financially weak banks managed income upward by delaying provisions for losses on heterogeneous loans. In contrast, we predict and find that during the 1990s boom profitable banks managed income downward by accelerating provisions for losses on homogeneous loans. Profitable banks obscured their income smoothing by accelerating charge-offs of homogeneous loans and by recording more gross charge-offs to offset recoveries of previously charged-off loans. Over the three years subsequent to the acceleration of charge-offs, they had higher and more persistent income before provisions for loan losses than other banks, consistent with income smoothing over a prolonged horizon.

Keywords: *income smoothing; business cycle; banks; provisions for loan losses; loan charge-offs.*

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

I. INTRODUCTION

We investigate how commercial banks' management of provisions for loan losses and loan charge-offs changed from their period of poor health and ultimately crisis (bust) from 1974–1990 to their period of robust health (boom) throughout the 1990s. A considerable body of prior research finds that during the pre-1990 bust banks delayed provisioning for loan losses, with this effect being stronger for financially weaker banks holding more heterogeneous loans. In contrast, we predict and find that during the

1990s boom banks accelerated provisions and made this less apparent by also accelerating charge-offs, with these effects being stronger for more profitable banks holding more homogeneous loans.

As in Liu and Ryan (1995), we exploit differences in how provisions and charge-offs are determined for heterogeneous and homogeneous loans under Generally Accepted Accounting Principles and related accounting practices. For heterogeneous (e.g., commercial) loans, provisions and charge-offs typically are determined with judgment on a loan-by-loan basis. For homogeneous (e.g., consumer) loans, provisions are determined using statistical methods at the portfolio level, while charge-offs are determined using number-of-days-past-due rules. Liu and Ryan (1995) predict and find that banks had more ability to *delay* provisions for *heterogeneous* than homogeneous loans during the pre-1990 bust. In contrast, we predict and find that banks had more ability to *accelerate* charge-offs for *homogeneous* than heterogeneous loans during the 1990s boom.

We focus on banks' acceleration of charge-offs of homogeneous loans to obscure their income smoothing, a previously undocumented discretionary behavior, not on the strategic reasons for that behavior. Numerous studies argue convincingly that banks have incentives to smooth their income, and in particular to store income in booms such as the 1990s to cushion income in subsequent busts. Consistent with these incentives, most of the numerous empirical studies investigating this question—on samples drawn wholly or largely from the pre-1990 bust—find that banks do smooth their income using provisions for loan losses. Building on this prior research, we posit that banks prefer smoother income.

We also posit that, in smoothing their income, banks prefer that their allowances for loan losses do not fluctuate too much, in order to avoid scrutiny by bank regulators, the SEC, auditors, and market participants. The primary way that banks can reconcile these preferences is by exercising discretion over loan charge-offs, for example, by accelerating charge-offs when the allowance for loan losses would otherwise be too high. Bank regulators and analysts facilitate this discretionary behavior by using the ratio of the allowance for loans losses to net loan charge-offs to assess the adequacy of banks' allowances for loan losses.

We test and find support for four specific hypotheses about banks' provisioning and charge-off behavior during the 1990s boom. First, we predict and find that more profitable banks holding more homogeneous loans exhibit a more positive association between the provision for loan losses and income before the provision for loan losses, consistent with greater income smoothing by these banks. Second, we predict and find that more profitable banks charging off more homogeneous loans recover those charge-offs at a higher rate, consistent with greater acceleration of charge-offs by these banks. Third, we predict and find that more profitable banks recovering more charge-offs of homogeneous loans in a given year record more gross loan charge-offs in that year, consistent with these banks making new charge-offs to keep their allowances for loan losses from ballooning. Fourth, we predict and find that banks charging off more homogeneous loans had higher and more persistent income before the provision for loan losses over the next three years than did other banks, consistent with these banks smoothing income over a prolonged horizon.

Collectively, our results strongly suggest that profitable banks managed their income downward and accelerated charge-offs of homogeneous loans to obscure this discretionary

behavior over the prolonged 1990s boom.[1] Our paper is the first to provide evidence of banks' management of loan charge-offs for the purposes of income smoothing; prior research typically treats charge-offs as a nondiscretionary control variable, perhaps because charge-offs do not directly affect income. It is also the first to provide evidence of banks' management of provisions and charge-offs for homogeneous rather than heterogeneous loans in boom times. This evidence adds to our understanding of the range and determinants of banks' discretionary behavior.

Our paper also contributes to the broader area of research on income smoothing. As discussed by Dechow and Skinner (2000), a debate remains in this literature—especially between academics and practitioners—as to whether, when, and how income smoothing occurs. In our view, a primary reason for the lack of resolution of this debate is that income smoothing is a more contextual and less purely symmetrical behavior than is captured by the usual research designs. We provide an example of such behavior, showing that banks manage income downward in boom times differently from how they manage income upward in bust times.

The remainder of this paper is organized as follows. Section II develops our hypotheses based on the rules and practices governing the accounting for loan losses and prior research. Section III describes the sample and reports descriptive statistics. Section IV reports the empirical results. Section V concludes.

II. HYPOTHESIS DEVELOPMENT
Accounting for and Disclosures of Loan Losses

Under FAS No. 5 (FASB 1975), *Accounting for Contingencies*, when credit losses on a loan or portfolio of homogeneous loans are probable and can be reasonably estimated, an expense called the provision for loan losses and a contra-asset (to loans outstanding) called the allowance for loan losses should be recorded. When a specific loan is deemed uncollectible, it should be charged off, which involves reducing both loans outstanding and the allowance for loan losses by the uncollectible amount. Charge-offs do not directly affect total assets, net loans outstanding, owners' equity, or net income. Charged-off loans may turn out to be collectible, in which case the charge-offs are reversed and called recoveries. Net loan charge-offs equal gross loan charge-offs less recoveries.

Banks are required to disclose nonperforming assets, which includes the entire book value of loans more than 90 days past due, restructured troubled debt, and repossessed real estate. Nonperforming assets is a relatively nondiscretionary and timely source of information about loan default, although it does not reflect either the probability of default or expected losses given default.

Banks' Discretion over Provisions for Loan Losses
The Effect of the 1990s Boom

This study was motivated in part by our belief that banks saw their income increase in the early 1990s and immediately began overstating provisions for loan losses, initially to undo past under-reserving, but fairly quickly (no later than 1994) over-reserving. Consistent with this belief, from no later than October 1994 throughout the remainder of the 1990s boom, various governmental and regulatory bodies repeatedly expressed concern that banks

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[1] While not directly related to this paper, Moyer (1990), Beatty et al. (1995), and Collins et al. (1995) make hypotheses about and generally find evidence of the management of regulatory capital using net loan charge-offs. Loan charge-offs reduce regulatory capital to the extent that the allowance for loan losses is included in regulatory capital. The allowance for loan losses was included in primary capital up to 1990 and subsequently is included with limits in Tier 2 capital.

were over-reserved for loan losses and thereby smoothing their income across the business cycle. Most notably, in an October 1994 report, the General Accounting Office states that a sample of "institutions maintained significant amounts of unsupported reserves ... not clearly linked to likely losses" (U.S. GAO 1994). In November 1998, the SEC required SunTrust Banks—which reported a high level of gross charge-offs that it recovered at a rate close to 40 percent from 1993–1997—to reduce its allowance for loan losses by $100 million. The public nature of this requirement was intended as a signal to all banks either to justify or reduce their allowances.[2] In January 1999, the SEC sent a form letter to selected bank holding companies suggesting specific enhanced disclosures regarding their allowance and provision for loan losses. In July 2001, the SEC staff issued SAB No. 102, *Selected Loan Loss Allowance Methodology and Documentation Issues*, which requires "a systematic methodology to be employed each period in determining the allowance for loan losses to be reported," emphasizing that this methodology should be "consistently applied" through time. The major bank regulators contemporaneously revised their regulatory guidance to be consistent with SAB No. 102.

Prior Research

Prior research on banks' management of provisions for loan losses falls into three distinct literatures. The first argues that banks have incentives to decrease income in good times such as the 1990s boom to allow increased income in subsequent bad times. Joyce (1996) argues that banks manage provisions for compensation purposes. Galai et al. (2003) argue that banks create "hidden reserves" that they release as needed either to raise income to meet analyst forecasts or capital requirements. Kanagaretnam et al. (2003) hypothesize that banks that smooth income downward are more likely to obtain financing externally.

The second literature examines empirically whether banks manage provisions for loan losses to smooth income. Most, though not all, of these studies find evidence consistent with income smoothing.[3] Kanagaretnam et al. (2003) find that downward income smoothing is stronger for banks that are more likely to raise funds externally. Beatty et al. (2002) find that publicly traded banks are more likely than privately held banks to manage earnings upward to avoid earnings decreases.

The third literature examines the market pricing of the allowance or provision for loans losses.[4] All of these studies are motivated at least in part by the idea that banks exercise discretion over provisions for loan losses, with several advancing the hypothesis that banks do so to signal their quality.[5] A number of these studies examine the market's reaction to the March–April 1987 announcements of provisions for less-developed-country debt for which banks had clearly exercised discretion to delay making those provisions, given that much of this debt was known to be troubled since the early 1980s.[6]

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[2] The "SunTrust Banks—After the Restatement" case in Ryan (2002, Chapter 5) examines this situation in detail.

[3] Greenawalt and Sinkey (1988), Ma (1988), Collins et al. (1995), Robb (1998), Beatty et al. (2002), Kanagaretnam et al. (2003), and Gray (2004) provide evidence that banks smooth income using provisions for loan losses, while Scheiner (1981), Beatty et al. (1995), and Ahmed et al. (1999) do not.

[4] See Beaver et al. (1989), Wahlen (1994), Liu and Ryan (1995), Beaver and Engel (1996), Liu et al. (1997), Ahmed et al. (1999), and the papers on less-developed-country debt cited in footnote 6.

[5] Beaver et al. (1989), Musumeci and Sinkey (1990), Grammatikos and Saunders (1990), Wahlen (1994), and Liu et al. (1997) advance the signaling hypothesis.

[6] See Grammatikos and Saunders (1990), Musumeci and Sinkey (1990), Elliott et al. (1991), and Griffin and Wallach (1991). Poland and other Eastern bloc countries had problems repaying debt in the early 1980s and Mexico and Brazil announced moratoria repaying interest and principal in late 1982. Boehmer and Megginson (1990) report that the average market price for less-developed-country debt in January 1986 ranged from 27.5 cents on the dollar for Peru to 83 cents on the dollar for Columbia.

Effects of Loan Portfolio Composition

Liu and Ryan (1995) argue that, under Generally Accepted Accounting Principles and related accounting practices, banks have differential ability to exercise discretion over provisions for different types of loans. For homogeneous (e.g., consumer) loans, provisions are determined primarily on a statistical basis at the portfolio level. For heterogeneous (e.g., commercial) loans, provisions are determined primarily on a judgmental basis at the individual-loan level. During bust periods when banks have incentives to delay provisions for loan losses, the statistical approach should yield timelier and less discretionary provisions for homogeneous loans than the judgmental approach yields for heterogeneous loans. Consistent with this argument, for a sample of banks during the pre-1990 bust, Liu and Ryan (1995) find that provisions for loan losses were highly untimely compared to non-performing assets for banks that held above-median heterogeneous loans, but relatively timely for banks that held above-median homogeneous loans.

In contrast, we expect discretionary acceleration of both provisions and charge-offs for homogeneous loans during the 1990s boom. Homogeneous loans typically are charged off based on number-of-days-past-due rules, while heterogeneous loans typically are charged off based on judgment on a loan-by-loan basis. While the use of number-of-days-past-due rules may suggest that less discretion is applied to charge-offs of homogeneous than heterogeneous loans, this turns out not to be true when banks desire to accelerate charge-offs in boom times, for three reasons.

First, these rules interact with economic conditions, yielding charge-offs that are recovered with much higher probability in good than bad times. While this could be viewed as a mechanical rather than discretionary aspect of these rules, in principle banks could and should adjust the number of days past due they use in these rules to remove this effect. In practice, however, they do not appear to do so, perhaps reflecting McNichols and Wilson's (1988) observation that as "receivables turnover decline (for example, in banking), mechanical rules are more difficult to specify, leaving greater room for discretion over write-offs."

Second, and more importantly, at least until bank regulators changed the guidance for charge-offs of consumer loans effective June 1999, as discussed below, banks employed discretion in determining and applying their policies regarding the number of days past due to charge off homogeneous loans, leading to time-series and cross-sectional variation in those policies.[7] To curb diversity across banks in charge-off practices for homogeneous loans, in February 1999 the Federal Financial Institutions Examination Council (FFIEC, a cooperative group of the main bank regulators) revised guidance for charge-offs of consumer loans that had been in place since 1980, stating that "[p]revious policy guidance had been interpreted and applied inconsistently," "[c]harge-off practices ranged from 120 to

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[7] Until pressured by the SEC to do so in late 1998 (via the SunTrust restatement) and early 1999 (via the sample letter sent to bank holding companies [SEC 1999]), banks rarely disclosed their charge-off policies in their public filings. Hence, during our sample period, it is generally not possible to determine when and how banks changed their charge-off policies. We determined that a fair number of such changes did occur by conducting a web search using "charge-off policy" and "change." For example, Standard & Poor's Creditwire explained the change in charge-off rates for an index of credit card-backed securities from June to July 1997 as being significantly affected by First USA's decision to charge off credit card accounts at 180 days past due rather than 210 days past due it had used previously.

240 days'' past due, and ''a number of institutions were not following existing policy guidance for charging off open-end accounts based on past due status.''[8]

Third, charge-offs of heterogeneous loans typically are based on loan-by-loan evaluations by loan officers, whose incentives generally work against acceleration of charge-offs and whose decisions are harder to coordinate. Office of the Comptroller of the Currency et al. (1993) states that ''an effective credit grading framework generally places primary reliance on loan officers to identify emerging loan problems.'' However, in a 2001 speech, Federal Reserve Board Chairman Alan Greenspan stated ''regrettably, incentives for loan officers ... traditionally have rewarded loan growth, market share, and the profits that derive from booking interest income with, in retrospect, inadequate provisions for possible default.'' Udell (1989) and Berger and Udell (2002) discuss and provide evidence about loan officers' informational advantages in monitoring loans and their incentive to hide loan default on the loans they originated. They argue that loan officers devote insufficient time to monitoring existing loans, because their compensation is based disproportionately on short-term revenues. Berger and Udell (2003) emphasize that this time allocation issue and other incentive problems are more likely to arise in booms, such as the 1990s, when the opportunities for loan growth are highest and when realized loan default has been low for extended periods.

Hypotheses

Building on the prior research discussed above, we posit that banks prefer smoother income, all else being equal. During the 1990s boom, smoothing usually involved banks reducing income, as evidenced by the actions of the governmental and regulatory bodies described above. We also posit that, in smoothing their income, banks prefer that their allowances for loan losses do not fluctuate too much, in order to avoid scrutiny by bank regulators, the SEC, auditors, analysts, and other market participants. We hypothesize that banks satisfy both these preferences by exercising discretion over loan charge-offs. During the 1990s boom, this usually involved banks accelerating loan charge-offs to reduce the allowance for loan losses.

While banks' loan charge-offs are observable, this discretionary behavior likely is opaque to outsiders for the following two reasons. First, charge-offs can be volatile at the bank level even in good times, and discretionary charge-offs are not directly observable. Hence, the exercise of discretion can appear to be attributable to chance, at least for a while. Second—and more importantly given the prolonged period over which we hypothesize that banks smoothed income—bank regulators and analysts facilitate this discretionary behavior by using the ratio of the allowance for loans losses to net loan charge-offs to assess the adequacy of banks' allowances for loan losses.[9] Increasing net charge-offs lowers this ratio by both reducing its numerator and increasing its denominator, so a bank that that increases its charge-offs appears to have a less excessive allowance for loan losses.

We test four hypotheses about how more profitable banks smoothed their income downward during the 1990s boom by accelerating provisions for and charge-offs of homogeneous

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[8] See FFIEC (1999) February 10, 1999. In this guidance, the FFIEC requires credit card and other open-end consumer loans to be charged off no later than 180 days past due and closed-end consumer (e.g., auto) loans to be charged off no later than 120 days past due as of June 1999. These new rules do not eliminate differences in charge-off practices across banks, however, because they allow banks to adopt a ''policy more conservative than the one detailed.'' For example, SunTrust Banks continues to charge off closed-end consumer loans at 90 (not 120) days past due, despite consistently recovering these charge-offs at about a 40 percent rate.

[9] See Federal Reserve Board (2005, Section 2072.1, 13), Office of the Comptroller of the Currency (1998, 38), and Ryan (2002, Chapter 5).

loans for which charge-offs are determined using number-of-days-past-due rules and so can be more easily accelerated. First, consistent with most prior empirical research, which finds that banks smooth their income, we hypothesize that banks' provisions for loan losses are positively associated with income before the provision for loan losses. Extending this prior research, we hypothesize that this association is stronger for more profitable banks that hold more homogeneous loans, consistent with greater income smoothing by these banks.

Second, we hypothesize that more profitable banks that charged off more homogeneous loans had higher rates of recoveries of charge-offs, consistent with these banks accelerating charge-offs of these loans. As discussed above, recovery rates are used by bank regulators and analysts to assess the aggressiveness of banks' charge-off policies.[10]

Third, we hypothesize that more profitable banks that recovered more charge-offs of homogeneous loans in a given year recorded more new gross loan charge-offs in that year, consistent with these banks reducing their allowances for loan losses in order to obscure their income smoothing across the prolonged 1990s boom.

Fourth, we predict and find that profitable banks that charged off more homogeneous loans have higher and more persistent income before the provision for loan losses over the next three years, consistent with these banks smoothing income over a prolonged horizon.

III. SAMPLE AND DESCRIPTIVE STATISTICS

The sample covers the period from 1991–2000, which includes the entire 1990s boom. The number of commercial bank holding companies in the sample rises from 122 in 1991 to 304 in 2000, peaking at 329 in 1999. Since the sample does not include the bust period up to 1990, we contrast our results to those of the prior research summarized in Section II to make inferences about changes over time in banks' management of provisions for loan losses and loan charge-offs. While this is not optimal, we view it as preferable to attempting to construct a sample of banks that includes the bust period for the following reasons. First, the bank regulatory data discussed below becomes available only in 1986, and its definitions of variables change at the beginning of our sample period in significant ways. In particular, the data by loan type discussed below became available in its current form either at the end of 1990 or in the first quarter of 1991. Second, Bank Compustat does not include non-surviving banks, and so yields a highly selected sample in the bust period. Third, there are nontrivial problems matching banks over a longer period given the volume of mergers and acquisitions in the banking industry.

We obtain the following data by type of loan from commercial bank holding companies' regulatory Y-9C reports available on the Federal Reserve Bank of Chicago's website: loans outstanding, gross and net loan charge-offs, recoveries, and nonperforming assets. As in Liu and Ryan (1995), homogeneous loans include consumer loans, 1-4 family residential mortgages, loans to financial institutions, and acceptances of other banks. Heterogeneous loans include commercial and industrial loans, direct lease financing, all other real estate loans, agriculture loans, and foreign loans.[11] We also obtain the allowance and provision for loan losses, net income, total assets, and owners' equity from these reports.

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[10] See Federal Reserve Board (2005, Section 2072.1, 13), Office of the Comptroller of the Currency (1998, 17), and Ryan (2002, Chapter 5).

[11] Liu and Ryan (1995) use more aggregated data on loans outstanding by type from Bank Compustat to calculate homogeneous and heterogeneous loans. The main difference between our classification scheme and that of Liu and Ryan (1995) is our more descriptive classification of 1-4 family residential mortgages as homogeneous, whereas Liu and Ryan are constrained to classify all real estate loans in a single category, which they choose to be heterogeneous. This classification difference has minimal effect on the results in this paper.

We obtain Tier 1 risk-based capital ratios from 1993–2000 from Bank Compustat, because these ratios are only available beginning in 1997 in the Y-9C reports. Since Tier 1 risk-based capital ratios are not available prior to 1993 on Bank Compustat, in those years we proxy for it using equity divided by assets.

Table 1 reports descriptive statistics for the variables in the regression analyses reported in Section IV as well as additional descriptive variables. Panel A reports the means and quartiles of these variables for the entire sample period.

Panel B of Table 1 reports medians of the variables for the odd years in the sample period. The trends in the medians from 1991 to 1995 indicate that by no later than 1994 banks were experiencing low levels of loan losses and were far better reserved for loan losses than during the pre-1990 bust. Specifically, the downward trends for the provision for loan losses (*PLL*) and net loan charge-offs (*NLCO*) both deflated by beginning loans outstanding, indicate that loan losses dropped by about 65 percent from 1991 to 1995. The upward trends for the ratios of the allowance for loan losses (*ALL*) to nonperforming assets (*NPA*) and to *NLCO* indicate that loss reserve adequacy improved by about 150 percent over this period. The ratio of recoveries to gross loan charge-offs, *REC%*, referred to as the recovery rate, is a measure of the aggressiveness of banks' charge-off policies used by bank regulators and analysts. The upward trend for *REC%* indicates that the recovery rate doubled from 1991 to 1995, rising to a level of 32.5 percent in 1995 that is difficult to reconcile with charged-off loans being deemed uncollectible.

Reflecting banks' improving health, their return on assets, *ROA*, rose almost 40 percent from 0.96 percent in 1991 to 1.33 percent in 1995 and stayed at about that level throughout the remainder of the 1990s. The upward trend for the Tier 1 risk-based capital ratio, *CAP*, reported in Panel B is correct but overstated, because the ratio of book equity to book assets proxies for this variable in 1991. Bassett and Zakrajsek (2001) report that the average Tier 1 risk-based capital ratio for all U.S. chartered commercial banks rose approximately 30 percent, from .081 in 1991 to 0.106 in 1994, and Panel B indicates that our sample banks stayed well capitalized through 2000. These statistics illustrate a highly profitable and well-capitalized banking industry by no later than 1994, conditions that persist through 2000.

Panel C of Table 1 reports medians of $REC\%_t$ for groups of observations more and less likely to accelerate loan charge-offs to obscure their income smoothing. Using the prior year's values of variables, we group observations into above- and below-median ROA_{t-1} groups, into quintiles based on total gross loan charge-offs divided by loans outstanding, $GLCO_{t-1}$, and into quintiles based on each of gross loan charge-offs of homogeneous and heterogeneous loans divided by loans outstanding, $GLCO(HOM)_{t-1}$ and $GLCO(HET)_{t-1}$, respectively. Consistent with our hypothesis that more profitable banks with higher charge-offs of homogeneous loans are more likely to be accelerating loan charge-offs, for the above-median ROA_{t-1} group, $REC\%_t$ rises sharply and monotonically from 21.6 percent in the lowest $GLCO(HOM)_{t-1}$ quintile to 34.6 percent in the highest $GLCO(HOM)_{t-1}$ quintile. In contrast, $REC\%_t$ has no obvious trend across the $GLCO(HOM)_{t-1}$ quintiles for the below-median ROA_{t-1} group. Also in contrast, $REC\%_t$ generally decreases across the $GLCO(HET)_{t-1}$ quintiles for the above-median ROA_{t-1} group, and it has no obvious trend across these quintiles for the below-median ROA_{t-1} group.

Panel D of Table 1 reports Pearson correlations of these variables, which indicate that many of our explanatory variables—most notably, the provision for loan losses and net loan charge-offs—are highly correlated. While these correlations do not pose problems in

TABLE 1
Descriptive Statistics[a,b,c,d]

Panel A: Means and Quartiles of Variables in Pooled Sample

Variables	Mean	Min	25%	Med	75%	Max	#Obs
X	.0223	−.0117	.0177	.0216	.1260	.0822	2148
ROA	.0127	−.0197	.0103	.0128	.0155	.0392	1886
PLL	.0048	−.0041	.0019	.0033	.0053	.0476	2148
$NLCO$	.0038	−.0026	.0011	.0023	.0044	.0417	2148
REC	.0013	.0000	.0005	.0009	.0026	.0127	2159
$REC\%$	.3575	.0029	.1614	.2558	.4033	4.5223	2137
ΔNPA	−.0004	−.0612	−.0020	.0000	.0021	.0413	2148
$HOM\%$	.4731	.0361	.3633	.4775	.5959	.9708	2145
ALL/NPA	2.9521	.1921	1.0458	1.9008	3.3003	50.2022	2105
$ALL/NLCO$	8.0720	−62.2102	3.0375	5.4541	10.4358	77.7020	1751
CAP	.1156	.0414	.0850	.1099	.1370	.3071	1736

Panel B: Medians of Variables in Odd Years of Sample Period

Variables	1991	1993	1995	1997	1999
X	.0219	.0232	.0219	.0225	.0204
ROA	.0096	.0129	.0133	.0134	.0124
PLL	.0075	.0040	.0029	.0032	.0029
$NLCO$	.0058	.0028	.0022	.0021	.0018
REC	.0012	.0012	.0010	.0008	.0006
$REC\%$	.1576	.2912	.3253	.2648	.2474
ΔNPA	.0014	−.0023	−.0003	.0002	.0003
$HOM\%$	.4763	.5085	.5064	.4854	.4663
ALL/NPA	.7615	1.2770	1.9847	2.2635	2.4508
$ALL/NLCO$	2.5246	5.3861	6.2509	5.8624	6.1907
CAP	.0730	.1139	.1122	.1100	.1051
max #obs	122	141	197	252	329

Panel C: Median Recovery Rate ($REC\%_t$) by Profitability and Charge-Off Groups

ROA_{t-1}	Quintiles Based on Variables	Quintiles				
		1 (low)	2	3	4	5 (high)
Above median	$GLCO_{t-1}$	.2198	.2101	.2370	.2646	.2658
	$GLCO(HOM)_{t-1}$	.2158	.2244	.2579	.3007	.3457
	$GLCO(HET)_{t-1}$	.3529	.2663	.2271	.2371	.2146
Below median	$GLCO_{t-1}$	.2894	.2960	.2832	.2707	.2607
	$GLCO(HOM)_{t-1}$	.2647	.3563	.2467	.3000	.2560
	$GLCO(HET)_{t-1}$	.2831	.2717	.2389	.2850	.2563

(continued on next page)

TABLE 1 (Continued)

Panel D: Pearson Correlations of Variables in Pooled Sample

Variables	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
X (1)	.90	.32	.26	.17	−.00	−.05	−.17	.15	−.06	−.06
ROA (2)		−.11	−.06	.10	.06	−.05	−.10	.22	.05	−.05
PLL (3)			.86	.33	−.27	−.02	−.10	−.03	−.23	−.02
NLCO (4)				.41	−.33	−.18	−.04	−.06	−.26	−.04
REC (5)					.36	−.23	−.08	−.04	−.24	−.04
REC% (6)						−.02	−.04	.10	−.04	.04
ΔNPA (7)							.02	−.00	.01	.02
HOM% (8)								.00	.13	−.05
ALL/NPA (9)									.18	.06
ALL/NLCO (10)										.73
CAP (11)										

[a] All variables are collected from commercial bank holding companies' regulatory Y-9C filings except for Tier 1 risk-based capital, which is collected from Bank Compustat. The sample covers the period 1991–2000.

[b] The descriptive statistics reflect all observations of any variable included in any subsequent regression analysis. Observations in the outside 0.5 percent of either tail of the distribution of any variable in a given analysis or for which total assets or loans outstanding on the regulatory Y-9C reports differs from the value on Bank Compustat by more than 10 percent are deleted.

[c] Variable definitions:

X = net income before the provision for loan losses divided by beginning of year total loans;
ROA = net income divided by beginning of year total assets;
PLL = provision for loan losses divided by beginning of year total loans;
$GLCO$ = gross loan charge-offs divided by beginning of year total loans;
$NLCO$ = net loan charge-offs divided by beginning of year total loans;
REC = recoveries divided by beginning of year total loans;
$REC\%$ = recoveries divided by gross loan charge-offs;
ΔNPA = change in nonperforming assets divided by beginning of year total loans;
$HOM\%$ = percentage of total loans outstanding that are homogeneous loans (consumer loans, 1–4 family residential mortgages, loans to financial institutions, or acceptances of other banks);
ALL/NPA = allowance for loan losses divided by nonperforming assets;
$ALL/NLCO$ = allowance for loan losses divided by net loan charge-offs;
CAP = Tier 1 risk-based capital ratio; and
max #obs = the maximum number of observations of any variable in a given year (which typically exceeds the minimum number of observations of any variable in that year by 10–20 percent).

[d] A variable name followed by *HOM* or *HET* in parentheses denotes the value of that variable for homogeneous or heterogeneous loans, respectively. For example, *GLCO(HOM)* denotes gross loan charge-offs of homogeneous loans.

our pooled estimations, they preclude reliable year-by-year estimations of the models, especially in the early years in our sample period that have about one-third the observations of later years.

IV. MODELS AND RESULTS

Since our single-industry sample exhibits cross-sectional dependence, we estimate each regression model with fixed time effects. To mitigate heteroscedasticity, we deflate unscaled variables by beginning loans outstanding and delete observations of each variable in the outside 0.5 percent of each tail of its distribution each year. Our regression results are not sensitive to the treatment of outliers as long as extreme observations are deleted or pulled in; for example, deletion of influential outliers identified based on Belsley et al. (1980) diagnostics has minimal effect on our results.

Income Smoothing Using Provisions for Loan Losses

In this section, we test the hypothesis that during the 1990s boom, banks' provisions for loan losses are positively associated with their income before the provision for loan losses, consistent with banks managing provisions to smooth their income, and that this association is stronger for more profitable banks that hold more homogeneous loans. We conduct these tests using the following variant of a model developed by Ahmed et al. (1999):[12]

$$PLL_t = a + bI_{highroa_t} + cHOM\%_t + dX_t + f(X_t{}^*I_{highroa_t}) + g(X_t{}^*HOM\%_t)$$
$$+ hCAP_t + j\Delta NPA_t + e_t. \tag{1}$$

$I_{highroa,t}$ is an indicator variable that takes a value of 1 if a bank has an above-median return on assets in year t, and 0 otherwise. $HOM\%_t$ denotes the percentage of homogeneous loans in the bank's loan portfolio. X_t denotes income before the provision for loan losses.[13]

The hypothesis stated above has three main implications for the coefficients in Equation (1). First, the coefficient on X_t should be positive, consistent with banks smoothing their income using provisions for loan losses during the 1990s boom. Second, the coefficient on $X_t{}^*I_{highroa,t}$ should be positive, consistent with more profitable banks more aggressively smoothing income (downward) during this period. Third, the coefficient on $X_t{}^*HOM\%_t$ should be positive, consistent with banks that hold more homogeneous loans more aggressively smoothing income during this period.

While our hypothesis pertains to the coefficients on the variables in which $I_{highroa,t}$ and $HOM\%_t$ are interacted with X_t, we also include $I_{highroa,t}$ and $HOM\%_t$ separately in Equation (1) to ensure that the coefficients on the interaction terms do not reflect any direct effects of profitability and loan portfolio composition on provisions for loan losses. Ahmed et al. (1999) include CAP_t to control for banks recording provisions to raise regulatory capital and ΔNPA_t to control for economic loan default during the period, and they find a negative coefficient on CAP_t and a positive coefficient on ΔNPA_t.

PLL_t, X_t, and ΔNPA_t are deflated by loans outstanding at the beginning of year t. The other variables in Equation (1) are naturally deflated or scale-free.

Table 2 reports the fixed time effects estimation of Equation (1). As predicted, the coefficient on X_t is significantly positive ($t = 1.8$), consistent with banks smoothing their income using provisions for loan losses during the 1990s boom. As predicted, the coefficient on $X_t{}^*I_{highroa,t}$ is significantly positive ($t = 3.5$), consistent with more profitable banks more aggressively smoothing income using provisions for loan losses than less profitable banks during the 1990s boom. The coefficient on $I_{highroa,t}$ is significantly positive ($t = 2.9$), also

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[12] Equation (1) differs from the model in Ahmed et al. (1999) in the following ways. First, we do not include a difficult-to-collect control variable, the change in per capita dollar liabilities of failed businesses weighted by the geographic distribution of loans, which they found to be not significant. Second, we do not include the implied standard deviation of return on assets, which they use to proxy for the change in the risk of the loan portfolio, because this variable cannot be calculated for almost 20 percent of the sample due to insufficient returns data. We did conduct sensitivity analysis adding this variable for the subsample for which it is available, however, and the conclusions from our hypothesis tests are not altered. Third, we do not include certain interaction terms involving X and CAP that relate to their time-period-specific hypotheses. Fourth, we include $I_{highroa,t}$ by itself and interacted with X to test hypotheses regarding bank profitability. Fifth, we include $HOM\%$ by itself and interacted with X to test hypotheses regarding homogeneous loans.

[13] For simplicity, we use income before the pretax provision for loan losses throughout the paper. We tested the sensitivity of our results to using earnings before 0.6 times the provision for loan losses, and found no significant differences in the conclusions from our hypothesis tests (the coefficients on the provision for loan losses are algebraically affected, of course).

TABLE 2

Regression of the Provision for Loan Losses on Earnings before the Provision for Loan Losses with Profitability and Loan Portfolio Composition Interactions[a,b,c,d]

$$PLL_t = a + bI_{highroa_t} + cHOM\%_t + dX_t + f(X_t * I_{highroa_t}) + g(X_t * HOM\%_t)$$
$$+ hCAP_t + j\Delta NPA_t + e_t. \tag{1}$$

	Hypotheses	**Coefficients**
$I_{highroa,t}$		.008*
		(2.9)
$HOM\%$		−.011
		(−1.6)
X_t	+	.124*
		(1.8)
$X_t * I_{highroa,t}$	+	.718*
		(3.5)
$X_t * HOM\%$	+	.573*
		(2.2)
CAP_t		.015
		(1.2)
ΔNPA_t		−.039
		(−1.5)
R^2		.27
# obs		1739

* White's heteroscedasticity-adjusted t-statistic (shown in parentheses) is significant at the 5 percent level or better.
[a] The sample is described in the notes to Table 1.
[b] All variables are defined in the notes to Table 1 except for $I_{highroa,t}$, which takes a value of 1 if an observation has above median return on assets in year t, and 0 otherwise.
[c] The equation is estimated with fixed time effects, which are not tabulated.
[d] The R^2 does not include the explanatory power of the fixed effects.

possibly reflecting banks' income smoothing. As predicted, the coefficient on $X_t * HOM\%_t$ is significantly positive (t = 2.2), consistent with the hypothesis that this income smoothing is stronger for banks with more homogeneous loans.

In contrast to Ahmed et al.'s (1999) finding of significant coefficients on CAP_t and ΔNPA_t, we find none of the coefficients on the control variables CAP_t, ΔNPA_t, and $HOM\%_t$ are significant. This lack of significance suggests that banks determined their provisions for loan losses primarily based on their profitability during the 1990s boom, perhaps because they were well capitalized and experienced low levels of loan default during that period.

In summary, in this section we find that the provision for loan losses is positively correlated with income before the provision for loan losses, consistent with banks smoothing their income using provisions for loan losses during the 1990s boom. We find this income smoothing behavior is stronger for more profitable banks holding more homogeneous loans.

Acceleration of Loan Charge-Offs

In this section, we test the hypothesis that more profitable banks accelerated charge-offs of homogeneous loans in order to keep their overstated allowances for loan losses from ballooning during the 1990s boom. We conduct these tests using the following model:

$$REC_t = a + bHOM\%_{t-1} + cI_{highroa_{t-1}} + dGLCO(HET)_{t-1}$$
$$+ f[GLCO(HET)_{t-1}*I_{highroa_{t-1}}] + gGLCO(HOM)_{t-1}$$
$$+ h[GLCO(HOM)_{t-1}*I_{highroa_{t-1}}] + jCAP_{t-1} + \sum_{s=0}^{3}k_s\Delta NPA_{t-s} + e_t. \qquad (2)$$

We infer that banks have charged off loans more quickly when their gross loan charge-offs have a more positive association with one-year-ahead recoveries, denoted REC_t.[14] We distinguish gross loan charge-offs for heterogeneous and homogeneous loans, denoted $GLC(HET)_{t-1}$ and $GLCO(HOM)_{t-1}$, respectively, because we expect banks to have more ability to accelerate charge-offs of homogeneous loans than heterogeneous loans. Because we expect that more profitable banks accelerated charge-offs more than less profitable banks during the 1990s boom, we interact these gross loan charge-off variables with $I_{highroa,t}$.

The coefficients on the gross loan charge-off variables in Equation (2) reflect the rates of recovery in year t of incremental charge-offs in year $t–1$. Since some level of recoveries is to be expected even in the absence of discretion, the coefficients on both $GLCO(HET)_{t-1}$ and $GLCO(HOM)_{t-1}$ should be positive. The hypothesis stated above has two main implications for these coefficients. First, the coefficient on $GLCO(HOM)_{t-1}*I_{highroa,t-1}$ should be positive, consistent with more profitable banks accelerating charge-offs for homogeneous loans more than less profitable banks. Second, the sum of the coefficients on $GLCO(HOM)_{t-1}$ and $GLCO(HOM)_{t-1}*I_{highroa,t-1}$ should be larger than the sum of the coefficients on $GLCO(HET)_{t-1}$ and $GLCO(HET)_{t-1}*I_{highroa,t-1}$, i.e., $g + h > d + f$, consistent with more profitable banks accelerating charge-offs more for homogeneous loans than for heterogeneous loans.

We include $HOM\%_{t-1}$ and $I_{highroa,t-1}$ separately in Equation (2) to ensure that the coefficients on the interaction variables do not reflect any direct effects of loan portfolio composition and profitability on recoveries. We include CAP_t because Moyer (1990), Beatty et al. (1995), and Collins et al. (1995) predict and generally find that loan charge-offs are used to manage regulatory capital.[15] We include current and three lagged changes in nonperforming assets, ΔNPA_{t-s}, $0 \leq s \leq 3$, to control for banks' economic exposure to loan losses, because nonperforming assets is the best available measure of those losses.

REC_t, $GLCO(HET)_{t-1}$, $GLCO(HOM)_{t-1}$, and ΔNPA_{t-s} are deflated by loans outstanding at the beginning of year $t−3$. The other variables in Equation (2) are naturally deflated or scale-free.

Table 3 reports the fixed time effects estimation of Equation (2). As expected even in the absence of discretion, the coefficients on $GLCO(HET)_{t-1}$ and $GLCO(HOM)_{t-1}$ are significantly positive ($t = 7.1$ and 11.4, respectively). These coefficients imply that gross charge-offs for heterogeneous loans are recovered 11.9 percent of the time, while gross charge-offs for homogeneous loans are recovered at the much higher rate of 23.8 percent.

As predicted, the coefficient on $GLCO(HOM)_{t-1}* I_{highroa,t-1}$ is significantly positive ($t = 2.2$), consistent with more profitable banks accelerating charge-offs of homogeneous

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[14] We are able to demonstrate excessive loan charge-offs by healthy banks during the 1990s in various ways other than the association between gross loan charge-offs and future recoveries (e.g., by a rising ratio of net loan charge-offs to nonperforming assets). We chose recoveries as our dependent variable because of bank regulators' and analysts' use of recoveries to assess the aggressiveness of banks' loan charge-off policies, as discussed in Section II.

[15] We do not expect loan charge-offs to be delayed to increase regulatory capital after the first couple of years in our sample period, however, because virtually all banks are well capitalized by no later than 1994.

TABLE 3
Regression of Recovery Rate on Heterogeneous and Homogeneous Loan Charge-Offs with Profitability Interactions[a,b,c,d]

$$REC_t = a + bHOM\%_{t-1} + cI_{highroa_{t-1}} + dGLCO(HET)_{t-1}$$
$$+ f[GLCO(HET)_{t-1}*I_{highroa_{t-1}}] + gGLCO(HOM)_{t-1}$$
$$+ h[GLCO(HOM)_{t-1}*I_{highroa_{t-1}}] + jCAP_{t-1} + \sum_{s=0}^{3}k_s\Delta NPA_{t-s} + e_t. \qquad (2)$$

	Hypotheses	**Coefficients**
$HOM\%$		−.014
		(−.4)
$I_{highroa,t-1}$		−.007
		(−.8)
$GLCO(HET)_{t-1}$		.119*
		(7.1)
$GLCO(HET)_{t-1}*I_{highroa,t-1}$		.046
		(1.4)
$GLCO(HOM)_{t-1}$		.238*
		(11.4)
$GLCO(HOM)_{t-1}*I_{highroa,t-1}$	+	.083*
		(2.2)
CAP_{t-1}		.010*
		(3.4)
ΔNPA_t		−1.642*
		(−2.8)
ΔNPA_{t-1}		−2.610*
		(−4.1)
ΔNPA_{t-2}		−2.017
		(−3.1)
ΔNPA_{t-3}		−1.479
		(−2.1)
g+h−d−f	+	.156
		(3.6)
R^2		.47
# obs		1709

* White's heteroscedasticity-adjusted t-statistic (shown in parentheses) is significant at the 5 percent level or better.
[a] The sample is described in the notes to Table 1.
[b] All variables are defined in the notes to Tables 1 and 2.
[c] The equation is estimated with fixed time effects, which are not tabulated.
[d] The R^2 does not include the explanatory power of the fixed effects.

loans more than other banks. This result implies that above-median-profitability banks recovered gross loans charge-offs of homogeneous loans at an 8.3 percent higher rate than below-median-profitability banks. Also as predicted, the difference between the sum of the coefficients on $GLCO(HOM)_{t-1}$ and $GLCO(HOM)_{t-1}* I_{highroa,t-1}$ and the sum of the coefficients on $GLCO(HET)_{t-1}$ and $GLCO(HET)_{t-1}* I_{highroa,t-1}$ is significantly positive (t = 3.6), consistent with more profitable banks accelerating charge-offs of homogeneous loans more than heterogeneous loans.

The coefficient on the control variable CAP_{t-1} is significantly positive (t = 3.4), implying better capitalized banks recorded charge-offs more quickly than did poorly capitalized banks.[16] The coefficients on ΔNPA_{t-s}, $0 \leq s \leq 3$, are all significantly negative, consistent with these variables capturing economic loan default. The coefficients on $HOM\%_{t-1}$ and $I_{highroa,t-1}$ are not statistically significant.

In summary, the descriptive statistics in Table 1, Panel B discussed above show that banks experienced sharply increasing recovery rates during the early 1990s, consistent with banks charging off loans too quickly. Consistent with the descriptive analysis of recovery rates in Table 1, Panel C, in this section we find that, superimposed on this overall trend, recovery rates were higher for more profitable banks holding more homogeneous loans. These results are consistent with loan charge-offs being substantially determined by more profitable banks' discretionary behavior during the 1990s boom.

Sustaining the Income Smoothing

An alternative explanation for the high recovery rates for profitable banks charging off homogeneous loans is that these banks were consistently surprised by the persistently favorable economic conditions during the extended 1990s boom, more so than other banks. In this section, we attempt to rule out this alternative explanation and demonstrate how these banks obscured their income smoothing over such an extended period. Specifically, we test the hypothesis that during the 1990s boom profitable banks experiencing recoveries of homogeneous loans recorded new gross loan charge-offs in order to reduce their allowances for loan losses.

To test this hypothesis, we estimate the following model:

$$GLCO_t = a + bHOM\%_t + cI_{highroa_t} + dREC(HET)_t + f[REC(HET)_t*I_{highroa_t}]$$
$$+ gREC_t(HOM)_t + h[REC(HOM)_t*I_{highroa_t}]$$
$$+ jCAP_t + kPLL_t + lALL_{t-1} + m\Delta NPA_t + e_t. \qquad (3)$$

The model captures the association of gross loan charge-offs with contemporaneous recoveries of charge-offs of both heterogeneous and homogeneous loans, $REC(HET)_t$ and $REC(HOM)_t$, respectively, distinguishing above- and below-median-profitability banks.

The coefficients on the recovery variables in Equation (3) reflect the rates of new gross loan charge-offs per incremental dollar of recoveries. The hypothesis stated above has two main implications. First, the coefficient on $REC(HOM)_t*I_{highroa,t}$ should be positive, consistent with more profitable banks recording more new charge-offs when they experience recoveries of homogeneous loans than do less profitable banks. Second, the sum of the coefficients on $REC(HOM)_t$ and $REC(HOM)_t*I_{highroa,t}$ should be larger than the sum of the coefficients on $REC(HET)_t$ and $REC(HET)_t*I_{highroa,t}$, i.e., $g + h > d + f$, consistent with more profitable banks recording more new gross loan charge-offs when they experience recoveries of homogeneous rather than heterogeneous loans.

We include $HOM\%_t$ in Equation (3) to control for loan portfolio composition. We include $I_{highroa,t}$ separately to ensure that the coefficients on the interaction variables do not capture any direct effect of profitability. We include CAP_t to control for the previously

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[16] This result could be attributable to more poorly capitalized banks delaying charge-offs to increase regulatory capital, as the research discussed above generally finds happened during the bust period prior to 1990. Given that virtually all the banks in our sample are well capitalized, however, it is more likely that the better capitalized banks accelerated charge-offs.

discussed finding of prior research that banks use loan charge-offs to manage regulatory capital. We include PLL_t and ΔNPA_t to control for new information about loan default during the year. We include ALL_{t-1} in the model to control for prior estimates of loan default.

$GLCO_t$, $REC(HET)_t$, $REC(HOM)_t$, PLL_t, ALL_{t-1}, and ΔNPA_t are deflated by loans outstanding at the beginning of year t. The other variables in Equation (3) are naturally deflated or scale-free.

Table 4 reports the fixed time effects estimation of Equation (3). As predicted, the coefficient on $REC(HOM)_t*I_{highroa,t}$ is significantly positive (t = 1.9), consistent with more profitable banks recording more new charge-offs when they experience recoveries of homogeneous loans than less profitable banks. Also as predicted, the difference between the

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TABLE 4
Regression of Gross Loan Charge-Offs on Recoveries of Heterogeneous and Homogeneous Loans with Profitability Interactions[a,b,c,d]

$$GLCO_t = a + bHOM\%_t + c\,I_{highroa_t} + dREC(HET)_t + f[REC(HET)_t * I_{highroa_t}]$$
$$+ gREC_t(HOM)_t + h[REC(HOM)_t * I_{highroa_t}] +$$
$$+ jCAP_t + kPLL_t + lALL_{t-1} + m\Delta NPA_t + e_t. \tag{3}$$

	Hypotheses	**Coefficients**
HOM%		−.027
		(−1.5)
$I_{highroa,t}$		.035*
		(2.5)
REC(HET)$_t$		.547
		(.8)
*REC(HET)$_t$*$I_{highroa,t}$*		1.022
		(1.0)
REC(HOM)$_t$		2.980*
		(5.5)
*REC(HOM)$_t$*$I_{highroa,t}$*	+	1.468*
		(1.9)
CAP$_t$		−.099
		(−.8)
PLL$_t$		.478*
		(4.0)
ALL$_{t-1}$		.059
		(1.6)
ΔNPA$_t$		−.022
		(−.3)
g+h−d−f	+	2.879*
		(1.8)
R²		.97
#obs		1729

* White's heteroscedasticity-adjusted t-statistic (shown in parentheses) is significant at the 5 percent level or better.

[a] The sample is described in the notes to Table 1.

[b] All variables are defined in the notes to Tables 1 and 2.

[c] The equation is estimated with fixed time effects, which are not tabulated.

[d] The R² does not include the explanatory power of the fixed effects.

sum of the coefficients on $REC(HOM)_t$ and $REC(HOM)_t*I_{highroa,t}$ and the sum of the coefficients on $REC(HET)_t$ and $REC(HET)_t*I_{highroa,t}$ is significantly positive (t = 1.8), consistent with more profitable banks recording more new gross loan charge-offs when they recover homogeneous loans than when they recover heterogeneous loans.

The coefficient on $I_{highroa,t}$ is significantly positive (t = 2.5), likely reflecting some of the hypothesized discretionary behavior. The coefficient on PLL_t is significantly positive (t = 4.0), reflecting the well-known high positive correlation between charge-offs and provisions for loan losses. The coefficients on $HOM\%_t$, CAP_t, ALL_{t-1}, and ΔNPA_t are all not statistically significant.

In summary, in this section we find that during the 1990s boom profitable banks that experienced more recoveries of charge-offs of homogeneous loans recorded more new gross loan charge-offs in the same year. These results are consistent with the hypothesis that banks recorded those loan charge-offs to reduce their allowances for loan losses and thereby obscure their downward income smoothing during that period.

The Level and Persistence of Net Income

Due to the prolonged nature of the 1990s boom, profitable banks smoothing their income downward had to do so over a fairly (and perhaps unexpectedly) long horizon. In this section, we test the hypothesis that profitable banks that charged off more homogeneous loans during this period had higher and more persistent income before the provision for loan losses over the next three years, consistent with them smoothing income over a prolonged horizon.

We test this hypothesis using the following model:

$$X_{t+s} = a + bHOM\%_t + c\,NLCO(HET)_t + dNLCO(HOM)_t + fX_t$$
$$+ g(X_t * HOM\%_t) + h[X_t * NLCO(HET)_t] + j[X_t * NLCO(HOM)_t]$$
$$+ kCAP_t + lPLL_t + m\Delta NPA_t + e_{t+s}, 1 \leq s \leq 3. \tag{4}$$

This model regresses income before the provision for loan losses for each of the next three years, X_{t+s}, $1 \leq s \leq 3$, on net loan charge-offs for both homogeneous and heterogeneous loans, denoted $NLCO(HET)_t$ and $NLCO(HOM)_t$, respectively, both separately and interacted with current income before the provision for loan losses, X_t.

Based on the hypothesis stated above, we expect positive coefficients on $NLCO(HOM)_t$, indicating that higher net charge-offs of homogeneous loans are associated with higher future income before the provision for loan losses. We also expect positive coefficients on $X_t*NLCO(HOM)_t$, indicating that higher net charge-offs for homogeneous loans are associated with more persistent income before the provision for loan losses.

We include X_t in Equation (4) to capture the average level of income persistence for the sample. We include $HOM\%_t$ and $X_t*HOM\%_t$ to control for the effect of loan portfolio composition on the level and persistence of income. We include CAP_t to capture the previously discussed finding of prior research that banks use loan charge-offs to manage regulatory capital. We include PLL_t and ΔNPA_t to control for new information about loan default during the year.

The variables X_{t+s}, $0 \leq s \leq 3$, $NLCO(HET)_t$, $NLCO(HOM)_t$, PLL_t, and ΔNPA_t are deflated by loans outstanding at the beginning of year t. The other variables in Equation (4) are naturally deflated.

Table 5 reports the fixed time effects estimation of Equation (4). As predicted, the coefficient on $NLCO(HOM)_t$ is significantly positive for the two- and three-year horizons

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TABLE 5
Regression of Future Earnings before the Provision for Loan Losses on Current Net Loan Charge-Offs of Heterogeneous and Homogeneous Loans and Earnings before the Provision for Loan Losses with Interactions between Charge-Offs and Earnings[a,b,c,d]

$$X_{t+s} = a + bHOM\%_t + cNLCO(HET)_t + dNLCO(HOM)_t + fX_t + g(X_t * HOM\%_t)$$
$$+ h[X_t * NLCO(HET)_t] + j[X_t * NLCO(HOM)_t] + kCAP_t + lPLL_t$$
$$+ m\Delta NPA_t + e_{t+s}, \; 1 \leqslant s \leqslant 3. \tag{4}$$

		Coefficients		
	Hypotheses	X_{t+1}	X_{t+2}	X_{t+3}
HOM%ₜ		−.001	−.001	−.004
		(−1.0)	(−.3)	(−1.3)
NLCO(HET)ₜ		−.186	.227	.211
		(−1.1)	(1.1)	(.8)
NLCO(HOM)ₜ	+	.142	.711*	.663*
		(.9)	(3.0)	(2.4)
Xₜ		.952*	1.087*	1.240*
		(29.2)	(21.5)	(15.9)
*Xₜ*HOM%ₜ*		−.491*	−.607*	−.591*
		(−3.0)	(−3.2)	(−2.0)
*Xₜ*NLCO(HET)ₜ*		−6.167	−31.892	−56.546*
		(−1.2)	(−1.5)	(−4.0)
*Xₜ*NLCO(HOM)ₜ*	+	19.718*	45.234*	82.764*
		(2.7)	(2.7)	(3.5)
CAPₜ		−.003	−.009	−.018
		(−1.0)	(−1.3)	(−1.5)
PLLₜ		.050	−.600*	−.763*
		(.3)	(−3.7)	(−3.0)
ΔNPAₜ		−.023	−.015	−.126
		(−.6)	(−.4)	(−1.7)
R²		.69	.53	.41
# obs		1680	1363	1115

* White's heteroscedasticity-adjusted t-statistic (shown in parentheses) is significant at the 5 percent level or better.
[a] The sample is described in the notes to Table 1.
[b] All variables are defined in the notes to Tables 1 and 2.
[c] The equation is estimated with fixed time effects, which are not tabulated.
[d] The R²s do not include the explanatory power of the fixed effects.

(t = 3.0 and 2.4, respectively), consistent with banks recording more charge-offs of homogeneous loans having higher future income before provisions for loan losses than other banks, though this coefficient is positive but not significant for the one-year horizon. In contrast, the coefficient on *NLCO(HET)ₜ* is not statistically significant. Also as predicted, the coefficient on *Xₜ*NLCO(HOM)ₜ* is significantly positive for each of the one-year to three-year horizons (t = 2.7, 2.7, and 3.5, respectively), consistent with banks recording more charge-offs of homogeneous loans having more persistent future income before provisions for loan losses than other banks. In contrast, the coefficient on *Xₜ*NLCO(HET)ₜ* is always negative, and significantly so at the three-year horizon.

The coefficient on X_t is significantly positive and generally in excess of 1, consistent with the sample banks' income before the provision for loan losses having high persistence during the 1990s boom. The coefficients on PLL_t and ΔNPA_t are either not significant or significantly negative. The coefficient on $HOM\%_t$ is not significant.

In summary, in this section we find that, during the 1990s boom, banks recording more charge-offs of homogeneous loans had higher and more persistent future income before provisions for loan losses over the next three years than other banks. These results are consistent with these banks smoothing income over a prolonged horizon.[17]

V. CONCLUSION

In this paper, we illustrate the contextual and asymmetric nature of income smoothing in the setting of banks' provisions for loan losses and loan charge-offs. Our evidence indicates that during the 1990s boom profitable banks smoothed their income downward by overstating provisions for loan losses for homogeneous loans, and they obscured this income smoothing by accelerating charge-offs of those loans and by recording more gross charge-offs when they inevitably recovered more charge-offs of these loans. Our results are in striking contrast with those of prior research that banks delayed provisions for loan losses primarily for heterogeneous loans during the pre-1990s bust period. Collectively, our results and those of prior research indicate that banks' exercise of discretion over provisions for loan losses and loan charge-offs is constrained by whether they hold homogeneous or heterogeneous loans, and that these constraints bind differently in the bust and boom phases of the business cycle.

While we examine a specific context, contextual and asymmetric income smoothing is likely to occur beyond the banking industry and as a result of firm-specific or industry-level rather than macroeconomic phenomena. We believe that research on income smoothing would benefit in terms of economic interest, faithfulness to the rules and practices of accounting, and statistical power by seeking out and documenting discretionary behavior that manifests itself in more contextual and less purely symmetrical ways than is captured in the usual research designs.

Our results also bear on the recent debate about rules- versus principles-based accounting standards. While rules-based standards are often thought to yield less discretionary accounting, our results suggest that an accounting rule that appears particularly nondiscretionary—the charging off of homogeneous loans more than a given number of days past due—leads to more discretion in certain contexts.

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[17] Consistent with our hypothesis and findings regarding income persistence, in prior versions of this paper we predict and find that $NLCO(HOM)_t$ is significantly positively associated with banks' contemporaneous April–March share returns during the 1990s boom, controlling for current income before the provision for loan losses and various indicators of loan default. We also predict and find that $NLCO(HOM)_t$ is significantly positively associated with banks' April–March share returns for the next year, controlling for current income before the provision for loan losses and various indicators of loan default, and that this association was fully explained by the association of $NLCO(HOM)_t$ with the next year's income before the provision for loan losses and recoveries. These results suggest that the market partially understands the discretionary behavior we document.

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