Basel Buckets and Loan Losses:
Absolute and relative loan underperformance at banks and thrifts

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Abstract

We examine the distribution (across institutions and intertemporally) in charge-off and delinquency rates for six categories of loans held by U.S. banks and thrifts. The sample uses regulatory reporting data for roughly 230,000 institution-years from 1984 to 1999 (comprising over 2 million data items). We find that the Basel risk weights do not accurately track the historical credit experience of U.S. loan portfolios, suggesting that some loans may be relatively overburdened by the current standards. Collateralized loans generally pose the smallest credit risk. Commercial loans in particular appear to be under-burdened by the Basel weights, while mortgages are relatively overburdened. [JEL codes: G21, G28]

Contents

Introduction

Regulatory accounting requires banks and thrifts to hold a fractional loan loss reserve against their credit assets. Conceptually, this reserve is intended to cover the institution's "expected losses" – those that can be rationally forecast based on prior experience with portfolios of similar composition. Delinquency classifications meanwhile provide early warning of possible losses. New loans typically involve a new provision for loan losses to augment the reserve, while defaulting loans involve a charge-off, which simultaneously writes off the loan itself and decreases the reserve. The incidence of loan and lease charge-offs therefore measures directly – if perhaps imperfectly – the (ex-post) credit quality of the portfolio. This paper compares the actual credit performance of various categories of bank and thrift loans to each other and to the Basel standards, as evidenced by their reported charge-offs and delinquencies over the 1984-99 period.

In this context, the salient economic function of equity capital for banks and thrifts is to provide a buffer within the firm to absorb <u>unexpected</u> losses – i.e., the margin by which actual loss exceeds expected loss – thus avoiding bank failure with its attendant costs and externalities. This function is especially important for financial intermediaries, because these firms are typically both highly levered and federally insured. These characteristics create complex incentives for managers, depositors, and regulators, including the important possibility that capital policy can feed back into an intermediary's optimal risk profile for its asset portfolio.[1]

1.1. The Basel standards and bank credit risk

Regulators have traditionally regarded loan default risk to be the primary source of unexpected losses, and have therefore focused on credit risk in setting policies for regulatory capital. In particular, the 1988 Basel capital accord originally focused almost exclusively on credit risk – defined there as the risk of counterparty failure – leaving examiners to attend to

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[1] Calem and Rob (1999) and Keeley (1990), to cite just two examples, investigate theoretically the impact of capital on the optimal risk profile of an insured intermediary. Keeley (1990) finds that increased capital counteracts the moral hazard of deposit insurance by giving shareholders a positive "charter value," which they will protect by reducing risk. Calem and Rob (1999) find that this effect is overwhelmed at higher capital levels, where failure probabilities become negligible and further capital increases provoke augmented risk-taking.

other prominent risk factors, including interest-rate risk.[2] The accord imposes a minimum leverage capital ratio plus a set of risk-based capital thresholds, for which the assets of the bank are weighted (roughly) according to the default risks they pose. Under the U.S. implementation of the accord, the four asset "buckets" and their associated risk weights are:

Weight	**Assets**
0 %	Cash, and claims on OECD central banks and national governments
20 %	Claims on private-sector OECD banks, OECD sub-national governments and GSEs, and cash items in process of collection
50 %	First mortgages on 1-4 family real estate, and local government project finance in OECD countries
100 %	Commercial and consumer loans, and loans to non-OECD governments

Banks must hold eight percent capital (Tier I plus Tier II) against assets with a full (100%) weighting. There is significant degree of imprecision (and thus arbitrariness) implicit in the broad ranges of these buckets. Moreover, it is unclear that the combination of the risk weight and 8% benchmark charges appropriately for the risk of the loan, even for the "average" loan in each bucket. Indeed, Golding and Van Order (1994, p. 481) assert directly that, "the risk based capital ratios were chosen based on little or no empirical content." This is consistent with the argument of Kapstein (1994), among others, that the central motivations for the accord were as much geopolitical as economic. Largely because of these concerns about imprecision, the BIS's ongoing revisions to the accord now propose an increase in the granularity of the asset categories as well as a new 150% risk weight for certain loans.[3]

[2] See BIS (1998). U.S. regulators have supplemented the Basel standards with a limit on (unweighted) leverage, which has been interpreted as a constraint on interest-rate risk; see Hancock and Wilcox (1994, p. 60), for example. The 1988 accord was amended in 1996 to include a specific capital charge for "market-risk" interest-rate exposures within an internationally active bank's trading book (but not the banking book). More recently, the Basel Committee has proposed to develop a capital charge for interest-rate exposures in the banking book, but this is as yet only a proposal; see BIS (1999a). In the U.S., the Office of the Comptroller of the Currency (OCC), Federal Deposit Insurance Corporation (FDIC), Federal Reserve, and the Office of Thrift Supervision (OTS) have applied highly similar implementations of the Basel accord, although the OTS's adherence to the accord is voluntary; see Board of Governors (1999). In addition, the "S" component of the CAMELS supervisory rating system encompasses market risks, including interest-rate risk; see OTS (1998), for example. Finally, the OTS maintains a formal and extensive interest-rate risk analysis model (the "NPV Model").

[3] See BIS (1999a). Altman and Saunders (2000) provide an analysis. Mingo (2000, p. 25) notes that the internal models of large banks typically have eight to ten risk buckets, in contrast to the Basel accord's four.

Mingo (2000) aptly frames the question of capital regulation in terms of insolvency probabilities. However, he notes pointedly that the current Basel (i.e., as agreed in 1988 and modified in 1996) standard is not the upshot of a deliberate and systematic analysis of insolvency (Mingo, 2000, p. 19):

> As you are well aware by now, the Basle Accord does not flow from any explicitly stated goal or goals for prudential regulation. A decade ago, the framers of the Accord did not say, for example, 'we are trying to set capital standards so as to limit the probability of insolvency at banks to no more than *x*%'. Rather, a capital ratio was defined, and a number chosen (8.0%) that made policy-makers comfortable.

He goes on to note that insolvency probability is likely to be a contentious framework for analysis, because capital requirements are likely to be highly sensitive to maximum insolvency probability limits (see Mingo, 2000, p. 23, note 14).

A substantial research literature – surveyed ably by Jackson, et al. (1999) and Jones (2000) – investigates the manifold impact of the Basel accord on bank behavior. Of particular interest for us is the research into the effect on bank loan portfolios, which falls roughly into three categories: (a) whether the accord caused reductions in overall bank lending; (b) whether the accord caused banks to reallocate within their portfolios away from (toward) assets with high (low) risk weightings; and (c) whether banks have accommodated the accord through cosmetic accounting gimmicks known collectively as regulatory capital arbitrage. Jackson, et al (1999) distinguish broadly between regulatory capital arbitrage and "balance sheet adjustment," which latter category comprises both items (a) and (b) above, as well as raising additional capital (presumably the response most hoped-for by the Basel committee). Much of the empirical research on balance sheet adjustment focuses on the "credit crunch" of the early 1990s.

A significant empirical issue is the impact of regulatory capital restrictions on the denominator of the capital ratio – in particular whether the early 1990s reduction in aggregate consumer and commercial lending in the U.S. was caused by the introduction of the Basel standards. Hall (1993), for example, concludes that the credit crunch was largely a consequence of the Basel accord. In contrast, Berger and Udell (1994) examine the "credit-crunch period," 1990Q1-1992Q2, and conclude the opposite. Berger and Udell attempt to distinguish among four supply-side explanations – three of which are induced by regulation – and two on the

demand-side.[4] They test these by regressing quarterly growth rates in bank loan portfolios on a number of explanatory variables for the credit-crunch period and a longer control period that precedes it. They conclude that there is little evidence of regulation-induced reductions in the supply of loans. Hancock and Wilcox (1994) study the same issue and come to conclusions similar to those of Berger and Udell.

A slightly subtler question is whether and how capital restrictions affect institutions' portfolio allocations. Flannery (1994) describes the (asset-side) risk-taking incentives of leverage for a financial intermediary and the implications for its liability-side contracting. This link between capital structure and portfolio allocation is particularly relevant in light of the Basel accord's explicit discrimination of the riskiness of asset types. As Ho (1999, p.1) notes: "Capital allocation has recently become an important area of research because in part, regulatory agencies have proposed or are considering alternative risk-based capital requirements. If these risk-based capital requirements are not well designed, these regulations may result in inefficient use of capital and an increase in the cost of financial services to the economy." In other words, risk-based capital standards operate (potentially inefficiently) as a regulator-mandated credit allocation scheme.

Recent empirical research suggests a broad connection between regulatory policy and portfolio allocations. A recent paper by Kashyap and Stein (2000) shows that "small" institutions (the bottom 95% of the size distribution), in particular, are liquidity constrained, such that funding constraints induced by monetary policy shocks cannot be absorbed by reductions in securities holdings. Keeton (1994) calculates VAR impulse response functions to explain the changing composition of bank balance sheets. He concludes that the shift from loans to securities during the early 1990s recession was abnormally large, consistent with a credit crunch induced by the Basel requirements. Wagster (1999) similarly identifies dramatic shifts from loans to securities but is unable to decide among any of his various hypotheses as an explanation.

The third level of response to the risk-based standards, "capital arbitrage," is narrower in scope and frequently relies on some form of accounting gimmickry. Jackson, et al (1999) identify four typical capital-arbitrage tactics: (a) cherry-picking high-return (and high-risk) loans

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[4] Specifically: (a) Basel's risk-based newly imposed capital requirements; (b) the roughly simultaneous imposition in the U.S. of an unweighted leverage requirement; (c) heightened regulatory scrutiny of loans; (d) voluntary risk retrenchment by banks' management; (e) recession-related reductions in aggregate and regional demand for loans; and (f) manifestations of a longer-term secular trend away from intermediated finance.

to exploit the very rough granularity of the risk buckets; (b) securitization to move assets off the balance sheet while still financing (a typically very junior) part of the risk through recourse arrangements and credit enhancements; (c) "remote" origination of securitized assets to avoid the effective 100% capital charge on the securitized sale of an institution's own loans; and (d) indirect credit enhancements that substitute (and compensate) for formal guarantees in a securitization. Jones (2000) surveys the issues in detail.

One question that is not directly addressed in most of these studies is the absolute magnitude of the Basel risk weights relative to the credit experience of the assets involved. Intuitively, one expects the default experience to vary substantially across both asset types and the business cycle. Yet virtually all bank loans fall into one of two risk buckets (50% and 100%). One aim of the present paper is to provide some direct measures of loan underperformance (both default and delinquency) across loan types and over time. Such measures will hopefully provide evidence on the magnitude of potential inefficiencies implied by the current bucketing scheme.

1.2. Methodological considerations

Our basic methodology is a variation of the marginal mortality rate (MMR) approach described by Saunders (1999, ch. 7). The MMR is defined as the value of the defaulting portion of an asset pool in a given year, stated as a proportion of the total value of the pool at the start of the year. By measuring the proportional value of ex-post defaults, MMR implicitly considers both the probability of default and the loss in event of default (LIED). Although the MMR technique has typically been applied to corporate bond portfolios, the extension to bank loan portfolios is straightforward. The results obtained here are more general than those from a standard mortality table, however, since we do not condition on a particular institution's loan portfolio to obtain an MMR point estimate as the actual historical loss experience for that portfolio and year. Rather, we consider the universe of U.S. banks and thrifts, and obtain the full cross-sectional distribution of marginal default rates each year.

It is important in this context to measure performance of the portfolio(s) at issue. Carey (1998), for example, demonstrates that extrapolating the performance of public corporate debt to that of privately held debt tends strongly to overstate the risks of the latter class, particularly for the lower-graded issues. That is, privately held and monitored debt is safer than its public

counterpart, and the extrapolation is misleading. From the perspective of a regulator who must apply a capital policy consistently across institutions – a crucial characteristic of the current Basel standard is its "one-size-fits-all" nature – the performance of asset portfolios actually held by financial institutions is of immediate interest.

Moreover, our approach does not depend on a particular technology for measuring portfolio credit risk. Commercial portfolio credit models typically make assumptions about the structure of default-risk correlations across individual contracts within a credit portfolio.[5] By measuring the aggregate portfolio loss/delinquency experience at the institutional level, charge-offs and delinquencies provide a model-independent view of loan performance. Furthermore, examination of the distribution of charge-off (and delinquency) rates reveals that these are extremely non-normal; indeed there is reason to suppose that they would be best modeled as a complex mixture of distributions. Since little would seem to be gained – beyond computational elegance – by fitting a parametric distribution to the data, we adopt a non-parametric measure of the tail of the distribution akin to the Monte-Carlo methods employed by Altman and Saunders (2000).

Note that this methodology also controls naturally for the portfolio-composition issue raised as a standard objection to the BIS's current capital standard (within each of our six loan types, at least). Specifically, the current BIS standard assesses each loan or security independently, assigning it to a risk bucket based on its individual characteristics. For example, a (hypothetical) bank holding only commercial loans to a single borrower would have the same BIS risk profile – the 100% risk bucket – as a bank holding a well-diversified commercial loan portfolio. By measuring performance on the actual portfolios held, we are able to condition without bias on financial institutions' precise portfolio choices. The alternative approach, taken by Altman and Saunders (2000) and Carey (1998), conditions on the default performance of a set of securities, and then aggregates those securities into debt portfolios to make inferences about their ex-ante risk.[6]

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[5] Examples are Credit Suisse/First Boston's *CreditRisk+*, J.P. Morgan's *CreditMetrics*, and McKinsey's *CreditPortfolioView*. See Saunders (1999) for a survey.

[6] There are advantages and disadvantages to both approaches. Carey (1998, p. 1363) points out that an ex-post analysis – such as we perform – provides "little guidance about the [ex-ante] risk posed by an individual portfolio or institution, or even about groups of similar institutions out of sample." Note, however, that our sample period is both broad (the universe of U.S. banks and thrifts) and long (covering 16 years, the mid-1980s banking crisis, and the early-1990s recession), so our sample should be quite representative.

1.3. Overview

The main conclusions are, first, that the cross-sectional distributions of both charge-off and delinquency rates for all loan types are extremely leptokurtic (peaked), with a surprising number of institutions reporting very low charge-offs and/or delinquencies. The chief cause of the leptokurtosis appears to be a cross-sectional mixture of distributions, in which many institutions hold very small, very undiversified ("lumpy") portfolios of certain loan types (producing in any given year either a very high or very low percentage of problem loans); other institutions, of course, hold better diversified – and more predictable – portfolios. Second, annual cross-sectional histograms reveal that real estate in general, and 1-4 family mortgages in particular, consistently pose the least credit risk of the six loan categories considered. Commercial and consumer loans typically pose the greatest risk. Third, industry consolidation over the sample period has reduced the number of small loan portfolios and raised the average portfolio size, thus steadily reducing the proportion of institutions with extreme charge-off or delinquency events.

2. Data sources and variable definitions

2.1. Bank and thrift data

Accounting data on six different loan categories for every bank and thrift in the country for the years 1984 through 1999 were taken from the Federal Deposit Insurance Corporation's (FDIC) Research Information System (RIS) data set. This data set matches line items from the official Consolidated Reports of Condition and Income (i.e., the bank call reports, forms 031-034) from the Federal Financial Institutions Examination Council (FFIEC) with the Thrift Financial Reports (TFRs) from the Office of Thrift Supervision (OTS). The sample thus covers essentially all depository institutions in the U.S. over a 16-year period. Data are broken down into six different loan categories, listed in table 1. The degree of disaggregation in asset types is

dictated largely by the variable definitions available in the RIS database. Also from the RIS database, we collected net charge-offs and delinquent loans in each of the categories.[7]

[INSERT TABLE 1 – RIS variable definitions – HERE]

To obviate potential problems due to seasonalities at quarterly frequencies, we use annual data. Balance sheet loan balances are measured in the fourth quarter as the average over the five consecutive lagging quarterly balances; for example, the agricultural loan balance for 1998 is the average of the quarterly balances for the five quarters 1997Q4 – 1998Q4.[8] Meanwhile, quarterly delinquencies and net charge-offs are cumulated over the year to produce an annual figure. Prior to 1991, the RIS data set does not provide a comprehensive breakdown for charge-offs and delinquencies on real estate loans. Rather, 1-4 family, multifamily, and non-residential real estate are lumped together in a portmanteau category for the 1984-89 period (using RIS variables NTRE for net charge-offs, and P3RE+NCRE for delinquencies).[9] The balance-sheet loan amounts are available for the three real-estate subcategories throughout the sample period, however.

2.2. Definitions of underperformance

Regulatory accounting requires reporting of at least five separate measures of loan quality:

- the allowance for loan and lease losses (ALLL), a.k.a. the loan loss reserve (LLR),
- provisions for credit losses, a.k.a. the provision for loan losses (PLL),

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[7] Prior to 1991, the breakdown of real estate loans into three subcategories was unavailable; hence for 1984-90, total real estate loans are measured, giving us a four-category breakdown of the loan portfolio. Further details on the RIS variable definitions – including the specific year-by-year mapping of call report and TFR fields into the RIS variables – can be found at the online RIS dictionary: http://www2.fdic.gov/dict/.

[8] This five-quarter averaging is a feature of the RIS database. Where possible, the procedure adjusts automatically for mergers, so that two firms that merge mid-year are combined throughout the year for purposes of the average. This adjustment is possible only in the case of pooling-of-interests accounting, which fortunately comprises the majority of cases (purchase-accounting mergers are too idiosyncratic to allow for a consistent merger adjustment). Note that the Financial Accounting Standards Board (FASB) is currently considering elimination of pooling-of-interests merger accounting on the grounds that it fails to discount goodwill appropriately.

[9] More exactly, disaggregated data on real-estate charge-offs are available for a <u>subset</u> of institutions in 1990 (and additionally for 1986-88 in the case of 1-4 family real estate). However, these data are ignored, since the subset is a small fraction of all instititutions for these years, and therefore prone to sampling biases.

- charge-offs, a.k.a. loan losses,
- loans past due (but still accruing interest), and
- non-accrual loans.

With this foundation, we define and measure "underperformance" in two ways: (a) as the rate of charge-offs as a proportion of loans; and (b) as a composite rate of past-dues plus non-accruals as a proportion of loans (see the last two columns of table 1).

Wall and Koch (2000) provide a good survey of current accounting issues involving bank loan losses. While all banks are subject to regulatory accounting principles, the Securities and Exchange Commission (SEC) further requires publicly traded bank holding companies – which covers most institutions – to report using generally accepted accounting principles (GAAP), as defined by the Financial Accounting Standards Board (FASB). While regulatory accounting for loan losses measures a forward-looking expected exposure, GAAP attempts to measure current-period net income (see FASB 5 as amended by FASB 114 and 118). This philosophical difference is the basis for the current debate over accounting policy between the SEC and bank regulators. As Wall and Koch (2000) point out, although the choice of how much to reserve is largely cosmetic, it can have real effects if over- or under-reserving limits an institution's ability to pay dividends, or if it provokes regulatory intervention via violation of regulatory capital rules.

The ALLL is a balance-sheet contra-asset account, imposing a haircut for likely credit losses in the loan portfolio – namely those that are "probable and estimable on the date of the evaluation."[10] Conceptually, the ALLL is intended to cover the institution's expected losses, while equity capital is intended for unexpected losses. (Note that the Basel standard blurs this distinction by stating its total capital requirement in terms of the sum of Tier I and Tier II capital, where the latter includes ALLL.) The PLL, in contrast, is a flow account that reflects marginal additions (or reductions) to the ALLL. Because it appears as an expense on the income-statement, the PLL affects book earnings (directly) and equity capital (indirectly). To the extent that managers aim to maximize reported income (in contrast to smoothing reported income over

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[10] See OCC (1996, p. 4). For internationally active banks, an allocated transfer risk reserve is required in addition to the ALLL. The OCC standard further asserts that the ALLL is a general reserve available to credit losses throughout the portfolio. This contrasts with the OTS's combination of a general valuation allowance (GVA, similar to the OCC's reserve) with special valuation allowances (SVAs) assigned to specific loan types. Under OTS

time, for example), this impact on earnings and leverage should tend to make managers reluctant to "over-provision," so that ALLL decreases would typically occur in response to a charge-off or a portfolio reallocation. However, accounting rules for provisioning leave very little discretion to managers, at least in principle. The unallocated (to losses on specific loans) portion of the ALLL counts as Tier II capital under the U.S. interpretation of the Basel standards.

Charge-offs (or loan losses) are simultaneous deductions to the ALLL and the appropriate loan account. In principle, they should not affect the right-hand side of the balance sheet, since (in principle) the income/capital hit should have been taken with a prospective PLL in a prior period. However, if a large negative surprise depletes the ALLL, a new PLL – and thus an income/capital charge – would be required to replenish it. Thus, charge-offs can have unappealing characteristics similar to PLLs. Charge-offs should represent a best estimate of the present (recoverable) value net of collection costs and collateral value, although management may have incentives to smooth or cluster both charge-offs and provisions over time. Charge-offs here are stated net of recoveries (from loans charged off in prior years). As a result, negative net charge-offs are possible, and in each year of our sample, a significant number of institutions indeed report a negative net amount.

Past-due and non-accrual are loan status indicators, intended to flag certain loans for special attention. In particular, classification of a loan (or portion of a loan pool) as past-due or non-accrual factors formally into the calculation of a PLL (see, for example, OCC, 1996, p. 23). We define "delinquencies" to comprise both past-due and non-accrual loans, and treat this composite measure as an alternative to charge-offs as an indicator of credit losses. For each of our seven loan types, the RIS data set distinguishes between loans that are 30-89 days past due and accruing interest, and loans 90+ days past due and non-accrual; we add these two categories together in measuring delinquencies.

3. Composition of loan portfolios at banks and thrifts

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accounting, a transfer from the GVA to an SVA is tantamount to a charge-off. This procedure has been in place since 1996.

We begin by examining the loan portfolio allocation decision of financial institutions. The allocation decision is important for interpreting the magnitude of charge-off rates, because it establishes the broad outlines of a given institution's credit risk exposure. For example, if credit cards have high loss rates, but are a small proportion of the loan portfolio, their net impact on safety and soundness will be small. More importantly, highly concentrated or "lumpy" loan portfolios should tend to have a bimodal cross-sectional distribution, with individual institutions likely to experience either very low or very high charge-off rates in a given year. In contrast, diversified or "granular" portfolios should tend to have a more continuous (and better predictable) distribution. Briefly, we find secular trends in industry-wide portfolio allocation over the sample period, a generally procyclical pattern in overall lending, and significant differences in portfolio allocation by charter type and urban/rural location.

3.1. Portfolio allocation

Table 2 presents an overview of portfolio allocation by the banks and thrifts covered by the RIS database in the 16-year period 1984-99. Amounts in the table are in millions of nominal dollars, but the consumer price index (CPI) is provided in the final row to facilitate conversion to real values.[11] Table 2 reveals that total real estate – aggregating 1-4 family, multifamily, and non-residential – is the most important loan type, ranging between 54% and 60% of the overall portfolio. Fully one third of all depository lending is composed of 1-4 family properties. One quarter of all lending goes to commercial and industrial (C&I) loans.

[INSERT TABLE 2 – Portfolio allocation – HERE]

Multifamily real estate, agricultural loans, and consumer loans grew more slowly than the rate of inflation over the 16-year sample period, while 1-4 family and non-residential real estate, and C&I loans grew faster. Credit-card balances (lumped together here with other consumer loans) also grew in real terms, but nonetheless remained less than half of all consumer lending in

[11] Specifically, this is the CPI for all urban consumers, annual averages of seasonally adjusted monthly figures, obtained from the Federal Reserve Bank of St. Louis, and normalized so that $CPI_{84} = 100$. Spong and Sullivan (1999) provide a good summary of more general economic forces affecting the financial services industry over the sample period.

1999. Unsurprisingly, most loan types are procyclical: with the notable exception of agricultural loans, all other loan types experienced a substantial nominal decrease during the 1990-92 recession. Credit cards, although not broken out separately in table 2, were similarly immune to the credit crunch. The apparent countercyclicality of credit card lending may reveal a role as a standby source of retail credit, to be avoided in better times when other sources of credit are more available.

3.2. Stratification by charter type

Table 3 shows the composition of the industry, broken down by general charter type and headquarters location. The most pronounced intertemporal pattern is the sharp increase in the size of the average institution. This is largely the result of consolidation within the industry, as the number of reporting institutions dropped from 17918 in 1984 (14500 banks and 3418 thrifts) to 10400 in 1999 (8767 banks and 1633 thrifts). This is no surprise, since the period included much of the banking and thrift crises of the 1980s, as well as the introduction of nationwide branch banking.

[INSERT TABLE 3 – Industry composition– HERE]

Looking within the aggregate, however, total thrift lending shrank substantially while bank lending grew over this same period, despite a retrenchment during the 1991-92 recession.[12] On average, the portfolio allocation of thrifts is sharply distinct from that of banks. The vast majority of thrift lending is on real estate. Taken together, the three real-estate subcategories comprise roughly 90% of all thrift lending, while the similar statistic for banks is less than 50%. Indeed, 1-4 family mortgages alone account for roughly two-thirds of all thrift lending (this includes only mortgages held on balance sheet, not those originated and sold in the secondary market).[13] Interestingly, Cole and McKenzie (1994) confront a similar issue and conclude that

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[12] See Bomfim and Nelson (1999) for a more detailed analysis of balance sheet trends at commercial banks.

[13] Under section 10(m) of the Home Owners' Loan Act of 1987 [12 U.S.C. 1467a(m)], savings associations were required to hold at least 60% of their portfolio assets in residential mortgages and related investments. This QTL test was raised by section 303 of the Financial Institutions Reform Recovery and Enforcment Act of 1989 (FIRREA) to 70%, and subsequently lowered to 65%. While the thrift industry as a whole (i.e., on average) has

this seemingly highly concentrated portfolio nonetheless places the typical thrift at or near the mean-variance efficient frontier (within the universe of thrift asset investments). Banks, on the other hand, are much more likely than thrifts to engage in non-real-estate lending, including C&I, consumer, and credit card loans. Despite the gradual easing of thrift portfolio restrictions on C&I lending, and while the majority of thrifts hold some C&I loans, the average thrift still holds less than 3% of its loans in this category.[14] For the most part, thrift lending on credit cards and agriculture is negligible (and in some cases, nonexistent).[15]

3.3. Stratification by urban/rural location

Rural institutions naturally allocate a greater proportion of loans to agriculture than urban banks and thrifts. They also allocate more to consumer loans, most likely because this category includes mobile-home and auto lending. In compensation, rural institutions generally make fewer credit-card and C&I loans as a proportion of their portfolios. Note, however, that the relative tendency against C&I lending by rural institutions is driven by banks rather than thrifts; Pilloff and Prager (1998, p. 1033) find that rural thrifts are actually more likely than their urban counterparts to make C&I loans. Banks are much more likely to be rural than are thrifts. The majority of banks in every year sampled are rural institutions, while approximately 70% of thrifts are urban. Lastly, the allocation to real-estate loans does not vary dramatically by region type, although multifamily real estate does weigh more heavily for urban institutions (3.8% of all loans, on average over the sample period, vs. 1.5% for rural institutions).

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exceeded the QTL threshold throughout the sample period, Cole and McKenzie (1994, p. 96) report that asset allocations for failed thrift institutions were typically quite different from those of well-capitalized institutions.

[14] Restrictions on thrifts' C&I lending (as a percent of assets) were eased successively to 5%, 10%, and 20%, respectively, by the Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA), the Garn-St. Germain Act of 1982, and the Economic Growth and Regulatory Paperwork Reduction Act of 1996. See Pilloff and Prager (1998) for a detailed analysis, including statistics on the number of institutions making C&I loans.

[15] Only the very largest institutions – banks or thrifts – report charge-offs or delinquencies on agricultural loans, even if they allocate substantial assets to agricultural loans. Kliesen and Gilbert (1996) define an "agricultural bank" as one whose allocation of loans for agricultural investments exceeds the unweighted average ratio across all banks. Agricultural banks by this definition have a much higher proportion of loans devoted to agricultural (23% in 1994) than the average bank, but are also very small – with $45 million in assets on average.

4. Loan underperformance

We next consider whether the Basel standard is calibrated appropriately to the credit risks involved in the different loan types. Institutions specializing in loan types for which the capital charge is relatively high on a risk-adjusted basis should expect to yield returns on equity (ROE) that underperform those of their peers. That is, if the risk-based capital proportions specified by the Basel rules are misaligned relative to the true risk-return trade-off faced by the bank, then lenders will have incentives to adjust their portfolios into those loan types for which the official capital charge is relatively low. Thus, the Basel regime would effectively function as a credit allocation scheme, similar to other regulatory credit allocation rules such as the Qualified Thrift Lender (QTL) test and Glass-Steagall restrictions on securities lending.

4.1. Summary statistics

Univariate summary statistics for the cross-sectional distribution of charge-offs are compiled in table 4. The average charge-off rates are typically small and positive. Unsurprisingly, charge-off rates vary considerably across loan categories. C&I loans consistently have the highest average charge-off rates – and usually the most variable – while 1-4 family mortgages usually have the lowest. Later in the sample period, as credit-card lending grows in importance and real-estate lending becomes safer, consumer loans migrate from having a comparatively low charge-off rate (relative to other loan types) to a comparatively high rate.

For the most part, the data are strongly positively skewed (a symmetric distribution has a skewness of zero), although there are a significant number of large negative outliers among the charge-off rates (due to net recoveries), causing negative skewness and more pronounced kurtosis in some cases. For example, an institution that sells off its consumer loans may retain a very small consumer portfolio, thus magnifying the charge-offs or recoveries as a proportion of loans reported at year-end.[16] The most striking fact about the distribution of charge-offs is the extreme degree of leptokurtosis, which ranges well into the hundreds for almost all loan categories and years. This phenomenon is occasionally attributable to outliers with high percentage net recoveries. However, for all loan categories and years there are a large number of

[16] To a large extent, averaging quarterly asset balances over five quarters ameliorates this. However, it is nonetheless possible for charge-offs to be imposed retroactively, after five quarters have elapsed.

institutions – in some cases a substantial majority – reporting zero net charge-offs for the year. The kurtoses reported here are standardized such that the normal distribution would have a kurtosis of zero (and platykurtic distributions would have negative kurtosis).[17] This fact also appears in the median charge-off rates, which are frequently zero.

[INSERT TABLE 4 – Charge-off distribution – HERE]

Table 5 presents similar statistics for delinquencies. One immediate difference is that negative delinquencies are typically impossible, as there is nothing analogous to recoveries in the case of delinquencies. As always, there are exceptions; the lone institution reporting a negative delinquency rate (–10.5% on non-residential mortgages in 1992) was a bank in liquidation that reported a very small negative loan balance on the balance sheet. In general, the absence of negative values tends to reduce kurtosis and raise skewness. While median delinquency rates are slightly higher than their corresponding charge-off rates in most cases, kurtosis statistics tend to be lower. Nonetheless, the degree of leptokurtosis in absolute terms stands out again here.

[INSERT TABLE 5 – Delinquency distribution – HERE]

To emphasize further the degree of leptokurtosis, figure 1 depicts the proportion of all reporting institutions that claim exactly zero net charge-offs or delinquencies in each loan category and year. Note that zeroes are not reported for an institution unless it holds at least some loans of that type, since charge-off and delinquency rates cannot be calculated otherwise.[18] The numbers are strikingly high. For example, in any given year over 88% of all multifamily real estate lenders report zero net charge-offs (over 80% report no delinquencies). This appears to result from the large number of small institutions with a very small (and therefore lumpy) multifamily portfolio, since it is quite plausible that among a small handful of loans, none would experience problems. For example, in 1998, of 6759 institutions holding multifamily loans, 40%

[17] As a familiar point of comparison, we calculated the kurtosis of daily foreign exchange returns – which are notoriously leptokurtic – for 1998-99, using data obtained from the Federal Reserve Bank of Chicago. The measures for the CAD/USD, USD/GBP, and JPY/USD were 1.94, 1.29, and 3.27, respectively.

had a portfolio under $500,000, while 55% had a portfolio under $1,000,000. Similarly in other areas, it is possible that smaller institutions choosing to avoid a particular product line nonetheless make a very small number of minimal-risk loans in that line, as a courtesy to special customers. The incidence of zeroes is exacerbated significantly by rounding, which only measures charge-offs and delinquencies in increments of $1000.

[INSERT FIGURE 1 – Zero charge-offs – HERE]

On the other hand, there are also a significant number of institutions reporting zero net charge-offs on substantial portfolios. One possible explanation for some of these extremely low charge-off rates involves sales of loan portfolios. If the selling institution writes down bad loans in the portfolio prior to sale, and the buyer purchases them at a discount, the buyer might indeed experience very low underperformance rates, at least over the first few quarters after the purchase. Another factor at work in this context may have been the FDIC's practice of requiring loans sold with recourse to continue to be held on the vendor's balance sheet at full value, even after the sale. However, this practice never applied to thrifts, and was discontinued in 1996 since it was inconsistent with GAAP accounting rules. Despite this, there is no apparent change in the overall number of zeroes reported in figure 1 after the FDIC's rule change.

All this suggests strongly that the cross-sectional distribution is at best a mixture of canonical probability distributions, perhaps even with some institutions' loss experience best regarded as effectively non-random. The impact of portfolio lumpiness on capital at risk deserves further empirical study. In any case, estimates of unexpected charge-off or delinquency percentiles based on a parameterization of a simple normal distribution would clearly be inappropriate here. For example, following the method of Altman and Saunders (2000), for charge-offs on C&I loans in 1999 and an "acceptable" quantile of 95 percent (i.e., such that only 5% of all institutions have charge-offs greater than this rate), the unexpected charge-off rate calculated assuming a normal distribution with mean and standard deviation of 1.356% and 29.346%, respectively (see table 4) is 46.914%. Foregoing the assumption of a normal

[18] It was necessary for this study to lump together credit cards and other (mainly collateralized) consumer loans, because of the large number of institutions that fail to separate credit card charge-offs from those on other consumer loans, in apparent deviation from regulatory reporting requirements.

distribution, and counting the quantile nonparametrically (i.e., directly from the data) we find an unexpected charge-off rate of only 4.4%.[19]

4.2. Full univariate distributions

To examine the univariate distributions in more detail, figures 2 present cross-sectional histograms of loan charge-off and delinquency rates for all reporting institutions (only a subset of sample years is presented in the interest of space). Because these are rates per dollar lent, the histograms are not weighted by institutional size; large and small institutions enter the analysis as peers. Each bar indicates the percentage of institutions with a loan charge-off rate that is less than the corresponding number on the horizontal axis, but greater than the preceding number. Because of the heavy concentration of charge-offs at or near zero, the modal column is truncated at 20% on all histograms, to ensure legibility of the other columns; the true height of the bar comprising zero is indicated to the left of the bar. A loan type with relatively low credit risk appears as a histogram with columns clustered tightly around zero. While outliers occasionally upset the average underperformance rates in tables 4 and 5 (as well as higher moments), they have relatively little impact on the median or the histogram of the distribution.

[INSERT FIGURES 2-yy – Histograms – HERE]

A comparison of the typical delinquency histogram to the corresponding charge-off histogram reveals again that the former is much more highly skewed. Not all delinquent loans result in charge-offs. The delinquency distribution is also more likely to be bimodal, especially for 1-4 family mortgages and consumer loans, suggesting that businesses are more likely than individuals to be vigilant about their payment due dates.

Note that the reported charge-off rates do not include any compensating interest income that institutions may earn by charging higher risk premia to riskier customers or to riskier loan types (such as unsecured credit-card debt). Data on risk premia are not available at the

[19] This number for C&I loans (4.4%) can be read directly from top panel of figure 3-99. The corresponding number under the assumption of normality is 2.32634 standard deviations above the mean: .46914 = (2.23624)(.29346) – .01356. Altman and Saunders (2000) find similar discrepancies between normal and nonparametric estimates of unexpected loss rates on corporate bonds.

institutional level. However, were such data available, they could be netted directly against charge-offs to facilitate an all-in comparison across loan types. Thus, for example, a bank charging 12% more on its credit-card loans than on its mortgages could experience 12% more charge-offs on the credit cards and still consider the two loan types as having comparable risk-adjusted returns (assuming for simplicity that the operational costs of originating, servicing, etc., are equal).

Note also that the present analysis considers only the univariate distributions of charge-off rates for homogenous loan types (our six loan categories). Effectively, we are considering hypothetical institutions that specialize their lending absolutely in, for example, consumer loans, or multifamily real estate. In practice, of course, banks and thrifts diversify across product types, and this will reduce their overall risk. For example, tables 4 and 5 provide aggregate charge-off and delinquency rates for all real estate loans, in addition to a breakdown by sub-type for the years 1991-99. In only four instances (out of 27) for charge-offs – and zero cases for delinquencies – is the standard deviation for a sub-type lower than the standard deviation for real estate as a whole (for example, 1994 charge-offs on non-residential real-estate). In the interest of space, this paper restricts attention to the univariate distributions, but the multivariate distributions – including issues of diversification – remain an interesting topic for future research.

4.3. Comparison to risk-based capital buckets

In the context of the Basel accord, a statistic of interest is the cumulative percentage of institutions whose charge-offs would have exceeded a predefined loan-loss buffer or capital reserve. The top panels of figures 3 depict the cumulative percentage of institutions whose charge-offs would have exceeded – or "blown through" – a predefined buffer as measured (in percent) on the horizontal axis. For any given threshold, the vertical axis measures the percentage of institutions whose charge-offs exceeded that threshold. Thus, the graphs can be read in two ways: (a) pick a level for the capital buffer (including ALLL) on the horizontal axis and read up to find the proportion of institutions that would have exhausted a buffer of that size; or (b) pick a rate of "buffer inadequacy" on the vertical axis and read across to find the buffer size that would produce that rate. The bottom panels of figures 3 depict analogous thresholds for delinquencies.

[INSERT FIGURES 3-yy – Cumulative distributions – HERE]

Figures 3 – derived directly from figures 2 – facilitate a comparison across loan types. In the first half of the sample period, real estate and consumer loans together stand out as having the lowest credit risk. This is almost certainly due to the presence of specific collateral for most of these loans (1-4 family mortgages, automobiles, mobile homes, etc.). Later in the sample, as credit-card lending becomes a larger component of consumer loans, the charge-off rate on consumer loans drifts upward. Throughout the sample period, real-estate loans are among the safest (in terms of charge-off rates), while C&I loans have the greatest credit risk. Post-1990, the breakdown in real-estate charge-off data reveals that 1-4 family mortgages, although composing the lion's share of total real estate, tends to be safer than real estate in general. While the extreme leptokurtosis of the distribution of multifamily charge-off rates makes it safer at low thresholds, it is considerably riskier than 1-4 family mortgages at thresholds above 2% or so.

Figures 3 also allow a comparison between loan-loss experience and the official risk buckets under the Basel standards. Assuming for simplicity that <u>expected</u> losses are zero, the four Basel buckets correspond to thresholds of 0.000, 0.016, 0.040, and 0.080, respectively, along the horizontal axis in figures 3. For example, in 1984, assuming for simplicity that all real estate consists of 1-4 family mortgages with a Basel threshold of 0.040, we find that roughly 2% of all institutions would have exhausted their Basel-assigned capital for those loans. For C&I loans in the same year, with a Basel threshold of 0.080, well in excess of 10% of all institutions would have exhausted their Basel-assigned capital. Later in the sample, in 1996 for example, this contrast is starker. Only 0.21% of institutions would have exceeded their Basel allocation for 1-4 family mortgages, while 2.84% would have exhausted their allocation for C&I loans. We conclude that the current Basel buckets fail to "price" the different loan types comparably.[20]

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[20] The Basel total capital requirement is based on the sum of Tier I and Tier II capital, where the latter includes ALLL. We can roughly measure the ALLL by loan type by assuming that: (a) institutions hold ALLL equal to expected charge-offs; and (b) expected charge-offs equal the industry average over our sample period. Using an unweighted average of the cross-sectional average charge-off rates from table 4 over the full 16-year sample period, we measure expected charge-offs for real estate at 0.27%, while expected charge-offs on C&I loans are almost exactly ten times higher, at 2.67%. Similar long-run averages for other loan types are 0.70% for consumer loans and 0.50 for agricultural loans. Over the 1991-99 subperiod, the average charge-off rates for real-estate subtypes were: 1-4 family: 0.08%; multifamily: 0.52%; and non-residential: 0.22%. Unfortunately, institutions do not break out their reported ALLL by loan type. We also attempted to allocate the reported ALLL by

Note that although this analysis fails to account for differences in interest-rate premia earned on different loan types, plausible risk premium differentials are insufficient to explain the differences here. For example, suppose that the typical institution in 1996 earned an interest-rate risk premium on C&I loans fully 10 percentage points higher than it earned on its 1-4 family mortgages. Adding in this extra interest income for C&I loans and assuming loan portfolios are well diversified, this implies an effective C&I threshold (Basel capital plus additional interest income) of 0.180 instead of 0.080. Based on this, 1.00% of institutions would have violated their "effective threshold," compared with 0.21% for 1-4 family mortgages. Although it is difficult to know what regulators would consider an acceptable threshold in this context, the presence of discrepancies such as these is unsurprising, given the apparently unsystematic way in which the risk buckets were originally determined.

4.4. Evolution of the cross-sectional distributions

Lastly, we consider more explicitly the trends over the sample period. Figure 4 depicts the sequence of charge-off and delinquency distributions over time. Each panel provides a topographical view of the evolution of the histogram over time. Two equal-area lines are tracked over time for each distribution: confidence intervals containing the central 50% (i.e., the dark region encompassing the median +/– 25%) and the central 90% (i.e., the light region with the median +/– 45%) of the distribution, respectively. The dotted black line is the average charge-off rate. Coincidentally, the mean tracks the 75th percentile of the distribution remarkably faithfully in most cases. All of the distributions are sharply positively skewed. As noted above, the distributions are sharply modal (i.e., peaked), with a very high concentration of observations at or near zero. Thus, each of the histograms extended through time forms a steep ridgeline along the horizontal axis. In the case of agricultural loans, the concentration of observations at zero is so intense that it encompasses the 50% band throughout most of the sample period.

[INSERT FIGURE 4 – Histogram evolution – HERE]

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cross-sectional regressions of ALLL against loan portfolio allocations, but the regression estimates were unstable from year to year, and the attempt was abandoned.

Aside from the marked differences in dispersion across loan types considered above, the most striking fact from figure 4 is the pronounced secular trend apparent in most of the series. Specifically, the cross sectional dispersion in charge-off and delinquency rates has been declining steadily since 1985, implying that one is much less likely to find an institution with extreme charge-off or delinquency rates now than 15 years ago. This progress is interrupted briefly by the 1990-91 recession, and begins well before the introduction of the Basel rule. Surprisingly, however, the impact of the recession is relatively weak. The one possible exception to this trend – consumer loans – actually proves the rule, since credit card loans constitute a steadily increasing share of the consumer loans category. Credit cards, which tend to have very high charge-off and delinquency rates, grow from 19% of consumer loans in 1984 to over 36% in 1999.

One possible explanation for this pronounced trend is a gradual and general improvement in underwriting, perhaps attributable to growth in the markets for securitized loans. However, if secondary loan markets have imposed new discipline in the underwriting process by refusing poorly underwritten loans, they would then also have been cherry-picking credits such that the worst loans remain on the books of the originator. Thus, improvements in state-of-the-art underwriting would have to be sufficient to overwhelm the draining of the best credits into the secondary market.

Alternatively, a more plausible explanation for this trend is the contemporaneous consolidation of the industry, as the number of institutions shrank by more than 40% over the period. Consolidation is also evident in the average portfolio size (see table 2). Moreover, this consolidation has been felt more strongly among the smallest institutions, which presumably have the least diversified loan portfolios. Stiroh and Poole (2000) establish that mergers and acquisitions account for virtually all of the growth in average bank assets during the 1990s (as opposed to banks' internal growth). Consolidation could reduce the cross-sectional dispersion in underperformance rates via geographic diversification, by purging accumulated bad credits from the loan book at the time of acquisition, or by reducing the lumpiness of the consolidated loan book.[21] While prior research has tended to focus on operational efficiencies as a motivation for consolidation, this suggests risk-reduction as another significant goal.

[21] Kashyap and Stein (2000) also demonstrate the possibility of a size effect, due to the relatively low liquidity of smaller institutions.

In any case, the evident non-stationarity of the cross-sectional distribution of loan underperformance essentially guarantees that a fixed set of risk buckets cannot have provided the same safety and soundness controls in both 1989 and 1999.

5. Conclusions

We define loan "underperformance" as net charge-offs as a percent of loans outstanding, and delinquencies (30+ days past due) as a percent of loans outstanding. We measure annual cross-sectional distributions of both charge-off and delinquency rates for six loan types for every U.S. bank and thrift between 1984 and 1999. For every year and loan type, the cross sectional distributions are extremely leptokurtic (peaked). A surprising number of institutions report very low charge-offs and/or delinquencies. This fact appears at least partly due to the large number of institutions holding small (and lumpy) portfolios. A surprisingly large number of institutions report exactly zero charge-offs, particularly for agricultural and real-estate loans. The empirical impact of portfolio lumpiness/diversification on observed underperformance rates deserves further research.

Second, we examine underperformance in the context of the 1988 Basel capital accord, which measures credit risk only, ignores diversification and cross-hedging across loan types, and establishes a set of four risk buckets for assigning required capital. Annual cross-sectional histograms reveal that real estate in general, and 1-4 family mortgages in particular, consistently pose the least credit risk of the six loan categories considered. Commercial and consumer loans typically pose the greatest risk. The Basel risk weights do not appear to price risk consistently across loan types. For example, applying the Basel risk weights to the cross-sectional charge-off distributions, the proportion of institutions that would exhaust a Basel-designated capital allocation for C&I loans is much higher than the similar proportion for real-estate loans. This difference is sufficiently large that it is difficult to explain by interest-rate risk premia or loan-loss allocations.

Finally, an examination of the evolution of the cross-sectional distributions over time reveals a pronounced secular trend, with extreme charge-off and delinquency rates becoming steadily less common. This appears to be the result of industry consolidation over the sample period, which has reduced the number of small loan portfolios and raised the average portfolio

size. This systematic change in the pattern of extreme credit events – by itself – suggests that a reconsideration of the Basel risk weights is desirable.

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7. Exhibits

Tables:

Figures:

Table 1: RIS Loan Categories

Category	RIS variable name(s): Loans	RIS variable name(s): Charge-offs	RIS variable name(s): Delinquencies
Total Real Estate (1984-99) ▪ 1-4 Family Real Estate (as below) ▪ Multifamily Real Estate (as below) ▪ Non-residential Real Estate (as below)	LNRE5	NTRE	P3RE + NCRE
1-4 Family Real Estate (1991-99 only**)** ▪ 1-4 family first mortgages ▪ 1-4 family revolving, open-ended loans ▪ Revolving consumer credit secured by 1-4 family mortgages	LNRERES5	NTRERES	P3RERES + NCRERES
Multifamily Real Estate (1991-99 only**)** ▪ Multifamily mortgages	LNREMUL5	NTREMULT	P3REMULT + NCREMULT
Non-residential Real Estate (1991-99 only**)** ▪ 1-4 family construction loans ▪ Multifamily construction loans ▪ Non-residential construction loans ▪ Non-residential mortgages, except land ▪ Land loans	LNRE5 – LNRERES5 – LNREMUL5	NTREOT – NTREMULT	P3RE – P3RERES – P3REMULT + NCRE – NCRERES – NCREMULT
Consumer Loans ▪ Unsecured consumer loans, including credit cards ▪ Educational loans ▪ Auto loans ▪ Mobile home loans ▪ Other consumer loans	LNCRCD5 + LNCONOT5	NTCRCD + NTCONOTH	P3CRCD+ P3CONOTH + NCCRCD + NCCONOTH
Commercial Loans (C & I) ▪ Commercial loans	LNCI5	NTCI	P3CI + NCCI
Agricultural Loans ▪ Agricultural loans	LNAG5	NTAG	P3AG + NCAG

NOTE: *The Total Real Estate category aggregates the three real-estate subcategories, which latter are available for only a portion of the sample period. Disaggregated data on real-estate charge-offs are available for a subset of institutions in 1990 (and additionally for 1986-88 in the case of 1-4 family real estate). However, these data are ignored, since the subset is a small fraction of all institutions for these years, and is therefore prone to sampling biases.*

Table 2: Loan portfolio allocation, aggregate of all institutions

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
RE (total)	1,048,843	1,166,578	1,255,751	1,369,446	1,508,938	1,636,141	1,623,160	1,550,852	1,497,366	1,486,569	1,525,185	1,641,812	1,718,031	1,790,953	1,910,235	2,034,795
	59	65	71	80	92	102	106	107	108	112	121	137	150	165	184	201
	54.5%	54.7%	55.7%	57.1%	58.6%	59.2%	58.7%	58.8%	59.4%	59.2%	57.9%	56.4%	55.6%	54.9%	54.9%	55.1%
1-4 family	677,285	721,208	731,942	774,408	867,887	951,660	955,348	932,228	924,945	937,793	977,541	1,062,606	1,114,710	1,158,261	1,237,651	1,283,231
	38	41	41	45	53	60	63	65	67	71	78	90	99	108	120	128
	35.2%	33.8%	32.5%	32.3%	33.7%	34.4%	34.5%	35.4%	36.7%	37.4%	37.1%	36.5%	36.1%	35.5%	35.6%	34.8%
Multifamily	81,461	93,855	91,792	100,686	108,437	112,232	104,747	97,556	95,130	92,205	91,314	94,784	95,213	95,154	96,463	100,313
	8	9	8	9	11	11	11	10	10	10	11	12	12	13	13	14
	4.2%	4.4%	4.1%	4.2%	4.2%	4.1%	3.8%	3.7%	3.8%	3.7%	3.5%	3.3%	3.1%	2.9%	2.8%	2.7%
Non-resid.	290,098	351,515	419,510	478,362	512,921	570,677	561,188	518,796	474,849	453,445	453,619	476,893	500,774	530,820	571,748	646,756
	17	20	24	28	32	36	37	36	35	35	36	40	44	50	56	65
	15.1%	16.5%	18.6%	20.0%	19.9%	20.6%	20.3%	19.7%	18.8%	18.1%	17.2%	16.4%	16.2%	16.3%	16.4%	17.5%
Consumer	277,883	334,821	372,550	395,306	422,301	443,875	448,263	432,942	419,283	432,116	484,985	548,198	586,780	608,033	605,712	603,380
	16	19	21	23	26	28	29	30	30	33	39	46	52	56	59	60
	14.4%	15.7%	16.5%	16.5%	16.4%	16.0%	16.2%	16.4%	16.6%	17.2%	18.4%	18.8%	19.0%	18.6%	17.4%	16.3%
C & I	558,205	591,762	605,544	617,880	632,243	656,750	665,265	620,792	573,701	558,080	586,898	689,931	750,840	826,178	920,858	1,011,907
	35	37	38	39	42	45	47	46	44	45	50	61	69	80	93	104
	29.0%	27.8%	26.9%	25.8%	24.6%	23.7%	24.0%	23.5%	22.7%	22.2%	22.3%	23.7%	24.3%	25.3%	26.5%	27.4%
Agricultural	40,856	38,956	33,575	30,229	29,839	30,501	31,906	34,241	34,814	35,595	38,533	39,725	40,456	43,022	46,028	45,915
	4	3	3	3	3	3	3	4	4	4	5	5	5	6	7	7
	2.1%	1.8%	1.5%	1.3%	1.2%	1.1%	1.2%	1.3%	1.4%	1.4%	1.5%	1.4%	1.3%	1.3%	1.3%	1.2%
Totals	1,925,788	2,132,117	2,254,912	2,396,871	2,573,628	2,765,696	2,766,717	2,636,556	2,522,722	2,509,233	2,632,890	2,912,138	3,088,772	3,261,468	3,478,460	3,691,502
	117	128	136	148	166	183	191	191	191	198	219	254	282	312	348	378
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
CPI	100.00	103.53	105.54	109.41	113.87	119.33	125.80	131.11	135.09	139.09	142.71	146.73	151.02	154.55	156.95	160.38

NOTE: The numbers in each cell are, respectively: (a) the aggregate of balance-sheet loan amounts, in nominal $ millions; (b) the average holdings per institution, in nominal $ millions; and (c) the percentage of all loans represented by this category, as a percent of all loans for that year. CPI is normalized at $CPI_{84} = 100.0$

Table 3: Industry composition (number of institutions)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total Inst.	17918	18050	17898	17351	16598	16169	15441	14678	14042	13407	12729	12156	11636	11118	10648	10400
Banks	14500	14424	14221	13729	13159	12803	12447	12025	11570	11081	10574	10125	9711	9339	8966	8767
-- Urban	6990	7039	6999	6674	6319	6156	5960	5679	5414	5078	4800	4548	4331	4159	4026	3990
-- Rural	7510	7385	7222	7055	6840	6647	6487	6346	6156	6003	5774	5577	5380	5180	4940	4777
Thrifts	3418	3626	3677	3622	3439	3366	2994	2653	2472	2326	2155	2031	1925	1779	1682	1633
-- Urban	2400	2592	2645	2620	2493	2457	2190	1934	1785	1672	1530	1436	1350	1246	1172	1141
-- Rural	1018	1034	1032	1002	946	909	804	719	687	654	625	595	575	533	510	492
Urban	9390	9631	9644	9294	8812	8613	8150	7613	7199	6750	6330	5984	5681	5405	5198	5131
-- Banks	6990	7039	6999	6674	6319	6156	5960	5679	5414	5078	4800	4548	4331	4159	4026	3990
-- Thrifts	2400	2592	2645	2620	2493	2457	2190	1934	1785	1672	1530	1436	1350	1246	1172	1141
Rural	8528	8419	8254	8057	7786	7556	7291	7065	6843	6657	6399	6172	5955	5713	5450	5269
-- Banks	7510	7385	7222	7055	6840	6647	6487	6346	6156	6003	5774	5577	5380	5180	4940	4777
-- Thrifts	1018	1034	1032	1002	946	909	804	719	687	654	625	595	575	533	510	492

erative banks; banks are everything else. If the headquarters address has a positive metropolitan statistical area (MSA) code, it is classified as an urban institution, regardless of the size of the MSA; all other institutions ero) are rural.

Table 4: Cross-sectional distribution of charge-offs

		1984	1985	1986	1987	1988	1989	1990	1991
RE (total)	Count	14628	14652	14515	14036	13465	13053	15207	14448
	Average	0.00394	0.00577	0.00598	0.00522	0.00395	0.00347	0.00335	0.00302
	Median	0.00000	0.00000	0.00020	0.00000	0.00000	0.00000	0.00000	0.00012
	Min	-0.390	-0.547	-17.500	-0.475	-0.193	-0.242	-0.121	-0.631
	Max	1.117	0.695	1.343	0.541	0.537	1.186	0.755	0.202
	Std. Dev.	0.02141	0.02081	0.14752	0.01829	0.01443	0.01576	0.01331	0.01178
	Skewness	20.9	8.4	-115.1	4.6	9.7	34.1	18.7	-9.8
	Kurtosis	863.9	217.8	13668.4	198.2	229.1	2454.1	794.3	668.2
1-4 family	Count			445	461	470		2532	14411
	Average			0.00012	0.00008	0.00013		0.00082	0.00186
	Median			0.00000	0.00000	0.00000		0.00000	0.00000
	Min			-0.002	-0.008	0.000		-0.176	-0.649
	Max			0.010	0.007	0.020		0.140	0.533
	Std. Dev.			0.00072	0.00066	0.00130		0.00655	0.01265
	Skewness			8.9	0.8	11.4		2.6	-10.7
	Kurtosis			101.2	75.6	143.7		404.1	990.7
Multifamily	Count							2234	9474
	Average							0.00542	0.01362
	Median							0.00000	0.00000
	Min							-0.261	-7.419
	Max							1.261	24.615
	Std. Dev.							0.04706	0.34203
	Skewness							17.1	50.0
	Kurtosis							388.2	3261.1
Non-residential	Count							2505	14329
	Average							0.00545	0.00585
	Median							0.00000	0.00000
	Min							-1.992	-2.780
	Max							0.588	8.685
	Std. Dev.							0.05286	0.08245
	Skewness							-19.7	80.8
	Kurtosis							837.1	8710.7
Consumer	Count	14411	14316	14110	13614	13038	13091	15233	14472
	Average	0.00615	0.00803	0.01065	0.00866	0.00753	0.00726	0.00780	0.00797
	Median	0.00280	0.00400	0.00490	0.00430	0.00360	0.00367	0.00341	0.00389
	Min	-0.310	-0.250	-0.082	-0.265	-0.232	-0.357	-0.256	-6.360
	Max	0.505	0.668	4.658	0.836	0.624	0.772	1.674	2.092
	Std. Dev.	0.01527	0.01791	0.06035	0.01886	0.01629	0.01836	0.02496	0.06007
	Skewness	9.7	10.8	54.3	11.9	8.4	14.4	28.1	-78.7
	Kurtosis	229.7	240.4	3486.9	358.0	203.6	462.7	1495.8	8837.0
C & I	Count	14323	14206	14336	13850	13305	12891	14065	13416
	Average	0.03949	0.06537	0.06681	0.04449	0.03264	0.02878	0.03542	0.02305
	Median	0.00960	0.01520	0.01780	0.01110	0.00670	0.00611	0.00501	0.00569
	Min	-1.212	-4.775	-2.300	-1.170	-20.000	-2.727	-30.000	-80.000
	Max	4.989	69.444	22.595	16.266	62.500	22.045	78.333	15.000
	Std. Dev.	0.12440	0.64145	0.31027	0.23842	0.58438	0.26402	0.99363	0.72994
	Skewness	15.2	93.4	44.0	40.1	88.9	59.2	66.4	-96.9
	Kurtosis	410.0	9797.6	2684.6	2178.2	9920.8	4434.4	5338.7	10792.3
Agricultural	Count	521	557	588	600	589	618	633	655
	Average	0.01049	0.02598	0.02682	0.00749	0.00489	0.00002	0.00171	0.00994
	Median	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Min	-0.177	-0.079	-0.794	-1.333	-0.347	-1.544	-0.282	-0.209
	Max	0.369	1.813	1.511	0.617	0.681	0.600	0.384	3.077
	Std. Dev.	0.04090	0.11914	0.13051	0.07271	0.05155	0.07417	0.03163	0.12973
	Skewness	5.0	9.3	6.9	-9.3	5.4	-13.0	3.8	20.8
	Kurtosis	34.5	110.5	72.5	205.0	71.6	317.4	67.9	481.6

Table 4: Cross-sectional distribution of charge-offs (cont.)

		1992	1993	1994	1995	1996	1997	1998	1999
RE (total)	Count	13828	13193	12512	11866	11344	10795	10323	10081
	Average	0.00259	0.00179	0.00096	0.00075	0.00045	0.00041	0.00048	0.00044
	Median	0.00009	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Min	-0.143	-0.230	-0.833	-0.393	-1.563	-0.833	-0.074	-0.120
	Max	0.396	0.351	1.665	0.092	0.213	0.125	0.219	0.078
	Std. Dev.	0.01035	0.01028	0.01760	0.00637	0.01627	0.00996	0.00406	0.00352
	Skewness	12.5	10.5	59.4	-20.1	-80.6	-61.8	18.8	-2.1
	Kurtosis	370.4	358.2	6796.6	1339.6	7596.4	4899.9	919.2	339.3
1-4 family	Count	13791	13164	12479	11827	11306	10756	10279	10031
	Average	0.00076	0.00148	0.00063	0.00081	0.00049	0.00048	0.00052	0.00037
	Median	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Min	-11.667	-0.411	-3.000	-1.094	-1.563	-0.833	-0.127	-0.576
	Max	0.486	0.744	1.665	0.494	0.342	0.187	0.113	0.114
	Std. Dev.	0.09978	0.01320	0.03147	0.01403	0.01593	0.00943	0.00467	0.00882
	Skewness	-115.9	20.3	-57.6	-36.7	-82.4	-62.6	4.9	-49.0
	Kurtosis	13560.2	1048.4	7250.1	3392.2	8213.1	5723.4	291.7	3094.3
Multifamily	Count	9315	9025	8640	8213	7914	7496	7162	6974
	Average	0.00563	0.00521	0.00334	0.00068	0.01749	0.00192	-0.00245	0.00156
	Median	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Min	-11.089	-2.167	-1.565	-9.000	-2.687	-20.000	-30.000	-0.372
	Max	6.245	5.000	3.421	3.691	131.492	23.500	8.846	2.752
	Std. Dev.	0.15452	0.09222	0.05955	0.12873	1.47888	0.35771	0.37154	0.04655
	Skewness	-29.5	32.8	25.3	-47.0	88.8	14.5	-71.6	41.7
	Kurtosis	3199.1	1666.7	1454.7	3358.0	7896.9	3788.7	5980.8	2115.6
Non-residential	Count	13727	13100	12431	11775	11256	10704	10239	9988
	Average	0.00491	0.00335	0.00141	0.00094	0.00143	0.00060	0.00046	0.00050
	Median	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Min	-0.491	-0.751	-0.135	-0.417	-0.539	-0.435	-0.495	-0.132
	Max	1.609	3.058	0.997	0.312	5.667	0.208	0.332	0.323
	Std. Dev.	0.03314	0.04018	0.01526	0.01089	0.05840	0.00913	0.00846	0.00692
	Skewness	25.2	42.1	31.4	-3.3	86.3	-4.1	-11.4	18.1
	Kurtosis	945.6	2792.1	1709.1	438.2	8071.1	605.8	1446.5	712.8
Consumer	Count	13848	13209	12526	11873	11356	10814	10338	10093
	Average	0.00766	0.00602	0.00416	0.00487	0.00608	0.00623	0.00677	0.00662
	Median	0.00320	0.00214	0.00181	0.00232	0.00302	0.00348	0.00323	0.00294
	Min	-7.564	-0.940	-1.923	-0.532	-2.549	-5.896	-3.095	-0.135
	Max	5.000	3.932	0.889	1.417	0.881	0.548	1.417	1.676
	Std. Dev.	0.08961	0.04608	0.02486	0.01987	0.03040	0.06061	0.04133	0.02604
	Skewness	-23.4	59.4	-29.5	29.4	-47.8	-85.5	-35.4	37.0
	Kurtosis	4674.0	4665.4	3113.0	2260.5	4502.3	8321.9	3277.0	2053.7
C & I	Count	12850	12293	11697	11148	10712	10253	9816	9628
	Average	0.01892	0.01230	0.00555	0.01337	0.00490	0.01587	0.00594	0.01356
	Median	0.00396	0.00108	0.00000	0.00018	0.00054	0.00055	0.00072	0.00062
	Min	-12.188	-15.000	-25.000	-8.475	-210.385	-10.000	-170.000	-1.891
	Max	7.911	7.742	7.742	55.202	86.957	83.947	136.250	25.814
	Std. Dev.	0.18978	0.20217	0.31704	0.54165	2.25897	0.84194	2.20695	0.29346
	Skewness	-24.1	-26.6	-52.5	95.1	-69.0	96.5	-22.6	73.9
	Kurtosis	2046.3	2803.9	3906.6	9685.4	7254.4	9638.5	5067.7	6277.6
Agricultural	Count	687	693	710	739	735	674	654	699
	Average	-0.01133	0.00447	0.00209	0.00152	-0.00024	0.00501	0.00314	-0.01207
	Median	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Min	-8.500	-0.616	-0.256	-0.304	-1.645	-0.263	-0.347	-9.792
	Max	0.403	3.392	0.793	1.341	0.554	1.630	1.106	0.404
	Std. Dev.	0.32678	0.13393	0.03968	0.05442	0.07649	0.07079	0.04817	0.37112
	Skewness	-25.6	23.3	12.6	19.9	-14.6	19.1	18.1	-26.3
	Kurtosis	666.6	594.3	243.0	501.3	322.1	421.5	428.3	693.8

Table 5: Cross-sectional distribution of delinquencies

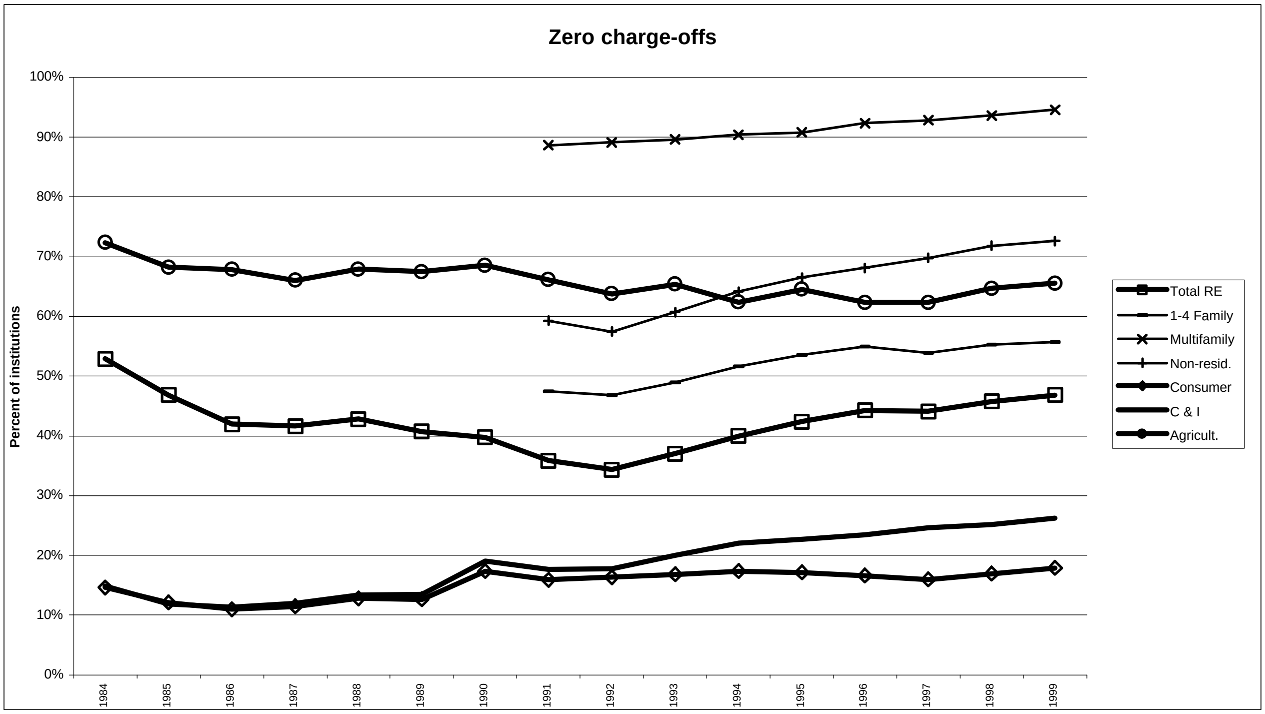
		1984	1985	1986	1987	1988	1989	1990	1991
RE (total)	Count	2059	14286	14514	14036	13465	13053	15207	14448
	Average	0.04799	0.05904	0.05745	0.04983	0.04490	0.04359	0.04726	0.04488
	Median	0.03630	0.03960	0.03690	0.03070	0.02780	0.02824	0.03197	0.03246
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	0.535	2.174	2.818	1.551	1.112	1.667	1.061	0.893
	Std. Dev.	0.04636	0.07617	0.07558	0.06488	0.05958	0.05609	0.05494	0.04984
	Skewness	3.2	5.7	6.8	4.4	4.6	5.5	3.7	3.9
	Kurtosis	19.7	85.0	149.0	46.2	44.4	83.5	31.2	33.7
1-4 family	Count			445	461	470		2532	14411
	Average			0.02697	0.02383	0.02983		0.04863	0.04071
	Median			0.02130	0.01940	0.02000		0.03679	0.02773
	Min			0.000	0.000	0.000		0.000	0.000
	Max			0.379	0.150	0.270		0.475	3.435
	Std. Dev.			0.02796	0.02016	0.02942		0.04646	0.06501
	Skewness			5.8	2.2	3.0		2.8	20.8
	Kurtosis			59.4	7.1	15.3		13.3	891.3
Multifamily	Count								7539
	Average								0.05560
	Median								0.00000
	Min								0.000
	Max								14.393
	Std. Dev.								0.34955
	Skewness								21.7
	Kurtosis								670.3
Non-residential	Count								12150
	Average								0.04944
	Median								0.02182
	Min								-0.008
	Max								7.879
	Std. Dev.								0.10785
	Skewness								34.0
	Kurtosis								2309.6
Consumer	Count	1379	13554	13303	12758	12159	12008	11593	12278
	Average	0.02859	0.04230	0.04041	0.03630	0.03481	0.03548	0.03669	0.03625
	Median	0.02300	0.02950	0.02750	0.02545	0.02460	0.02541	0.02653	0.02611
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	0.425	2.186	13.087	2.290	1.962	3.899	2.558	1.815
	Std. Dev.	0.02516	0.05683	0.13011	0.05181	0.04559	0.05340	0.04996	0.04738
	Skewness	4.7	10.0	79.4	14.3	11.2	33.6	15.9	9.8
	Kurtosis	51.0	240.1	7699.6	438.7	327.9	2298.5	632.8	231.2
C & I	Count	2063	14206	14336	13850	13305	12891	14065	13416
	Average	0.07447	0.16965	0.14773	0.13131	0.15168	0.11952	0.16386	0.19786
	Median	0.05320	0.07660	0.07140	0.06180	0.05500	0.05353	0.05377	0.04823
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	1.158	152.308	22.033	25.556	230.000	60.000	370.000	1135.000
	Std. Dev.	0.07821	1.45871	0.35734	0.48027	2.72499	0.83288	3.88310	9.80837
	Skewness	4.0	89.4	25.5	33.4	71.5	58.6	84.7	115.5
	Kurtosis	30.4	8805.0	1223.6	1438.2	5402.8	3864.0	7439.2	13359.8
Agricultural	Count	521	557	588	600	589	618	633	655
	Average	0.06402	0.11562	0.04928	0.04675	0.04942	0.03628	0.03773	0.04021
	Median	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	3.258	34.247	0.873	1.000	2.564	1.171	1.471	2.000
	Std. Dev.	0.21905	1.45513	0.11345	0.10776	0.15438	0.09991	0.11415	0.13698
	Skewness	9.7	23.3	3.9	4.2	9.3	6.0	6.8	9.1
	Kurtosis	120.6	547.3	18.7	23.3	128.4	46.9	62.2	107.9

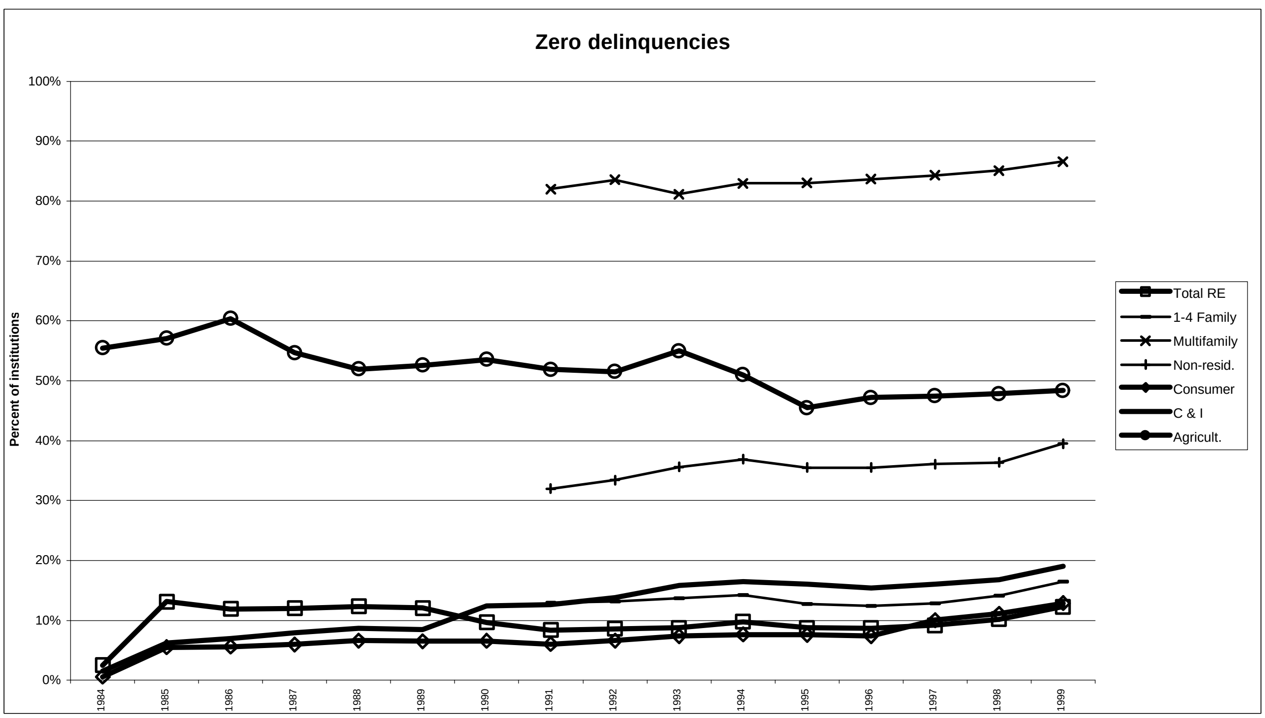
Table 5: Cross-sectional distribution of delinquencies (cont.)

		1992	1993	1994	1995	1996	1997	1998	1999
RE (total)	Count	13828	13193	12512	11866	11344	10795	10323	10081
	Average	0.03592	0.03171	0.02648	0.02754	0.02759	0.02588	0.02495	0.02098
	Median	0.02481	0.02084	0.01789	0.01949	0.01969	0.01814	0.01673	0.01341
	Min	-0.105	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	0.900	1.366	0.548	1.299	1.000	0.698	1.577	0.469
	Std. Dev.	0.04222	0.04390	0.03155	0.03605	0.03365	0.03105	0.03507	0.02665
	Skewness	4.5	7.7	3.9	10.5	6.6	4.9	12.4	4.1
	Kurtosis	47.2	130.4	32.1	278.4	112.3	53.1	416.4	35.0
1-4 family	Count	13791	13164	12479	11827	11306	10756	10279	10031
	Average	0.03290	0.02999	0.02676	0.02852	0.02992	0.02852	0.02682	0.02341
	Median	0.02204	0.01954	0.01751	0.01972	0.02056	0.01934	0.01783	0.01463
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	1.113	1.098	0.596	0.863	1.027	1.160	0.736	1.030
	Std. Dev.	0.04321	0.04399	0.03482	0.03690	0.04016	0.03945	0.03646	0.03494
	Skewness	6.3	7.9	4.6	5.6	7.0	8.0	5.7	9.3
	Kurtosis	88.4	122.3	41.9	66.7	103.9	137.3	67.3	200.3
Multifamily	Count	7604	9025	8640	8213	7914	7496	7162	6974
	Average	0.04729	0.03559	0.03165	0.02658	0.02610	0.01999	0.01879	0.01495
	Median	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	30.932	6.641	32.105	14.200	41.944	5.000	5.000	5.000
	Std. Dev.	0.51922	0.19618	0.41567	0.21425	0.49997	0.13201	0.14057	0.10079
	Skewness	45.7	16.6	59.8	41.5	76.2	19.1	22.8	22.8
	Kurtosis	2499.1	392.7	4310.5	2471.8	6284.4	546.1	713.3	919.3
Non-residential	Count	11798	13100	12431	11776	11256	10705	10239	9988
	Average	0.03876	0.03488	0.02815	0.02711	0.02604	0.02367	0.02340	0.01918
	Median	0.01564	0.01148	0.00857	0.00981	0.00885	0.00794	0.00724	0.00465
	Min	-0.105	-0.008	-0.002	-0.005	-0.002	0.000	0.000	0.000
	Max	1.427	2.049	7.606	1.299	5.074	1.429	1.812	1.220
	Std. Dev.	0.06650	0.06927	0.09171	0.05419	0.06805	0.04780	0.04992	0.04259
	Skewness	5.2	7.2	51.9	7.9	38.7	8.0	10.2	9.3
	Kurtosis	54.6	109.4	3976.1	121.6	2711.3	133.3	229.2	178.6
Consumer	Count	11905	11491	10993	10446	10031	10814	10338	10093
	Average	0.03053	0.02843	0.02850	0.03020	0.03262	0.03210	0.03146	0.02822
	Median	0.02149	0.01911	0.01873	0.02122	0.02366	0.02252	0.02131	0.01880
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	1.762	3.561	8.219	1.442	1.685	5.000	2.822	1.049
	Std. Dev.	0.04519	0.05606	0.09464	0.04247	0.04700	0.06291	0.05478	0.04265
	Skewness	13.6	30.2	66.3	11.5	13.3	47.3	21.9	8.7
	Kurtosis	362.8	1579.1	5382.6	266.2	339.5	3610.4	924.0	139.2
C & I	Count	12850	12293	11697	11148	10712	10253	9816	9628
	Average	0.09331	0.08814	0.07896	0.08692	0.08609	0.06485	0.07421	0.06498
	Median	0.03619	0.02744	0.02312	0.02494	0.02655	0.02366	0.02362	0.01851
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	48.636	50.235	45.000	128.654	60.870	24.070	58.750	96.512
	Std. Dev.	0.49595	0.62870	0.68923	1.31168	0.80176	0.33536	0.70004	1.03762
	Skewness	75.7	54.3	50.6	87.3	53.5	48.8	68.2	86.1
	Kurtosis	7192.0	3717.5	2863.4	8355.6	3491.2	3008.3	5313.7	7833.8
Agricultural	Count	687	693	710	739	735	674	654	699
	Average	0.03621	0.02944	0.02761	0.03265	0.03378	0.02539	0.02967	0.02414
	Median	0.00000	0.00000	0.00000	0.00223	0.00120	0.00109	0.00057	0.00058
	Min	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Max	1.350	1.695	1.573	1.667	5.000	0.931	1.814	1.667
	Std. Dev.	0.11680	0.11661	0.10012	0.11157	0.19831	0.07833	0.10747	0.09256
	Skewness	6.5	8.8	8.7	9.1	21.8	6.8	10.1	11.5
	Kurtosis	51.4	95.2	102.7	109.2	538.6	55.8	136.1	169.9

Figure 1

Percent of institutions with exactly zero charge-offs / delinquencies





-84: Underperformance distribution of institutions, 1984

The percentage of all institutions (vertical) with a charge-off/delinquency rate in a given range (horizontal)

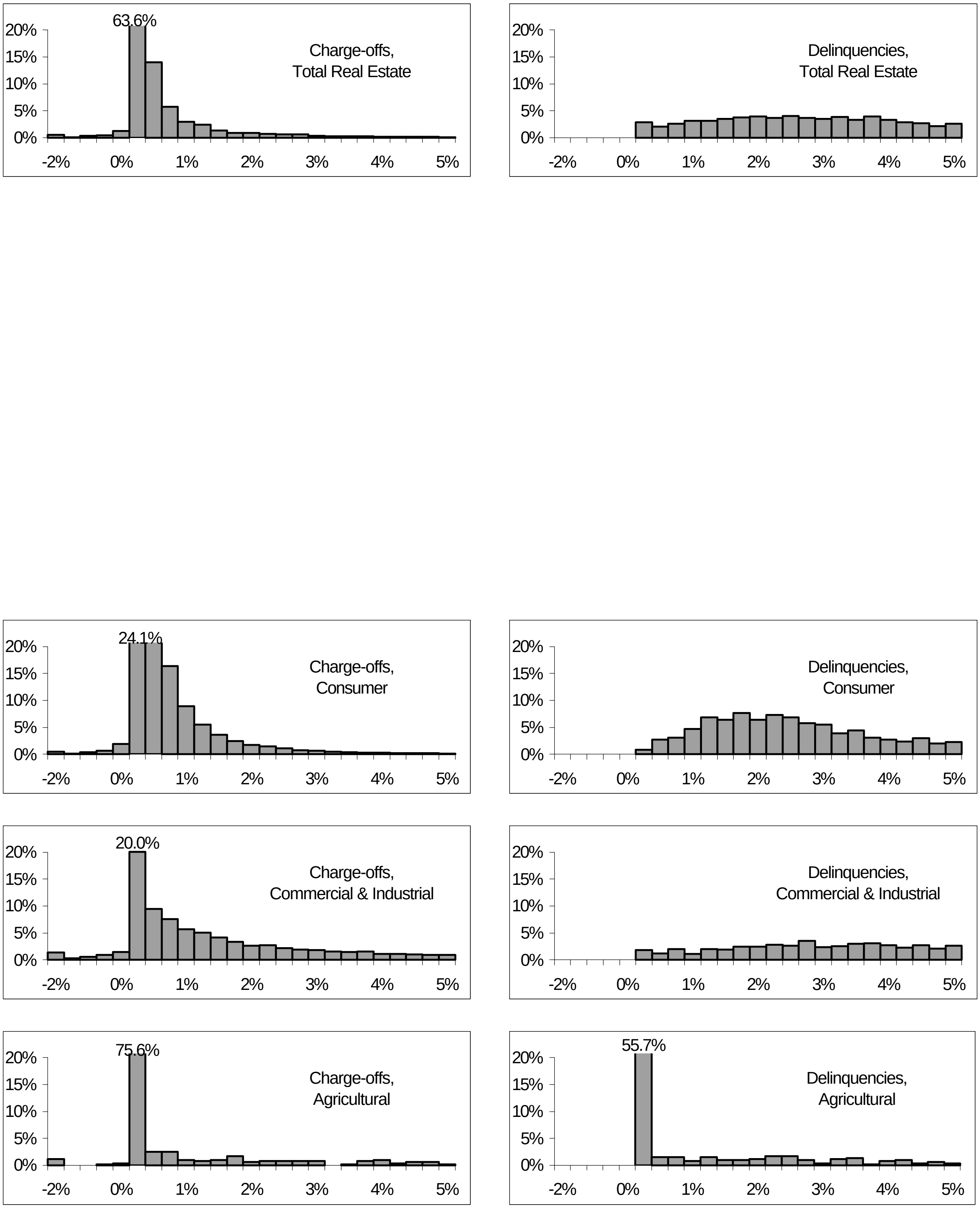


Figure 2-87: Underperformance distribution of institutions, 1987

The percentage of all institutions (vertical) with a charge-off/delinquency rate in a given range (horizontal)

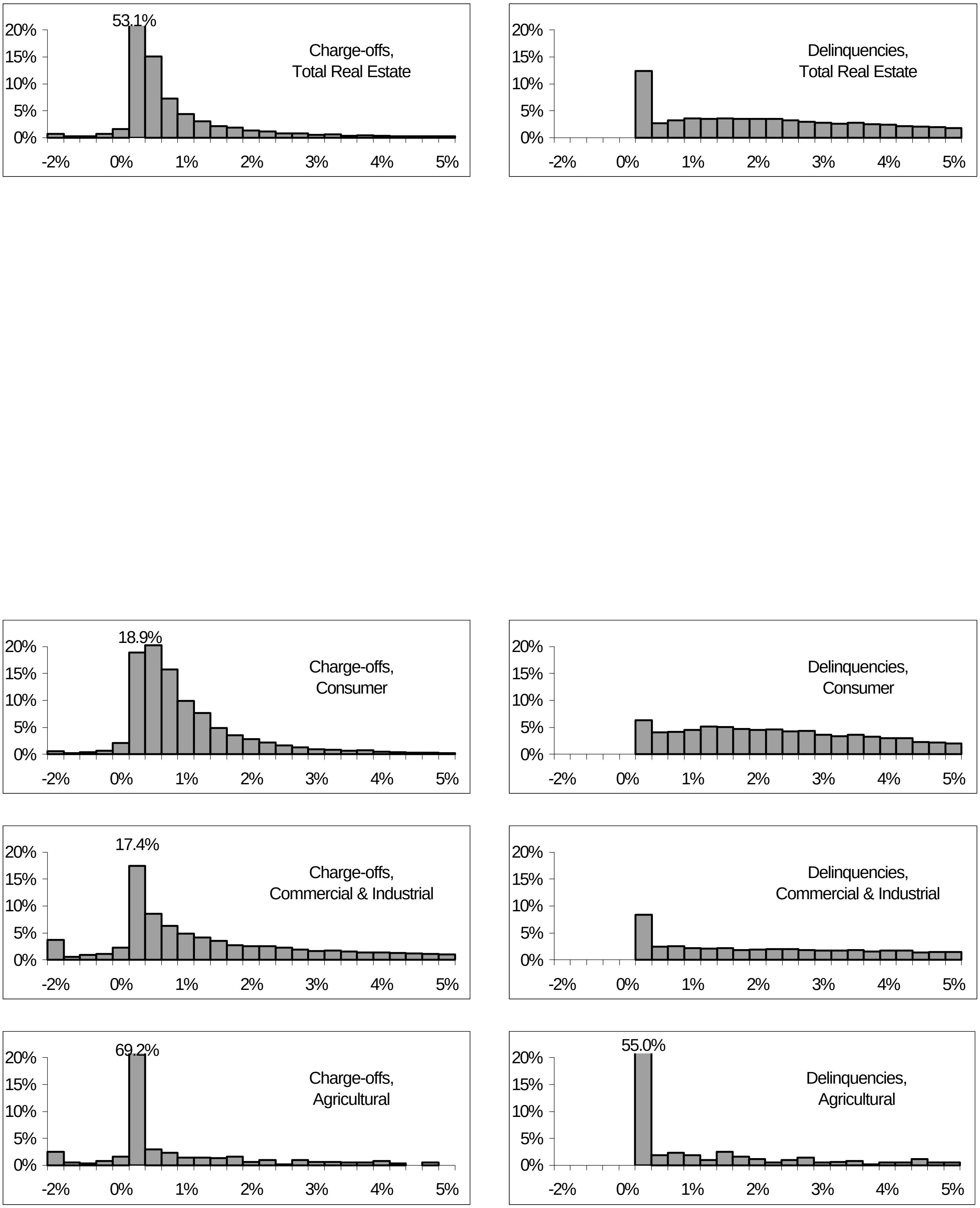


Figure 2-90: Underperformance distribution of institutions, 1990

The percentage of all institutions (vertical) with a charge-off/delinquency rate in a given range (horizontal)

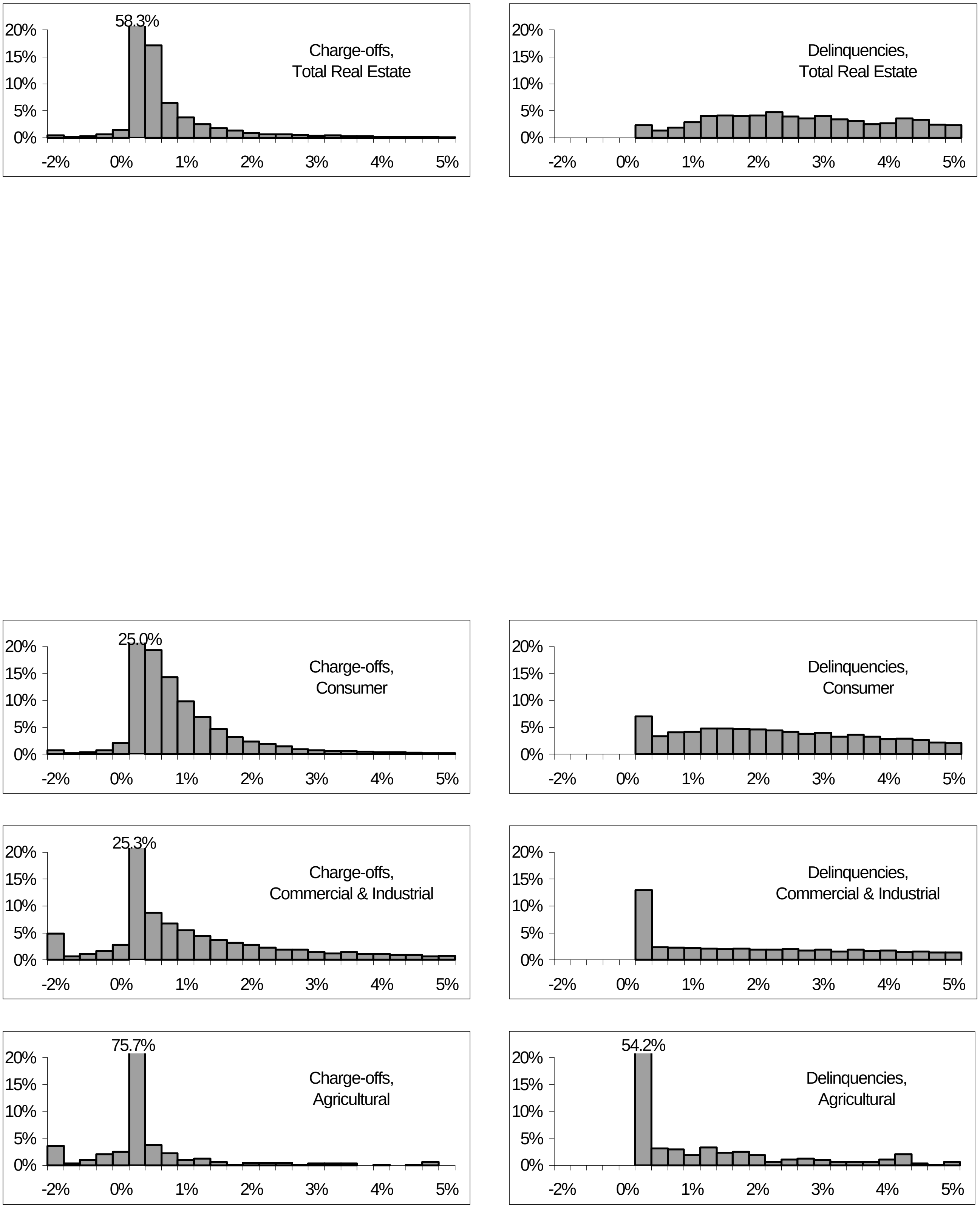


Figure 2-93: Underperformance distribution of institutions, 1993

The percentage of all institutions (vertical) with a charge-off/delinquency rate in a given range (horizontal)

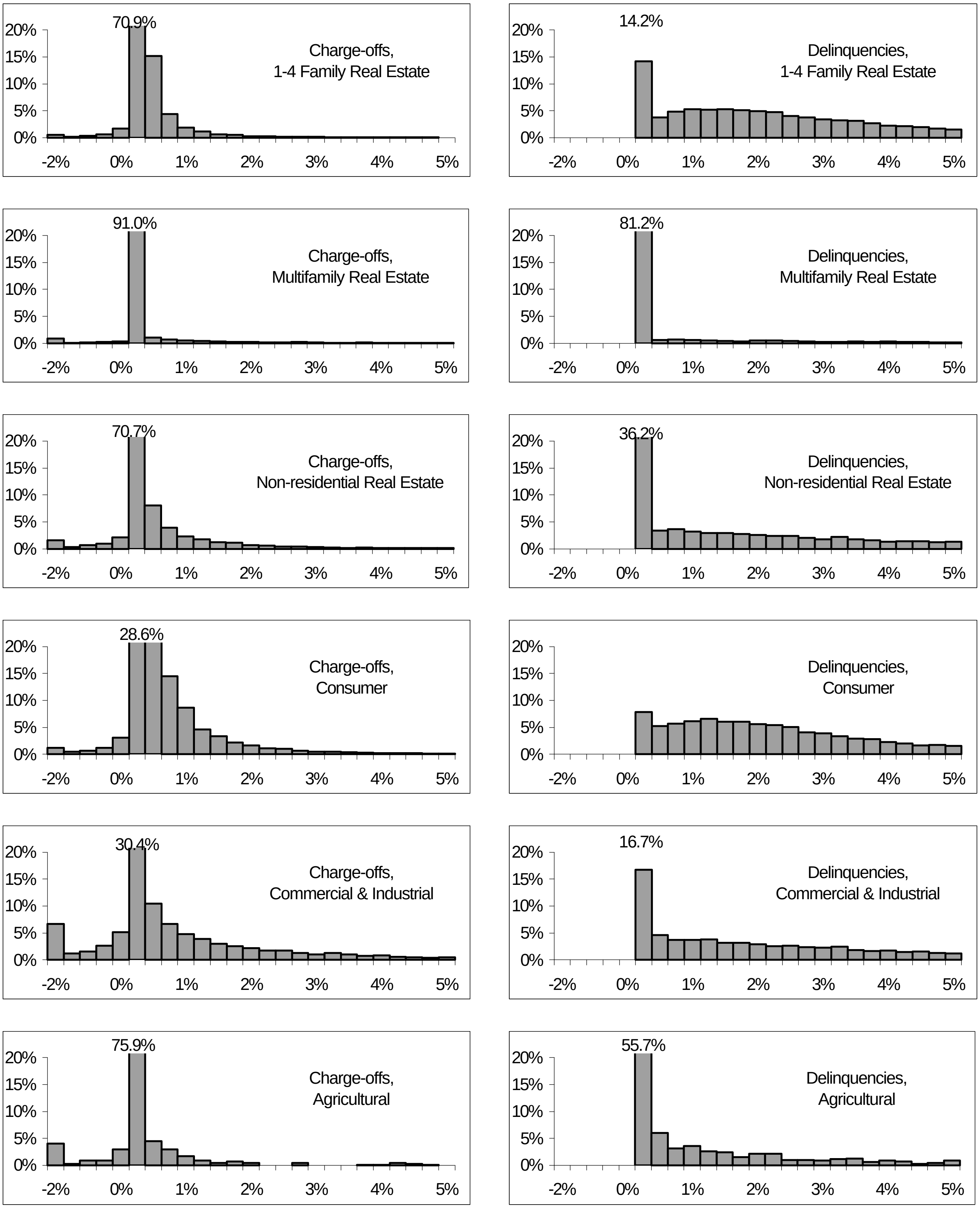


Figure 2-96: Underperformance distribution of institutions, 1996

The percentage of all institutions (vertical) with a charge-off/delinquency rate in a given range (horizontal)

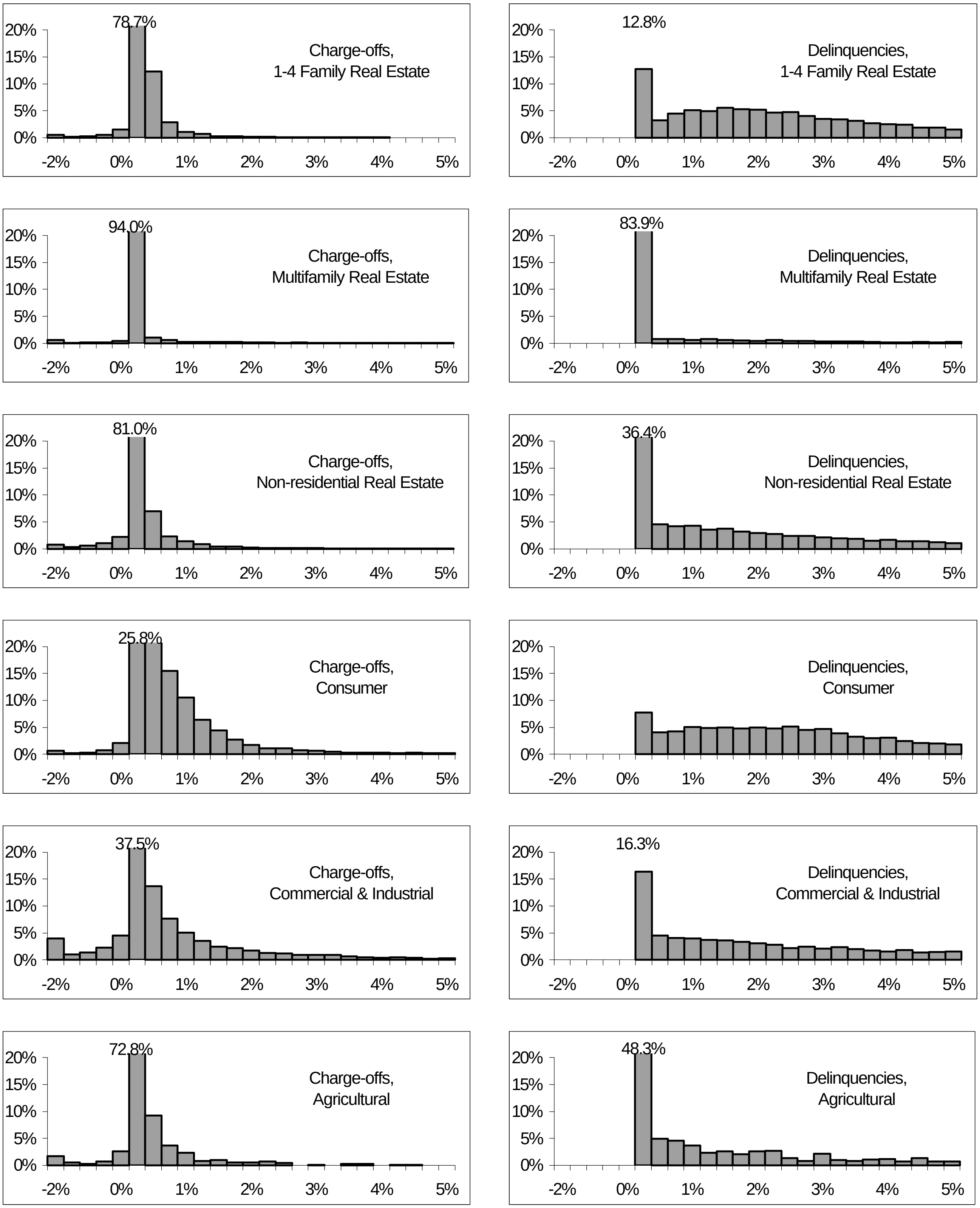


Figure 2-99: Underperformance distribution of institutions, 1999

The percentage of all institutions (vertical) with a charge-off/delinquency rate in a given range (horizontal)

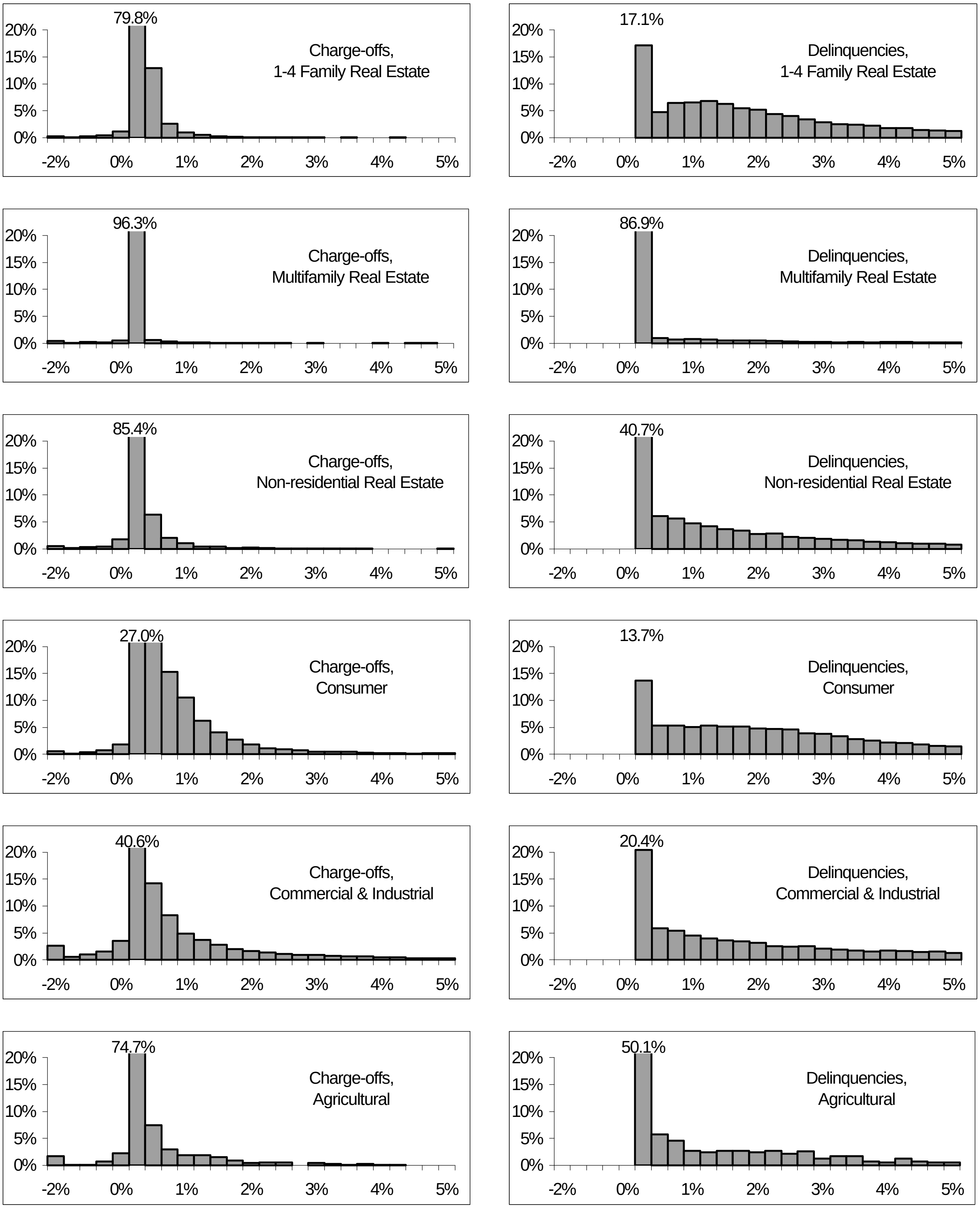
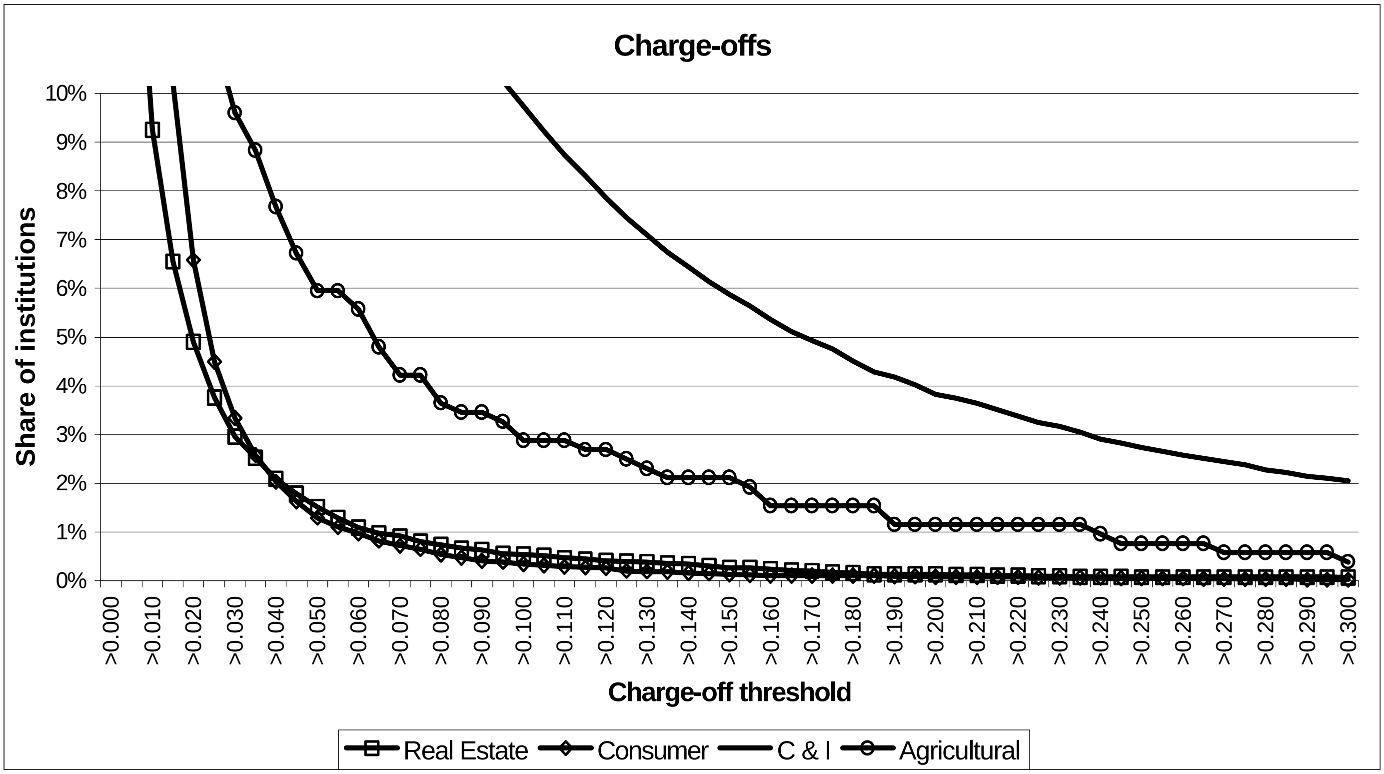


Figure 3-84:

Share of institutions with charge-offs/delinquencies exceeding a given level, 1984



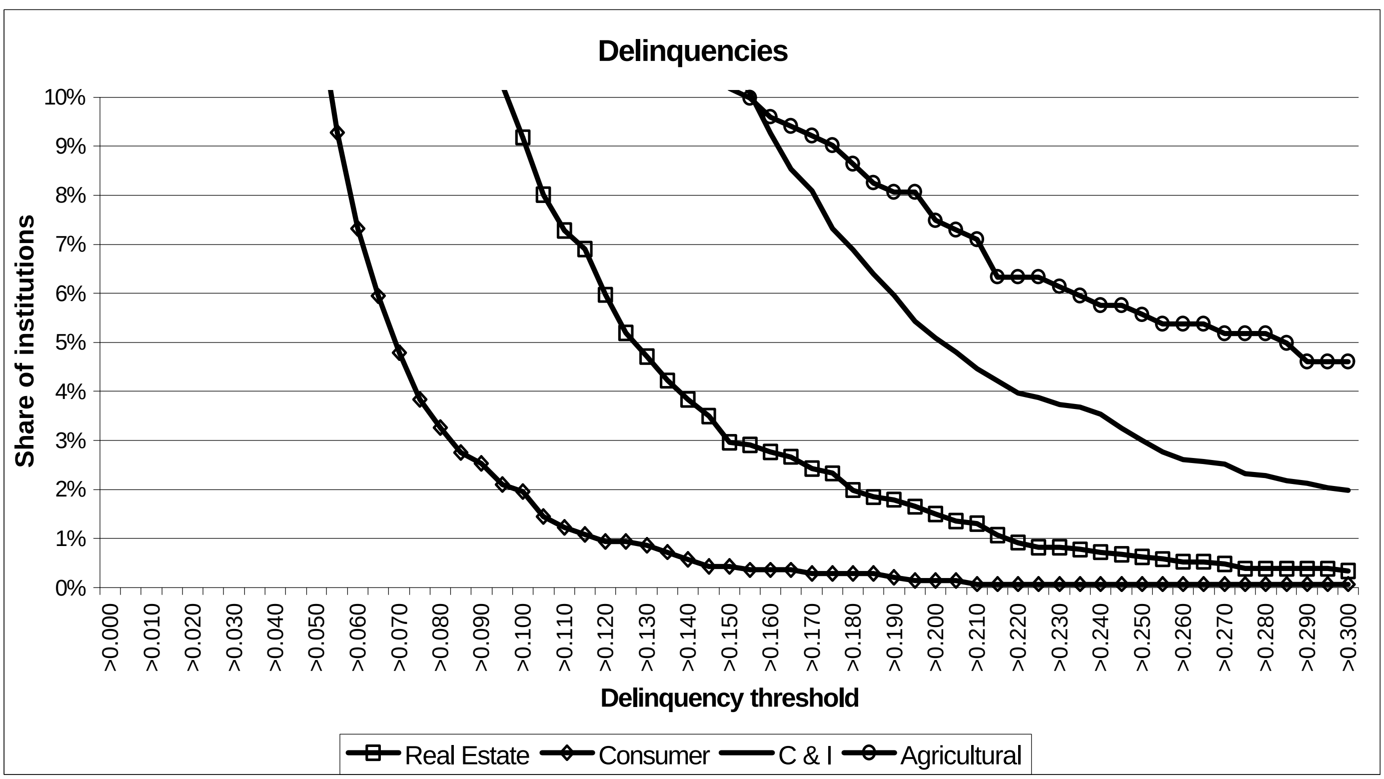
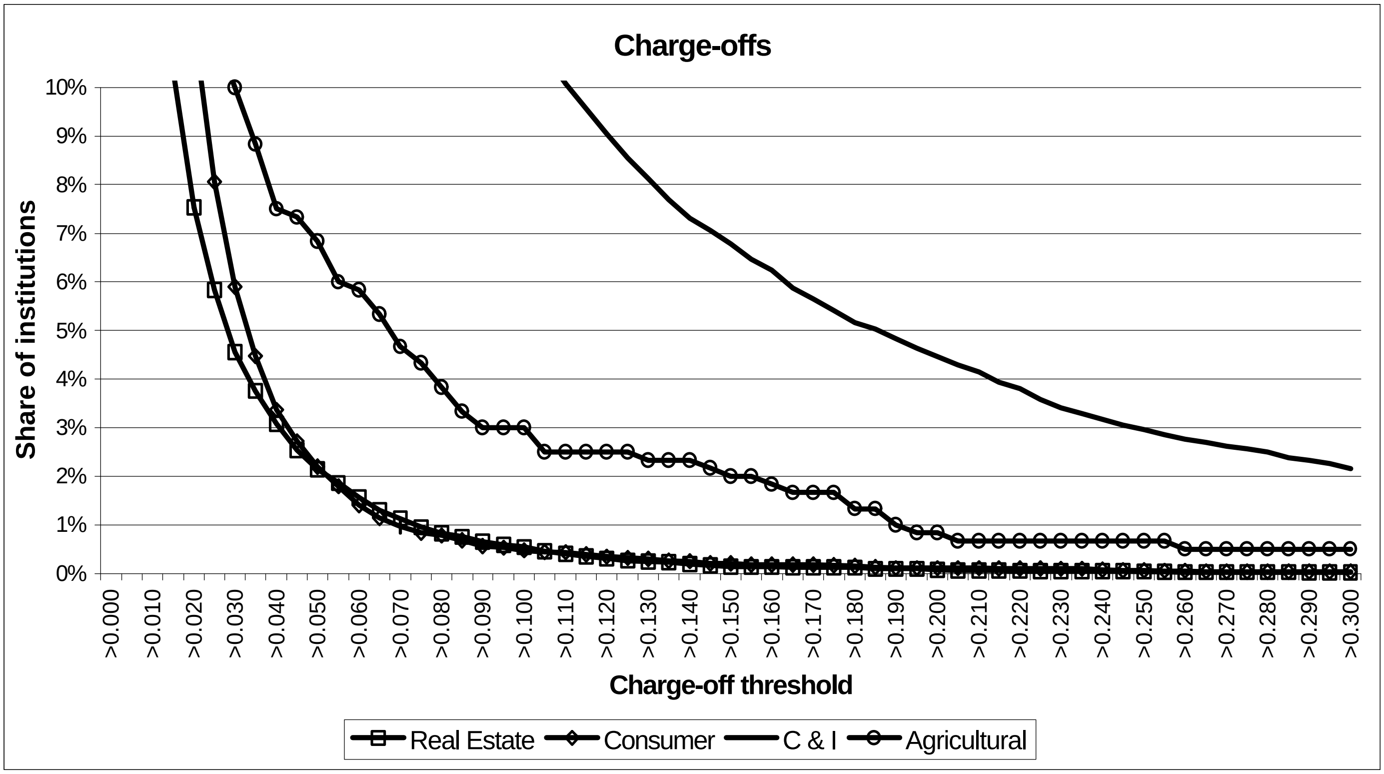


Figure 3-87:

Share of institutions with charge-offs/delinquencies exceeding a given level, 1987



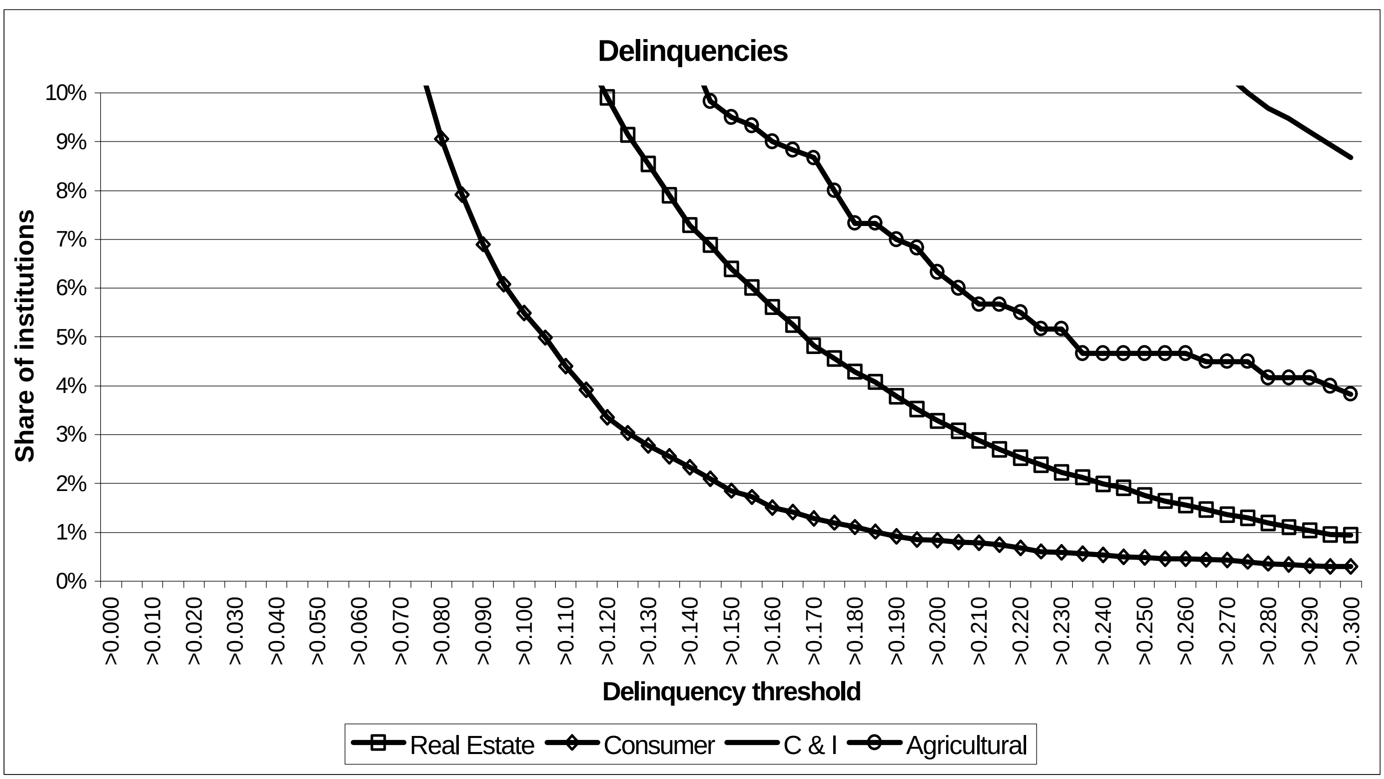
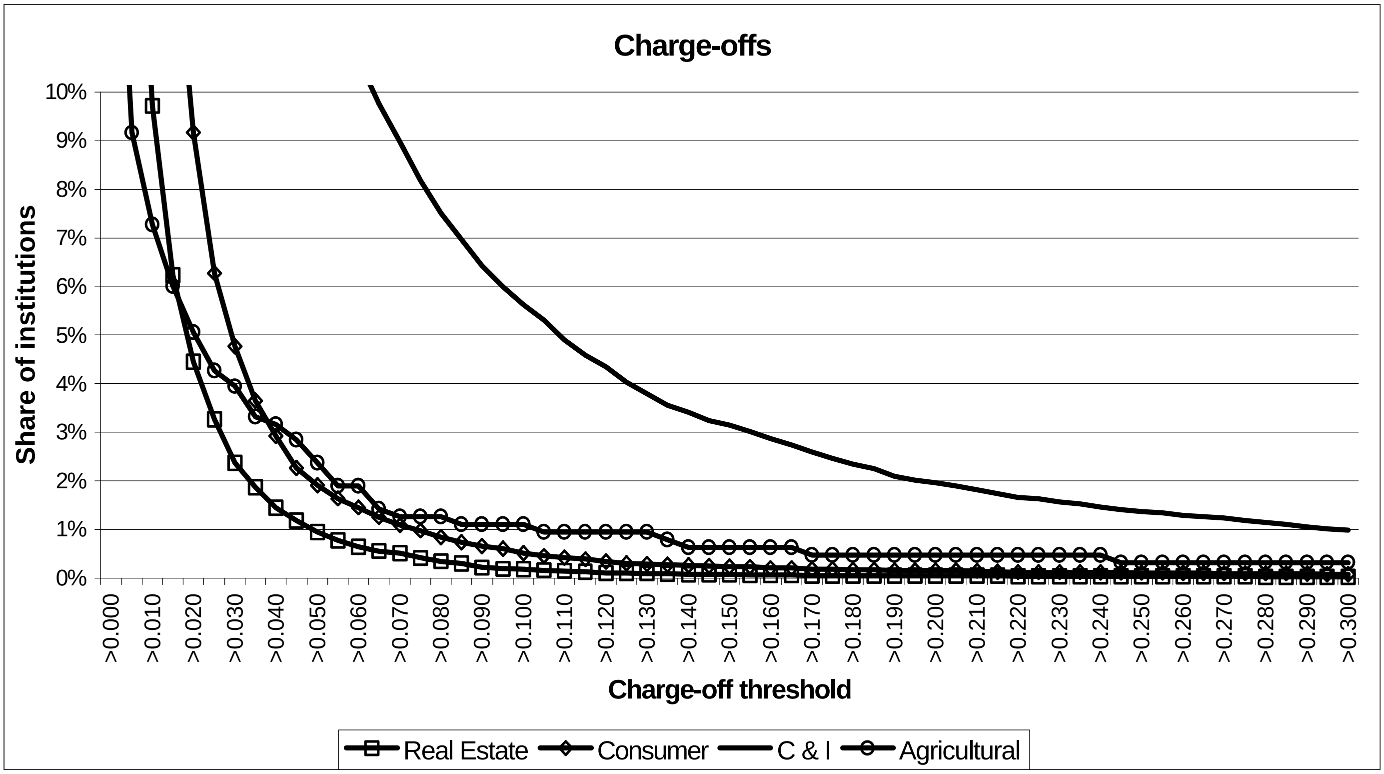


Figure 3-90:

Share of institutions with charge-offs/delinquencies exceeding a given level, 1990



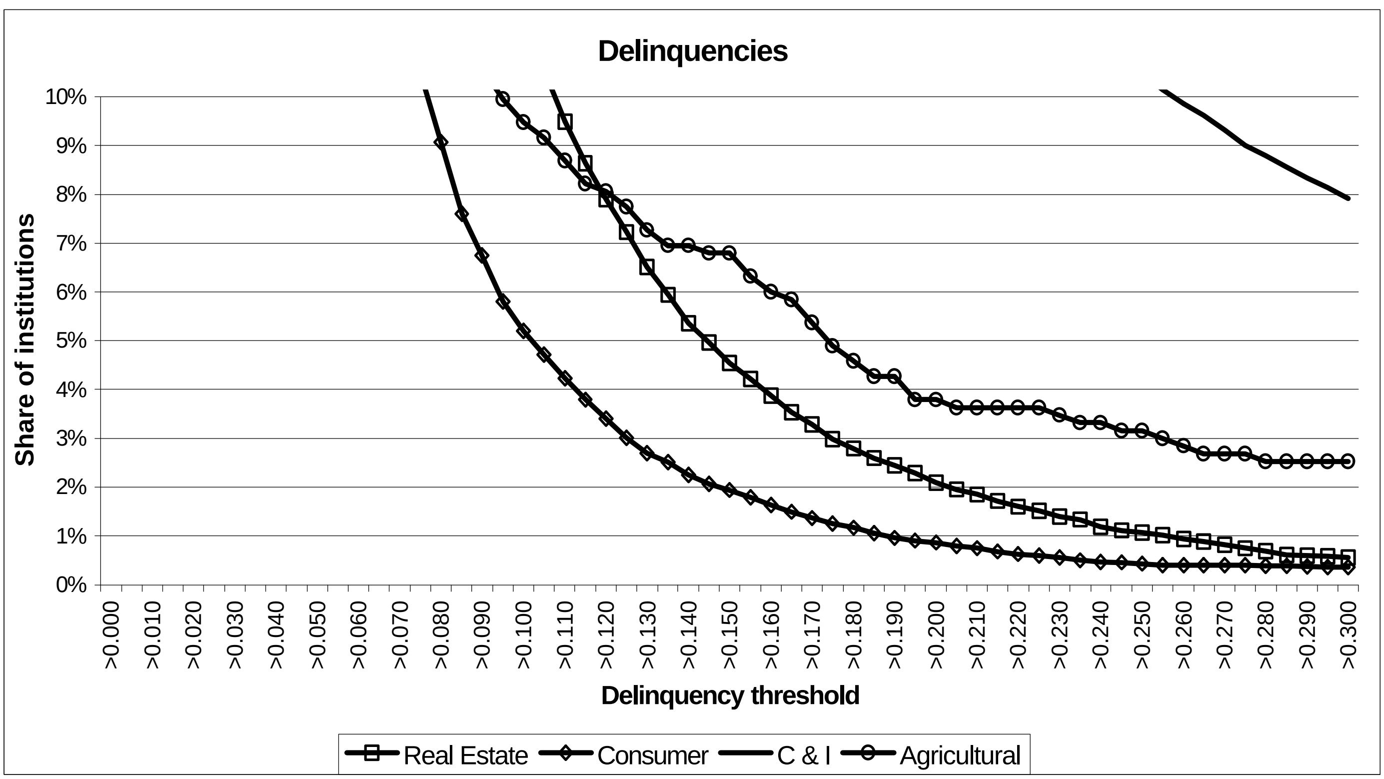
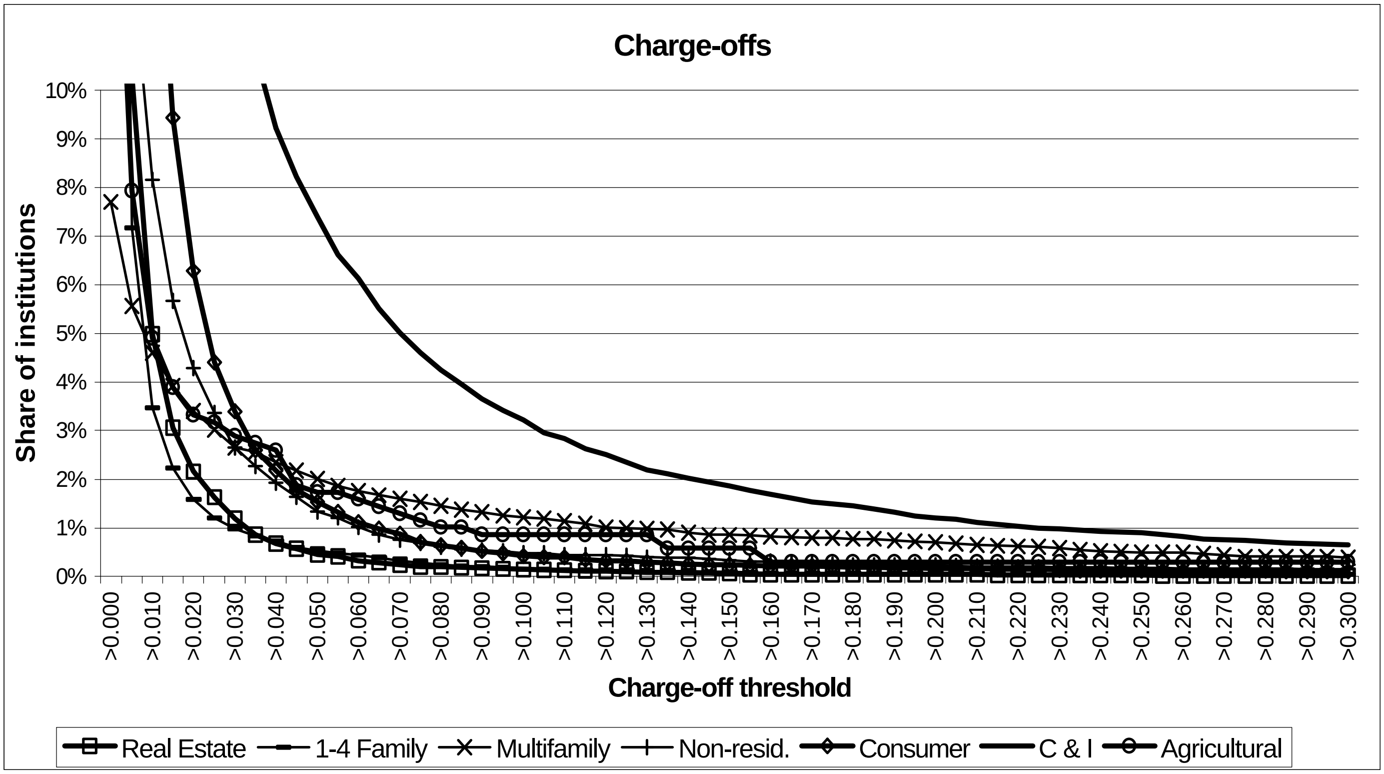


Figure 3-93:

Share of institutions with charge-offs/delinquencies exceeding a given level, 1993



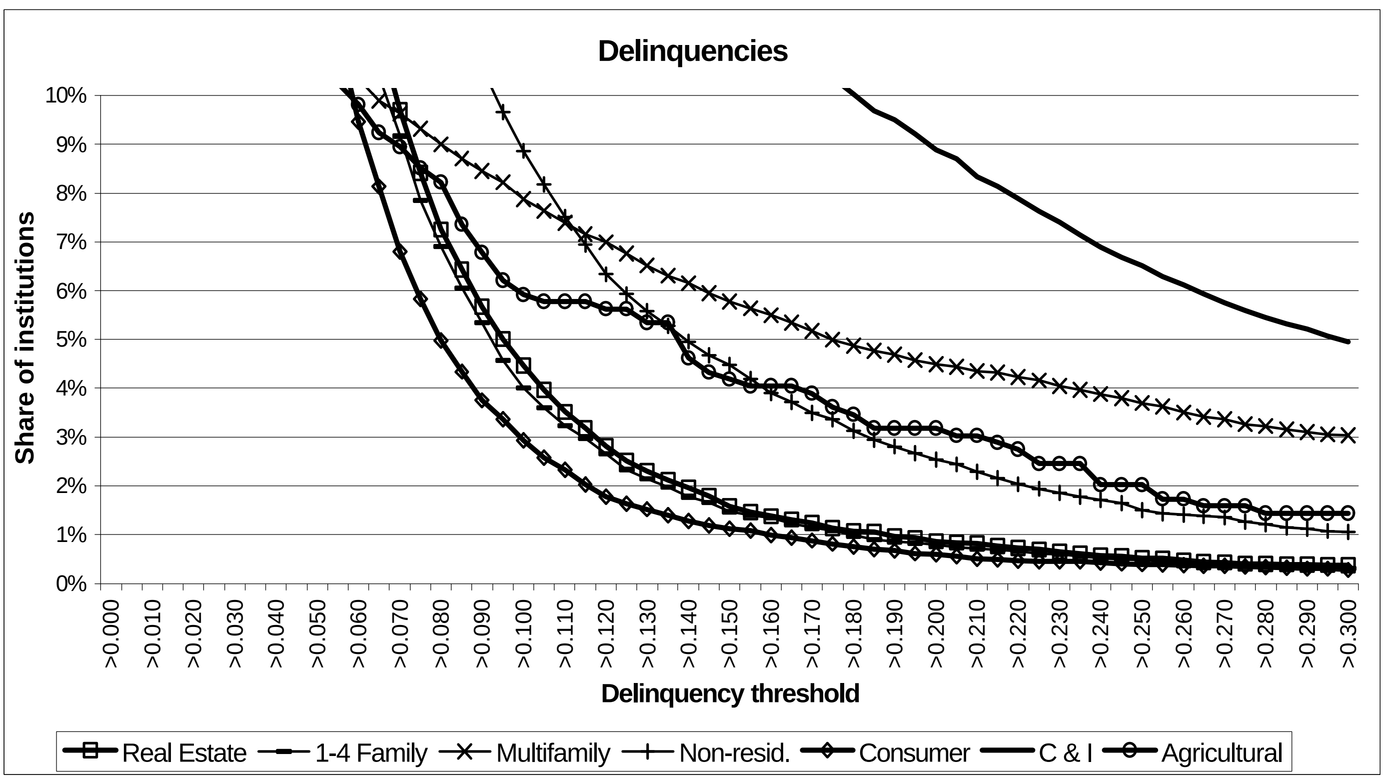
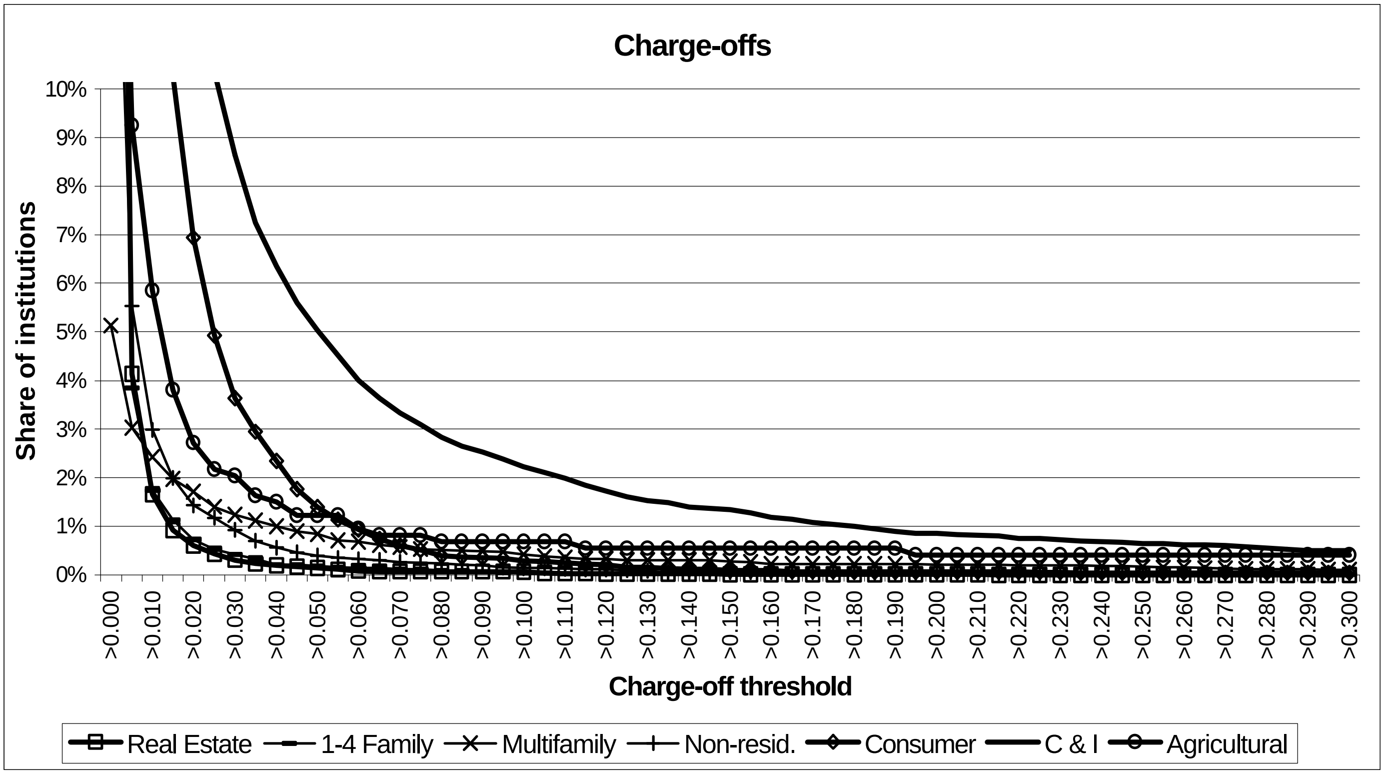


Figure 3-96:

Share of institutions with charge-offs/delinquencies exceeding a given level, 1996



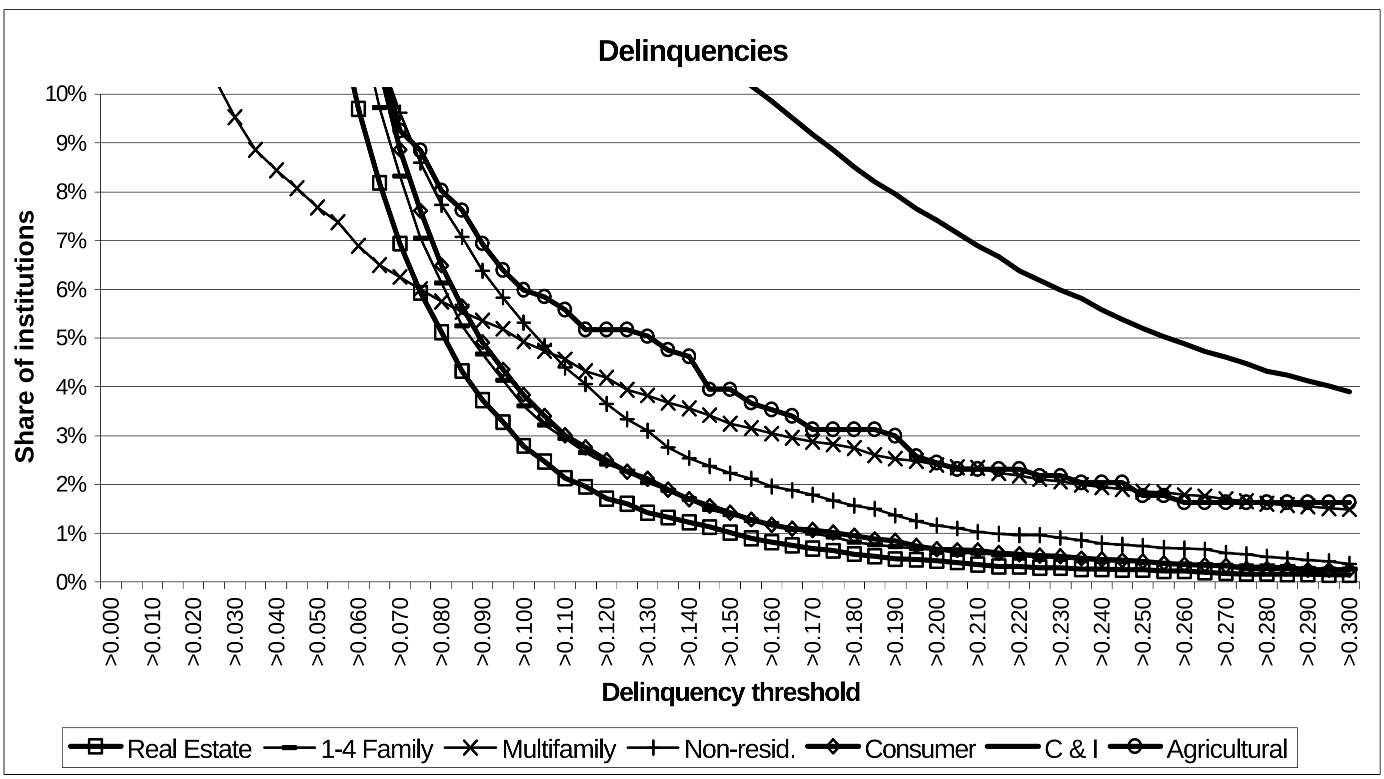
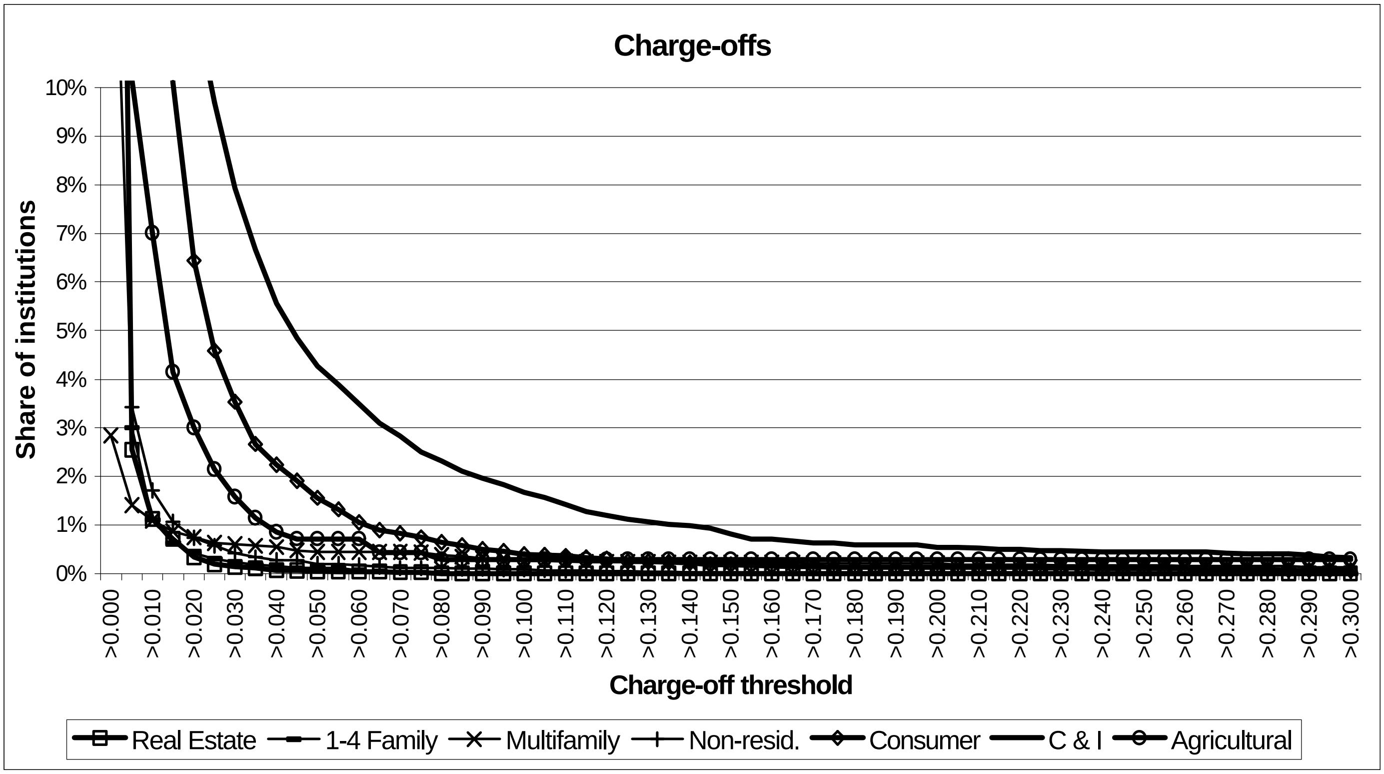


Figure 3-99:

Share of institutions with charge-offs/delinquencies exceeding a given level, 1999



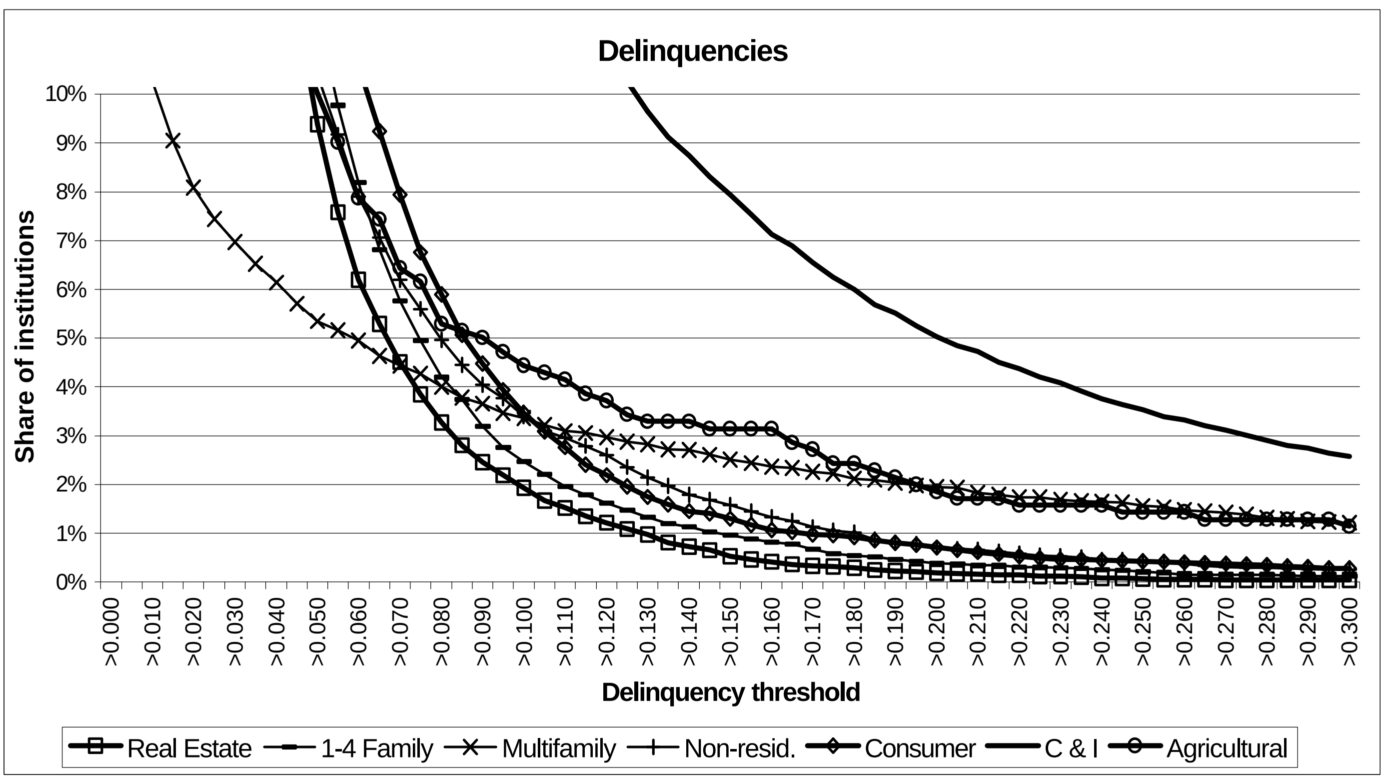


Figure 4:

Evolution of charge-off / delinquency distributions over time