Assessing Problems of Default in Local Mortgage Markets

Prepared for:
U.S. Department of Housing and Urban Development
Office of Policy Development and Research

Prepared by:
Robert F. Cotterman
Unicon Research Corporation
Santa Monica, CA

Under Contract: C-OPC-18484

March 2001

Revised September 30, 2000

Preface

This study was undertaken to address concerns raised about concentrations of FHA defaults in neighborhoods and among lenders in a 1997 study by the National Training Information Center (NTIC). This report was completed in two phases between December 1997 and September 2000. The first phase culminated with a March 1998 report which examined whether FHA defaults were concentrated among a group of high-default neighborhoods and high-default lenders. The report used statistical analysis to distinguish between patterns caused by chance from those attributable to specific factors such as the loan-to-value characteristics of the loan. After controlling for these factors, the statistical analysis found evidence of non-random default concentrations, at a substantially lower scale than that found in the more limited NTIC analysis. Moreover, the particular neighborhoods and lenders identified as high default changed from year to year, suggesting transitory causes which might not be amenable to policy changes. Finally, it was thought that control for differences in applicant credit histories, which was not possible for the first phase of the analysis, might explain the remaining non-random concentrations.

The second phase of the study replicated a number of the initial analyses with the addition of credit history data. This report combine the first phase of findings with the new second phase of findings, which are presented separately in Appendix C. As expected, the updated analysis shows that high default neighborhoods and lenders have more borrowers with poor credit. Including credit data in the analysis reduces the differential default rate among neighborhoods and lenders, but not as much as might be expected. However, non-random concentrations of default remain even after controlling for differential credit histories, and thus the findings of the original study still hold, albeit at a smaller scale.

TABLE OF CONTENTS

PREFACE TO REVISED REPORT

The vast majority of this paper was completed in March 1998 using then-available data on individual FHA-insured loans. After data on credit scores for many of these loans subsequently became available, selected analyses were rerun to incorporate these credit scores. Appendix C has been added to the original paper to present the findings obtained after including the credit scores. Nothing substantive other than this appendix has been changed. In particular, the original Summary of Findings and the complete body of the paper have been left in their original form.

SUMMARY OF FINDINGS

The purpose of this study is to help FHA understand the geographical dimension of default behavior by examining concentrations of defaults of 1992 and 1994 loan originations in 22 urban areas. More specifically, the paper asks, first, whether defaults on FHA-insured loans are concentrated within a distinct set of high-default neighborhoods and, second, whether defaults on FHA-insured loans are concentrated within a set of high-default lenders. A heavy concentration of defaults in certain areas or among certain lenders could reveal problems that are amenable to policy solutions. Such problems might include overly generous underwriting standards, lax or fraudulent application of existing underwriting criteria, or inappropriate servicing of delinquent borrowers. Alternatively, heavy concentrations of defaults may occur because of chance alone, suggesting that the reasons may be fleeting and not amenable to policy changes. The findings in this study regarding the extent and implications of default concentrations differ from those presented in a recent study by the National Training and Information Center (NTIC), which has received much public attention.

Given the numerous possible causes of concentrations of default among areas and lenders, along with correspondingly divergent remedies, it is important to identify the reasons for concentrations of defaults, and it is especially important to identify causes that are likely to respond to policy changes, and those that are not. Because statistical analysis permits the calculation of the probability that chance alone (which is typically beyond the reach of any remedial policy) could be responsible for observed levels of default activity, this study adopts statistical analysis as the primary tool for deciding whether concentrations of defaults in specific areas or among certain lenders should be a source of concern.

Although three different measures of default are entertained in this study, a primary measure includes both claims paid and 90-day delinquencies in progress that are not observed to cure by the end of the observation period. Most of the latter delinquencies go uncured for at least nine months following the recording of the 90-day delinquency; allowing this much time to pass without observing a cure helps ensure that the delinquency is on the way to claim. The latter delinquencies thus tend to be more serious than the set of all 90-day delinquencies, most of which cure rather than proceed to claim.

MAIN CONCLUSIONS

The study reaches the following five principal conclusions:

- **By serving less affluent borrowers, FHA extends home ownership to those who are less well served by the conventional market. In neighborhoods where less affluent borrowers predominate, FHA assumes an especially important role, but default activity is more common as well. Putting further restrictions on FHA borrowers will reduce default rates but will also work against extending homeownership.**

- **Some of the differences in default rates across neighborhoods and lenders are plausibly traceable to characteristics of the borrowers and loans. Borrowers in neighborhoods and among lenders with high default rates are more frequently first time homebuyers and are more often black, have higher loan-to-value ratios, lower incomes, and smaller values of assets after closing than do borrowers in neighborhoods and among lenders with low default rates.**

- **Although low incomes are associated with higher default rates, income does not completely determine default behavior. Many neighborhoods with low incomes or substantial minority representation have default rates that are below the metropolitan area average.**

- **Simple statistical analysis identifies a set of high-default neighborhoods and a set of high-default lenders, though far fewer neighborhoods and different lenders than are identified using the NTIC methods. Removing the influence of a variety of default-related factors with more sophisticated techniques generally reduces the estimated effect on default of residence in a high-default neighborhood and origination by a high-default lender, but there still appear to be some high-default neighborhoods and high-default lenders in most of the urban areas examined in this study. It is unclear what factors are responsible for these differences in default rates, but differences in credit history may play a role.**

- **The identification of high-default neighborhoods and high-default lenders varies with the loan origination year, indicating that some problems generating high default rates are temporary. Transitory causes of high default rates are less important to treat and are less amenable to remedial action.**

The NTIC study uses data on twenty Metropolitan Statistical Areas (MSAs), ten of which are included here as well, to address some of the same basic issues. The NTIC study draws different conclusions and employs a different methodology than that used here. For example, the NTIC study identifies high-default neighborhoods solely by comparing the default rate of the neighborhood to that of the metropolitan area as a whole, and it identifies poorly performing lenders as those with the largest number of defaults in the metropolitan area, regardless of loan volume. These non-statistical methods lead to improper identification of high-default lenders, to labeling of neighborhoods as high-default even when causes appear to be transitory, and to overzealous labeling of neighborhoods as high-default (about 7 percent of areas are so identified using statistical methods in this study, as compared with 24 percent of areas using the NTIC method). Not only does the NTIC study fail to adhere to commonly accepted statistical practices in its analysis of raw default rates, it fails to consider whether other default-related factors might vary with, and perhaps account for, the default rate of the area or lender. The methodology and findings of the current study are contrasted to those presented in the NTIC report at various points in the text.

SPECIFIC FINDINGS

Through both independent study and comparisons with the NTIC approach, this paper reaches the following conclusions:

- **A comparison of census tract-level default rates to MSA-level default rates, without regard to the level of lending activity within the tract, can be misleading and, if used to guide the application of remedial activity, unproductive as well.**

By ignoring the role of randomness, simple comparisons of census tract-level default rates to those at the MSA level can mislead in either direction. On the one hand, a tract with a high default rate on very few loans may receive attention even though it is quite likely that the observed level of defaults is due to chance alone. On the other hand, tracts with many loans and a default rate that exceeds the metropolitan area rate by a moderate amount may go unnoticed even though there is little chance that such a level of defaults could be traceable to randomness. For these reasons, using such simple comparisons to prescribe further investigation or intervention will result in an incorrect focus. In addition, tracts embedded in metropolitan areas with very low default rates (*e.g.*, Denver) may be singled out as high-default tracts even though they have default rates that are, as a practical matter, too low to be of real concern. Moreover, the tendency to give disproportionate attention to tracts with small loan volume also results in a focus on tracts where the potential gain from remedial action is small as well. That is, all else the same, low-volume tracts offer smaller possible gains from a given reduction in the default rate as a consequence of remedial action.

- **The NTIC method of classifying lenders as poor performers by looking only at the volume of defaults unfairly penalizes large lenders and misses potential problems in smaller lenders.**

A high volume of defaults could be traceable to high loan volume alone and, in and of itself, implies nothing about the selectivity of the lender or its policies in handling delinquencies. In the data used in this study, applying the NTIC method tends clearly to select large lenders, some of which have default rates that are lower than the rate in the metropolitan area as a whole.

- **Default rates vary substantially across tracts and lenders within an MSA. For certain census tracts and lenders, rates are high enough that chance alone is unlikely to be the explanation; systematic factors are probably at work.**

Although we emphasize that one should not draw conclusions on the basis of a simple comparison of the default rate for a tract or lender with the default rate for the MSA as a whole, default rates do in fact vary across tracts and across lenders. The first row in the summary table[1] below gives some indication of the variation in default rates across tracts (Panel A) and lenders (Panel B). Here tracts

[1] Both the summary table and all other references to specific numbers within this section refer to a default measure that includes claims paid and uncured delinquencies in progress at two years following origination. The text considers two other definitions of default as well.

SUMMARY TABLE

CHARACTERISTICS OF TRACTS AND LENDERS IN VARIOUS RELATIVE DEFAULT RATE CLASSES (TRACTS OR LENDERS WITH MORE THAN 30 LOANS)

PANEL A: TRACTS

Row Number	Characteristic	Default Rate of Tract Relative to MSA Rate				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
1	% of All Tracts in Default Rate Class	40%	20%	17%	17%	6%
2	% of All Loans in Default Rate Class	34%	24%	20%	18%	4%
3	% FHA Black	6	10	15	24	34
4	% First Time	42	44	45	48	52
5	% LTV .97 +	23	23	25	31	39
6	Income-$ Difference from MSA average	123	90	-10	-237	-657
7	Assets-$ Difference from MSA average	881	508	-253	-1497	-3633

PANEL B: LENDERS

Row Number	Characteristic	Default Rate of Lender Relative to MSA Rate				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
1	% of All Lenders in Default Rate Class	30%	28%	21%	17%	4%
2	% of All Loans in Default Rate Class	18%	39%	28%	13%	1%
3	% FHA Black	10	11	14	20	33
4	% First Time	40	43	48	51	60
5	% LTV .97 +	22	25	25	31	39
6	Income-$ Difference from MSA average	53	54	-19	-163	-451
7	Assets-$ Difference from MSA average	562	342	-145	-1091	-3287

or lenders in each MSA are classified according to the ratio of the tract (or lender) default rate relative to the default rate in the MSA as a whole. The first row of Panel A shows the percentage distribution of tracts across relative default rate classes, while Panel B presents the corresponding distribution of lenders across relative default rate classes. The second row of each panel shows how loans are divided up among the corresponding groups of tracts or lenders.

In the MSAs examined here, standard statistical tests show that, using both origination years together, about 5.2 percent of tracts and about 5.7 percent of lenders can be classified as "high-default" according to conventional standards.[2] These percentages vary widely across MSAs and across origination years. For example, using both origination years together, 9.6 percent of tracts in the Memphis MSA are labeled as high-default by the statistical methodology employed here, while only 2.4 percent of the Sacramento, CA PMSA tracts are so labeled. About 9.3 percent of lenders in the Fort Worth-Arlington, TX PMSA are labeled as high-default, but only 3.1 percent of the lenders in the Sacramento, CA PMSA.

- **The identification of high-default census tracts and high-default lenders varies with the loan origination year, indicating that some problems generating high default rates are temporary.**

Whether one identifies high-default tracts and lenders by simply looking at the default rate relative to the metropolitan area average, or by conducting formal statistical tests, the identification of particular tracts or lenders as high-default depends on the loan origination year; and this is true even if defaults are recorded at a given number of years following loan origination. For some MSAs, there is virtually no overlap in the tracts or lenders identified as "high-default" in the two origination years (1992 and 1994) used in this study. For most MSAs, less than one percent of tracts are labeled as high-default in both origination years, while for the vast majority of MSAs, less than three percent of the lenders are labeled as high-default in both years. This finding suggests that some of whatever is captured in identifying a "high-default" tract or lender is transitory. Not only are truly transitory fluctuations presumably less important to remedy, they may also be less susceptible to remedial action since they may require anticipation on the part of monitoring agencies. That is, to identify and cure a problem that appears only sporadically, one may need to be able to predict when the problem will arise. For these reasons, it is not at all clear that policy should be altered in an attempt to contend with these transitory problems or that policy could successfully do so.

- **Borrowers in tracts and lenders with high default rates are more frequently first time homebuyers and are more often black, have higher loan-to-value ratios, lower incomes, and smaller values of assets after closing than do borrowers in tracts and among lenders with low default rates.**

---

[2] These calculations pertain to tracts or lenders with two or more loans in the two origination years together. When restricted to tracts and lenders with more than 30 loans in the two years together, 7.2 percent of tracts and 9.6 percent of lenders are classified as high-default.

Rows 3 through 7 of each panel in the summary table illustrate this point by showing the attributes of loans among those tracts or lenders falling into each of the relative default rate categories. These rows show, in order, that the percentages of borrowers who are black, who are first-time homebuyers, and who have a loan-to-value ratio exceeding 97 percent, are all higher in tracts with higher relative default rates, as well as among lenders with higher relative default rates. For example, while 23 percent of borrowers in tracts in the lowest default rate category have loan-to-value ratios of at least 97 percent, the figure rises to 39 percent of borrowers in tracts with the highest default rates. The fraction of borrowers who are black is only 6 percent for tracts in the lowest default rate category, but rises to 34 percent for tracts in the top default rate category. The bottom two rows (rows 6 and 7) show that borrowers in tracts or lenders with higher relative default rates have lower incomes and smaller asset levels when compared with MSA averages. For example, average monthly incomes are $123 above the MSA average for borrowers in tracts that are in the lowest default rate category, but average monthly incomes for borrowers in tracts in the highest default rate category are $657 below the MSA average.

Taken as a whole, these findings suggest that the observed differences in default rates across tracts or lenders should perhaps not be surprising. FHA promotes homeownership by serving those who are not well served by the conventional market. This mission places FHA in a position in which it would be expected to attract borrowers who have higher default probabilities, and we should not be surprised to find differences in the distribution of these borrowers across areas and lenders.

- **Although tracts with high default rates tend to have borrowers with lower incomes than in the MSA as a whole, many low income or high minority tracts have default rates that are below the MSA average.**

It is worth emphasizing that while there appear to be relationships between default rates of tracts (and lenders), on the one hand, and borrower income and related characteristics, on the other hand, it is not at all unusual to find low income or minority tracts with relatively low default rates. We find, for example, that among tracts[3] that are 30 to 50 percent minority, about 45 percent have default rates that are below the MSA average. Among tracts with median family incomes that are no more than 80 percent of the MSA median, we find that 40 percent of such tracts have default rates that are below the MSA average. Thus, many tracts with substantial minority populations or low incomes, which are traditionally viewed as portions of the underserved population that FHA attempts to aid, still have relatively low default rates.

- **The fraction of loans that are FHA-insured is greater in tracts with higher default rates, but even in tracts with high default rates the FHA share of the market is under 50 percent.**

[3] Figures in this paragraph refer to tracts with more than 30 loans, which in turn contain over 90 percent of the FHA loans in these MSAs.

By a variety of measures, tracts with higher default rates tend to be poorer, and it is not surprising to find that FHA-insured loans have a more substantial market share within such tracts. The FHA is not intended to displace conventional lending but is instead intended to expand opportunities for home ownership. Even within tracts and lenders that exhibit relatively high default rates, however, the FHA share of the market is under 50 percent. Thus, even in areas where there are relatively high default rates on FHA loans, conventional lending has not been driven out. The evidence is that conventional lenders find acceptable risks even in these areas.

- **Allowing for the influence of a variety of default-related factors generally reduces the estimated impact of residence in a high-default tract and origination by a high-default lender. Even after controlling for the impact of these other factors, however, there still appear to be a set of high-default tracts and a set of high-default lenders in most of the MSAs examined in this study. It is unclear what factors are responsible for these differences in default rates, but differences in credit history may play a role.**

The more sophisticated statistical analysis presented in Section 5 shows that once we account for the influence of those default-related factors that can be measured in our data, there is typically a marked decline in the effect that can be attributed to residence in a high-default tract or origination by a high-default lender. Effects remain, however, even after these statistical adjustments are made. We cannot be certain why these effects persist, but one probable ingredient is our inability to control for differences in credit history among borrowers, which stems from a simple lack of data on credit history. The reason that this omission is likely to be important is that the quality of a borrower's credit may vary, on average, across tracts and lenders; and the result may well be that differences in default rates across tracts and lenders remain even after adjusting for factors that we can observe. Other subtle statistical influences may reinforce this tendency.

The lack of data on underwriting factors like credit history also makes it impossible to ascertain whether or not lenders are following FHA underwriting guidelines by simply looking at default statistics or even by performing sophisticated statistical analyses. Underwriting guidelines permit underwriters to trade off weakness in one area for strength in another. This practice makes it impossible to tell whether an unfavorable value for one underwriting criterion that we might observe is offset by a very favorable rating in another area, like credit history, that we do not observe.

- **When compared with non-high-default lenders, high-default lenders do not appear to intervene more quickly in a delinquency, nor do they more often institute foreclosure proceedings when contending with a delinquency.**

The FHA delinquency data permit us to perform a rather limited investigation of two possible avenues by which default rates could be affected by lender servicing behavior. We look at the possibility, suggested in the NTIC study, that high-default lenders intervene more quickly in delinquencies in progress than do non-high-default lenders, and that such intervention more often takes the form of a movement toward foreclosure. The evidence on the first of these points is

entirely ambiguous, sometimes showing high-default lenders intervene more quickly, sometimes less quickly, depending on the definition of default. We next group lender interventions into two categories: either as a movement to foreclose, on the one hand, or as providing help to avoid foreclosure (through offering forbearance, for example), on the other hand. The evidence on differences across lenders is again weak and ambiguous, with no convincing evidence of any differences in the path chosen by high-default lenders versus non-high-default lenders. Thus, the possibility of overly aggressive pursuit of foreclosure on the part of high-default lenders, as suggested in the NTIC report, receives little support in the FHA data examined here.

- **The non-statistical methods employed by NTIC lead to misclassification of tracts and lenders and substantial overstatement of potential problems. That is, these methods lead to overzealous labeling of tracts as high-default and to improper identification of high-default lenders. In addition, the NTIC study does not attempt to unravel the effects of other factors on the default rates of tracts and lenders, making it impossible to judge whether there are problems that do warrant attention.**

When the statistical methods used in this study are applied to the ten MSAs that also appear in the NTIC study, we find that about 7 percent of the tracts[4] are labeled as high-default tracts. In contrast, the NTIC method labels about 24 percent of such tracts as high-default. About 70 percent of the tracts labeled as high-default under the NTIC methodology are labeled as non-high-default in this study.

While both this study and the NTIC method single out about 10 percent of lenders in these ten MSAs as high-default lenders, the identities of the lenders so labeled are very different. The reason is that lenders with high numbers of defaults do not necessarily have default rates well above the MSA average. Sixty-three percent of the lenders identified as high-default under the NTIC methodology are labeled as non-high-default in this study. In addition, the NTIC methodology fails to identify 60 percent of the lenders labeled as high-default in the current study.

We again emphasize that the problem is not simply that the NTIC criteria select too many or too few tracts or lenders as high-default entities; even if the percentage identified is the same under the two methods, the particular tracts or lenders will generally be different. The NTIC method will single out some tracts or lenders for which chance alone is a plausible explanation for size of the default rate, but it will ignore others for which default activity is very unlikely to be a consequence of chance alone.

---

[4] Calculations in this discussion use tracts or lenders with more than 30 loans in the two origination years together.

- **FHA serves less affluent borrowers, thus extending home ownership to those who are less well served by the conventional market. In neighborhoods where less affluent borrowers predominate, and thus FHA lending assumes an especially important role, one can anticipate heavier default activity. Putting further restrictions on FHA borrowers will reduce default rates but will also work against extending homeownership.**

FHA plays an especially important role in supporting the home ownership opportunities of less affluent borrowers. The extension of homeownership to such groups fosters neighborhood stability. Given the role of FHA, however, less affluent neighborhoods will tend to have a stronger FHA presence, as well as a higher level of default activity. Reducing the risk in FHA lending by raising loan qualification standards can be expected to reduce default rates, but it can also be expected to reduce FHA's ability to support the market that it has historically served. The result may be a lower default rate, but also reduced homeownership rates and thus reduced neighborhood stability. Hence, there is a tradeoff inherent in policy choices. What is important is for FHA to monitor and understand the causes for defaults so that the appropriate tradeoffs can be made in an informed manner.

Although the approach in this paper is essentially statistical, the paper opens with a purely descriptive section that examines how default rates vary across census tracts and across lenders within each of the 22 MSAs that we study. Digging deeper, we examine the characteristics of loans originated within high-default tracts and by high-default lenders, as well as the characteristics of the corresponding borrowers and of the economic environment. Following this descriptive work, attention shifts to more formal statistical tests applied to simple counts of defaults and loans. In this way we isolate tracts and lenders that may be labeled as "high-default" according to standard statistical criteria. Because this simple analysis does not account for differences among the borrowers who live in the various tracts or are serviced by the various lenders, we perform a more sophisticated statistical analysis that removes the effects of observable characteristics of loans and borrowers, thus permitting us to isolate the effects of neighborhoods and lenders.

SECTION 1

INTRODUCTION

1.1. Purpose and Methodological Approach

The purpose of this paper is to answer two related questions. First, are FHA defaults geographically concentrated in a set of high-default neighborhoods? Second, are FHA defaults concentrated in a set of high-default lenders? To answer these questions in the most useful way, we must be more precise about what is meant by "concentrated." Even if loan activity were evenly distributed across neighborhoods and lenders, we would not realistically expect to find defaults distributed absolutely evenly in these same dimensions. Pure chance alone --- in the form of death or debilitating illness of the borrower, for example --- would likely cause some lenders and geographic areas to have more than the expected share of default activity. It is only when there are surprisingly large numbers of defaults, given the level of loan activity, that we might possibly want to delve further into possible causes. Presumably, we are surprised by the outcome, however, only when the observed number of defaults is highly unlikely to have arisen because of chance alone. That is, we may rephrase the initial question more usefully as follows:

> Is it highly unlikely that the geographic concentration of defaults could have arisen from chance alone?
>
> Similarly, is it highly unlikely that the concentration of defaults among lenders could have arise from chance alone?

Although the term "highly unlikely" must still be defined, rephrasing these questions in this way invites statistical analysis, for the purpose of one kind of statistical analysis is to assess how unlikely a particular event is to occur strictly as a result of chance. Hence, in this paper we use standard statistical methods to gauge how unlikely outcomes are to have occurred as a result of chance alone. Our approach to answering these questions is thus essentially statistical.

Despite the fact that the main line of inquiry is statistical, we first take a nonstatistical, descriptive look at the data on FHA originations in 1992 and 1994 in 22 MSAs,[5] characterizing tracts and lenders that seem to have high default rates relative to the MSA-wide average. We then provide a simple statistical analysis of these raw default rates, moving later to a more sophisticated statistical model that takes account of the presence of other measurable factors that could give rise to intertract and interlender differences in default probabilities.

This study contrasts with a recent, provocative study by the National Training and Information Center (see National Training and Information Center [1997]) that answers the same initial questions with an entirely nonstatistical methodology. Using FHA originations from 1991 through 1994 in a sample of 20 cities, the NTIC study identifies high-default tracts as those with a

---

[5] The individual MSAs are listed in Table 1 in Appendix A.

default rate that is at least 1.5 times the MSA-wide default rate. No consideration is given to the influence of sample size, much less systematic influences, on one's ability to draw conclusions from tract-level data on raw default rates. From this ambiguous evidence, the NTIC report concludes that defaults are too heavily concentrated geographically.

The NTIC report's attempt to find culprits for the observed geographical dispersion in default rates raises even more questions. The ten lenders in each city that have the largest number of defaulted loans are singled out as the "ten worst lenders" in each city.[6] Not only does this method ignore the role of chance, it fails to give any consideration to the sheer volume of loans in determining the number of defaults. Using the NTIC methodology, a high volume lender may show up in the "10 worst" list even though it has an exceptionally careful loan screening process, fair underwriting standards, a practice of offering numerous alternatives to foreclosure, and a low default rate.

Nowhere in the NTIC study is there any mention of variation in other factors, such as income or the prevalence of first-time homebuyers, that could lead to geographic and interlender dispersion in default rates in the absence of any wrongdoing on the part of lenders. That is, not all borrowers who are acceptable loan risks have the same propensity to default, and one should not be surprised to find that underlying default-related factors vary systematically, both geographically and across lenders. Below we see that there is indeed such variation.

1.2. Organization of the Report

The remainder of this paper proceeds through a statistical analysis that attempts to isolate the differences in default probabilities across tracts and lenders after allowing for the effects of chance and the influence of measurable systematic factors. The series of steps is as follows. In the next section, we lay the foundation for the subsequent work by explaining the nature of the FHA data that underlie our analysis and the conventions we adopt to measure defaults. In Section 3 we examine, in a largely nonstatistical and informal way, the distribution of default rates across tracts and lenders under three different measures of default and, within a measure, across origination years. We then go on to characterize tracts and lenders in a variety of dimensions, showing in particular how tracts and lenders with high default rates differ in key ways from other tracts and lenders --- ways that make intertract and interlender differences in default rates readily understandable.

Section 4 begins a more formal statistical analysis, first looking for evidence on whether there is any detectable overall association between tract and default activity. We next move into simple statistical tests at the basis of the individual tract, asking whether the default rate in each individual tract differs from the MSA rate beyond that which would be expected from random influences alone. Such tests are performed on data from each separate origination year and for both origination years together. The battery of statistical tests is then repeated for lenders.

One of the more important insights in this section is that random influences alone can cause

---

[6] It is unclear whether lenders' default volume is measured at the city level or within high-default census tracts alone. The same statistical flaws are inherent either way.

default rates for individual tracts or lenders to differ in a statistically significant way from that in the MSA. Thus, when conducting such tests on a large number of tracts or lenders, one should expect to find the appearance of significant differences even if nothing is awry. Such is the nature of statistical tests. The evidence here also suggests that some of the apparently significant differences in default rates across tracts or lenders vanish over a two-year period, suggesting that some perceived problems are only temporary.

Section 5 takes a deeper statistical look at interarea and intertract differentials through an examination of default at the level of the individual loan. The idea is that if interarea or interlender differentials exist, they should show up as determinants of default in microdata. We control for a few of the standard underwriting factors, as well as for a more extensive set of other factors that characterize the loan, the borrower, and the economic environment, and we ask how much influence of tract and lender remains after controlling for these other default-related factors. Although the estimates reveal that tract and lender influences remain even after controlling for other measurable factors, their influence declines considerably once such controls are introduced.

Unfortunately, the fact that FHA data do not contain many of the important determinants of default behavior, including possibly crucial elements of credit history, almost guarantees that tract and lender effects will remain, and other more subtle statistical factors tend to reinforce this tendency. For the same reasons, it proves impossible to tell whether lenders are following underwriting guidelines. The data do, however, permit a rather crude and cursory examination of other aspects of lender behavior. Section 5.2 briefly outlines some simple tests of whether high-default lenders intervene in delinquencies more quickly than do other lenders and whether they less frequently offer alternatives to foreclosure.

Section 6 closes with a summary that highlights the methodology. The "Summary of Findings" above provides a more complete summary of the analytical and policy findings.

The paper contains two appendices, each of which is devoted to tables. The text of the paper refers to 27 tables, most of which are composed of multiple panels. Appendix A presents a complete list of these tables, as well as all of the tables themselves. To help minimize searching through appendix material, the most critical tables are also copied and inserted at the appropriate place in the text, though they still appear in Appendix A as well. Appendix B contains MSA-specific results that either underlie some of the main tables or else repeat an aggregate analysis at the MSA-level. Because of its length, Appendix B has been omitted from the paper; Appendix B is available from HUD.

SECTION 2

DATA AND DEFINITIONS

2.1. Data Construction and Data Sources

The data to be used in this study come primarily from FHA data files on approximately 650,000 FHA-insured loans that were originated in calendar years 1992 and 1994[7] on properties in 22 MSAs.[8] Ten of these MSAs are also included in the NTIC study. The data contain the usual array of FHA data on the loan and the borrower, as well as information on the geographic area (state, county, census tract) in which the property is located and the identity of the lender.

These FHA data have been supplemented with tract-level data from two sources: 1990 Decennial Census data (which generally measure activity in 1989 or 1990) and mortgage data for 1992 through 1996 that have been generated under the Home Mortgage Disclosure Act (HMDA).

Following the NTIC report, we generally use the census tract as a neighborhood. The advantage of such a choice is that the Bureau of the Census attempts to choose tract boundaries so as to maintain the separate identity of neighborhoods. The disadvantage for the current study is that many census tracts have so few FHA loans in the period under consideration that statistical analysis at the tract level is all but impossible. Aggregating tracts into larger "supertracts" is one solution, but it is not obvious how to define an appropriate, feasible aggregation procedure, given the costs of the inevitable mistakes in aggregation. The cost of inappropriate aggregation is that dissimilar neighborhoods are put together, masking problems that would be exposed if tracts were kept separate, and this cost of aggregation must be traded against the benefits of subjecting additional areas to statistical analysis.

In this study we have opted for aggregation of many tracts with low loan volume. The aggregation method used here tries to minimize information loss in aggregation in two ways. First, we generally attempt to aggregate only those tracts with so few loans that they could not easily support statistical analysis in the absence of aggregation. Second, we demand that the tracts that are to be aggregated have similar tract incomes and minority representation in their populations and be in reasonable geographic proximity. The basic aggregation method is as follows. For each of the

---

[7] More precisely, the data set includes loans that originated in calendar year 1992 or 1994 or for which the amortization start date was in the interval February 1, 1992, through January 31, 1993, or the interval February 1, 1994, through January 31, 1995.

[8] The choice of these particular MSAs was based on the number of defaults over a broader period (1989 through 1994) for which we expected to be able to obtain suitable FHA data on the loan and the borrower. In the current application, only the data on 1992 and 1994 originations are available. In these FHA data, we assign a loan to a particular MSA based on the state and county in which the property is located. The alternative of using the coded value of MSA in the FHA data base leads to approximately the same set of loans, however. Using the coded values of tract and state to identify loans in the MSA leads to substantially fewer loans in the MSAs, especially in the 1992 origination data. Presumably, the tract coding in the 1992 FHA data fails to reflect consistently the then-current tract definitions and codes.

separate MSAs at issue, we use the Decennial Census data to calculate the deciles of tract-level median family income. For each census tract in these MSAs, we then record that tract's median family income decile. Next, we categorize the percentage minority into ten intervals of 10 percentage points each (0 to 10%, 10 to 20%, etc.) and use the Decennial Census data to record the bracket into which each tract's percentage minority falls. Finally, we make a grid of approximate rectangles that are roughly four miles on each side, adjusting the precise dimensions of the "rectangle" for each MSA so as to fit an integral number of gridlines between the extreme tract centroids in each MSA. We use the Census data to record the particular "rectangle" containing the centroid of each census tract.

These three aspects of each tract are used to form cells, each of which contains all tracts that are identical in these three dimensions, *i.e.*, have centroids in the same grid cell, are in the same median family income decile, and are in the same 10-percentage point minority representation bracket. Within each cell, all tracts having less than 30 loans[9] in the FHA data are aggregated together. If, within a cell, the aggregate thus formed still contains fewer than 30 loans, then the next smallest tract (in terms of loan volume) with more than 30 loans is included as well. Although this aggregation method is unlikely to match tracts for aggregation in an optimal way, it is guaranteed to aggregate only those tracts that are similar in minority composition, income, and geographic proximity. The effect of this aggregation procedure is to reduce the number of tracts having less than 30 loans by 15 percent (in the Fort Lauderdale, FL PMSA) to 59 percent (in the Chicago, IL PMSA), with over a 30 percent reduction in most MSAs.

2.2. Preliminary Matters: The Identification of Defaults and Observation Intervals

Analysis of these data requires the resolution of several immediate issues: the identification of defaults (*i.e.*, what constitutes a "problem" loan), the number of origination years to include in the analysis, and a resolution of two related timing issues: the length of loan duration over which default activity will be observed and the calendar date at which loan status will be recorded. As to the first of these items, default definitions can range from claims paid to simple 90-day delinquencies, with the choice hinging in part on the severity of the payment problem that is to be analyzed. As to the second item, the number of origination years, which is here limited to a maximum of two by virtue of the data available for this study, could be further limited in a particular analysis to focus on a more homogeneous lending environment; yet difficulties (*e.g.*, lax underwriting) that persist for only brief periods may not be worth treating, and limiting the range of origination years further reduces sample sizes.

2.2.1. Timing Issues

The third set of issues --- those related to timing --- is complex, in part because of possible

---

[9] The cutoff at 30 loans is arbitrary. Note that only tracts appearing in the Census data files are eligible for aggregation under this procedure. This fact precludes aggregation of those FHA loans for which tract identifiers do not match the Census files, including those loans with missing tract identifiers.

data problems. The FHA delinquency data in particular seem likely to contain substantial error and, moreover, our understanding is that these data have become more complete and more accurate with the passage of time. The latter consideration would suggest some advantage in measuring default status as late in calendar time as possible if delinquencies are to come under the definition of default. Clearly, however, measurement of loan status at a particular date implies measurement at a certain interval of loan duration (given the date of loan origination), and thus one must consider appropriate loan durations as well. The NTIC study argues that one should look long after loan origination to pick up the bulk of default activity. While it is true that the bulk of claims occur after the first few years of loan duration, the kinds of problems singled out by the NTIC study --- leaky roofs, absence of heating systems, and other structural problems --- could seemingly not go unnoticed for more than a couple of years if these problems were known or detectable at the point of sale. Indeed, one could argue underwriters and inspectors have done their jobs if the loan survives the first couple of years following origination, for the informational content of much of what underwriters and inspectors can observe deteriorates quickly with age. There is, for example, evidence that underwriting factors like credit history are much less predictive at longer loan durations. (See Holloway, MacDonald, and Straka [1993].)

The latter observations are not meant to deny that underwriting factors can affect default at longer loan durations; there is little doubt that they can. Lowering the maximum acceptable loan-to-value ratio to, say, 50 percent would generate a large cushion that would protect equity against substantial declines in local housing markets and would surely reduce the incidence of claims over a wide range of loan durations. Changes like these, however, involve policy changes at the national level and involve major tradeoffs in other dimensions. The search in this study is for indications of improper lender behavior, such as failure to follow existing underwriting guidelines, and these seem likely to be exposed rather rapidly after loan origination. It also seems reasonable to assume that other potential problem areas, such as improper loan servicing, will show up in loans at all durations.

2.2.2. Definitions of Default

For this paper we identify defaults in three ways, and we provide virtually all analyses for each of the three definitions. The three definitions are

1. Claims that have been made within two years of the amortization start date. We shall generally refer to this definition as "claims at two years."

2. Claims that have been made within two years of the amortization start date, plus all loans that are in delinquency (for 90 or more days) two years after the amortization start date and that are not observed to cure by May 1, 1997 (the time at which the data tapes were made). We will generally refer to this definition more simply as "uncured delinquencies at two years," though it is understood that this definition includes all claims included in the first definition as well.

3. Claims that have been made as of December 31, 1995, plus loans that are delinquent as of that date and are not observed to cure by May 1, 1997. We shall generally refer to this definition of default as "uncured delinquencies at 12/95," though again this definition additionally incorporates claims that have been made by December 31, 1995. This particular cutoff date is that utilized in the NTIC report. Note that this definition, unlike the first two, does not use a two-year window.

These choices represent compromises among the numerous ways in which a "problem" loan may be identified and compromises among the timing issues discussed above as well. Restrictive definitions, such as the first one above, capture those loans that are virtually guaranteed to impose costs on FHA as the loan insurer; looser definitions, such as all loans that are in delinquency status as of a particular date, surely capture numerous loans that will never end in a claim. Moreover, only loans that end in foreclosures (or related terminations, such as deeds-in-lieu) are likely to result in vacant properties that might lead to the deterioration of neighborhoods suggested by the NTIC study.

An important disadvantage of the most restrictive definition (claims at two years), however, is that it fails to include those ongoing delinquencies that will evolve into claims. For this reason, it makes sense to build in those delinquencies that do not show a cure by the end of the time over which we can observe such behavior. Notice that for loans that begin amortization in January 1995 --- the latest start among loans examined here --- the two-year window on observing claims or ongoing delinquencies expires in January of 1997, leaving little remaining time over which to observe a cure before the observation period ends.

There is another potential problem with the second of the two definitions above: the FHA data show marked increases in delinquencies as calendar time passes, and this feature suggests (but does not prove) that delinquency data have become more complete in recent years, as noted above. As a consequence, we may be missing delinquencies, particularly for loans that originate in early 1992, for which the two-year window ends in early 1994. We have attempted to minimize the problem of incomplete delinquency data by supplementing the FHA F42 delinquency data with A43 claims data, picking up some claims that are not reflected in the former data set and imputing a delinquency date for these claims. It seems likely that this imputation procedure has only a minimal effect in making the delinquency data more complete.

The third definition above may be less sensitive to data problems. This definition has the advantage of measuring ongoing delinquencies early enough (at December 31, 1995) that 16 months remain over which cures could occur and still be observed; it seems very likely that those delinquencies not observed to cure over this long an interval will end in a claim. In addition, this date is late enough that improvements in tracking delinquencies over time are likely to result in more complete coverage by this date, likely yielding a more comprehensive measure of delinquencies for the 1992 originations than is obtained at the two-year mark. Finally, this particular cutoff date is that used in the NTIC study, thus facilitating comparisons with that study. The major disadvantage of the third measure --- and the reason that it is not adopted as the primary measure here --- is that it is asymmetric in its treatment of loans that originate at different points in time, allowing too little time to elapse for loans that originate at the end of 1994 but (arguably) allowing too much time to

elapse for loans that originate in early 1992 (about four years). The adoption of a two-year window for the first two definitions used here seems long enough to capture default behavior that arises out of poor underwriting, yet not so long that default behavior is completely overwhelmed by external factors that cannot possibly be reckoned with in the underwriting process.

The fact that these different definitions of default enjoy their own particular advantages means that the choice of any specific definition inevitably involves trade offs. In addition, we find that at times the alternative measures of default behave differently in a particular analysis, and sometime these differences may be instructive. At other times, the three measures behave similarly, and that is noteworthy. For these reasons, we make virtually all calculations in the paper for all three definitions of default, and our discussion sometimes covers all three measures as well. Nonetheless, because we believe that the second definition (uncured delinquencies at two years) offers, on the whole, slightly more important advantages than the other two definitions, and because the use of a single definition simplifies the exposition, we sometimes focus the discussion on only the second default definition, and we present tables in the text for only that definition. A complete set of all 27 tables referenced in the text, including those relying on the other two definitions, is contained in Appendix A.

Table 1 (in Appendix A) shows, for each of the 22 MSAs, the default rates calculated under all three definitions for each year of origination separately and for the two origination years together. We see, for example, that when default is defined as uncured delinquencies at two years following the amortization start date ("uncured delinquencies at two years"), the default rate in the Atlanta, GA, MSA is 1.4 percent in 1992 originations, 2.73 percent in 1994 originations, and 2.04 percent overall. The table shows that there is clearly variation from definition to definition within each MSA, as well as variation between origination years within each definition, even when, as in the first two definitions, the same number of years (two) elapse after loan origination.[10] For the second of these definitions (uncured delinquencies at two years), the 1994 originations display a higher rate than the 1992 originations in each MSA, perhaps in part because delinquencies are reported more completely as time passes.

[10] Notice also that similarities in default rates under the claims definition do not imply similarities in default rates under the other two definitions. See, for example, the data for Minneapolis and Philadelphia, which have very similar claim rates but very different default rates under either of the other two definitions.

SECTION 3

DISPARITIES IN DEFAULT RATES ACROSS AREAS AND LENDERS

3.1. The Geographic Concentration of Defaults

Using the two years (1992 and 1994) of loan originations together, the three panels of Table 2 show the percentage distribution of tracts[11] within each MSA across default rate categories. (Panel B of Table 2 is presented below; the remaining two panels are in Appendix A.) As is true for many of the tables in the remainder of this paper, only those tracts with more than 30 loans are classified into specific default rate categories, while all tracts with 30 or fewer loans are lumped into a single category. In the Atlanta MSA, for example, we see from Panel A (in Appendix A), which uses claims at two years as the measure of default, that among the 480 tracts in that MSA, 30.21 percent of the tracts have 30 or fewer loans in the two origination years together, and 42.29 percent of the tracts have more than 30 loans and a default rate that is between 0 and 0.5 percent. In Panel B below, which measures default as an uncured delinquency at two years, we see that in the Atlanta MSA, 20.83 percent of the tracts have more than 30 loans and a default rate that is in the range of 0 to 0.5 percent. Quite clearly, within each MSA there is substantial variation in raw default rates across census tracts under any of the three definitions entertained here. In addition, numerous tracts have 30 or fewer loans. (As we shall see, however, these low-volume tracts contain only a small fraction of loans in the aggregate.)

3.1.1. Tract Default Rates Relative to MSA Default Rates

A somewhat different look at the intertract variation in default rates is obtained by using the *relative* default rate of each tract, *i.e.,* by taking the ratio of the default rate of the tract to the default rate of the MSA in which the tract is located. Such a calculation presumes, of course, that the comparison of the tract rate to the MSA rate is not only appropriate, but is more meaningful than a comparison of the tract rate to, say, the national default rate. A major argument in favor of using the MSA rate as the basis for comparison, as is done throughout this paper, either implicitly or explicitly, is that there are strong idiosyncratic factors affecting local housing markets that should not be permitted to influence (in either direction) the labeling of a tract (or lender) as "high-default." Relying on MSA default rates as a benchmark controls for MSA-wide differences in the strength of the housing market and the local economy, as well as certain institutional features (such as the legal setting) that probably vary less within MSAs than across MSAs.[12] The alternative of making

---

[11] In the remainder of this paper, we use tracts that have been aggregated according to the procedures outlined in Section 2, and we generally exclude the approximately 10 percent of the loans for which tract identifiers are missing.

[12] Comparisons of tract rates with MSA rates precludes the possibility of picking out tracts (or lenders) that actually do perform poorly but whose poor performance is hidden by comparison with an MSA composed disproportionately of other poorly performing tracts (or lenders). That is, the assumption is that, absent local factors and differences across borrowers, tracts (lenders) would on average perform similarly in all MSAs. The more sophisticated analysis in Section 5 minimizes reliance on the latter assumptions by controlling for

TABLE 2

PERCENTAGE DISTRIUBTION OF TRACTS ACROSS DEFAULT RATE CLASSES, BY MSA
1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	Total Tracts	< 31 Loans	Raw Default Rates (Percent) in Tracts with > 30 Loans									
			0 to 0.5 %	>0.5 to 1.0 %	>1.0 to 1.5 %	>1.5 to 2%	>2 to 3 %	>3 to 4 %	>4 to 7 %	>7 to 10 %	>10 to 15%	>15 %
ATLANTA, GA MSA	480	30.21%	20.83%	4.79%	7.71%	5.42%	12.71%	7.50%	7.92%	2.71%	0.21%	0.00%
BALTIMORE, MD PMSA	479	40.50	17.12	2.92	5.01	4.59	13.15	5.01	7.10	3.97	0.42	0.21
CHICAGO, IL PMSA	1142	46.23	18.30	1.58	3.50	5.87	8.32	4.29	7.88	2.80	0.70	0.53
DALLAS, TX PMSA	489	36.81	20.45	4.09	7.77	4.70	9.00	9.41	5.32	2.25	0.20	0.00
DENVER, CO PMSA	404	11.88	49.26	13.86	9.90	5.94	5.69	2.48	0.74	0.25	0.00	0.00
DETROIT, MI PMSA	1079	73.49	13.99	0.09	1.11	1.76	3.61	1.39	2.32	1.39	0.65	0.19
FORT LAUDERDALE, FL PMSA	147	34.01	16.33	2.04	2.72	10.88	10.88	8.16	12.93	1.36	0.00	0.68
FORT WORTH-ARLINGTON, TX PMSA	305	33.77	16.39	2.30	5.57	9.18	13.11	9.51	7.21	2.62	0.33	0.00
HOUSTON, TX PMSA	544	63.24	13.05	2.57	3.49	3.13	7.72	4.41	1.65	0.74	0.00	0.00
LOS ANGELES-LONG BEACH, CA PMSA	842	72.80	2.14	0.00	0.48	0.59	2.85	2.85	7.96	5.70	3.80	0.83
MEMPHIS, TN-AR-MS MSA	190	30.53	15.26	4.21	5.26	6.32	8.95	6.84	15.79	4.74	2.11	0.00
MIAMI, FL PMSA	225	52.89	8.44	2.22	3.56	3.56	7.11	5.78	12.44	2.67	0.89	0.44
MINNEAPOLIS-ST PAUL, MN-WI MSA	619	15.67	49.43	9.37	8.24	5.17	5.98	2.91	2.58	0.65	0.00	0.00
NORFOLK-VIRGINIA BEACH-NEWPORT	315	47.30	16.51	2.54	3.81	2.86	11.43	6.35	4.13	4.13	0.95	0.00
ORLANDO, FL MSA	222	44.14	12.61	1.35	6.31	5.41	9.01	10.81	5.86	2.25	1.80	0.45
PHILADELPHIA, PA-NJ PMSA	782	61.38	10.10	0.51	1.66	3.84	8.44	4.35	6.78	2.17	0.77	0.00
PHOENIX-MESA, AZ MSA	490	20.00	26.12	8.16	8.98	9.39	12.04	9.39	5.10	0.61	0.20	0.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	328	20.73	2.44	0.61	2.13	3.05	6.71	8.84	32.93	17.99	3.35	1.22
SACRAMENTO, CA PMSA	273	56.04	14.29	0.37	2.93	4.40	7.33	4.40	8.06	1.83	0.37	0.00
ST. LOUIS, MO-IL MSA	367	36.78	22.89	7.36	5.45	4.90	7.90	7.08	5.99	1.36	0.27	0.00
TAMPA-ST PETERSBURG-CLEARWATER	359	52.65	16.16	0.56	3.62	6.41	6.13	4.46	8.36	1.39	0.28	0.00
WASHINGTON, DC-MD-VA-WV, PMSA	769	43.04	19.90	2.60	5.59	5.07	8.32	6.24	6.63	1.56	0.91	0.13

comparisons against a national default rate would ignore area-wide events that cause sharp divergence in default rates across areas.

Table 3 below summarizes relative default rates for all MSAs in a single table. (A breakdown for each individual MSA is presented in Appendix B, which is available from HUD.) Here we consider not only the three definitions of default discussed above, but three additional, related definitions as well: "delinquencies at two years," which includes all claims completed and (90-day) delinquencies in progress as of two years after the amortization start date, whether or not a cure is subsequently observed; "claims at 12/95," which includes only claims as of December 31, 1995; and "delinquencies at 12/95," which includes all claims completed or delinquencies in progress as of December 31, 1995 (the default measure used by NTIC). In this table, for each of the six default definitions, the raw default rate for each tract having more than 30 loans is divided by the raw default rate for the MSA as a whole, and the resulting relative default rate is used to categorize the tract into one of five categories; tracts having 30 or fewer loans are treated in a separate category. For each default rate class and each definition of default, the body of the table gives the number and percentage of tracts falling in the class, the number and percentage of all loans contained in those tracts, and the number and percentage of defaults that are contained in those tracts. Thus, for example, the first section of the table considers the first definition of default: claims occurring by two years after amortization start. The first row of the table shows that under this definition 5,053 tracts, or 46.71 percent of the 10,818 tracts, have 30 or fewer loans in the two origination years together. The second row shows that tracts containing 30 or fewer loans contain 56,862 loans, or only 9.54 percent of the total of 596,188 loans (for which tract is identified). Finally, the third row shows that tracts with 30 or fewer loans contain 471 defaults, which amounts to only 9.5 percent of the total of 4,956 defaults.

The next set of columns to the right (*i.e.*, the fourth and fifth columns of numbers from the left) provide the same information for those tracts having more than 30 loans and a relative default rate of 0 up to 0.5 (*i.e.*, zero up to one-half of the MSA average default rate). Identifying defaults as claims within two years (the first three rows), we see that there are 3,520 such tracts, which represent 32.54 percent of the total; that these tracts contain 267,057 loans, or 44.79 percent of the total number of loans; and that these tracts contain 67 defaults, or 1.35 percent of the total number of defaults.

It is worth emphasizing that a substantial number of tracts have 30 or fewer loans (5,053 tracts, or nearly 47 percent of the total[13]), but these low-volume tracts contain very few loans in the aggregate (56,862 loans, or about 9.54 percent of the total). Thus, while it may be unsettling to have a vast number of tracts that have so few loans that they drop out of some of our comparisons, these tracts are relatively unimportant in the sense that they contain relatively few loans. In addition, these low-volume tracts contain defaults in approximately the same proportion as they do loans --- around 9.5 percent of the defaults --- thus indicating that, at least in this dimension, these low-volume tracts are similar in the aggregate to tracts with higher loan volume.

---

observable differences across loans when estimating the influence of tracts or lenders on default probabilities.

[13] Note that these counts are made after the aggregation procedure has been used to collapse many of the tracts with 30 or fewer loans.

Table 3

Number and Percentage Distribution of Tracts, Loans, and Defaults Across Default Rate Classes
1992 and 1994 Originations

Default Definition	Type	Total	<=30 Loans		Default Rate of Tract Relative to MSA Rate (Tracts with >30 Loans)									
					0 to <0.5		0.5 to <1.0		1.0 to <1.5		1.5 to <3.0		3.0 and Above	
			Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
1. Claims at Two Years	Tracts	10818	5053	46.71%	3520	32.54%	380	3.51%	410	3.79%	807	7.46%	648	5.99%
	Loans	596188	56862	9.54	267057	44.79	72643	12.18	64755	10.86	89234	14.97	45637	7.65
	Defaults	4956	471	9.5	67	1.35	596	12.03	896	18.08	1632	32.93	1294	26.11
2. Uncured Delinquencies at Two Years	Tracts	10818	5053	46.71	2295	21.21	1163	10.75	971	8.98	993	9.18	343	3.17
	Loans	596188	56862	9.54	182068	30.54	127208	21.34	109466	18.36	97099	16.29	23485	3.94
	Defaults	14378	1420	9.88	549	3.82	2579	17.94	3794	26.39	4372	30.41	1664	11.57
3. Delinquencies at Two Years	Tracts	10818	5053	46.71	2010	18.58	1428	13.2	999	9.23	1060	9.8	268	2.48
	Loans	596188	56862	9.54	160749	26.96	148366	24.89	113712	19.07	98905	16.59	17594	2.95
	Defaults	18138	1806	9.96	776	4.28	3541	19.52	4916	27.1	5487	30.25	1612	8.89
4. Claims at 12/95	Tracts	10818	5053	46.71	3158	29.19	479	4.43	534	4.94	1010	9.34	584	5.4
	Loans	596188	56862	9.54	262220	43.98	74196	12.45	68505	11.49	95920	16.09	38485	6.46
	Defaults	6797	697	10.25	204	3	844	12.42	1168	17.18	2305	33.91	1579	23.23
5. Uncured Delinquencies at 12/95	Tracts	10818	5053	46.71	2218	20.5	1174	10.85	964	8.91	1049	9.7	360	3.33
	Loans	596188	56862	9.54	185807	31.17	135062	22.65	98467	16.52	95492	16.02	24498	4.11
	Defaults	14659	1457	9.94	667	4.55	2748	18.75	3231	22.04	4737	32.31	1819	12.41
6. Delinquencies at 12/95	Tracts	10818	5053	46.71	1992	18.41	1412	13.05	973	8.99	1106	10.22	282	2.61
	Loans	596188	56862	9.54	164006	27.51	153858	25.81	105901	17.76	97484	16.35	18077	3.03
	Defaults	18383	1856	10.1	844	4.59	3723	20.25	4287	23.32	5886	32.02	1787	9.72

Another noteworthy feature of Table 3 is that claims tend to be more highly concentrated in the highest relative default rate class than do uncured delinquencies, and delinquencies as a whole are least concentrated in the uppermost relative rate class. More specifically, 23 to 26 percent of the tracts fall in the highest relative rate class (3 or more times the MSA rate), while about 12 percent of the uncured delinquencies and only about 9 to 10 percent of all (90-day) delinquencies are in the top relative rate category. We note that alongside this pattern, default rates are lowest for claims, higher for uncured delinquencies, and highest for all delinquencies.

3.1.2. Variation Across Definitions and Across Years

Before turning to a more systematic examination of the geographic concentration of defaults, it is of interest to point out two additional features of FHA data that promise to make it difficult for anyone to identify problem tracts easily and unambiguously. Here and in the remainder of this section we adopt, without endorsing, the NTIC practice of referring to a tract as a "high-default census tract," or more simply a "high-default tract," if it exhibits a raw default rate that is at least 1.5 times the MSA average. The first point to note is that while the tables above demonstrate that defaults exhibit geographic concentration under all definitions considered here, the identities of the particular tracts selected as high-default tracts depend on the default definition chosen. Table 4 (in Appendix A) illustrates this point. (Recall again that Appendix A contains all tables referenced in the text --- Tables 1 through 27. Only selected tables, or portions thereof, are copied and inserted into the text.) The first column of Table 4 shows, for each MSA, the number of tracts appearing in both origination years and having more than 30 loans in the two origination years together. The second column shows, among these tracts, the percentage of tracts having raw default rates that are at least 1.5 times the MSA average (are "high-default tracts") under the "claims at two years" definition of default only; the third column gives the percentage that are high-default tracts under the "uncured delinquency at two years" definition only; the fourth column gives the percentage that are high-default tracts under both of the latter two measures of default; and the fifth column shows the percentage that are not high-default tracts under either definition. We see, for example, that in the Atlanta MSA, there are 335 tracts having more than 30 loans and appearing in both origination years. Among these tracts, 13.13 percent of the tracts are identified as high-default under the claims definition only, another 8.66 percent of the tracts are high-default under the uncured delinquency definition only, and 16.72 percent are high-default tracts under both definitions. Looking over the table as a whole, it is clear that the particular tracts that constitute high-default tracts depend on the definition employed, and hence the choice of definition is likely to be crucial in singling out tracts that deserve further study.

The other feature of interest is that the particular tracts isolated as high-default tracts depend on the origination year examined. Each panel of Table 5 (in Appendix A) shows, for each MSA, the percentage of tracts (among those with more than 30 loans in each year) that are high-default tracts for 1992 originations only, high-default tracts for 1994 originations only, high-default tracts for both origination years, or high-default tracts in neither origination year. For example, the first line of Panel A indicates that, when defaults are defined as claims at two years, among the 281 Atlanta tracts with more than 30 loans in each origination year, 16.37 percent are high-default tracts for 1992 originations only, 16.01 percent are high-default tracts for 1994 originations only, 7.12 percent are high-default for both origination years, and 60.5 percent are not high-default tracts for

either origination year. The table shows quite clearly that the identification of a tract as a "problem" tract depends on which origination year is used. The changing identity of high-default tracts suggests that this method picks up, in part, purely transitory factors, rather than long lasting effects that would suggest more serious problems.

- **To conclude, we find that when tracts are labeled as "high-default" by comparing their default rate to that of the MSA as a whole, the identity of such high-default tracts depends on which definition of default is adopted. In addition, within a definition of default, the identity of tracts labeled as "high-default" varies with the origination year selected, a result that suggests that some of whatever causes tracts to have high default rates is transitory, and thus presumably less serious.**

3.2. Characteristics of Tracts with High Relative Default Rates

Even if one believes that chance alone is unlikely to be responsible for the observed geographic differences in raw default rates, it by no means follows that lax underwriting practices, inappropriate underwriting standards, or any other particular cause is responsible. There are numerous reasons for variation in default rates across tracts, only some of which can be properly accounted for in underwriting even under ideal circumstances. In this section we group tracts into relative default rate categories and examine how numerous default-related factors vary across these relative default rate groups.

The three panels of Table 6 use the FHA data, Decennial Census data, and HMDA data to summarize conditions in all 22 MSAs for census tracts categorized by their default rate relative to (divided by) the MSA rate over the two origination years together. Corresponding tables for each individual MSA are included in Appendix B (available from HUD). The three panels of Table 6 consider the three measures of default; Panel B is presented below while the remaining two panels may be viewed in Appendix A. The discussion here considers all three default definitions because some of the differences across definitions are noteworthy.

Among the factors listed down the left-hand side are many that could plausibly affect loan success and might potentially explain differences in default rates across tracts. The five columns on the right give relative default rate classes into which tracts of over 30 loans are categorized; the leftmost column of numbers pertains to tracts of 30 or fewer loans regardless of default rate.

The first thirteen rows are calculated directly from the FHA data. The first three rows of each panel of Table 6 repeat the information from Table 3 above, and are included solely for ease of reference. The fourth row of a panel gives the overall raw default rate for tracts falling into each relative default rate category.

3.2.1. Attributes of Borrowers and Loans in High-default Tracts

Rows 4 through 13 of Table 6 consider characteristics of tracts that are often found empirically to be related to default rates. (See, for example, Neal (1989) and Quercia and Stegman (1992) for useful reviews of the literature on loan default.) The row labeled "FHA % Black" shows

TABLE 6

CHARACTERISTICS OF TRACTS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Characteristic	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Tracts in Default Rate Class	46.71%	21.21%	10.75%	8.98%	9.18%	3.17%
% of All Loans in Default Rate Class	9.54	30.54	21.34	18.36	16.29	3.94
% of All Defaults in Default Rate Class	9.88	3.82	17.94	26.39	30.41	11.57
Default Rate (%) in Class	2.50	0.30	2.03	3.47	4.50	7.09
FHA % Black	14.01	5.64	10.16	14.68	24.37	34.40
FHA % Hispanic	14.35	9.07	14.14	15.79	12.97	10.51
First Time (%)	52.80	41.63	43.58	44.63	47.50	51.91
% LTV .97 +	22.27	22.87	22.61	24.86	31.10	39.27
% Front end .29+	20.30	17.36	20.68	20.79	18.62	15.28
% Back end .41+	16.71	16.04	17.56	17.26	16.10	12.97
Income-MSA average	132.10	122.76	90.46	-9.74	-237.47	-657.26
Mortgage-MSA average	3452.04	2102.14	3616.56	988.76	-6694.90	-19306.42
Assets-MSA average	815.92	881.43	507.72	-253.44	-1496.62	-3632.94
FHA/Tot originations (%)	11.36	23.17	29.16	34.50	37.20	44.48
Black FHA/Blk originations (%)	30.72	39.75	43.64	47.45	52.39	56.56
Hispanic FHA/Hisp originations (%)	23.03	37.46	42.32	49.78	51.64	53.14
Conventional denials/applications (%)	15.55	11.00	13.42	15.58	17.57	22.42
Census % Hispanic	16.08	10.32	15.22	14.21	13.51	8.86
Census % Black	15.14	7.01	11.22	18.58	29.86	50.28
Census % Unemp Rate (%)	7.71	5.74	6.46	7.54	9.36	14.50
Census Income Ratio	1.02	1.12	1.06	1.03	0.93	0.79
Census Poverty Rate (%)	13.33	7.37	9.15	10.98	14.99	21.73
Census Home Ownership Rate (%)	57.49	66.76	65.16	63.11	60.34	54.13

the percentage of FHA loans that go to blacks within tracts in each relative default rate class.[14] Note that this percentage rises as one moves to higher default rate classes, particularly in Panels B and C, where the uncured delinquency definitions of default are used. This pattern is consistent with a common empirical finding (which will be reestablished in the loan-level analysis below) that blacks tend to have higher default rates. The percentage of FHA loans in these tracts going to Hispanics, given in the row "FHA % Hispanic," shows a brief increase and then a decline as one moves into the higher default rate categories. The "First Time (%)" row shows the percentage of FHA loans going to first-time home buyers within the tracts in each default rate class. The tendency of this percentage to rise across default rate classes, again especially in Panels B and C, is again consistent with, and may be causally related to, the pattern of defaults. The row "% LTV .97+" shows the percentage of loans in each default rate class with loan-to-value ratios exceeding 97 percent, a level that would generally be considered high. Again, the increase in the percentage of high-LTV loans as one moves into the higher default rate categories --- more impressive in Panel B --- is entirely consistent with, and perhaps causally related to, the attendant rise in default rates.

The rows "% Front end .29 +" and "% Back end .41+" give the percentage of FHA loans with front end ratios (monthly housing expenses divided by monthly income) exceeding 29 percent and the percentage of FHA loans with back end ratios (monthly housing expenses and other debt payments divided by monthly income) exceeding 41 percent. These percentages appear to rise and then decline as one moves across the various default rate categories. The statistical analysis later in this study shows that these ratios have mixed estimated effects on default probabilities at the level of the individual loan as well.

The next three rows again show a pattern consistent with, and possibly causally related, to the pattern of default rates. The row "Income-MSA average" shows average income in the relevant tracts, expressed as a deviation from MSA average income. The row "Mortgage-MSA average" shows the average mortgage amount in these tracts, expressed as a deviation from the average mortgage amount in the MSA. The row "Assets-MSA average" shows how assets after closing (again expressed as a deviation from the MSA average) vary, on average, across tracts in each default rate class. All three of these rows display the pattern one would expect: tracts with higher relative default rates generally display lower average incomes, smaller mortgage amounts, and smaller values of assets after closing relative to MSA averages. Trends again tend to appear somewhat stronger in Panels B and C.

3.2.2. FHA vs. Conventional Lending in High-Default Tracts

The next four rows of Table 6 are obtained from tract-level HMDA data (aggregated for

---

[14] Note that the calculations with the FHA data across all 22 MSAs implicitly weight each MSA in accordance with its size in the relevant dimension. That is, each tract is assigned a default rate category based on its default rate relative to the MSA average (if its total loan volume exceeds 30). Data on all loans within the relative default rate category are aggregated across all MSAs, and thus larger MSAs tend implicitly to be given more weight. The alternative of performing calculations for each MSA, and then taking, say, an arithmetic average across the MSAs, seems problematic since such a procedure would entirely ignore size differences. As noted, tables for individual MSAs are presented in Appendix B, which is available from HUD.

1992 through 1996), rather than from FHA data.[15] The rows "FHA/Tot Originations (%), " "Black FHA/ Blk originations (%)," and "Hispanic FHA/ Hisp originations (%)" show the fraction of total, black, and Hispanic originations, respectively, that are made by FHA within the tracts in each of the relative default rate categories. The patterns in Panels B and C clearly show increasing FHA presence overall, as well as within each of the two minority groups, as one moves into higher default rate tracts, but these patterns are muted in Panel A.

The latter observations admit of more than one interpretation. One is that these figures demonstrate the importance of FHA in providing funding, particularly to minorities, in areas that are plagued by high default rates, which, as indicated above (and as will be reinforced below), are areas that tend to be poorer. The less charitable interpretation is that because FHA does a larger share of the originations in the higher default areas, it is somehow responsible for the higher default rates among FHA loans. Notice, however, that the conventional sector originates the majority of the loans even in the highest relative default rate category. We see in Panel B, for example, that conventional loans make up 56 percent of originations in the highest relative default rate tracts.

- **We conclude that while FHA has a larger share of the market in tracts with higher default rates, conventional lending is not driven out of tracts with high default rates. Even within high-default tracts, conventional lenders apparently find borrowers who are acceptable risks.**

The row "Conventional denials/applications (%)" shows the percentage of conventional applications that are denied within the tracts in each relative default rate category. The general rise in denial rates as one moves into higher default rate categories, which is again especially clear in Panels B and C, may indicate a general increase in riskiness of the mortgage-seeking population. This increase in riskiness among mortgage seekers may in turn be reflected in the riskiness of FHA loans, especially if those who are denied conventional loans are often accepted for FHA loans.[16] Indeed, FHA is presumably not intended simply to displace conventional borrowing, but is instead intended to extend home ownership opportunities to many who would otherwise not be able to obtain conventional funding.

3.2.3. Other Attributes of High-default Tracts

The bottom six rows of Table 6 provide additional measures of the characteristics of the various default rate groups calculated from Census data. The percentage of residents who are Hispanic (Census %Hispanic) rises and then falls as one moves into higher default tracts, but the percentage black (Census %Black) increases as one moves to higher default rate tracts, and again the trend is especially strong in Panels B and C. The unemployment rate (Census Unemp Rate)

---

[15] Calculations requiring HMDA or Census data at the census tract level require us to attach the appropriate census tract to the FHA loan data. This matching procedure fails for the approximately 15 percent of loans with nonmissing tract identifiers. Loans with unmatchable tract identifiers are excluded from analyses when their inclusion was impossible or when it was deemed likely to lead to misleading results.

[16] We do not have information on the default rate on conventional loans in these tracts.

rises, tract median income divided by MSA median income (Census Income Ratio) declines, the poverty rate (Census Poverty Rate, the percentage below the poverty line) rises, and the home ownership rate (Census Home Ownership Rate) declines as tract-level relative default rates increase. As before, trends again appear to be stronger in Panels B and C. All indications point to lower economic status in tracts characterized by higher relative default rates.

Given the tendencies displayed in Table 6, the pattern of default rates across tracts should perhaps not come as a surprise. To see if tract characteristics can fully account for differences in default rates across tracts, we shall later turn to a statistical examination of defaults on individual loans.

Before concluding this portion of the investigation, it is worth considering one feature of the data that seems to occur throughout this section and elsewhere as well. Variation in default-related factors seems more closely related to default rates that include uncured delinquencies as well as claims (uncured delinquencies at two years and uncured delinquencies at 12/95) than to default rates based on claims alone. In terms of Table 6, patterns in Panels B and C appear more pronounced than in Panel A. One interpretation of this apparent difference is that the claims only definition contains disproportionately those defaults that occur very early in the life of the mortgage, and these defaults may tend more frequently to be due to factors such as divorce, serious illness, and death that are much more weakly correlated with the measured default-related factors. That is, the measured default-related factors may better explain those defaults that occur later in the life of the loan, and these defaults are weighted more heavily in the default measures that include uncured delinquencies.

- **To conclude, we find that a wide variety of default-related factors vary across tracts classified by their relative default rates. We find, for example, that first-time homebuyers, black borrowers, and high loan-to-value ratios are all more common in tracts with higher relative default rates. At least some of the observed pattern of default rates across tracts is likely explained by the characteristics of loans within these tracts.**

3.2.4. Default Rates in Low Income and Minority Tracts

The observations in the last section may seem to imply that all low income or heavily minority tracts suffer from high default rates. This section presents some data that should serve to dispel that overly pessimistic view.

Table 7 (in Appendix A) gives the first piece of evidence. Each set of three rows presents information for all tracts in a group defined by the median family income of the tract relative to the median family income of the MSA. Originations from both years are pooled. Each row in one of these relative income groups of tracts presents the distribution of tracts, loans, or defaults across the tracts in various relative default rate classes. For example, the first row in Panel B shows that (for the indicated definition of default), among tracts having median family incomes no higher than 80 percent of the MSA median, 12.11 percent of the tracts have more than 30 loans and a default rate that is from zero to one-half of the MSA default rate. This same relative default rate category contains 19.32 percent of the loans within this tract income group, as well as 1.17 percent of the defaults. It is quite clear from the numbers in this table that many low income tracts have relatively low default rates. A bit of arithmetic will show that among tracts with more than 30 loans, 40

percent of the low income tracts (*i.e.*, those with median incomes no more than 80 percent of the MSA median) are in the lowest two default rate categories, and thus have tract default rates that are less than the average across the MSA as a whole.

Table 8 (in Appendix A) tells a similar story, but tracts are subdivided according to minority representation in the population of the tract, rather than income. For example, the first three rows show the distribution of tracts, loans, and defaults across relative default rate classes of tracts for those tracts in which minorities (blacks and Hispanics) make up zero to under ten percent of the population. It is clear from these numbers that there are indeed many tracts with substantial minority representation and yet relatively low default rates. Some arithmetic will show that among tracts with more than 30 loans and minority representation of 30 to 50 percent, about 45 percent of tracts have a default rate that is below the MSA average.

- **The message from Tables 7 and 8 is clear. Although low incomes may be associated with high default rates, there are many tracts with low median incomes or substantial minority representation that have default rates that are below the MSA average.**

3.3. Are Defaults Concentrated in Particular Lenders?

We now take up the question of whether defaults in each MSA appear to be concentrated in particular lenders, following a similar, though somewhat abbreviated, methodology as that employed above in asking whether defaults appear to be concentrated geographically. As above, this initial look at the data is essentially descriptive and nonstatistical. The three panels of Table 9 are modeled after the corresponding panels of Table 2, except that here the focus is on lenders within each MSA, rather than on tracts. (Panel B is presented below; the remaining panels of Table 9 are in Appendix A.) Table 9 displays, for all three measures of default, the variation in raw default rates across lenders originating more than 30 loans[17] within an MSA. There is apparently substantial variation in raw default rates across lenders under all three definitions.

We emphasize that our primary focus is on a lender's default *rate* in an MSA. In contrast, as noted in Section 1, the NTIC study focuses on the *volume* of defaults by a lender in the MSA, a procedure that is questionable at best. Such a method has an obvious tendency to penalize high volume lenders even if such lenders are quite conservative in underwriting and strongly supportive of delinquent borrowers.

---

[17] Each lender is distinguished solely by the existence of a unique lender identification number in the FHA data file. Note that we do not attempt to aggregate low volume lenders. In contrast to the case for census tracts, where non-FHA data are available to help in identifying similar tracts, here we have no external sources of information that would aid us in aggregation. The small volume of loans that make aggregation of a lender desirable also make for imprecise measurement of characteristics that could be used to identify similar lenders that could properly be aggregated.

TABLE 9

PERCENTAGE DISTRIBUTION OF LENDERS ACROSS DEFAULT RATE CLASSES, BY MSA

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	Total Lenders	<31 Loans	Raw Default Rates (Percent) for Lenders with > 30 Loans									
			0 to 0.5 %	>0.5 to 1.0 %	>1.0 to 1.5 %	>1.5 to 2 %	>2 to 3%	>3 to 4%	>4 to 7%	>7 to 10%	>10 to 15%	>15 %
ATLANTA, GA MSA	303	50.83%	12.21%	3.96%	7.26%	6.27%	8.58%	5.61%	3.96%	0.66%	0.66%	0.00%
BALTIMORE, MD PMSA	226	56.19	9.73	3.54	4.87	5.75	7.08	6.64	5.31	0.44	0.44	0.00
CHICAGO, IL PMSA	310	53.87	9.03	5.48	5.48	6.13	9.68	3.87	4.19	0.97	0.97	0.32
DALLAS, TX PMSA	252	51.19	10.32	3.57	6.75	5.56	11.51	3.17	7.14	0.79	0.00	0.00
DENVER, CO PMSA	259	44.40	27.80	11.58	6.56	4.63	3.47	0.39	0.77	0.39	0.00	0.00
DETROIT, MI PMSA	164	50.61	11.59	8.54	5.49	7.93	6.10	3.66	3.66	1.22	0.61	0.61
FORT LAUDERDALE, FL PMSA	238	66.81	7.56	0.84	2.10	4.62	5.04	5.88	4.62	1.68	0.84	0.00
FORT WORTH-ARLINGTON, TX PMSA	228	61.40	7.02	3.95	6.14	5.26	4.39	4.82	4.39	1.32	1.32	0.00
HOUSTON, TX PMSA	188	56.38	10.11	4.79	7.45	5.85	9.04	4.26	2.13	0.00	0.00	0.00
LOS ANGELES-LONG BEACH, CA PMSA	438	68.04	0.91	0.00	0.00	2.05	1.83	3.20	9.13	10.05	3.42	1.37
MEMPHIS, TN-AR-MS MSA	121	57.02	7.44	4.13	2.48	1.65	9.92	8.26	3.31	4.13	1.65	0.00
MIAMI, FL PMSA	279	59.86	9.68	1.08	3.23	2.51	7.17	8.60	5.02	2.15	0.72	0.00
MINNEAPOLIS-ST PAUL, MN-WI MSA	200	53.00	21.00	9.50	6.50	5.00	1.00	3.00	1.00	0.00	0.00	0.00
NORFOLK-VIRGINIA BEACH-NEWPORT	150	52.67	8.67	2.67	7.33	6.67	10.00	6.00	5.33	0.67	0.00	0.00
ORLANDO, FL MSA	174	57.47	5.75	3.45	6.32	1.15	9.77	6.90	6.90	1.72	0.57	0.00
PHILADELPHIA, PA-NJ PMSA	189	61.38	6.88	2.12	3.17	5.29	11.64	4.76	4.23	0.00	0.53	0.00
PHOENIX-MESA, AZ MSA	190	37.37	12.63	7.37	12.63	11.05	14.21	3.16	1.58	0.00	0.00	0.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	532	70.86	0.75	0.00	0.75	0.19	1.69	3.76	11.28	6.95	3.01	0.75
SACRAMENTO, CA PMSA	240	63.33	7.92	0.42	3.75	3.75	9.17	5.42	4.17	1.67	0.42	0.00
ST. LOUIS, MO-IL MSA	121	54.55	8.26	2.48	6.61	8.26	9.92	3.31	6.61	0.00	0.00	0.00
TAMPA-ST PETERSBURG-CLEARWATER	200	59.50	10.50	3.00	4.00	3.00	11.00	4.50	3.50	1.00	0.00	0.00
WASHINGTON, DC-MD-VA-WV, PMSA	282	53.90	9.57	5.32	7.09	6.38	9.93	3.90	2.84	0.71	0.00	0.35

3.4. Characteristics of High-default Lenders

As with tracts, we adopt for convenience the term "high-default lender" to refer to a lender with a default rate in the MSA that is at least 1.5 times the MSA average. Two questions that deserve attention at the outset are (a) whether such high-default lenders operate in all areas and (b), if so, whether they have higher default rates than other lenders in all areas in which they lend or only in some areas. These questions are of interest for two reasons. First, if there is no overlap of the geographic areas in which high-default and non-high-default lenders operate, it will be difficult to separate the effects of lenders from the effects of area. Second, if we find that within each kind of geographic area, default rates do not vary across lenders, then we may want to focus all of our attention on area dispersion in default rates.

3.4.1. Does Lender Performance Vary Across Areas?

Table 10 provides some insight, though its format may be somewhat confusing and thus requires explanation. The discussion centers around Panel B, presented below; the remaining two panels (A and C) are in Appendix A. In Table 10, each lender is classified according to its relative default rate, *i.e.,* its default rate in the MSA relative to (divided by) the average default rate in the MSA as a whole. The calculations pool both origination years. The first row gives the overall raw default rate of lenders in each of the relative default rate categories. Rows 2 through 6 show, for each lender relative default rate group, the fraction of their loans, as well as the default rates on these loans, in high-default tracts with greater than 30 loans, in non-high-default tracts with greater than 30 loans, and in tracts with less than 30 loans (low volume tracts). The next six rows show similar calculations for central cities and suburban areas.

Some examples may help to fix ideas. The first row of Panel B shows that the default rate (uncured delinquencies at two years) for lenders with less than 31 loans is 3 percent, while among lenders having a default rate that is from 0 to 0.5 of the MSA average, the default rate is 0.59 percent. Looking further down the second column of numbers, we see that among lenders having a default rate that is 0 to 0.5 of the MSA average, 16.28 percent of the loans are in high-default-rate tracts (row 2); within these high-default tracts, the loans from these lenders have a default rate of 1.45 percent (row 3). An additional 76.99 percent of loans from this same group of lenders are in non-high-default rate tracts (row 4), and the default rate for these loans is 0.40 percent (row 5). For these same lenders, 6.73 percent of the loans are in low volume tracts, and the default rate for these loans is 0.68 percent. Continuing down the table, these same lenders have 26.97 percent of their loans in city tracts, and the default rate on these loans is 0.66 percent; 57.45 percent of the loans by these lenders are in suburban tracts, and the default rate on these loans is 0.56 percent.

Looking at Table 10, we see that there appears to be some tendency for lenders in higher relative default rate classes to have a greater share of their business in high-default rate tracts and in central city areas. Within a lender default rate class, default rates in high-default rate tracts are always higher than in the non-high-default rate class, and higher in central cities than in suburban areas. Within high-default rate tracts and within non-high-default rate tracts, as well as within tracts classified by city/suburban status, default rates tend generally to rise as one moves along a row to the right, *i.e.,* into higher lender default rate classes.

TABLE 10

PERCENTAGE DISTRIBUTION AND OTHER CHARACTERISTICS OF LOANS IN EACH LENDER RELATIVE DEFAULT RATE CLASS ACROSS TRACTS CLASSIFIED BY RELATIVE DEFAULT RATE AND BY CENTRAL CITY/SUBURBAN STATUS
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (Lenders with > 30 Loans)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% Default Rate	3.00%	0.59%	1.86%	3.16%	4.27%	8.15%
% of Loans in High Default Tracts	30.66	16.28	20.79	26.30	24.93	33.61
% Default Rate in High Default Tracts	5.69	1.45	4.43	6.80	8.68	14.83
% of Loans in Non-High Default Tracts	62.41	76.99	73.87	68.79	70.32	62.01
% Default Rate in Non-High Default Tracts	1.69	0.40	4.02	1.78	2.68	4.34
% of Loans in Low Volume Tracts	6.93	6.73	5.34	4.91	4.75	4.38
% Default Rate in Low Volume Tracts	2.91	0.68	1.90	2.95	4.69	10.88
% of Loans in City Tracts	28.42	26.97	30.60	32.58	31.13	47.59
% Default Rate in City Tracts	3.58	0.66	2.14	3.40	4.84	10.04
% of Loans in Suburban Tracts	58.95	57.45	53.98	53.09	55.92	42.69
% Default Rate in Suburban Tracts	2.71	0.56	1.73	3.02	3.95	6.06
% of Loans in unknown City/Suburban Tracts	12.63	15.59	15.42	14.33	12.95	9.72
% Default Rate in unknown City/Suburban Tracts	3.07	0.58	1.74	3.14	4.30	8.08
% of Borrowers in High Default Tracts Who are Black	20.79	21.66	21.04	23.53	33.95	53.03
% of Borrowers in Non-High Default Tracts Who are Black	11.53	7.61	8.55	10.56	14.48	21.82
% of Borrowers in Low Volume Tracts Who are Black	11.49	9.11	11.20	13.03	18.48	36.18

These observations admit of more than one interpretation. One possibility, of course, is that high-default lenders fail to follow underwriting standards, or they pursue foreclosure too aggressively. For these reasons, their default rates are higher than those of other lenders, even after controlling crudely for the default rate of the tract.

A second possibility is that our split of tracts into high-default and non-high-default rate tracts is too coarse, and a more detailed breakdown would show that all lenders have identical default rates in properly defined, homogeneous tracts. That is, the existing two-way categorization of tracts surely leaves much variation among tracts within each category. If each of these two categories could be subdivided into more homogeneous categories, we might find that lenders have the same default rate within each of these more narrowly defined groups. Under this explanation, then, all lenders act essentially the same within a homogeneous area, and differences at higher levels of aggregation are traceable to underlying heterogeneity of areas.

A related interpretation of the findings in Table 10 is that lenders specialize in different types of borrowers. Perhaps lenders are located in different areas and there are informational efficiencies in tailoring lending practices to the kinds of borrowers most frequently encountered in their local markets. Alternatively, different lenders may specialize in different kinds of borrowers because market efficiencies dictate such a structure even if all lenders have identical access to all kinds of borrowers. Under this interpretation, even if we were to isolate more homogeneous areas, we might find that differences in default rates across lenders remain because of differences in their clientele within an area. By this explanation, the patterns in Table 10 may suggest that lenders with higher default rates tend to specialize in higher risk borrowers, though not necessarily those with unacceptably high risk.

The final three rows in each panel of Table 10 provide a bit of additional information along the latter lines. Each of these three rows gives, for the indicated kind of tract, the fraction of the lenders' borrowers who are black. Thus, for example, the second entry from the left in the third row from the bottom in Panel B states that, among lenders with relative default rates that are 0 to 0.5 times the MSA average, 21.66 percent of their borrowers in high-default rate tracts are black, but as shown in the row immediately below, 7.61 percent of their borrowers in non-high-default rate tracts are black. Quite clearly, within each of the tract default rate categories (*i.e.*, along a row), the fraction of black borrowers tends to rise as one moves into the higher default rate classes of lenders. The rise is especially dramatic in Panels B and C, again suggesting that systematic factors play a bigger role in determining uncured delinquencies than in determining claims at two years. It appears that even within an area classified by its relative default rate, lenders with high relative default rates have very different lending patterns than do non-high-default rate lenders. It is possible that such differences in clientele may account for their differing default rate experience. The material in the next section and the more detailed statistical analysis in Section 5 will provide some additional information on this issue.

3.4.2. Attributes of Borrowers, Loans, and the Population Served by High-default Lenders

To characterize more fully the type of borrowers serviced by lenders in the various relative default rate categories, we turn to Table 11, which provides a more detailed characterization of borrowers in each relative default rate group of lenders, like that provided in Table 6 for tracts in

TABLE 11

CHARACTERISTICS OF LENDERS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Characteristic	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (> 30 Loans Per Lender)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Lenders in Default Rate Class	60.84%	11.81%	10.92%	8.33%	6.69%	1.41%
% of All Loans in Default Rate Class	4.32	17.63	37.64	26.78	12.33	1.30
% of All Defaults in Default Rate Class	5.38	4.31	29.00	35.08	21.84	4.40
Default Rate (%) in Class	3.00	0.59	1.86	3.16	4.27	8.15
FHA % Black	14.36	10.00	11.29	14.09	19.53	32.94
FHA % Hispanic	18.23	9.37	11.44	15.19	13.08	11.68
First Time (%)	39.98	39.69	43.35	48.30	50.88	59.81
% LTV .97 +	25.35	21.64	24.50	24.66	30.53	39.28
% Front end .29+	23.61	16.77	19.40	20.12	18.26	13.57
% Back end .41+	17.86	16.40	16.38	17.10	16.00	12.28
Income-MSA average	173.48	53.16	53.73	-18.56	-163.25	-450.65
Mortgage-MSA average	5083.77	-1383.87	1709.29	1162.72	-5244.91	-14422.89
Assets-MSA average	813.15	561.81	341.68	-144.99	-1090.71	-3286.62
FHA/Tot originations (%)	35.50	33.70	36.74	38.52	37.71	45.29
Black FHA/Blk originations (%)	39.64	37.68	40.12	41.84	41.44	48.28
Hispanic FHA/Hisp originations (%)	41.33	38.77	41.56	63.94	41.36	43.44
Conventional denials/applications (%)	17.93	14.97	15.47	16.40	17.19	19.62
Census % Black	13.60	11.06	11.87	13.16	16.95	25.85
Census % Hispanic	14.91	9.43	9.85	11.64	10.43	9.43
Census Unemp Rate (%)	7.89	6.71	7.05	7.41	7.44	10.83
Census Income Ratio	1.03	1.05	1.04	1.03	1.00	0.92
Census Poverty Rate (%)	9.67	7.90	8.30	9.01	9.20	12.13
Census Home Ownership Rate (%)	67.11	69.17	68.78	67.76	67.81	67.17

various relative default rate groups.[18] Panel B of Table 11 is presented below, and the remaining two panels (A and C) may be viewed in Appendix A. (MSA-level versions of Table 11 are presented in Appendix B, which is available from HUD.) Calculations underlying Table 11 are similar to those in Table 6, except in the case of calculations from Census or HMDA data. Whereas in Table 6 we are able to aggregate census tracts together to obtain tract-level measures from the HMDA or Census files, for the purposes of Table 11 we would need the equivalent measures at the lender level, rather than the census tract level. Because we do not have such lender-level data, we instead produce estimates by calculating weighted averages of the tract-level Census and HMDA data. The weights are the fraction of loans of each lender type that fall within each tract. Hence, in effect we produce measures that show "lender exposure" to the tract-level variables.

Notice that the patterns observed in Table 11 are qualitatively very similar to those seen in Table 6, though there are a few exceptions.[19] As might be expected, causal factors generally exhibit trends across lender groups classified by their relative default rates similar to the pattern across tract groups classified by tract relative default rates. We again reach the sensible conclusion that some of the pattern in default rates across lenders may arise because borrower, loan, and neighborhood characteristics lead to the observed differences in default rates. The more detailed statistical procedures in Section 5 will shed additional light on this issue.

- **To conclude, we find that characteristics of loans differ sharply across lenders classified by their relative default rates. It would not be surprising to find that these differences in loan composition account for at least some of the differences in default rates across lenders.**

3.5. Conclusions

The raw data show quite clearly that default rates vary substantially across tracts and lenders, both in raw terms and relative to the MSA average. As emphasized above, however, these simple comparisons cannot tell us whether defaults are so concentrated in tracts or lenders that randomness is unlikely to be the explanation. If systematic factors, rather than randomness, lie behind the variation in default rates across tracts and lenders, we have already provided suggestions about what those systematic factors might be. The summaries that report on the characteristics of borrowers and loans in high-default tracts and lenders show that a variety of default-related attributes --- first-time home ownership and high loan-to-value ratios, for example --- vary in a sensible way across tracts and lenders. If systematic factors are responsible for disparities in default rates across tracts and lenders, we may not have to look far for at least some of the candidates.

---

[18] Lenders with no more than 30 loans, while common, originate a very small percentage of loans (4.32 percent). Moreover, the fraction of all defaults accounted for by these low-volume lenders is similar to the fraction of loans, particularly for the claims-at-two-years and the uncured-delinquencies-at-12/95 definitions. In this sense, the small-volume lenders appear similar, on average, to the high-volume lenders.

[19] We see, for example, that there is little variation in home ownership rates (the bottom row of each panel) across lender default rate categories. In Panels A and C, we find little variation in the "exposure" to the black population (Census % Black) across categories.

SECTION 4

PRELIMINARY STATISTICAL ANALYSIS OF DISPARITIES IN DEFAULT RATES

4.1. Statistical Tests of Geographical Differences

Although the nonstatistical work in Section 3 cannot determine whether there is "too much" geographical concentration of defaults, it does provide a useful beginning: a casual analysis of raw default rates that seems to indicate substantial concentrations in particular areas. It also took a reasonable second step, showing that there are numerous systematic factors that vary across tracts and which may be able to account for the observed intertract disparities in default rates, if in fact a statistical analysis determines that randomness alone is unlikely to be the explanation.

We now take up the question of whether the geographic concentration of defaults is likely to be attributable to chance, or whether the principal explanation lies in systematic factors, such as poor lending practices in certain neighborhoods or the factors examined in the last section. In a sense, then, we now take a step backwards. That is, despite having seen evidence that measurable default-related factors vary across tracts and might possibly account for variation in default rates across tracts, we now focus on the possibility that chance alone is responsible for the observed variation in default activity. The reason for taking this step is that, were one to attempt to isolate potential problem areas in practice, the first step might well be the one taken in this section: a simple statistical analysis of raw default rates. Hence, this section serves to illustrate these methods, including some of the problems inherent in applying these methods in practice.

It bears emphasis that here we depart in essential ways from the methods employed in the NTIC study, in which ratios of raw tract-level default rates to MSA rates are taken as proof of underlying problems. In contrast, the current study accounts for randomness in outcomes in deciding whether defaults are indeed too concentrated. An approach that acknowledges the existence of randomness is surely reasonable, for default rates are the product of a myriad random effects that could lead to sharp divergence in default probabilities across tracts.

A primary advantage of the statistical approach is that it recognizes the influence of randomness in a precise way. That is, it is not simply that the nonstatistical approach will necessarily identify too many tracts (or lenders) as high-default entities, and that if one simply relaxes the statistical standards for identifying tracts as high-default (by raising the allowable probability that chance alone is responsible) one will end up with the same set of tracts as would be obtained with the nonstatistical approach embraced by the NTIC study. Instead, the nonstatistical NTIC approach may single out some low-volume tracts as high-default where chance alone is a likely explanation, but it may ignore other high-volume tracts where chance alone is very unlikely to cause a default rate as high as that observed (but not high enough to reach the NTIC cutoff). That is, the NTIC approach allows for randomness in an inconsistent manner, and the result of using such methods to identify high-default tracts and prescribe solutions is an incorrect focus that is less likely to discover tracts where there truly are systematic causes for defaults, such as poor underwriting or inadequate servicing of delinquent borrowers.

We emphasize that the focus of the statistical approach in essentially ignoring tracts for which randomness appears to be a plausible explanation for default activity does not in any way

minimize the importance of defaults caused by chance factors alone. Foreclosure-induced vacancies may be a problem for neighborhoods regardless of the cause of foreclosure. The reason for focusing on tracts where there appear to be systematic factors, rather than solely random factors, causing default activity is that systematic factors are more likely to be permanent and more likely to be amenable to identification and remedial action.

At the same time, a blind application of statistical methods has its own drawbacks in the current context. In particular, looking only at the probability that chance alone is responsible for the level of defaults recognizes statistical significance, but says nothing about practical significance. In MSAs that are characterized by low average default rates, like Denver (see Table 1 in Appendix A), tracts may be properly singled out as high-default because their default rate is very unlikely to be produced by chance alone, yet the tract default rate is low enough to be of little practical importance. This problem does not argue in favor of the nonstatistical NTIC approach; it argues in favor of recognizing the gains from reducing the tract-level default rates as an additional criterion. In this study we crudely recognize the importance of possible gains from default rate reductions by paying most of our attention to entities (tracts or loans) with more than 30 loans. A superior alternative in practice may be to isolate problem tracts based on both statistical significance and the expected gains from reducing tract default rates.[20]

Before presenting the statistical work, we must also return to an issue raised in the introduction to this paper. As noted there, we shall use statistical procedures to ask *how unlikely* it is that we would find a particular outcome if in fact chance alone were at work. Although the statistical analysis will provide us with an answer to the latter question, it cannot answer for us how unlikely is *too* unlikely for us to accept the notion that chance alone is at work. If, for example, we find that there is only a 5 percent probability that we would obtain an outcome as extreme as that observed if chance alone were at work, we must still decide if 5 percent is so low a probability that we would reject chance as the explanation. Although there is no easy answer to this question, we will generally adopt the (essentially arbitrary) convention often used in empirical work: we shall reject chance alone as an explanation if we find that there is a 5 percent probability, or less, that an outcome as extreme as what we observe could have been produced by chance alone. Stated in traditional statistical terms, we shall agree to reject the hypothesis at issue (*e.g.*, that tract-level or lender-level default probabilities equal MSA default rates) at a significance level of 5 percent.[21]

4.1.1. Chi-Square Tests of Geographical Differences

To begin, we perform a standard chi-square test for whether the incidence of defaults (under any the three definitions) is independent of tract, given the number of loans in each tract and the overall number of defaults and nondefaults in the MSA as a whole. As we shall see, this test has

---

[20] We do not mean to deny the importance of default at the local level. Indeed, one of the gains from a reduction in defaults is presumably the localized benefit to the neighborhood.

[21] The hypothesis tests in this study are generally one-tailed tests. The choice of a smaller significance level could surely be justified as well.

limited applicability in the current study because of sample size problems. We present the results nonetheless, for such tests are commonly applied in situations like these, and they may be used to advantage in other investigations of default data. The approximations employed in this test are better met when there are adequate expected cell sizes, and thus we follow one convention by including only those tracts for which the expected number of defaults (calculated as the number of loans in the tract times the MSA default rate) is at least 5 (see Fleiss [1981]).[22] In these data, this standard is generally far more demanding than a requirement that there be at least 30 loans in a tract. Indeed, the effect of this restriction is to make many tracts ineligible for inclusion in the test by themselves, especially when defaults are defined to include only claims at two years --- a very rare event.

The results of these tests under the three default definitions for both origination years pooled[23] are given in the three panels of Table 12 (in Appendix A). The first two columns of numbers in each panel show the value of the chi-square statistic and the number of degrees of freedom, the latter of which equals the number of tracts included in the analysis minus one. The final column in each panel shows the probability that the intertract pattern in defaults could have arisen from chance alone, *i.e.,* the probability of observing this extreme an outcome if there really is no association between default behavior and tract identity.

As indicated above, the number of tracts included in this analysis (the number of degrees of freedom plus one) is generally far smaller than the total number of tracts in the MSA (reported in Table 2 above). This problem renders the analysis questionable at best, particularly for the claims definition utilized in Panel A. In those few MSAs where the number of tracts included in the analysis is at all large, we generally see probabilities well below 0.01 (1 percent) that a pattern so extreme could have arisen from chance alone. Putting aside the meaning of a test in which so many tracts are eliminated from consideration, we would generally be led to reject the hypothesis that defaults are distributed independently across tracts.[24]

4.1.2. Exact Probability Calculations

The last set of tests offers very weak evidence that differences in default propensities across tracts are unlikely to have arisen from chance alone. As noted, substantial numbers of tracts are excluded from the tests above because they have so few loans that they would otherwise render the statistical approximations too inaccurate for comfort. In addition, even if the latter difficulty did

---

[22] When a tract has too few loans for inclusion in the calculation as an individual tract, we put it in a pool that is ultimately used as a separate tract in the chi-square calculation. One alternative to this procedure is to omit such low volume tracts from the analysis entirely. It is unclear which alternative is superior.

[23] Analyzing each origination year separately, which would be desirable in other respects, exacerbates the problem of small sample sizes.

[24] A Fisher exact test would be preferable. The latter test gives the exact probability of observing an outcome at least as extreme as that observed and can contend with cells of any size. Such a test is extremely calculation-intensive, particularly on tables of the size used here, and for this reason, we have not implemented these tests.

not arise, these tests alone do not tell us in which particular tracts the problems may lie. That is, these tests do not isolate the tracts in which defaults differ significantly from what would be expected on the basis of chance alone.

To get around these problems, we present a second series of tests. In contrast to the last tests, these are conducted on a tract-by-tract basis. We calculate the exact probability of obtaining the number of defaults observed in a tract, or more, if in fact defaults occur with the same probability within a tract as at the MSA level.[25] The problem with these tests, however, is that there is no recognition of the interdependence across tracts; that is, the tests as a group do not account for the fact that, with fixed margins at the MSA level, increases in defaults in one tract necessarily reduce the number that must be distributed across other tracts.

The outcomes of these "exact probability calculations" are given in the various panels of Table 13; each panel corresponds to an alternative definition of default and a different origination year combination. Panel F is included below and is the basis for some of our discussion; the remaining panels of Table 13 may be viewed in Appendix A. We present the total number of tracts in the first column, and in the remaining columns we show the fraction of tracts falling into each "Probability of Outcome" category. The latter probability is that of obtaining as many defaults as observed in a tract, or more, if in fact the tract-level default probability is the same as that at the MSA level.[26] These calculated probabilities are separated into three groups: 5 percent or less, 5 to 10 percent, and greater than 10 percent.[27] Hence, tracts falling in the first category (5 percent or less) are those for which the probability of obtaining as many or more defaults as that observed (assuming chance alone is responsible) is 5 percent or less; those in the second group are tracts for which the probability is more than 5 but less than 10 percent; and so on. In the first row of Panel F of Table 13, for example, we see that 6.93 percent of the 476 tracts in the Atlanta MSA have a probability of up to 5 percent, another 3.99 percent have a probability of more than 5 but no more than 10 percent, and the remaining 89.08 percent have a probability of more than 10 percent. Looking across the various panels of Table 13, we see that there are quite clearly numerous tracts in which the probability of obtaining as many or more defaults from chance alone is 5 percent or less, an observation that seems to reinforce the idea that the geographic distribution of defaults is unlikely to be generated by random forces, but instead there are real intertract differences in default probabilities.

There is, however, another interesting feature of Table 13 that deserves explicit mention. Even if there is a very low (less than 5 percent) probability that so many defaults would be generated within a tract if chance alone were at work, there is still *some* probability that randomness

---

[25] We use a binomial model, which entails an assumption of sampling with replacement. When calculating probabilities for an individual tract, the latter assumption is unlikely to be of great importance. That is, the alternative assumption of sampling without replacement, which is based on the hypergeometric distribution rather than the binomial, is likely to yield results that are very similar to those presented above.

[26] We may alternatively think of this as a significance level category for a test of the null hypothesis that the tract-level and MSA-level default probabilities are the same, against the alternative that the tract-level probability is higher.

[27] The analysis is performed on only those tracts with at least 2 loans in the origination years under consideration. Tracts with only one loan are guaranteed to fall in the third category when the MSA default rate exceeds 10 percent, and thus we exclude single-loan tracts from all calculations.

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL F: 1992 AND 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	476	6.93%	3.99%	89.08%
BALTIMORE, MD PMSA	460	6.74	2.83	90.43
CHICAGO, IL PMSA	1083	5.91	2.95	91.14
DALLAS, TX PMSA	489	5.93	2.66	91.41
DENVER, CO PMSA	396	4.55	2.02	93.43
DETROIT, MI PMSA	941	4.46	1.06	94.47
FORT LAUDERDALE, FL PMSA	140	6.43	2.14	91.43
FORT WORTH-ARLINGTON, TX PMSA	295	5.08	3.73	91.19
HOUSTON, TX PMSA	499	2.61	2.20	95.19
LOS ANGELES-LONG BEACH, CA PMSA	729	3.84	2.61	93.55
MEMPHIS, TN-AR-MS MSA	187	9.63	2.67	87.70
MIAMI, FL PMSA	203	5.91	2.96	91.13
MINNEAPOLIS-ST PAUL, MN-WI MSA	612	5.88	1.63	92.48
NORFOLK-VIRGINIA BEACH-NEWPORT	311	7.07	2.57	90.35
ORLANDO, FL MSA	215	7.44	2.33	90.23
PHILADELPHIA, PA-NJ PMSA	726	3.17	2.75	94.08
PHOENIX-MESA, AZ MSA	475	4.84	3.16	92.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	316	6.33	2.85	90.82
SACRAMENTO, CA PMSA	255	2.35	3.92	93.73
ST. LOUIS, MO-IL MSA	366	5.74	1.64	92.62
TAMPA-ST PETERSBURG-CLEARWATER	340	3.82	2.35	93.82
WASHINGTON, DC-MD-VA-WV, PMSA	755	4.90	2.78	92.32

alone is responsible for the observed disparity, *i.e,* that the tract-level default probability differs from the MSA rate only because of randomness. When conducting numerous tests of this kind, one expects to encounter some cases in which the unusual does in fact occur. A finding that some tract-level tests fail our standard is thus to be expected, and there is substantial risk in attributing much meaning to a finding that *some* tracts fail statistical tests. Indeed, the adoption of a 5-percent standard will, when applied independently to a large number of tracts, generate rejections that randomness is responsible in about 5 percent of tracts, even if it is true that only randomness is at work. Such is the fallible nature of statistical tests.

In Table 13, then, one might expect to find the second column containing about 5 percent of tracts and the third column another 5 percent even if randomness prevails. In Table 13 we find that the percentage of tracts in the second and third columns is typically less than five percent when defaults are measured as claims at two years, and thus these findings often appear consistent with the pattern anticipated if defaults occurred randomly within tracts at the same rate as in the MSAs as a whole. In other panels, especially those that pool the two origination years and measure defaults as uncured delinquencies (Panels F and I), we often find more than 5 percent of the tracts falling in the column pertaining to a significance level of 5 percent. The latter finding suggests that defaults occur too frequently in a disproportionate share of the tracts compared to what would be expected from chance alone.

It should also be noted that once again patterns for the claims only definition of default appear to differ somewhat from patterns that emerge for the other two default definitions. The differences are again consistent with the notion that claims at two years are disproportionately those defaults that are traceable to purely random factors.

Comparisons of the probability calculations for the two different origination years are also revealing. Table 14 (in Appendix A) presents these results. The first column of numbers in each row gives the number of tracts that appear in both origination years. The remaining columns give the percentage of these tracts for which exact probability calculations in Table 13 (for a particular origination year) yield a number of 5 percent or less, thus identifying the tract as a "high-default tract" in that year by our current standards. In the first row of Panel B, for example, we see that among the 384 Atlanta MSA tracts appearing in both origination years, 0.78 percent of the tracts are identified as high-default tracts in both years and 6.77 percent are identified as high-default tracts in only one of the two years. As might have been expected from the findings in Table 5 (in Appendix A), we see that there is a substantial change in the identity of tracts that test out as high-default tracts, which again reinforces the notion that at least some of the effects being picked up here are transitory.[28]

- **To conclude, this statistical work suggests that in many tracts default rates are too high to be plausibly explained by chance alone, though the fraction of such high-default tracts varies substantially from MSA to MSA. The identities of these tracts vary greatly with the year of origination, however, casting some doubt on the importance of the disparities in default rates.**

---

[28] If effects were purely transitory, in the sense of independent across years, we would expect to see that only 5 percent of the tracts singled out as high-default in one year would also appear as high-default in the other.

A more detailed statistical treatment presented in Section 5 will help reveal whether the apparent disparities hold up once we control explicitly for observable differences among the loans and borrowers within the tracts that are tentatively labeled as high-default.

4.2. Statistical Tests of Differences Across Lenders

4.2.1. Chi-Square Tests of Differences

We begin in an analogous way to that in the last section: by testing for independence of defaults across lenders within each MSA, holding fixed the total number of defaults in the MSA as well as the number of loans made by each lender. Table 15 (in Appendix A) shows the chi-square statistics[29] and the associated probability that these data could have been generated by chance alone if in fact there were no association between lender and default behavior. We see that, as was the case with tracts, very few lenders (relative to the number potentially available, as reported in Table 9) are included individually in the MSA-specific analyses, especially when defaults are defined to include only claims (Panel A). Once again, this fact casts serious doubt on the usefulness of such a series of tests. Where the analysis includes reasonably large numbers of lenders, we generally find very low probabilities (much lower than 0.01, or 1 percent) that the observed pattern could have arisen from chance alone. Hence, the evidence suggests --- again weakly --- that defaults are concentrated in lenders beyond what could reasonably be attributed to purely random forces.

4.2.2. Exact Probability Calculations

As in the last section, we now calculate the probability that each lender would have as many defaults as observed, or more, under the assumption that defaults for a lender occur randomly with the same probability as in the MSA as a whole. Table 16 reports the results of these calculations. Panel F is given below, and the remaining panels are in Appendix A. As was the case with an examination of census tracts, we see that some lenders fail the test and are thus identified as "high-default lenders" by the current standard.

As was the case with tracts, we see that in some panels of Table 16, especially those for which defaults are measured as claims at two years, there are generally no more than 5 percent of the lenders in the column that corresponds to a "probability of outcome" of 5 percent and no more than another 5 percent in the column that corresponds to a "probability of outcome" between 5 and 10 percent. As was the case with tracts, however, there are often more than 5 percent of the lenders in the column with a 5 percent "probability of outcome" when defaults are measured as uncured delinquencies, especially when both origination years are pooled. The evidence overall again suggests that disparities in default rates across lenders are not due to chance alone.

Comparisons across years are presented in Table 17 (in Appendix A), which is the lender analog to Table 14 for tracts. We see that a very small percentage of lenders are identified as "high-

---

[29] We require that a lender have an expected number of defaults of at least 5 in order to be included individually in the chi-square calculation.

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL F: 1992 AND 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	276	7.25%	4.71%	88.04%
BALTIMORE, MD PMSA	200	5.00	2.50	92.50
CHICAGO, IL PMSA	272	6.25	1.84	91.91
DALLAS, TX PMSA	231	7.36	2.16	90.48
DENVER, CO PMSA	234	5.56	1.71	92.74
DETROIT, MI PMSA	155	6.45	0.00	93.55
FORT LAUDERDALE, FL PMSA	231	3.90	3.46	92.64
FORT WORTH-ARLINGTON, TX PMSA	193	9.33	3.11	87.56
HOUSTON, TX PMSA	156	3.85	1.92	94.23
LOS ANGELES-LONG BEACH, CA PMSA	402	5.47	1.99	92.54
MEMPHIS, TN-AR-MS MSA	99	7.07	2.02	90.91
MIAMI, FL PMSA	242	6.20	2.48	91.32
MINNEAPOLIS-ST PAUL, MN-WI MSA	179	6.15	5.03	88.83
NORFOLK-VIRGINIA BEACH-NEWPORT	121	5.79	2.48	91.74
ORLANDO, FL MSA	162	3.09	4.94	91.98
PHILADELPHIA, PA-NJ PMSA	156	5.13	3.21	91.67
PHOENIX-MESA, AZ MSA	177	4.52	3.39	92.09
RIVERSIDE-SAN BERNARDINO, CA PMSA	451	5.10	3.10	91.80
SACRAMENTO, CA PMSA	195	3.08	4.10	92.82
ST. LOUIS, MO-IL MSA	106	3.77	6.60	89.62
TAMPA-ST PETERSBURG-CLEARWATER	177	3.95	0.56	95.48
WASHINGTON, DC-MD-VA-WV, PMSA	257	7.39	1.95	90.66

default lenders" for both years by our current standard, again suggesting that a portion of what is picked up here is transitory and thus less important.

- **The initial statistical work for lenders suggests that default rates for many lenders are too high to be plausibly explained by chance alone. The identities of these lenders vary with the year of origination, casting doubt on the importance of the differences in default rates.**

4.3. Comparisons with NTIC Designations

The exact probability calculations in the preceding sections identify tracts and lenders for which there is a low probability (5 percent or less) that chance alone could have resulted in as many or more defaults as that observed; we label these as high-default tracts and lenders. It is of interest to compare the tracts and lenders identified in this way with those that would be picked out by the methodology utilized in the NTIC study.[30] Recall that the NTIC methodology identifies tracts as "high-default" tracts if the tract default rate is at least 1.5 times the MSA rate, and it identifies the "10 worst lenders" in each MSA as the 10 lenders with the largest number of defaults.

To preview the findings, when applied to the data on tracts with over 30 loans, the method used by NTIC selects far more tracts as high-default than does the statistical procedure employed here. On balance, the tendency of the NTIC method to attribute too much meaning to default rates in tracts with few loans more than offsets the tendency of the NTIC method to require too high a default rate in tracts with very large loan volume. The NTIC method of identifying poorly performing lenders from among those that originate more than 30 loans identifies about the same number of lenders as does the statistical procedure, but the bias in the NTIC method towards selecting high-volume lenders yields a different assortment of lenders.

To simplify the exposition, we focus the discussion in this section on a single default definition: uncured delinquencies at two years. As usual, Appendix A contains the corresponding analyses for all three default definitions.

To proceed with the evidence on tracts, Table 18 compares the tracts identified as high-default according to the two different standards. Panel B is presented below; the remaining panels of Table 18 are in Appendix A. For purposes of this comparison, we restrict the selection of tracts to those with more than 30 loans in the two origination years combined, and we use exact probability calculations, on the one hand, and the NTIC method on the other, applied to the two years of origination data together. The two columns of each cross tabulation give the classification of a tract according to the statistical methods used in this study, while the two rows give the classification according to the methods utilized in the NTIC study. Each cell of a cross tabulation contains three numbers. The top number is the count for the cell; the second is the row percentage (the cell count divided by the total count for the two cells in the row); and the bottom number is the column percentage (the cell count divided by the total for the two cells in the column). We see in

[30] We emphasize that while we use the NTIC methodology, we do not use the data used by NTIC, and thus our results do not necessarily correspond to what would be found in the data actually used in the NTIC study.

TABLE 18

CROSS TABULATION OF HIGH DEFAULT TRACTS AS IDENTIFIED IN THIS STUDY VERSUS HIGH DEFAULT TRACTS AS IDENTIFIED USING NTIC METHODOLOGY*

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

		This Study		
		Non-High Default	High Default	Total
NTIC METHODOLOGY	Non-High Default	4368	6	4374
		99.86	0.14	100
		81.68	1.44	75.87
	High Default	980	411	1391
		70.45	29.55	100
		18.32	98.56	24.13
	Total	5348	417	5765
		92.77	7.23	100
		100	100	100

*Restricted to tracts with more than 30 loans.

the cell in the upper left of Panel B, for example, that when defaults are defined as claims at two years, 4,368 tracts are labeled as non-high-default tracts under both methods, that this number of tracts represents 99.86 percent of the 4,374 tracts labeled as non-high-default tracts using the NTIC methodology, and that the tracts in this cell are 81.68 percent of the 5,348 tracts labeled as non-high-default tracts in this study.

An examination of Table 18 reveals several interesting features. First, almost all tracts classified as high-default in this study are also classified as high-default using the NTIC methodology. Second, the NTIC methodology classifies tracts as high-default overzealously: about 70 percent of the tracts labeled as high-default in the NTIC study are labeled as non-high-default in this study, *i.e.,* do not pass a standard statistical test at conventional levels. These tendencies are reflected in the overall rates; this study identifies 7 percent of the tracts as high-default tracts while the NTIC methodology labels about 24 percent as high-default.

Table 19 (in Appendix A) looks at the same phenomenon in a different metric. Instead of counting tracts according to their classification under alternative labeling schemes, Table 19 counts loans in these tracts. Thus, Table 19 is like Table 18 except that each tract is weighted in accordance with the number of loans in that tract. The message from Table 19, however, is the same as that in Table 18.

Turning to lenders, Table 20 compares lenders identified as high-default or non-high-default in this study to lender representation among the "10 worst lenders," *i.e.,* those with the highest default volume in the MSA, the method used by NTIC. Panel B, presented below, shows that the 10 lenders with the greatest default volume do not appear to match at all well with those lenders with default rates that are significantly different from the MSA rate. (Panels A and C of Table 20 are in Appendix A.) The list of the 10 worst lenders misses 60 percent of the lenders identified as high-default in this study. Moreover, about 63 percent of the list of 10 high-default-volume lenders are labeled as non-high-default using the methods employed in this study. Both methods single out about 10 percent of the lenders, but the methods disagree strongly over which lenders should be identified as problem lenders.

Table 21 (in Appendix A) repeats the analysis of Table 20, except that now each lender is weighted according to its loan volume. Although results here are qualitatively similar to those in Table 20, they show, not surprisingly, that the "10 worst lender" method picks out large lenders, so that while only about 10 percent of lenders are selected by this method (Table 20, Panel B, above), these lenders account for about 39 percent of loans (Table 21, Panel B, in Appendix A). This size bias also explains why only 21 percent of the loans made by lenders classified as high-default in this study are made by lenders that are not in the "10 worst lenders" list, yet 60 percent of the lenders identified as high-default in this study are not in the "10 worst" list (Table 20, Panel B, above).

Tables 22 and 23 (in Appendix A) repeat the analysis in Tables 20 and 21 using an alternative way of picking out problem lenders. Here we use lender identification numbers, provided by HUD, to identify the 10 worst lenders in each city that are singled out by the NTIC study. For the ten MSAs analyzed in this study that also appear in the NTIC study,[31] we produce

[31] These MSAs are Atlanta, Baltimore, Chicago, Denver, Detroit, Los Angeles-Long Beach, Minneapolis-St.Paul, Philadelphia, St.Louis, and Tampa-St. Petersburg.

TABLE 20

CROSS TABULATION OF HIGH DEFAULT LENDERS AS IDENTIFIED IN THIS STUDY VERSUS TEN LENDERS WITH HIGHEST DEFAULT VOLUME*

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

		This Study		
		Non-High Default	High Default	Total
Default Volume	Non-High Default	1851	123	1974
	Volume	93.77	6.23	100
		93.02	60.29	89.97
	High Default	139	81	220
	Volume	63.18	36.82	100
		6.98	39.71	10.03
	Total	1990	204	2194
		90.7	9.3	100
		100	100	100

*Restricted to lenders with more than 30 loans.

a cross-tabulation of whether the lender is a high-default lender as identified in this study, by whether the lender is on the list of the "10 worst lenders" in the NTIC study. As seen in Table 22 (in Appendix A), the findings are as might have been anticipated from Table 20: there is disagreement in both directions, but the NTIC method is generally too quick to label a lender as high-default. Table 23 (in Appendix A), which provides a parallel analysis in which each lender is weighted by loan volume, tells the same story as Table 22.

- **Tables 18 through 23 show that the methods employed by NTIC can be either too stringent or too lenient in identifying problem tracts and problem lenders. Whether leniency or stringency dominates overall depends on the distribution of loan volumes and on MSA default rates. In the data used in this study, the NTIC methods generally identify tracts as high-default tracts overzealously and label the wrong set of lenders as high-default.**

It is particularly easy to use data presented in the NTIC report to illustrate the possibility of overzealousness in identifying high-default tracts in their own data, *i.e.*, labeling individual tracts as high-default that may easily owe their high default rates to chance. The NTIC study reports the MSA default rates and the average loan totals in the tracts they single out as high-default in each city. Utilizing their criterion of high-default (having a default rate that is at least 1.5 times the MSA rate), we can compute probability of obtaining the minimum number of defaults, or more, that would result in a label of high-default status in a tract of average size, under the assumption that the tract-level default probability is actually the same as that at the MSA level.[32] These probabilities are reported in the last column of Table 24 (in Appendix A). Hence, this column shows the probability that a tract with average loan volume would be labeled as a high-default tract by the NTIC standard even though its defaults occurred randomly at the MSA rate. These probabilities are generally in the 20 percent to 30 percent range, far higher than the probability conventionally applied in statistical work. That is, the NTIC method will in this case result in overzealous labeling of tracts as high-default.

The opposite problem is also a real possibility with the NTIC methodology, especially if applied to data with many loans per tract. That is, with large sample sizes, the requirement that tract default rates be at least 1.5 times the MSA rate can be far too demanding in the sense that tracts in which defaults occur far too frequently to be plausibly generated by chance may escape detection. More generally, a simple decision rule like that employed by NTIC is an inappropriate detection tool, and better methods are readily available.

[32] The minimum number of defaults was rounded up to the next higher integer.

SECTION 5

STATISTICAL ANALYSIS OF DATA ON INDIVIDUAL LOANS

5.1. Analysis of Defaults

The statistical evidence in Section 4 suggests that there are geographic and interlender disparities in default rates that are not due to chance alone. Those analyses, however, make no allowance for other factors that may account for differences in default rates. In this section we continue the investigation by taking a more detailed look at what underlies the default behavior of individual loans. Such an analysis will enable us to see whether the individuals who are located in what have tentatively been identified as high-default tracts, or served by what have tentatively been called high-default lenders, are more likely to default even after controlling for characteristics of the loan and borrower, and we will be able to measure directly any effects on default stemming from presence in a high-default tract or service by a high-default lender.

The main tool for this investigation is a logit analysis[33] of defaults of purchase money loans[34] for each of the 22 MSAs. We perform a separate analysis for each of the three measures of default, and analyses using all three measures are presented in Appendix A, but again the discussion is largely confined to defaults defined as uncured delinquencies at two years. To measure the impacts of interest, we include indicators for high-default tracts and high-default lenders specific to each origination year. That is, to determine the impact of residence in a high-default tract, we include an indicator for whether a 1992 loan is in a high-default tract for 1992 originations (ctin92, ntin92, and n95tin92, for claims at two years, uncured delinquencies at two years, and uncured delinquencies at 12/95, respectively). A separate indicator (ctin94, ntin94, and n95tin94) shows whether a 1994 loan is in a high-default tract for 1994 originations. Similarly, we include indicators for whether a 1992 loan has been originated by a high-default lender (cin92, nin92, and n95in92) and for whether a 1994 loan was made by a high-default lender (cin94, nin94, and n95in94).[35] The determination of "high-default" is made from the analyses in Tables 13 and 16; a tract (lender) is treated as high-default for a particular origination year if the probability of obtaining as many or more defaults is 5 percent or less using data from that origination year alone.[36] We further restrict

---

[33] We use logit, as opposed to linear regression, because of the qualitative, dichotomous nature of the dependent variable. A hazard model would probably be a superior alternative, especially for modeling default behavior over longer intervals of loan duration, though logit is adequate for present purposes.

[34] Some of the variables included in the logit analysis are available only for purchase money loans, which also constitute the vast majority of loans at issue.

[35] The decision to include separate year-specific indicators is an attempt to reduce the importance of changes in tract definitions between the two origination years.

[36] By this criterion, high-default tracts contain 23 percent of defaults under the claims-at-two-years definition, 22 percent of uncured delinquencies at two years, and 25 percent of uncured delinquencies at 12/95. High-default lenders contain about 21 percent of claims at two years, 27 percent of uncured delinquencies at two

this label to tracts and lenders for which the underlying volume of loans in the tract (lender) exceeds 30 in the origination year at issue.[37]

5.1.1. Explanatory Variables

Among the controls is a set of variables that are intended to capture the influence on default of several standard underwriting criteria. These variables include the loan-to-value ratio, the back end ratio (the ratio of housing expenses and other debt payments to income), the front end ratio (the ratio of housing expenses to income), assets after closing, and monthly income. Other controls, such as age, race, number of dependents, etc., which are not recognized in underwriting, but which seem empirically to affect defaults, are included as well.[38] The full list of explanatory factors, other than the high-default tract and high-default lender indicators, is as follows.

ltv: Loan-to-value ratio (expressed as a spline[39] with a breakpoint at 0.95)
back: Back end ratio (expressed as a spline with a breakpoint at 0.36)
front: Front end ratio (a spline with breakpoint at 0.27)
asst: Assets after closing (entered as a spline with breakpoints at $6,000 and $10,000)
incdiff: Monthly income (expressed as monthly income minus the MSA average of monthly income)
_94: Indicator for the 1994 origination year
age: Age of borrower (a spline with breakpoints at 30 and 40)
less15: Indicator for loan term of 15 years or less
mtgdiff: Loan amount (with MIP) expressed as a deviation from the MSA average
intdiff: Note rate (expressed as deviation from the MSA average, and splined with a breakpoint at 0.7)
sepmale, sglmale: Indicators for separated borrowers and for single male borrowers
sepfmle, sglfmle: Indicators for separated borrowers and for single female borrowers
armflag: Indicator for ARMs
condo: Indicator for condominiums
firstime: Indicator for first-time buyer
black: Indicator for black borrower
hispan: Indicator for Hispanic borrower

---

years, and 26 percent of uncured delinquencies at 12/95.

[37] Rerunning the analysis with a cutoff of 10 loans, rather than 30, appeared to give qualitatively similar results.

[38] See Neal (1989) and Quercia and Stegman (1992) for useful summaries of the default literature.

[39] Breakpoints in splines were determined by casual observation of bivariate plots of means of explanatory variables against default rates.

cnincdif:	Tract income divided by MSA median (from Census files[40])
blkcen:	Fraction of tract population that is black (from Census files)
hspcen:	Fraction of population that is Hispanic (from Census files)
unempcen:	Tract unemployment rate in 1990 (from Census files)
fhaorig:	FHA originations divided by total originations (from HMDA files[41])
cnvadeny:	Conventional denials divided by conventional applications (from HMDA files)
hasasset:	Indicator variable for the presence of positive assets
hascen:	Indicator variable for the ability to match the tract to Census data
hashum:	Indicator variable for the ability to match the tract to HMDA data

In addition to the MSA-specific analyses, for expository purposes we run pooled versions of essentially identical logits in which data from all 22 MSAs are included in a single estimation procedure. In contrast to the MSA-specific logits, the pooled logits include indicators for the particular MSA, as well as two variables that are measured at the MSA level --- "avgrate," the average MSA unemployment rates from origination through mid-1997 (from the BLS), and "house," percentage MSA house price growth from origination through the first quarter of 1997 (from the Freddie Mac Repeat Sales Index).[42] Because the latter two variables are obtained at the MSA level, they exhibit variation within an MSA only because of differences in dates of loan origination; these variables have been excluded from the MSA-specific analyses. They have, however, been included to help explain differences across MSAs in the pooled analyses.

5.1.2. Logit Estimates of Pooled Data

Because the sheer volume of output from the logits on the 22 individual MSAs is so large, we present only the full estimates from the pooled model;[43] the MSA-specific analyses are presented in Appendix B (available from HUD). These pooled logit estimates are presented in Table 25 (in Appendix A). The first column of numbers in each of the three panels presents the coefficient estimate,[44] the second is the standard error, the third is the asymptotic normal statistic (z), the fourth gives the significance level (probability of obtaining results this extreme if the true effect is zero,

---

[40] Those loans in tracts that cannot be matched to Census data are assigned values of zero for all Census-derived variables, and an indicator variable, "hascen," is assigned a value of one.

[41] Those loans in tracts that cannot be matched to HMDA data are assigned values of zero for all HMDA-derived variables, and an indicator variable, "hashum," is assigned a value of one.

[42] For the model using defaults defined as uncured delinquencies at 12/95, we also include a variable "month" that measures potential loan duration, the number of months from origination to December 1995.

[43] Coefficient estimates for the MSA indicators are not of interest for current purposes and are suppressed.

[44] The coefficient estimates in Table 25 measure estimated impacts on the logit index function and are therefore difficult to interpret directly.

based on a two-tailed test), and the final column is a pair of numbers that constitute a 95-percent confidence interval. As can be seen in the three panels of Table 25, the effects of high-default tracts and high-default lenders appear to be significantly different from zero, even after controlling for a variety of default-related factors. The findings also show that the control factors generally do matter, typically in the anticipated direction.[45] Notice also that the qualitative effects of these default-related factors are in line with what we have seen in Tables 6 and 11. For example, according to Table 25, higher LTVs are associated with higher default probabilities, while according to Tables 6 and 11, tracts and lenders with higher default rates have more substantial fractions of borrowers with high LTVs. Similarly, according to the findings in Table 25, higher default probabilities among individual loans are associated with lower asset levels; with first time buyers, black borrowers, and non-Hispanic borrowers; with lower tract income relative to the MSA; and with higher conventional denial rates in the tract. All of these factors, when measured in the various tract or lender default-rate categories, are also associated with higher aggregate default rates, according to the data presented above in Tables 6 and 11.

- **These findings reinforce the notion that lenders and tracts have high default rates partly because their loans tend to be riskier. Clearly, numerous factors, only some of which can or should be considered in underwriting, have effects on default.**

5.1.3. Logit Results for Individual MSAs

Despite the fact that controlling for a variety of default-related factors still leaves area and lender impacts, their magnitudes are considerably reduced. To see this, we turn to a summary of the results from logits estimated over each of the individual MSAs; all of the individual MSA-level logits are presented in Appendix B. This summary, presented in the three panels of Table 26, shows the estimated impact of high-default tracts and lenders in "raw" form, *i.e.*, before we control for other factors,[46] and in "adjusted" form, *i.e.*, after we control for other factors. Panel B is given below and is the main focus of the discussion. (Panels A and C are in Appendix A.) The raw and adjusted numbers in this table are expressed as estimated effects on the odds ratio. That is, each number in the table is the estimated multiplicative effect (of a high-default tract or a high-default lender) on the odds of default, where the odds of default are the probability of default divided by the probability of nondefault. Thus, for example, Panel B of Table 26 indicates that for the Washington, DC, PMSA, the raw effect of being in a high-default tract in 1992 was to increase the odds of default by a factor of 5.69. After adjusting for the factors included in the logit, the estimated effect falls to an adjusted impact of 2.72; that is, after adjustment, being in a high-default

---

[45] Note that variables that are splined are represented by as many coefficients in the logit as there are segments in the spline. Each such coefficient is identified with the basic variable name (*e.g.*, ltv) as the first part of the coefficient name. The first such coefficient name gives the effect in the first segment of the spline, and each succeeding coefficient measures the marginal effect (and its significance level). Thus, the total effect of the variable in any segment of the spline is the sum of the coefficients pertaining to that segment and all previous segments.

[46] Estimates of raw effects were obtained from MSA-specific logit analyses that included only the year-specific high-default indicators and an indicator for 1994 originations.

TABLE 26

Raw and Adjusted Odds Ratios for High-Default Tracts and High-Default Lenders from MSA-Specific Logits

Panel B: Uncured Delinquencies at Two Years

	Tracts								Lenders							
	1992				1994				1992				1994			
MSA Name	raw	Z	adjusted	Z	raw	Z	adjusted	Z	raw	Z	adjusted	Z	raw	Z	adjusted	Z
ATLANTA, GA MSA	5.35	6.66	3.12	4.08	2.92	5.42	1.97	3.11	2.54	5.38	1.63	2.41	2.26	6.85	1.79	4.50
BALTIMORE, MD PMSA	7.70	7.19	4.18	4.79	3.60	6.86	2.09	3.63	2.95	3.66	1.55	1.29	2.08	6.12	1.57	3.42
CHICAGO, IL PMSA	4.91	11.05	2.56	5.96	3.78	13.90	2.06	6.70	1.95	5.54	1.41	2.60	2.06	9.96	1.59	5.78
DALLAS, TX PMSA	4.15	6.53	2.70	3.77	5.48	8.64	3.08	4.95	3.62	7.52	2.79	4.82	2.52	5.28	1.73	2.87
DENVER, CO PMSA	14.89	8.90	8.41	6.27	4.95	6.89	3.95	5.44	5.85	2.86	6.46	2.90	2.18	4.28	2.03	3.64
DETROIT, MI PMSA	4.67	6.10	2.74	3.62	3.44	8.29	1.71	3.14	3.88	6.16	1.30	1.06	5.02	12.05	2.15	4.93
FORT LAUDERDALE, FL PMSA	5.08	2.58	2.41	1.13	1.91	2.17	1.89	2.02	2.15	1.82	1.95	1.52	2.31	3.80	2.06	2.97
FORT WORTH-ARLINGTON, TX PMSA	4.09	2.80	2.52	1.45	2.19	2.84	0.72	-0.44	4.16	4.63	2.50	2.37	5.84	7.27	3.22	4.04
HOUSTON, TX PMSA	0.90	-0.14			2.26	3.45	4.40	3.87	2.38	3.31	1.94	2.04	1.58	1.96	1.02	0.07
LOS ANGELES-LONG BEACH, CA PMSA	1.63	2.11	1.78	2.35	2.35	8.56	1.99	5.77	2.98	6.60	2.78	5.53	2.17	6.29	2.10	5.57
MEMPHIS, TN-AR-MS MSA	3.58	4.93	1.91	2.18	3.84	8.54	2.17	4.34	2.47	3.78	1.82	2.26	1.45	1.87	1.42	1.38
MIAMI, FL PMSA	3.45	3.18	2.72	2.44	2.90	7.34	2.91	5.38	5.10	6.49	3.75	4.89	2.81	8.07	2.10	5.05
MINNEAPOLIS-ST PAUL, MN-WI MSA	11.39	9.34	7.32	7.04	4.40	6.33	3.77	5.35	3.58	4.94	3.26	4.17	1.87	3.43	1.82	3.02
ORLANDO, FL MSA	1.38	0.32	1.67	0.49	4.28	6.89	2.45	3.55	2.79	2.50	2.70	2.32	1.84	3.80	1.29	1.36
PHILADELPHIA, PA-NJ PMSA					2.05	5.63	1.46	1.63	5.06	4.02	3.55	2.98	1.68	4.43	1.41	2.59
PHOENIX-MESA, AZ MSA	4.69	6.39	3.69	4.95	3.83	7.42	3.35	6.26	1.72	2.87	1.58	2.20	1.69	3.33	1.39	1.92
RIVERSIDE-SAN BERNARDINO, CA PMSA	2.64	7.95	2.23	5.43	2.19	7.06	1.99	5.76	1.96	5.12	1.88	4.23	1.52	4.83	1.44	3.80
SACRAMENTO, CA PMSA					4.03	4.84	2.68	2.90	3.69	1.75	2.39	0.81	3.89	3.54	4.23	3.36
ST. LOUIS, MO-IL MSA	6.65	4.30	3.19	2.45	2.41	4.85	2.04	2.10	2.90	2.03	2.17	1.42	2.66	4.14	1.99	2.66
TAMPA-ST PETERSBURG-CLEARWATER					1.79	2.65	2.74	3.16	3.38	4.71	2.82	3.62	2.34	5.17	1.75	3.05
WASHINGTON, DC-MD-VA-WV, PMSA	5.69	6.46	2.72	3.00	2.48	9.07	2.63	6.63	2.23	4.70	1.86	3.27	2.25	9.03	1.73	5.51

tract is estimated to increase the odds of default by a factor of 2.72, rather than 5.69. The reduction in the estimated odds ratio is impressive, but the estimated impact after adjustment remains fairly high. In addition, we present the asymptotic normal statistic (z) for each coefficient estimate.[47]

Comparing the raw with the adjusted effects in Table 26, we see that for the vast majority of MSAs, there is a substantial decline in the estimated impact of high-default tracts and lenders. The aforementioned change in the estimated impact for high-default tracts in 1992 in the Washington, DC, PMSA is but one example. There are some cases in which the estimated impacts rise after introducing controls, particularly in Panel A, but these cases are relatively rare.[48] In addition, there are a number of cases in which the adjusted effects are no longer estimated to be significantly different from zero.[49] Thus, the fractions of tracts and lenders that are labeled as high-default --- fractions that were already substantially below the fractions yielded by the NTIC methodology (in the case of tracts) --- are thus further reduced, and the estimated impacts of high-default tracts and lenders are generally reduced as well.

- **To conclude, we find that controlling for a variety of default-related factors usually reduces the estimated impact on default of residence in a high-default tract or origination by a high-default lender. In most MSAs, however, estimated impacts are still significantly different from zero.**

5.1.4. Possible Reasons for Area and Lender Effects

Even after allowing for the influence of a wide variety of factors, there are typically still significant effects of high-default tracts and lenders. Although underwriting practice and lender servicing could be the problem, there are numerous other possibilities that are also plausible and which deserve mention. First, important underwriting factors, particularly all aspects of the borrower's credit history have been omitted from this analysis simply because we lack such data. Although we cannot tell whether this omission is the only factor leading to the appearance of tract and lender effects, it likely is a very important contributor.

Second, even if all underwriting guidelines are followed perfectly, the uneven distribution of house price growth, unemployment, etc., will likely lead to pockets of defaults. We lack detailed local information on such factors at the tract level; the information we do have is measured at the MSA level. Tract-to-tract differences are likely and might help explain intertract and interlender differences in default rates. Even such factors as illness, death of the borrower, and divorce, which

---

[47] The standard we use most other places in this paper is a significance level of 0.05 in a one-tailed test, for which the corresponding value of z is 1.645. For a two-tailed test at a significance level of 0.05, the value of z is 1.96.

[48] We may in some instances have poor estimates of the effect of other factors, leading perhaps to greater impacts being attributed to lender and tract.

[49] There are also some cases in which the raw effect is estimated to be insignificantly different from zero. This anomalous finding may reflect (a) our use of "good" data on purchase money loans for the logit, in contrast to the use of many more loans for the exact probability calculations, and (b) the use of a different probability model for the logit than for the exact probability calculations.

may help precipitate default, can display geographic differences that, while temporary, could lead to corresponding temporary differences in default rates.

Third, the data are surely not error free. Virtually all of these series are error-ridden measures of what they purport to measure. In many cases, even a perfectly measured variable would be only a readily available proxy for the unavailable variable that we would prefer to obtain. Measurement errors in explanatory variables generally reduce the ability of these factors to explain defaults, often causing other related variables to appear significant. Suppose, for example, that perfectly measured LTV is positively related to the incidence of default and also varies across tracts and lenders. We may find that an imperfectly measured LTV variable will fail to pick up all intertract and interlender variation in defaults arising from variation in true LTV, with the result that tract and lender effects fail to vanish even when controlling for measured LTV.

Fourth, the ability of the statistical analysis to explain defaults rests on assumptions about the way in which each of the included factors affects defaults. Failure to represent properly the way in which these factors operate mathematically could also lead to incomplete adjustment for these controls and an appearance that particular tracts or lenders have inexplicably high default rates.

Given the substantial declines in the estimated impacts of high-default tracts and lenders when we introduce other controls --- many of which may be more closely related to longer term defaults than to the early defaults examined here --- it is not inconceivable that a full set of controls would reduce estimated impacts to essentially zero. There is, however, no way of telling in advance of actually performing the operation. Thus, while the evidence contained herein indicates the existence of high-default tracts and lenders in at least some MSAs, this conclusion should be strongly tempered by the realization that these findings might well vanish if we could better measure all appropriate determinants of default.

It is possible, of course, that the appearance of high-default tracts or lenders arises because of poor underwriting and overly eager foreclosure policies by lending institutions. The findings above do not imply that underwriting guidelines are being followed by individual lenders or that guidelines are being followed in all areas, nor do they imply the contrary. That is, default related factors will have effects whether or not underwriting excludes those deemed to be "poor risks." Indeed, even if a set of default-related factors were to reduce all estimated tract and lender effects to zero, it would not follow that underwriting guidelines were or were not being followed. Unfortunately, direct testing of whether guidelines are being followed would require relatively error-free data on all underwriting factors, as well as a way to quantify correctly all underwriter judgement. These tasks are beyond the ability of FHA data to deliver.

- **Lack of data on credit history of borrowers, together with a variety of statistical difficulties, may in part explain why some tracts and lenders appear to affect default probabilities adversely. The FHA data do not permit us to tell whether underwriting criteria are or are not followed, and whether differences in default rates are in any way traceable to lax underwriting.**

5.1.5. Additional Comparisons with the NTIC Findings

In Section 4.3 we compared the numbers of high volume tracts and lenders (those having greater than 30 loans) that this study identifies as high-default entities with high volume tracts or

lenders identified as high-default using the NTIC methodology. Both the statistical methodology and the NTIC methodology employed to identify high-default entities are based on comparisons of each tract or lender individually with the MSA as a whole. There are no corrections for differences among the loans or borrowers serviced in the tracts. In addition, there is no allowance for the fact that the presence of high-default tracts or lenders (or low default tracts or lenders, for that matter) in the MSA affects the default rate in the pool of all MSA loans against which comparisons are made. The statistical work in Section 5 adjusts for a host of default-related factors in evaluating whether the tracts and lenders labeled as high-default by the simple statistical methodology have, as groups, significant effects on default probabilities of individual loans.

In this section we ask whether any of the high volume tracts or lenders that the NTIC methodology labels as high-default, but which are not labeled as high-default by the simple statistical methodology utilized in Section 4, have significant effects on default probabilities. Because of the burden of carrying out this exercise for each MSA, we use only the Chicago MSA as an example, though we cannot, of course, be certain whether this example is representative. In addition, we perform the exercise only for the default definition that uses uncured delinquencies at two years. To perform this exercise, we again use purchase money loans in the Chicago MSA to estimate a logit model like that described above; in this case, however, we replace the indicators for the high-default tracts and lenders as identified with the statistical methodology with indicators for each of the high-default tracts and lenders identified using the NTIC methodology that were not also identified as high-default by the statistical methodology.[50] The result is the inclusion of 12 origination-year-by-lender indicator variables and 63 origination-year-by-tract indicator variables to pick up the combinations of lenders and years, and the combinations of tracts and years, labeled as high-default by the NTIC methodology only. Upon estimating this logit, we find that for 9 of the 12 lender indicators, the estimated effects are of the "wrong" sign, *i.e.*, the estimates indicate that loans from these lenders have *lower* default probabilities for that origination year, other things the same, and the other 3 indicators are of the "right" sign but are not significantly different from zero (at even a 10-percent level in a two-tailed test). For tracts, we find that 24 indicators are of the "wrong" sign, another 21 are of the "right" sign but statistically insignificant, and 18 are of the "right" sign and significantly different from zero at the 10-percent level or better (in a two-tailed test).[51]

---

[50] More precisely, to ensure that the results are not biased by using one sample for the logit and a slightly different sample to identify the high-default tracts and lenders, we rerun the analysis to identify high-default tracts and lenders on the sample of Chicago purchase money loans for the two years separately (for identifying high-default entities under the statistical method) or for the two years together (using the NTIC method). We identify tracts and lenders as high-default for the logit only if the tract or lender has more than 30 loans in the origination year of the individual loan observation and is singled out by the NTIC method and not the statistical method for that particular origination year.

[51] Introducing four additional indicators for the year-specific groups of high-default tracts and high-default lenders identified in this study, we get qualitatively similar results for the coefficients on tracts and lenders that are held to be high-default in the NTIC study only. Among the individual tracts identified as high-default under the NTIC method alone, we find 18 have the "wrong" sign, 25 have the "right" sign but are statistically insignificant, and 20 are statistically significant with the "right" sign. Among lenders identified as high-default under the NTIC method only, we find that 4 have the "wrong" sign, 5 have the "right" sign but are statistically

The fact that coefficients for 18 of these tracts show up with significant effects, whereas none showed a statistically significant difference in the simpler statistical tests based on the binomial, deserves explanation. There are at least two reasons for these seemingly inconsistent findings. First, in the logit we control for the influence of a variety of default related characteristics of the loan and borrower when asking whether the tract has an effect; in the simple statistical tests there are no such controls. Second, in estimating the effect of each tract and lender for which an indicator is entered, the logit removes the effect of all other tracts and lenders for which separate indicators are entered; in contrast, the simpler statistical procedures compare each tract or lender against the MSA as a whole. To illustrate the importance of latter point, suppose there are four tracts, A, B, C, and D. The simple statistical methods used in Section 4 decide whether to label tract A as high-default by comparing the default rate in A to that in the pool composed of A, B, C, and D. In contrast, abstracting from other default related factors, a logit analysis that introduces indicators for, say, tracts A and B, implicitly compares the default rate of loans in tract A to loans in the pool composed of loans from C and D only. Removing tracts B and A from the comparison group can thus give different results than if these loans were included.

One should not conclude that this finding justifies the nonstatistical methods employed by NTIC; as noted the selection of lenders and tracts singled out by NTIC's methods turned up many with estimated effects in the "wrong" direction. The lesson here is that there are interdependencies in estimating logits, and estimated effects for each tract and lender may be sensitive to the inclusion of indicators for other tracts and lenders. Indeed, by searching for, and including indicators for, "low default tracts" and "low default lenders" one may find that some of the tracts previously estimated to be high-default are no longer classified as high-default. Labeling a tract or lender as high-default inevitably depends on the composition of the comparison group. To help prevent overlooking possible problem areas, it may be somewhat safer to start by statistically identifying overly inclusive groups of high-default tracts and lenders, letting more detailed statistical analysis determine which ones survive after correction for observable differences in borrowers and loans.[52]

5.2. A Tentative Analysis of Lender Responses to Delinquencies

As noted, the FHA data accessed here exclude potentially crucial ingredients in the underwriting decision, thus making it impossible to account for a full complement of default-related factors and similarly making it impossible to ascertain directly whether underwriting guidelines are being followed. The existing FHA delinquency data do, however, permit at least a crude analysis of two aspects of lender servicing behavior: the frequency with which alternatives to foreclosure are offered and the speed with which lenders intervene in a delinquency. Both of these seem to be of concern in the NTIC study, though no real evidence is offered there on either dimension of lender behavior. We pursue this brief empirical study with some misgivings; this analysis relies heavily

---

insignificant, and 3 have the "right" sign and are statistically significant.

[52] Alternatively, one could select problem areas by comparing actual default rates to rates predicted on the basis of a model, estimated nationally or locally, that takes account of characteristics of loans and borrowers. The difficulty with the latter method is in appropriately allowing for current conditions in local housing markets that may make them behave unusually well or unusually poorly.

on the completeness and accuracy of the delinquency data that have already been called into question. We thus proceed provisionally and with even more than the usual dose of *caveat emptor*.

The approach is as follows. We extract each occurrence of a 90-day delinquency in all of the data on the 1992 and 1994 originations that underlie this study, and we then classify the very next event into one of three categories: (1) censored by the closure of the data series (*i.e.*, no additional events are recorded), (2) cure instituted by the borrower, or (3) action taken by the lender, which could include a move to foreclose or an offer of an alternative to foreclosure (defined to include an offer of forbearance, repayment plan, modification, or assignment[53]). We then ask whether actions taken by the lender occur more quickly for lenders that we have identified as high-default than for non-high-default lenders.[54] For this calculation we treat both censored-by-close-of-data and cures as censored events, for both of these actions preclude our observing what the lender would have done in the absence of these intervening events. Using Cox regression to estimate a simple hazard model of the instantaneous probability of lender intervention, we find that high-default lenders intervene more quickly (z=2.685) when we use the claims-at-two-years definition of default, less quickly when we use the delinquencies-at-two-years definition of default (z=-1.86), and less quickly (though not significantly so) when we use the uncured-delinquencies-at-12/95 definition of default. The results regarding the speed of lender intervention are thus ambiguous.[55]

Because the lender interventions analyzed above include both movements to foreclose (which some would consider "bad") as well as offers of alternatives to foreclosures (which might be considered "good"), we further ask whether high-default and non-high-default lenders differ in the frequency with which one or the other is offered, given that some lender action is taken. Table 27 (in Appendix A) presents the appropriate cross tabulations. (Contents of cells follow the same format as the cross tabulations presented in Tables 18 through 23.) Notice that only about 8 to 10 percent of the lender actions fall into the "good" category, and that we again have mixed results. When the first definition of default is used (Panel A), high-default lenders offer alternatives to foreclosure more frequently than do non-high-default lenders, and the differences are significant at conventional levels. In Panel B high-default lenders are observed to move to foreclosure more frequently, while in Panel C, the opposite is true. In neither of the latter two panels do we see differences that are statistically significant at conventional levels, however.

- **Putting aside concerns about the data used in this exercise, the evidence in this section points to no consistent and important difference in the speed with which high-default lenders act on a delinquency, nor do we see any substantial evidence of a bias towards foreclosure among high-default lenders responding to delinquencies.**

---

[53] Inclusion of assignment could be problematic since borrowers could gain entry into the program even without lender support.

[54] For all of this section, we identify high-default lenders using the exact probability calculations in Table 16 for the two origination years together, and we restrict attention to lenders with at least 30 loans in the two years together.

[55] Reformulating the hazard model by reclassifying as censored all offers of alternatives to foreclosure (thus treating only movements to foreclose as uncensored) also yields ambiguous findings. None of the high-default lender effects were significantly different from zero at conventional levels.

SECTION 6

A SUMMARY OF THE METHODOLOGY AND GENERAL FINDINGS

6.1. Choosing Time Periods, Default Definitions, and Areas

Here we review the methods employed in this study, as well as a few of the general findings. The reader is referred to the summary at the beginning of the paper for a statement of more specific and detailed findings and conclusions.

The presumed main purpose of an analysis like that reported here is to identify neighborhoods and lenders for which high default rates are indicative of some failure. Although such failure could include poor servicing performance by lenders, the possibility of poor underwriting practice is a major focus. Poor underwriting practice could take two forms: either guidelines promulgated by FHA are not being followed, or the FHA underwriting criteria are themselves defective. Because the major focus is on underwriting, it is sensible to restrict the investigation to evidence that will most clearly indicate underwriting deficiencies. In our view, a focus on default activity in the early years reflects most clearly on underwriting, in part because many of the factors that can be measured at loan qualification can and do change over time. Even though autocorrelation tends to make factors (*e.g.*, income) measured at loan qualification fairly predictive for some time afterward, even these autocorrelations are not strong enough to make for excellent predictive power many years after underwriting takes place. In addition, a focus on relatively short loan durations will still permit identification of other difficulties; for example, servicing problems seem likely to show up in default experience at all loan durations.

As noted earlier, we do not deny that default activity far later in the life of the loan could still be influenced by underwriting policy. A dramatic decline in the acceptable level of the loan-to-value ratio, for example, could reduce default activity many years after loan origination. It is simply that many of the effects of underwriting factors become more tenuous as loan duration rises. The current study operationalizes this idea by focusing on two measures of default that measure loan status two years following loan origination, and a third that measures loan status at up to four years.

There is a related question of how to define a default. The operating assumption in this paper is that while there are some costs to delinquencies, foreclosures are the major events to be avoided, and the purpose of the analysis is ultimately to help reduce foreclosure probabilities. A broad definition that includes as defaults all loans in delinquency status will pick up many loans that will never enter foreclosure, and this definition is thus too broad. At the other extreme, restricting the definition of default to loans that have gone to claim will miss many loans that are in the earlier stages of a foreclosure process that is certain to be completed. Moreover, the speed with which delinquencies make their way to claim depends in part on state foreclosure practices and laws. Including as defaults those delinquencies that have not been observed to cure for at least several months after becoming 90-days delinquent seems to be a reasonable middle ground. Including these delinquencies-in-progress is likely to pick up most delinquencies that will terminate in foreclosure at the conclusion of the existing spell, while excluding many loans with delinquency spells that are likely to end in cure. Two of the measures examined in this paper follow the latter strategy, while the other uses only claims to measure default activity.

Having decided on a definition of default and a time at which to measure delinquency, the next task is to look at default activity so defined within an appropriate geographic area and within an appropriate set of origination years. Time of origination is relevant in part because the underwriting criteria or their enforcement --- *i.e.,* the objects at issue --- may themselves change, but also because changes in the economic environment may alter the default rates against which performance is to be measured. For similar reasons, it is desirable to focus an investigation of geographic dispersion in default rates on relatively homogeneous areas so that problem areas are not hidden by aggregation with areas that are not suffering from high default rates. The current study assumes that census tracts are homogeneous neighborhoods and that two origination years (1992 and 1994) which are separated by one year are sufficiently homogenous. We find, however, that there are substantial differences in the tracts and lenders that are identified as high-default in the two origination years used in this study.

In building a sample by using small neighborhoods or narrow intervals of loan origination, one trades off sample size for homogeneity, and there are several costs in reducing sample sizes that should be considered. First, small samples make it difficult to detect default rates that are substantially higher than the standard against which one is measuring. Suppose, for example, the MSA default rate is taken as the standard for comparison, and the MSA default rate over the relevant time interval is, say, 5 percent. Suppose further that we agree to use a significance level of 5 percent in our tests. That is, we will reject the notion that the true, underlying default probability in an area is the same as the MSA rate (and thus we will label the area as a high-default area) only if the probability of finding at least as many defaults as what we actually observe is calculated to be 5 percent or less when the area default probability is the same as the MSA default rate. If a particular area has only five loans over this same period, our decision rule would lead us to assign high-default status to the area if we find two or more defaults among the five loans. Suppose, however, that the true, underlying probability of default in the area were 20 percent. The probability of finding one or fewer defaults among the five loans, and thus incorrectly failing to label the area as a high-default area, is about 73 percent. There is thus an excellent chance that a small area where the true underlying probability of default greatly exceeds the underlying MSA rate will escape detection.

Another advantage in large sample sizes is that they increase the accuracy of tests based on large sample approximations. As seen in our discussion of the chi-square tests, the combination of small samples and rare events can make some standard tests virtually unusable.

An unrelated difficulty with utilizing areas or lenders with small loan volume is that the potential gains from reductions in the default rate will tend to be small as well. There are likely to be costs in conducting a statistical investigation and in instituting and monitoring corrective action when called for, and these resources are better spent where the prospective gains are largest, which will generally mean dealing with larger areas or lenders, or only those small-volume areas or lenders with especially high default rates.

6.2. Statistical Analysis of Default Probabilities

Having identified relatively homogeneous observational units --- areas or lenders --- the next simple step is to make an initial statistical exploration to compare performance to the benchmark. A useful benchmark is a rate calculated over a larger area (such as the MSA) in the same time period, under the assumption that an MSA-wide average recognizes that idiosyncratic events may

affect the area as a whole and cause it to have a different experience than other MSAs. One does not want to mix in these effects with any due to policies of individual lenders. At the same time, the use of MSA rates as a benchmark in low-default MSAs means that some tracts and lenders labeled as high-default may have default rates that are low enough to be considered unimportant from a practical standpoint. A related implicit assumption is that within-MSA comparisons are not distorted by differences in, say, the average quality of lenders across MSAs. For example, a comparison of the default rate of each lender to that in the MSA as a whole assumes that the default rate in the MSA as a whole is not strongly affected by, say, an abundance of poorly performing lenders in that particular MSA.

It is reasonable to begin with simple tests of association, like the chi-square, which are easy to calculate and can give a useful overall view of disparities in the market as a whole. As we have seen above, however, sample size requirements can be steep when dealing with rare events. If these tests give evidence that defaults are not distributed independently of tract or lender, it makes sense to turn to an examination of individual tracts and lenders, again starting with an analysis based on counts of loans and defaults. Simple tests based on the binomial, like those used above, are again easy to calculate and should reveal the particular tracts or lenders where problems may lie. It should be noted, however, that although starting with tests based on the statistical analysis of raw default rates minimizes data requirements, using such an initial screen could mask poor performance by lenders that operate in low-default tracts.

One should expect to find that some areas or lenders will fail the statistical tests; that is, for some areas and lenders there will be a low probability that as many defaults as are observed would occur by chance alone. One should not jump to the conclusion that such areas or lenders are necessarily problem prone. Rare events do occur and, especially when the number of tracts or lenders examined is quite large, one can expect to find that exceptional cases do indeed occur. Thus, what may appear unlikely to be chance does indeed occur by chance.

To help isolate tracts or lenders for which there really are problems, it may help to look for evidence of longer lasting effects. The assumption is that transitory problems will be viewed quite differently than more permanent difficulties, in part because temporary difficulties will be of less importance, and in part because they may be less amenable to remedial action. Hence, it may be informative to see if the same areas or lenders appear to have difficulties in more than one time period, restricting additional attention to those that appear to have problems more consistently.[56]

Those areas or lenders that appear to have longer lasting deficiencies may be subjected to additional analysis to see whether there are plausible reasons for the observed disparities in default activity that do not reflect poor underwriting or servicing. That is, the lack of controls for relevant factors makes raw differences alone rather irrelevant. Thus, one should examine intertract and interlender differences systematically by including other measurable default-related factors to see if such factors explain away observed differentials. Statistical procedures such as logit (which was used in this study), probit, or even linear regression may be applied to this problem at the level of the individual MSA.

There is no guarantee that estimation of statistical models for a single MSA will yield

---

[56] In the empirical work above, we looked for additional evidence on even those areas or lenders that failed the statistical tests for one origination year only. The reason we did so, however, is that we were concerned that intertract or interlender patterns in incomplete default data could cause some areas or lenders to appear acceptable when they are not.

appropriate estimates for key parameters, especially when the time period for originations is quite limited as well. The logit results for individual MSAs, presented in Appendix B, show many instances in which we obtain strange estimates for parameters for which the pooled logits, which utilize evidence across MSAs as well as within, obtain reasonable estimates. In such an event, one alternative is to use national samples to obtain parameter estimates that can be used as constraints in the MSA-level analysis.

Notice that when performing a more detailed statistical analysis, there is an advantage in deviating from what was done in the current study by making separate indicators for each individual tract or lender that has been singled out as potentially problematic. If complete separation is infeasible or undesirable (because, say, there are many tracts in the potentially high-default group), separation into small groups of tracts is an appealing alternative. Treating these areas or tracts as separate in the statistical procedures will make it possible to avoid having to make a blanket judgment on all potential problem areas together and instead permit one to single out those individual tracts or lenders that still appear troubled even after controlling for other factors.

Notice also that a more systematic study of default that controls for a variety of default-related factors could also serve to identify tracts or lenders that are under performing despite the fact that their raw default rates do not fail statistical tests. Picking these out would require a study of residuals by tract or lender.

6.3. Statistical Analysis of Lending or Servicing Practices

Whether or not the more detailed statistical analysis shows that interlender differentials vanish when additional factors are properly accounted for, one would want to see if lenders are following underwriting guidelines. Doing so, however, will require more data on underwriting factors (*e.g.*, on credit history) than were available in the current study or are generally available in FHA data files. The advent of automated underwriting systems may make such data more readily available for analysis. If the evidence is that underwriting guidelines are followed, and properly accounting for these and other factors explains away interlender and intertract differentials, then attention could turn to the possibility that underwriting criteria should be changed to include new factors or alter the tradeoffs permitted among existing underwriting factors.

Even if tightening underwriting criteria could be expected to reduce default rates, both overall and for specific areas and lenders, it does not of course follow that FHA should take such a step. FHA serves less affluent borrowers, thus extending home ownership to those who are less well served by the conventional market. Presumably, the benefits of homeownership in and of themselves serve to improve neighborhoods by promoting stability. Although reducing the risk in FHA lending by raising loan qualification standards can be expected to reduce default rates, it can also be expected to reduce FHA's ability to support the market that it has historically served. The result may be a lower default rate, but also reduced homeownership rates and thus reduced neighborhood stability. Thus, there is a tradeoff inherent in policy choices.

There is a very real possibility that unexplained differences among tracts and lenders will remain even after performing statistical analysis designed to adjust for a host of other factors. As in the current study, one may find that the impacts of tracts and lenders are reduced and in some cases vanish completely, but substantial estimated impacts remain for some lenders and some tracts. For a variety of reasons, this kind of result is not unexpected. Various underwriting factors may not be observed or they may be observed with considerable error, or other determinants of default may

go unmeasured, and these factors may not be distributed evenly across tracts or lenders. In addition, analysts may not be able to reduce underwriting guidelines to simple formulas dealing only in observables. Underwriter judgement in particular may be difficult to quantify.

In the event that tract and lender impacts remain, additional avenues of inquiry could also be pursued. Data permitting, one could obtain measures of a variety of aspects of servicing performance --- intervals of delinquency prior to foreclosure, for example --- and employ these data to analyze differences in behavior across lenders. Pursuit of this idea in the current study, which raised serious questions of data quality, did not reveal any important and consistent differences in the speed with which high-default lenders intervened or the frequency with which the intervention took the form of an offer of an alternative to foreclosure.

Provided one had the resources, one could, of course, go further. One could, for example, sample application records from suspect lenders and use these to perform statistical analyses designed to see whether underwriting guidelines are followed. Such prospects are well beyond the scope of the current study but could be pursued elsewhere.

REFERENCES

Fleiss, J.L. *Statistical Methods for Rates and Proportions.* New York: John Wiley & Sons (1981).

Holloway, Thomas M., Gregor D. MacDonald, and John W. Straka,"Credit Scores, Early-Payment Mortgage Defaults, and Mortgage Loan Performance." Prepared for 1993 ORSA/TIMS Joint National Meeting. Phoenix, Arizona: November 1, 1993.

National Training and Information Center. "The Devil's in the Details: An Analysis of Federal Housing Administration Default Concentration and Lender Performance in 20 U.S. Cities." October, 1997.

Neal, Sue G. "Review of the Mortgage Default Literature," U.S. Department of Housing and Urban Development, Office of Policy Development and Research, unpublished working paper (December 1989).

Quercia, J.M. and Michael A. Stegman. "Residential Mortgage Default: A Review of the Literature." *Journal of Housing and Research, 3, no. 2* (1992):341-80.

APPENDIX A

LIST OF TABLES

TABLE 1

MSA DEFAULT RATES (PERCENT) BY DEFAULT DEFINITION AND YEAR OF LOAN ORIGINATION

MSA NAME	DEFINITION OF DEFAULT								
	Claim at Two Years			Uncured Delinquency at Two Years			Uncured Delinquency at 12/95		
	1992 Originations	1994 Originations	Both Origination Years	1992 Originations	1994 Originations	Both Origination Years	1992 Originations	1994 Originations	Both Origination Years
ATLANTA, GA MSA	0.56%	0.64%	0.60%	1.40%	2.73%	2.04%	2.67%	1.65%	2.18%
BALTIMORE, MD PMSA	0.41	0.82	0.62	1.30	3.20	2.27	2.67	1.61	2.13
CHICAGO, IL PMSA	0.40	0.53	0.47	1.53	3.32	2.44	3.08	1.61	2.33
DALLAS, TX PMSA	0.80	0.88	0.84	1.63	2.34	1.98	2.89	1.46	2.19
DENVER, CO PMSA	0.32	0.42	0.36	0.46	1.07	0.72	0.66	0.65	0.66
DETROIT, MI PMSA	0.62	1.20	0.93	1.25	2.46	1.90	2.69	1.70	2.16
FORT LAUDERDALE, FL PMSA	0.54	0.85	0.70	1.86	3.12	2.54	3.53	1.66	2.52
FORT WORTH-ARLINGTON, TX PMSA	1.36	1.17	1.27	2.20	2.55	2.38	3.83	1.74	2.78
HOUSTON, TX PMSA	0.75	0.76	0.76	1.48	2.00	1.75	3.19	1.19	2.16
LOS ANGELES-LONG BEACH, CA PMSA	2.07	2.90	2.62	4.72	7.72	6.70	10.85	3.92	6.26
MEMPHIS, TN-AR-MS MSA	0.71	0.69	0.70	1.92	3.66	2.82	3.57	1.98	2.74
MIAMI, FL PMSA	0.66	0.93	0.82	2.26	3.43	2.94	4.18	1.71	2.74
MINNEAPOLIS-ST PAUL, MN-WI MSA	0.25	0.42	0.32	0.50	1.17	0.77	0.90	0.67	0.81
NORFOLK-VIRGINIA BEACH-NEWPORT	0.76	0.96	0.86	1.70	2.75	2.25	3.40	1.42	2.36
ORLANDO, FL MSA	0.62	0.81	0.73	1.76	3.39	2.66	3.85	1.94	2.80
PHILADELPHIA, PA-NJ PMSA	0.33	0.42	0.38	1.71	3.39	2.60	4.45	1.64	2.97
PHOENIX-MESA, AZ MSA	0.97	0.71	0.85	1.48	1.69	1.58	2.44	1.12	1.83
RIVERSIDE-SAN BERNARDINO, CA PMSA	1.90	2.26	2.11	4.81	7.24	6.19	10.74	3.97	6.88
SACRAMENTO, CA PMSA	0.59	0.99	0.84	1.52	2.98	2.43	4.75	1.39	2.66
ST. LOUIS, MO-IL MSA	0.52	1.02	0.73	1.04	2.60	1.70	2.15	1.71	1.96
TAMPA-ST PETERSBURG-CLEARWATER	0.74	0.87	0.81	1.57	2.91	2.34	2.98	1.54	2.16
WASHINGTON, DC-MD-VA-WV, PMSA	0.37	0.73	0.57	1.21	2.86	2.10	2.73	1.53	2.08

TABLE 2

PERCENTAGE DISTRIUBTION OF TRACTS ACROSS DEFAULT RATE CLASSES, BY MSA
1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

MSA NAME	Total Tracts	< 31 Loans	Raw Default Rates (Percent) in Tracts with > 30 Loans									
			0 to 0.5 %	>0.5 to 1.0 %	>1.0 to 1.5 %	>1.5 to 2%	>2 to 3 %	>3 to 4 %	>4 to 7 %	>7 to 10 %	>10 to 15%	>15 %
ATLANTA, GA MSA	480	30.21%	42.29%	8.54%	7.92%	3.33%	3.54%	1.67%	2.08%	0.42%	0.00%	0.00%
BALTIMORE, MD PMSA	479	40.50	39.67	5.01	3.13	2.30	6.26	2.09	0.63	0.42	0.00	0.00
CHICAGO, IL PMSA	1142	46.23	40.46	2.10	3.33	2.71	3.68	1.05	0.44	0.00	0.00	0.00
DALLAS, TX PMSA	489	36.81	34.97	5.52	7.98	4.70	6.54	1.23	2.25	0.00	0.00	0.00
DENVER, CO PMSA	404	11.88	63.86	11.88	6.19	3.47	1.73	0.74	0.25	0.00	0.00	0.00
DETROIT, MI PMSA	1079	73.49	17.79	0.56	1.48	1.76	1.95	0.65	1.67	0.46	0.19	0.00
FORT LAUDERDALE, FL PMSA	147	34.01	40.14	8.16	4.76	3.40	6.80	1.36	0.68	0.68	0.00	0.00
FORT WORTH-ARLINGTON, TX PMSA	305	33.77	31.15	2.95	8.52	7.54	8.52	2.62	4.26	0.66	0.00	0.00
HOUSTON, TX PMSA	544	63.24	22.61	3.31	2.94	3.49	2.94	0.92	0.55	0.00	0.00	0.00
LOS ANGELES-LONG BEACH, CA PMSA	842	72.80	8.91	0.48	1.31	2.26	4.99	2.85	5.11	1.07	0.24	0.00
MEMPHIS, TN-AR-MS MSA	190	30.53	37.37	11.58	6.84	3.16	4.21	4.74	1.58	0.00	0.00	0.00
MIAMI, FL PMSA	225	52.89	23.56	4.44	6.22	3.56	5.78	2.22	1.33	0.00	0.00	0.00
MINNEAPOLIS-ST PAUL, MN-WI MSA	619	15.67	65.59	5.82	5.49	3.23	1.94	1.45	0.65	0.16	0.00	0.00
NORFOLK-VIRGINIA BEACH-NEWPORT	315	47.30	29.21	3.49	4.13	6.67	5.71	1.27	1.90	0.32	0.00	0.00
ORLANDO, FL MSA	222	44.14	35.14	4.95	3.15	4.95	3.60	2.70	0.90	0.45	0.00	0.00
PHILADELPHIA, PA-NJ PMSA	782	61.38	32.10	0.64	1.28	1.41	2.43	0.51	0.26	0.00	0.00	0.00
PHOENIX-MESA, AZ MSA	490	20.00	38.37	12.24	10.20	7.55	6.94	2.65	1.84	0.20	0.00	0.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	328	20.73	16.46	7.01	10.06	10.37	18.29	9.15	7.93	0.00	0.00	0.00
SACRAMENTO, CA PMSA	273	56.04	26.74	2.93	3.30	2.93	4.40	1.47	2.20	0.00	0.00	0.00
ST. LOUIS, MO-IL MSA	367	36.78	39.51	5.99	3.81	4.63	5.18	2.18	1.63	0.27	0.00	0.00
TAMPA-ST PETERSBURG-CLEARWATER	359	52.65	30.64	1.11	3.90	5.85	4.18	0.84	0.56	0.28	0.00	0.00
WASHINGTON, DC-MD-VA-WV, PMSA	769	43.04	39.40	4.94	3.38	3.64	3.25	1.43	0.78	0.00	0.13	0.00

TABLE 2

PERCENTAGE DISTRIUBTION OF TRACTS ACROSS DEFAULT RATE CLASSES, BY MSA
1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	Total Tracts	< 31 Loans	Raw Default Rates (Percent) in Tracts with > 30 Loans									
			0 to 0.5 %	>0.5 to 1.0 %	>1.0 to 1.5 %	>1.5 to 2%	>2 to 3 %	>3 to 4 %	>4 to 7 %	>7 to 10 %	>10 to 15%	>15 %
ATLANTA, GA MSA	480	30.21%	20.83%	4.79%	7.71%	5.42%	12.71%	7.50%	7.92%	2.71%	0.21%	0.00%
BALTIMORE, MD PMSA	479	40.50	17.12	2.92	5.01	4.59	13.15	5.01	7.10	3.97	0.42	0.21
CHICAGO, IL PMSA	1142	46.23	18.30	1.58	3.50	5.87	8.32	4.29	7.88	2.80	0.70	0.53
DALLAS, TX PMSA	489	36.81	20.45	4.09	7.77	4.70	9.00	9.41	5.32	2.25	0.20	0.00
DENVER, CO PMSA	404	11.88	49.26	13.86	9.90	5.94	5.69	2.48	0.74	0.25	0.00	0.00
DETROIT, MI PMSA	1079	73.49	13.99	0.09	1.11	1.76	3.61	1.39	2.32	1.39	0.65	0.19
FORT LAUDERDALE, FL PMSA	147	34.01	16.33	2.04	2.72	10.88	10.88	8.16	12.93	1.36	0.00	0.68
FORT WORTH-ARLINGTON, TX PMSA	305	33.77	16.39	2.30	5.57	9.18	13.11	9.51	7.21	2.62	0.33	0.00
HOUSTON, TX PMSA	544	63.24	13.05	2.57	3.49	3.13	7.72	4.41	1.65	0.74	0.00	0.00
LOS ANGELES-LONG BEACH, CA PMSA	842	72.80	2.14	0.00	0.48	0.59	2.85	2.85	7.96	5.70	3.80	0.83
MEMPHIS, TN-AR-MS MSA	190	30.53	15.26	4.21	5.26	6.32	8.95	6.84	15.79	4.74	2.11	0.00
MIAMI, FL PMSA	225	52.89	8.44	2.22	3.56	3.56	7.11	5.78	12.44	2.67	0.89	0.44
MINNEAPOLIS-ST PAUL, MN-WI MSA	619	15.67	49.43	9.37	8.24	5.17	5.98	2.91	2.58	0.65	0.00	0.00
NORFOLK-VIRGINIA BEACH-NEWPORT	315	47.30	16.51	2.54	3.81	2.86	11.43	6.35	4.13	4.13	0.95	0.00
ORLANDO, FL MSA	222	44.14	12.61	1.35	6.31	5.41	9.01	10.81	5.86	2.25	1.80	0.45
PHILADELPHIA, PA-NJ PMSA	782	61.38	10.10	0.51	1.66	3.84	8.44	4.35	6.78	2.17	0.77	0.00
PHOENIX-MESA, AZ MSA	490	20.00	26.12	8.16	8.98	9.39	12.04	9.39	5.10	0.61	0.20	0.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	328	20.73	2.44	0.61	2.13	3.05	6.71	8.84	32.93	17.99	3.35	1.22
SACRAMENTO, CA PMSA	273	56.04	14.29	0.37	2.93	4.40	7.33	4.40	8.06	1.83	0.37	0.00
ST. LOUIS, MO-IL MSA	367	36.78	22.89	7.36	5.45	4.90	7.90	7.08	5.99	1.36	0.27	0.00
TAMPA-ST PETERSBURG-CLEARWATER	359	52.65	16.16	0.56	3.62	6.41	6.13	4.46	8.36	1.39	0.28	0.00
WASHINGTON, DC-MD-VA-WV, PMSA	769	43.04	19.90	2.60	5.59	5.07	8.32	6.24	6.63	1.56	0.91	0.13

TABLE 2

PERCENTAGE DISTRIUBTION OF TRACTS ACROSS DEFAULT RATE CLASSES, BY MSA
1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

MSA NAME	Total Tracts		Raw Default Rates (Percent) in Tracts with > 30 Loans									
		< 31 Loans	0 to 0.5 %	>0.5 to 1.0 %	>1.0 to 1.5 %	>1.5 to 2%	>2 to 3 %	>3 to 4 %	>4 to 7 %	>7 to 10 %	>10 to 15%	>15 %
ATLANTA, GA MSA	480	30.21%	21.46%	5.42%	6.25%	4.58%	10.63%	7.92%	8.54%	4.38%	0.63%	0.00%
BALTIMORE, MD PMSA	479	40.50	17.95	3.34	5.64	5.01	10.65	5.22	7.93	2.09	1.25	0.42
CHICAGO, IL PMSA	1142	46.23	18.13	1.93	3.15	5.17	8.93	4.55	7.88	3.15	0.79	0.09
DALLAS, TX PMSA	489	36.81	16.97	4.09	8.38	4.91	10.84	6.95	7.77	2.86	0.41	0.00
DENVER, CO PMSA	404	11.88	50.25	14.85	8.66	5.69	5.94	1.98	0.50	0.25	0.00	0.00
DETROIT, MI PMSA	1079	73.49	12.70	0.19	1.85	1.76	2.87	2.22	2.87	1.02	0.74	0.28
FORT LAUDERDALE, FL PMSA	147	34.01	18.37	0.68	4.76	12.93	13.61	8.16	4.76	2.04	0.00	0.68
FORT WORTH-ARLINGTON, TX PMSA	305	33.77	16.39	1.31	6.23	5.57	10.49	10.16	12.13	3.28	0.33	0.33
HOUSTON, TX PMSA	544	63.24	11.40	1.84	3.68	3.13	7.72	4.23	3.68	0.74	0.18	0.18
LOS ANGELES-LONG BEACH, CA PMSA	842	72.80	4.16	0.00	0.71	0.36	2.61	1.90	8.55	4.63	3.09	1.19
MEMPHIS, TN-AR-MS MSA	190	30.53	13.68	5.26	6.84	4.21	13.16	6.32	11.58	5.79	1.58	1.05
MIAMI, FL PMSA	222	53.60	10.36	1.80	4.50	6.76	9.91	4.50	7.21	2.25	0.00	0.45
MINNEAPOLIS-ST PAUL, MN-WI MSA	619	15.67	48.30	9.37	8.08	5.82	6.79	2.91	2.10	0.81	0.00	0.16
NORFOLK-VIRGINIA BEACH-NEWPORT	315	47.30	14.92	2.22	5.08	3.17	10.16	7.62	5.71	3.17	0.63	0.00
ORLANDO, FL MSA	222	44.14	10.36	0.90	5.41	6.31	13.51	5.86	9.46	2.25	1.80	0.00
PHILADELPHIA, PA-NJ PMSA	782	61.38	9.97	0.38	1.15	2.56	7.54	4.48	9.46	2.30	0.77	0.00
PHOENIX-MESA, AZ MSA	490	20.00	19.59	9.18	8.57	8.57	14.90	9.59	7.76	1.22	0.61	0.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	328	20.73	4.27	0.61	1.22	2.44	4.57	7.93	27.74	17.07	10.98	2.44
SACRAMENTO, CA PMSA	273	56.04	14.29	0.73	3.30	2.56	8.79	5.49	5.49	2.20	1.10	0.00
ST. LOUIS, MO-IL MSA	367	36.78	19.62	5.72	6.27	5.45	8.45	7.63	7.63	1.91	0.54	0.00
TAMPA-ST PETERSBURG-CLEARWATER	359	52.65	16.43	0.56	3.62	6.69	9.47	4.18	5.29	0.84	0.28	0.00
WASHINGTON, DC-MD-VA-WV, PMSA	769	43.04	19.12	2.86	4.29	4.68	10.01	6.50	6.63	2.21	0.52	0.13

Table 3

Number and Percentage Distribution of Tracts, Loans, and Defaults Across Default Rate Classes
1992 and 1994 Originations

Default Definition	Type	Total	<=30 Loans		Default Rate of Tract Relative to MSA Rate (Tracts with >30 Loans)									
					0 to <0.5		0.5 to <1.0		1.0 to <1.5		1.5 to <3.0		3.0 and Above	
			Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
1. Claims at Two Years	Tracts	10818	5053	46.71%	3520	32.54%	380	3.51%	410	3.79%	807	7.46%	648	5.99%
	Loans	596188	56862	9.54	267057	44.79	72643	12.18	64755	10.86	89234	14.97	45637	7.65
	Defaults	4956	471	9.5	67	1.35	596	12.03	896	18.08	1632	32.93	1294	26.11
2. Uncured Delinquencies at Two Years	Tracts	10818	5053	46.71	2295	21.21	1163	10.75	971	8.98	993	9.18	343	3.17
	Loans	596188	56862	9.54	182068	30.54	127208	21.34	109466	18.36	97099	16.29	23485	3.94
	Defaults	14378	1420	9.88	549	3.82	2579	17.94	3794	26.39	4372	30.41	1664	11.57
3. Delinquencies at Two Years	Tracts	10818	5053	46.71	2010	18.58	1428	13.2	999	9.23	1060	9.8	268	2.48
	Loans	596188	56862	9.54	160749	26.96	148366	24.89	113712	19.07	98905	16.59	17594	2.95
	Defaults	18138	1806	9.96	776	4.28	3541	19.52	4916	27.1	5487	30.25	1612	8.89
4. Claims at 12/95	Tracts	10818	5053	46.71	3158	29.19	479	4.43	534	4.94	1010	9.34	584	5.4
	Loans	596188	56862	9.54	262220	43.98	74196	12.45	68505	11.49	95920	16.09	38485	6.46
	Defaults	6797	697	10.25	204	3	844	12.42	1168	17.18	2305	33.91	1579	23.23
5. Uncured Delinquencies at 12/95	Tracts	10818	5053	46.71	2218	20.5	1174	10.85	964	8.91	1049	9.7	360	3.33
	Loans	596188	56862	9.54	185807	31.17	135062	22.65	98467	16.52	95492	16.02	24498	4.11
	Defaults	14659	1457	9.94	667	4.55	2748	18.75	3231	22.04	4737	32.31	1819	12.41
6. Delinquencies at 12/95	Tracts	10818	5053	46.71	1992	18.41	1412	13.05	973	8.99	1106	10.22	282	2.61
	Loans	596188	56862	9.54	164006	27.51	153858	25.81	105901	17.76	97484	16.35	18077	3.03
	Defaults	18383	1856	10.1	844	4.59	3723	20.25	4287	23.32	5886	32.02	1787	9.72

TABLE 4

PERCENTAGE OF TRACTS* THAT ARE HIGH DEFAULT TRACTS UNDER TWO DEFINITIONS OF DEFAULT, BY MSA
1992 AND 1994 ORIGINATIONS

DEFAULT MEASURED TWO YEARS AFTER AMORTIZATION START

MSA NAME	Total Tracts	DEFAULT DEFINITIONS			
		Claims Definition Only	Uncured Delinquency Definition Only	Both Definitions	Neither Definition
ATLANTA, GA MSA	335	13.13%	8.66%	16.72%	61.49%
BALTIMORE, MD PMSA	285	12.28	8.42	15.09	64.21
CHICAGO, IL PMSA	614	11.07	12.70	12.05	64.17
DALLAS, TX PMSA	309	9.06	8.41	19.42	63.11
DENVER, CO PMSA	356	9.55	7.87	16.85	65.73
DETROIT, MI PMSA	286	8.39	5.59	18.18	67.83
FORT LAUDERDALE, FL PMSA	97	8.25	8.25	15.46	68.04
FORT WORTH-ARLINGTON, TX PMSA	202	10.89	5.45	16.34	67.33
HOUSTON, TX PMSA	200	12.00	9.00	15.50	63.50
LOS ANGELES-LONG BEACH, CA PMSA	229	11.79	4.80	12.23	71.18
MEMPHIS, TN-AR-MS MSA	132	13.64	15.15	15.91	55.30
MIAMI, FL PMSA	106	15.09	8.49	19.81	56.60
MINNEAPOLIS-ST PAUL, MN-WI MSA	522	5.17	10.34	17.24	67.24
NORFOLK-VIRGINIA BEACH-NEWPORT	166	16.87	7.23	16.27	59.64
ORLANDO, FL MSA	124	16.94	8.06	10.48	64.52
PHILADELPHIA, PA-NJ PMSA	302	9.27	18.54	7.62	64.57
PHOENIX-MESA, AZ MSA	392	7.14	7.65	19.64	65.56
RIVERSIDE-SAN BERNARDINO, CA PMSA	260	12.69	3.08	5.00	79.23
SACRAMENTO, CA PMSA	120	11.67	8.33	17.50	62.50
ST. LOUIS, MO-IL MSA	232	6.90	7.33	19.83	65.95
TAMPA-ST PETERSBURG-CLEARWATER	170	15.88	8.82	14.71	60.59
WASHINGTON, DC-MD-VA-WV, PMSA	438	10.50	9.13	15.07	65.30

* Restricted to tracts with more than 30 loans in two years combined.

TABLE 5
PERCENTAGE OF TRACTS* THAT ARE HIGH DEFAULT TRACTS FOR DIFFERENT ORIGINATION YEARS, BY MSA

PANEL A: CLAIMS AT TWO YEARS

MSA NAME	TOTAL TRACTS	ORIGINATION YEAR			
		NEITHER YEAR	1992 ONLY	1994 ONLY	BOTH YEARS
ATLANTA, GA MSA	281	60.50%	16.37%	16.01%	7.12%
BALTIMORE, MD PMSA	269	66.17	10.04	20.07	3.72
CHICAGO, IL PMSA	551	73.68	8.35	13.61	4.36
DALLAS, TX PMSA	260	59.62	12.69	22.69	5.00
DENVER, CO PMSA	322	69.57	12.11	15.53	2.80
DETROIT, MI PMSA	282	70.21	6.74	15.96	7.09
FORT LAUDERDALE, FL PMSA	94	65.96	10.64	20.21	3.19
FORT WORTH-ARLINGTON, TX PMSA	170	57.06	15.88	17.65	9.41
HOUSTON, TX PMSA	167	65.27	17.37	14.37	2.99
LOS ANGELES-LONG BEACH, CA PMSA	224	61.16	14.73	15.18	8.93
MEMPHIS, TN-AR-MS MSA	119	53.78	19.33	20.17	6.72
MIAMI, FL PMSA	104	59.62	11.54	22.12	6.73
MINNEAPOLIS-ST PAUL, MN-WI MSA	490	76.33	9.80	10.82	3.06
NORFOLK-VIRGINIA BEACH-NEWPORT	140	61.43	8.57	22.86	7.14
ORLANDO, FL MSA	112	65.18	11.61	17.86	5.36
PHILADELPHIA, PA-NJ PMSA	297	82.49	7.07	8.75	1.68
PHOENIX-MESA, AZ MSA	348	55.17	18.10	17.24	9.48
RIVERSIDE-SAN BERNARDINO, CA PMSA	228	57.46	17.98	17.11	7.46
SACRAMENTO, CA PMSA	109	65.14	6.42	25.69	2.75
ST. LOUIS, MO-IL MSA	224	65.62	12.50	13.39	8.48
TAMPA-ST PETERSBURG-CLEARWATER	161	65.84	12.42	19.88	1.86
WASHINGTON, DC-MD-VA-WV, PMSA	393	68.96	7.63	18.58	4.83

* Restricted to tracts with more than 30 loans in each year.

TABLE 5
PERCENTAGE OF TRACTS* THAT ARE HIGH DEFAULT TRACTS FOR DIFFERENT ORIGINATION YEARS, BY MSA

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	TOTAL TRACTS	ORIGINATION YEAR			
		NEITHER YEAR	1992 ONLY	1994 ONLY	BOTH YEARS
ATLANTA, GA MSA	281	58.72%	17.44%	12.46%	11.39%
BALTIMORE, MD PMSA	269	54.65	19.33	15.99	10.04
CHICAGO, IL PMSA	551	56.08	15.25	15.79	12.89
DALLAS, TX PMSA	260	59.23	11.92	18.85	10.00
DENVER, CO PMSA	322	59.63	11.80	20.81	7.76
DETROIT, MI PMSA	282	62.41	11.35	14.89	11.35
FORT LAUDERDALE, FL PMSA	94	59.57	14.89	14.89	10.64
FORT WORTH-ARLINGTON, TX PMSA	170	56.47	18.24	16.47	8.82
HOUSTON, TX PMSA	167	54.49	19.76	17.96	7.78
LOS ANGELES-LONG BEACH, CA PMSA	224	64.29	15.62	12.05	8.04
MEMPHIS, TN-AR-MS MSA	119	52.10	18.49	15.13	14.29
MIAMI, FL PMSA	104	54.81	24.04	11.54	9.62
MINNEAPOLIS-ST PAUL, MN-WI MSA	490	61.43	12.65	17.96	7.96
NORFOLK-VIRGINIA BEACH-NEWPORT	140	59.29	11.43	15.00	14.29
ORLANDO, FL MSA	112	57.14	21.43	10.71	10.71
PHILADELPHIA, PA-NJ PMSA	297	50.84	22.22	16.16	10.77
PHOENIX-MESA, AZ MSA	348	53.16	19.54	14.37	12.93
RIVERSIDE-SAN BERNARDINO, CA PMSA	228	71.93	17.11	8.77	2.19
SACRAMENTO, CA PMSA	109	55.05	11.01	26.61	7.34
ST. LOUIS, MO-IL MSA	224	53.12	18.30	16.07	12.50
TAMPA-ST PETERSBURG-CLEARWATER	161	57.14	17.39	16.77	8.70
WASHINGTON, DC-MD-VA-WV, PMSA	393	60.05	16.28	15.27	8.40

* Restricted to tracts with more than 30 loans in each year.

TABLE 5
PERCENTAGE OF TRACTS* THAT ARE HIGH DEFAULT TRACTS FOR DIFFERENT ORIGINATION YEARS, BY MSA

PANEL C: UNCURED DELINQUENCIES AT 12/95

MSA NAME	TOTAL TRACTS	ORIGINATION YEAR			
		NEITHER YEAR	1992 ONLY	1994 ONLY	BOTH YEARS
ATLANTA, GA MSA	281	54.09%	19.22%	13.52%	13.17%
BALTIMORE, MD PMSA	269	52.79	17.10	17.47	12.64
CHICAGO, IL PMSA	551	53.18	16.33	17.24	13.25
DALLAS, TX PMSA	260	57.31	17.69	16.92	8.08
DENVER, CO PMSA	322	59.01	17.08	15.22	8.70
DETROIT, MI PMSA	282	58.51	15.25	12.06	14.18
FORT LAUDERDALE, FL PMSA	94	59.57	13.83	22.34	4.26
FORT WORTH-ARLINGTON, TX PMSA	170	51.76	15.88	24.12	8.24
HOUSTON, TX PMSA	167	58.68	17.96	17.96	5.39
LOS ANGELES-LONG BEACH, CA PMSA	224	61.16	11.61	20.54	6.70
MEMPHIS, TN-AR-MS MSA	119	56.30	13.45	13.45	16.81
MIAMI, FL PMSA	104	55.77	16.35	16.35	11.54
MINNEAPOLIS-ST PAUL, MN-WI MSA	490	61.22	18.57	11.84	8.37
NORFOLK-VIRGINIA BEACH-NEWPORT	140	57.14	13.57	20.00	9.29
ORLANDO, FL MSA	112	52.68	21.43	16.07	9.82
PHILADELPHIA, PA-NJ PMSA	297	51.85	17.85	21.89	8.42
PHOENIX-MESA, AZ MSA	348	51.44	19.54	16.67	12.36
RIVERSIDE-SAN BERNARDINO, CA PMSA	228	74.56	5.70	14.04	5.70
SACRAMENTO, CA PMSA	109	52.29	11.01	27.52	9.17
ST. LOUIS, MO-IL MSA	224	54.46	19.64	12.95	12.95
TAMPA-ST PETERSBURG-CLEARWATER	161	54.66	17.39	20.50	7.45
WASHINGTON, DC-MD-VA-WV, PMSA	393	51.91	19.59	17.30	11.20

* Restricted to tracts with more than 30 loans in each year.

TABLE 6

CHARACTERISTICS OF TRACTS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

Characteristic	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Tracts in Default Rate Class	46.71%	32.54%	3.51%	3.79%	7.46%	5.99%
% of All Loans in Default Rate Class	9.54	44.79	12.18	10.86	14.97	7.65
% of All Defaults in Default Rate Class	9.50	1.35	12.03	18.08	32.93	26.11
Default Rate (%) in Class	0.83	0.03	0.82	1.38	1.83	2.84
FHA % Black	14.01	9.98	11.54	13.27	17.51	25.71
FHA % Hispanic	14.35	9.92	16.59	17.36	13.34	11.27
First Time (%)	52.80	43.59	42.46	43.76	45.06	49.51
% LTV .97 +	22.27	24.59	22.02	23.72	27.58	34.30
% Front end .29+	20.30	18.05	21.17	21.85	19.01	16.97
% Back end .41+	16.71	16.30	17.76	18.00	16.23	14.41
Income-MSA average	132.10	65.36	98.76	-9.01	-156.73	-378.23
Mortgage-MSA average	3452.04	1328.26	4028.98	876.91	-4526.29	-10637.42
Assets-MSA average	815.92	388.81	356.88	-0.69	-830.41	-2195.38
FHA/Tot originations (%)	11.36	25.26	33.62	36.85	34.42	35.24
Black FHA/Blk originations (%)	30.72	43.71	45.67	51.21	51.04	52.76
Hispanic FHA/Hisp originations (%)	23.03	40.13	42.46	52.92	49.51	48.42
Conventional denials/applications (%)	15.55	11.76	14.92	16.73	16.73	16.42
Census % Black	15.14	11.24	10.74	18.38	21.88	40.17
Census % Hispanic	16.08	9.68	24.96	18.06	15.15	9.38
Census Unemp Rate (%)	7.71	6.24	6.99	7.70	8.34	11.55
Census Income Ratio	1.02	1.07	1.10	1.03	0.99	0.90
Census Poverty Rate (%)	13.33	8.24	10.59	12.60	12.73	18.13
Census Home Ownership Rate (%)	57.49	66.29	65.94	61.44	59.83	57.55

TABLE 6

CHARACTERISTICS OF TRACTS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Characteristic	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Tracts in Default Rate Class	46.71%	21.21%	10.75%	8.98%	9.18%	3.17%
% of All Loans in Default Rate Class	9.54	30.54	21.34	18.36	16.29	3.94
% of All Defaults in Default Rate Class	9.88	3.82	17.94	26.39	30.41	11.57
Default Rate (%) in Class	2.50	0.30	2.03	3.47	4.50	7.09
FHA % Black	14.01	5.64	10.16	14.68	24.37	34.40
FHA % Hispanic	14.35	9.07	14.14	15.79	12.97	10.51
First Time (%)	52.80	41.63	43.58	44.63	47.50	51.91
% LTV .97 +	22.27	22.87	22.61	24.86	31.10	39.27
% Front end .29+	20.30	17.36	20.68	20.79	18.62	15.28
% Back end .41+	16.71	16.04	17.56	17.26	16.10	12.97
Income-MSA average	132.10	122.76	90.46	-9.74	-237.47	-657.26
Mortgage-MSA average	3452.04	2102.14	3616.56	988.76	-6694.90	-19306.42
Assets-MSA average	815.92	881.43	507.72	-253.44	-1496.62	-3632.94
FHA/Tot originations (%)	11.36	23.17	29.16	34.50	37.20	44.48
Black FHA/Blk originations (%)	30.72	39.75	43.64	47.45	52.39	56.56
Hispanic FHA/Hisp originations (%)	23.03	37.46	42.32	49.78	51.64	53.14
Conventional denials/applications (%)	15.55	11.00	13.42	15.58	17.57	22.42
Census % Hispanic	16.08	10.32	15.22	14.21	13.51	8.86
Census % Black	15.14	7.01	11.22	18.58	29.86	50.28
Census % Unemp Rate (%)	7.71	5.74	6.46	7.54	9.36	14.50
Census Income Ratio	1.02	1.12	1.06	1.03	0.93	0.79
Census Poverty Rate (%)	13.33	7.37	9.15	10.98	14.99	21.73
Census Home Ownership Rate (%)	57.49	66.76	65.16	63.11	60.34	54.13

TABLE 6

CHARACTERISTICS OF TRACTS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

Characteristic	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Tracts in Default Rate Class	46.71%	20.50%	10.85%	8.91%	9.70%	3.33%
% of All Loans in Default Rate Class	9.54	31.17	22.65	16.52	16.02	4.11
% of All Defaults in Default Rate Class	9.94	4.55	18.75	22.04	32.31	12.41
Default Rate (%) in Class	2.56	0.36	2.03	3.28	4.96	7.43
FHA % Black	14.01	6.10	10.67	13.10	24.43	36.75
FHA % Hispanic	14.35	9.54	14.50	14.39	13.26	10.98
First Time (%)	52.80	41.95	44.44	44.38	46.23	51.43
% LTV .97 +	22.27	23.12	25.59	24.23	28.36	36.01
% Front end .29+	20.30	18.38	20.01	20.05	18.35	16.01
% Back end .41+	16.71	16.74	17.43	16.88	15.49	12.60
Income-MSA average	132.10	169.52	43.60	-17.73	-267.75	-664.21
Mortgage-MSA average	3452.04	4118.75	1572.44	106.83	-7181.44	-18986.32
Assets-MSA average	815.92	920.97	96.19	-183.78	-1362.55	-3200.99
FHA/Tot originations (%)	11.36	23.39	29.93	33.53	38.71	47.41
Black FHA/Blk originations (%)	30.72	39.56	44.62	47.16	52.57	57.74
Hispanic FHA/Hisp originations (%)	23.03	37.33	43.20	50.01	50.81	55.56
Conventional denials/applications (%)	15.55	10.94	13.78	15.55	18.48	23.16
Census % Black	15.14	6.68	11.85	16.10	31.27	55.84
Census % Hispanic	16.08	10.78	14.02	15.29	13.39	8.70
Census Unemp Rate (%)	7.71	5.63	6.48	7.37	9.98	14.56
Census Income Ratio	1.02	1.13	1.06	1.02	0.92	0.75
Census Poverty Rate (%)	13.33	7.04	8.84	11.33	15.80	22.44
Census Home Ownership Rate (%)	57.49	66.90	66.05	63.33	58.73	53.32

TABLE 7

PERCENTAGE OF TRACTS, LOANS, AND DEFAULTS IN VARIOUS RELATIVE DEFAULT RATE CLASSES

BY RELATIVE INCOME OF TRACT

1992 AND 1994 ORIGINATIONS

PANEL A

CLAIMS AT TWO YEARS

Characteristic	Tract Income/ MSA Income	Total	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
				0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of Tracts in Default Rate Class	<=80 %	2544	54.48%	22.72%	1.73%	2.63%	7.74%	10.69%
% of Loans in Default Rate Class	<=80 %	96011	16.69	36.33	4.92	6.78	17.60	17.68
% of Defaults in Default Rate Class	<=80 %	1320	17.58	0.38	4.92	7.50	26.59	43.03
% of Tracts in Default Rate Class	>80 & <=100 %	2525	35.56	38.38	3.60	4.48	10.53	7.45
% of Loans in Default Rate Class	>80 & <=100 %	152181	7.58	46.09	9.79	9.99	17.23	9.32
% of Defaults in Default Rate Class	>80 & <=100 %	1274	7.06	1.18	9.58	18.37	35.79	28.02
% of Tracts in Default Rate Class	>100 & <=120	2048	35.79	41.94	4.69	5.42	7.76	4.39
% of Loans in Default Rate Class	>100 & <=120	145119	6.70	47.90	13.49	11.64	15.47	4.80
% of Defaults in Default Rate Class	>100 & <=120	1030	4.27	1.07	13.40	22.14	41.94	17.18
% of Tracts in Default Rate Class	>120 %	2151	47.23	36.49	4.60	3.72	5.02	2.93
% of Loans in Default Rate Class	>120 %	125446	8.89	52.91	15.51	10.48	9.21	3.01
% of Defaults in Default Rate Class	>120 %	713	7.29	3.93	21.46	23.98	29.45	13.88

PANEL B

UNCURED DELINQUENCIES AT TWO YEARS

Characteristic	Tract Income/ MSA Income	Total	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
				0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of Tracts in Default Rate Class	<=80 %	2544	54.48%	12.11%	6.13%	7.35%	12.22%	7.70%
% of Loans in Default Rate Class	<=80 %	96011	16.69	19.32	12.59	14.95	23.95	12.50
% of Defaults in Default Rate Class	<=80 %	3596	17.99	1.17	8.59	15.07	31.62	25.56
% of Tracts in Default Rate Class	>80 & <=100 %	2525	35.56	21.82	14.30	12.20	12.44	3.68
% of Loans in Default Rate Class	>80 & <=100 %	152181	7.58	26.16	23.23	20.21	18.30	4.51
% of Defaults in Default Rate Class	>80 & <=100 %	3849	7.48	3.27	19.49	26.81	30.58	12.37
% of Tracts in Default Rate Class	>100 & <=120	2048	35.79	27.00	14.55	10.64	10.30	1.71
% of Loans in Default Rate Class	>100 & <=120	145119	6.70	31.21	25.00	19.43	15.48	2.17
% of Defaults in Default Rate Class	>100 & <=120	3202	6.15	3.72	20.58	29.01	34.88	5.65
% of Tracts in Default Rate Class	>120 %	2151	47.23	28.13	11.34	8.60	4.28	0.42
% of Loans in Default Rate Class	>120 %	125446	8.89	42.97	24.14	16.43	7.27	0.31
% of Defaults in Default Rate Class	>120 %	2065	8.14	9.15	29.44	33.61	18.45	1.21

PANEL C

UNCURED DELINQUENCIES AT 12/95

Characteristic	Tract Income/ MSA Income	Total	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
				0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of Tracts in Default Rate Class	<=80 %	2544	54.48%	10.18%	6.84%	7.43%	13.21%	7.86%
% of Loans in Default Rate Class	<=80 %	96011	16.69	16.55	13.19	14.37	25.84	13.36
% of Defaults in Default Rate Class	<=80 %	3746	16.82	0.85	8.36	13.29	34.12	26.56
% of Tracts in Default Rate Class	>80 & <=100 %	2525	35.56	22.18	14.81	11.21	12.55	3.68
% of Loans in Default Rate Class	>80 & <=100 %	152181	7.58	27.18	23.40	17.63	19.61	4.61
% of Defaults in Default Rate Class	>80 & <=100 %	3868	6.93	3.39	20.84	22.54	34.10	12.20
% of Tracts in Default Rate Class	>100 & <=120	2048	35.79	29.44	13.28	10.79	9.52	1.17
% of Loans in Default Rate Class	>100 & <=120	145119	6.70	35.75	22.97	18.12	15.23	1.23
% of Defaults in Default Rate Class	>100 & <=120	3025	5.06	4.53	20.23	28.30	38.28	3.60
% of Tracts in Default Rate Class	>120 %	2151	47.23	29.29	11.67	7.81	3.67	0.33
% of Loans in Default Rate Class	>120 %	125446	8.89	45.78	25.03	14.31	5.76	0.24
% of Defaults in Default Rate Class	>120 %	1911	7.54	12.14	32.97	32.71	13.87	0.78

TABLE 8

PERCENTAGE OF TRACTS, LOANS, AND DEFAULTS IN VARIOUS RELATIVE DEFAULT RATE CLASSES

BY PERCENT MINORITY IN TRACT

1992 AND 1994 ORIGINATIONS

PANEL A

CLAIMS AT TWO YEARS

Characteristic	Percent Minority	Total	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
				0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of Tracts in Default Rate Class	0 & <10	3770	40.72%	43.50%	2.28%	2.41%	5.94%	5.15%
% of Loans in Default Rate Class	0 & <10	208648	8.82	59.97	8.54	5.96	10.40	6.31
% of Defaults in Default Rate Class	0 & <10	903	6.76	1.11	11.63	13.51	34.00	33.00
% of Tracts in Default Rate Class	10 & <30	2580	37.83	35.39	5.54	6.05	9.53	5.66
% of Loans in Default Rate Class	10 & <30	177965	6.55	41.88	15.48	13.63	16.50	5.95
% of Defaults in Default Rate Class	10 & <30	1555	6.05	1.93	13.89	21.80	36.27	20.06
% of Tracts in Default Rate Class	30 & <50	1057	49.76	23.37	4.16	5.87	9.65	7.19
% of Loans in Default Rate Class	30 & <50	54628	11.32	30.06	12.37	15.50	20.27	10.48
% of Defaults in Default Rate Class	30 & <50	720	7.22	1.25	11.11	20.97	35.83	23.61
% of Tracts in Default Rate Class	50 & <=100	1865	53.62	20.97	3.06	3.32	8.47	10.56
% of Loans in Default Rate Class	50 & <=100	77546	15.74	32.00	8.40	8.48	19.34	16.03
% of Defaults in Default Rate Class	50 & <=100	1159	18.21	0.86	6.64	10.35	27.61	36.32

PANEL B

UNCURED DELINQUENCIES AT TWO YEARS

Characteristic	Percent Minority	Total	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
				0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of Tracts in Default Rate Class	0 & <10	3770	40.72%	30.40%	11.22%	8.62%	7.16%	1.88%
% of Loans in Default Rate Class	0 & <10	208648	8.82	44.18	20.86	13.96	10.11	2.07
% of Defaults in Default Rate Class	0 & <10	2605	9.56	7.26	24.84	24.61	25.64	8.10
% of Tracts in Default Rate Class	10 & <30	2580	37.83	21.82	14.88	12.05	10.47	2.95
% of Loans in Default Rate Class	10 & <30	177965	6.55	26.40	26.73	21.96	15.16	3.19
% of Defaults in Default Rate Class	10 & <30	4391	6.51	4.28	22.48	31.54	27.08	8.11
% of Tracts in Default Rate Class	30 & <50	1057	49.76	12.30	10.31	11.54	12.02	4.07
% of Loans in Default Rate Class	30 & <50	54628	11.32	14.77	20.90	24.39	22.13	6.50
% of Defaults in Default Rate Class	30 & <50	2141	8.92	1.59	16.53	29.89	31.01	12.05
% of Tracts in Default Rate Class	50 & <=100	1865	53.62	9.54	7.67	7.51	13.99	7.67
% of Loans in Default Rate Class	50 & <=100	77546	15.74	13.31	14.84	15.96	28.73	11.41
% of Defaults in Default Rate Class	50 & <=100	3575	16.06	1.82	9.45	14.85	36.11	21.71

PANEL C

UNCURED DELINQUENCIES AT 12/95

Characteristic	Percent Minority	Total	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
				0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of Tracts in Default Rate Class	0 & <10	3770	40.72%	31.25%	11.14%	8.30%	7.11%	1.49%
% of Loans in Default Rate Class	0 & <10	208648	8.82	46.10	20.25	13.22	10.08	1.52
% of Defaults in Default Rate Class	0 & <10	2555	8.92	8.77	25.48	24.11	26.61	6.11
% of Tracts in Default Rate Class	10 & <30	2580	37.83	22.64	15.27	11.43	10.16	2.67
% of Loans in Default Rate Class	10 & <30	177965	6.55	29.10	26.40	19.82	15.11	3.01
% of Defaults in Default Rate Class	10 & <30	4372	6.13	5.03	22.74	28.91	29.73	7.46
% of Tracts in Default Rate Class	30 & <50	1057	49.76	12.58	10.88	10.31	12.30	4.16
% of Loans in Default Rate Class	30 & <50	54628	11.32	16.03	21.15	19.70	25.66	6.15
% of Defaults in Default Rate Class	30 & <50	2114	8.28	1.56	17.46	23.08	38.36	11.26
% of Tracts in Default Rate Class	50 & <=100	1865	53.62	8.42	7.61	7.72	14.32	8.31
% of Loans in Default Rate Class	50 & <=100	77546	15.74	12.69	15.76	14.49	28.38	12.93
% of Defaults in Default Rate Class	50 & <=100	3509	14.93	1.57	9.89	13.76	35.02	24.82

TABLE 9

PERCENTAGE DISTRIBUTION OF LENDERS ACROSS DEFAULT RATE CLASSES, BY MSA

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

MSA NAME	Total Lenders	<31 Loans	Raw Default Rates (Percent) for Lenders with > 30 Loans									
			0 to 0.5 %	>0.5 to 1.0 %	>1.0 to 1.5 %	>1.5 to 2 %	>2 to 3%	>3 to 4%	>4 to 7%	>7 to 10%	>10 to 15%	>15 %
ATLANTA, GA MSA	303	50.83%	32.01%	10.56%	2.97%	1.32%	0.66%	0.99%	0.66%	0.00%	0.00%	0.00%
BALTIMORE, MD PMSA	226	56.19	29.65	6.19	3.98	2.21	0.00	0.88	0.88	0.00	0.00	0.00
CHICAGO, IL PMSA	310	53.87	33.87	4.19	2.58	2.90	1.94	0.65	0.00	0.00	0.00	0.00
DALLAS, TX PMSA	252	51.19	24.21	8.73	7.54	2.78	4.37	0.00	1.19	0.00	0.00	0.00
DENVER, CO PMSA	259	44.40	40.93	8.88	4.25	0.77	0.77	0.00	0.00	0.00	0.00	0.00
DETROIT, MI PMSA	164	50.61	35.98	6.10	2.44	1.22	2.44	0.00	1.22	0.00	0.00	0.00
FORT LAUDERDALE, FL PMSA	238	66.81	19.33	5.04	2.94	2.94	0.84	1.68	0.42	0.00	0.00	0.00
FORT WORTH-ARLINGTON, TX PMSA	228	61.40	16.67	5.26	5.26	3.51	2.19	3.51	2.19	0.00	0.00	0.00
HOUSTON, TX PMSA	188	56.38	22.34	9.04	5.85	3.19	2.13	0.53	0.53	0.00	0.00	0.00
LOS ANGELES-LONG BEACH, CA PMSA	438	68.04	6.62	1.37	3.42	5.71	7.08	2.51	4.34	0.91	0.00	0.00
MEMPHIS, TN-AR-MS MSA	121	57.02	22.31	9.92	3.31	2.48	2.48	1.65	0.83	0.00	0.00	0.00
MIAMI, FL PMSA	279	59.86	24.01	6.45	3.58	2.51	1.43	1.43	0.72	0.00	0.00	0.00
MINNEAPOLIS-ST PAUL, MN-WI MSA	200	53.00	40.00	3.00	2.00	1.00	0.50	0.50	0.00	0.00	0.00	0.00
NORFOLK-VIRGINIA BEACH-NEWPORT	150	52.67	23.33	12.67	5.33	3.33	2.67	0.00	0.00	0.00	0.00	0.00
ORLANDO, FL MSA	174	57.47	20.11	8.05	7.47	2.87	2.30	1.15	0.57	0.00	0.00	0.00
PHILADELPHIA, PA-NJ PMSA	189	61.38	31.22	5.29	1.06	1.06	0.00	0.00	0.00	0.00	0.00	0.00
PHOENIX-MESA, AZ MSA	190	37.37	28.42	15.26	10.53	2.63	5.26	0.00	0.53	0.00	0.00	0.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	532	70.86	6.02	1.88	3.57	3.57	8.27	2.07	3.01	0.75	0.00	0.00
SACRAMENTO, CA PMSA	240	63.33	17.92	5.00	6.25	2.08	3.75	0.83	0.83	0.00	0.00	0.00
ST. LOUIS, MO-IL MSA	121	54.55	23.97	8.26	5.79	3.31	4.13	0.00	0.00	0.00	0.00	0.00
TAMPA-ST PETERSBURG-CLEARWATER	200	59.50	23.50	6.50	6.50	0.50	3.00	0.00	0.50	0.00	0.00	0.00
WASHINGTON, DC-MD-VA-WV, PMSA	282	53.90	34.40	7.09	2.13	0.35	1.77	0.35	0.00	0.00	0.00	0.00

TABLE 9

PERCENTAGE DISTRIBUTION OF LENDERS ACROSS DEFAULT RATE CLASSES, BY MSA

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	Total Lenders	<31 Loans	Raw Default Rates (Percent) for Lenders with > 30 Loans									
			0 to 0.5 %	>0.5 to 1.0 %	>1.0 to 1.5 %	>1.5 to 2 %	>2 to 3%	>3 to 4%	>4 to 7%	>7 to 10%	>10 to 15%	>15 %
ATLANTA, GA MSA	303	50.83%	12.21%	3.96%	7.26%	6.27%	8.58%	5.61%	3.96%	0.66%	0.66%	0.00%
BALTIMORE, MD PMSA	226	56.19	9.73	3.54	4.87	5.75	7.08	6.64	5.31	0.44	0.44	0.00
CHICAGO, IL PMSA	310	53.87	9.03	5.48	5.48	6.13	9.68	3.87	4.19	0.97	0.97	0.32
DALLAS, TX PMSA	252	51.19	10.32	3.57	6.75	5.56	11.51	3.17	7.14	0.79	0.00	0.00
DENVER, CO PMSA	259	44.40	27.80	11.58	6.56	4.63	3.47	0.39	0.77	0.39	0.00	0.00
DETROIT, MI PMSA	164	50.61	11.59	8.54	5.49	7.93	6.10	3.66	3.66	1.22	0.61	0.61
FORT LAUDERDALE, FL PMSA	238	66.81	7.56	0.84	2.10	4.62	5.04	5.88	4.62	1.68	0.84	0.00
FORT WORTH-ARLINGTON, TX PMSA	228	61.40	7.02	3.95	6.14	5.26	4.39	4.82	4.39	1.32	1.32	0.00
HOUSTON, TX PMSA	188	56.38	10.11	4.79	7.45	5.85	9.04	4.26	2.13	0.00	0.00	0.00
LOS ANGELES-LONG BEACH, CA PMSA	438	68.04	0.91	0.00	0.00	2.05	1.83	3.20	9.13	10.05	3.42	1.37
MEMPHIS, TN-AR-MS MSA	121	57.02	7.44	4.13	2.48	1.65	9.92	8.26	3.31	4.13	1.65	0.00
MIAMI, FL PMSA	279	59.86	9.68	1.08	3.23	2.51	7.17	8.60	5.02	2.15	0.72	0.00
MINNEAPOLIS-ST PAUL, MN-WI MSA	200	53.00	21.00	9.50	6.50	5.00	1.00	3.00	1.00	0.00	0.00	0.00
NORFOLK-VIRGINIA BEACH-NEWPORT	150	52.67	8.67	2.67	7.33	6.67	10.00	6.00	5.33	0.67	0.00	0.00
ORLANDO, FL MSA	174	57.47	5.75	3.45	6.32	1.15	9.77	6.90	6.90	1.72	0.57	0.00
PHILADELPHIA, PA-NJ PMSA	189	61.38	6.88	2.12	3.17	5.29	11.64	4.76	4.23	0.00	0.53	0.00
PHOENIX-MESA, AZ MSA	190	37.37	12.63	7.37	12.63	11.05	14.21	3.16	1.58	0.00	0.00	0.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	532	70.86	0.75	0.00	0.75	0.19	1.69	3.76	11.28	6.95	3.01	0.75
SACRAMENTO, CA PMSA	240	63.33	7.92	0.42	3.75	3.75	9.17	5.42	4.17	1.67	0.42	0.00
ST. LOUIS, MO-IL MSA	121	54.55	8.26	2.48	6.61	8.26	9.92	3.31	6.61	0.00	0.00	0.00
TAMPA-ST PETERSBURG-CLEARWATER	200	59.50	10.50	3.00	4.00	3.00	11.00	4.50	3.50	1.00	0.00	0.00
WASHINGTON, DC-MD-VA-WV, PMSA	282	53.90	9.57	5.32	7.09	6.38	9.93	3.90	2.84	0.71	0.00	0.35

TABLE 9

PERCENTAGE DISTRIBUTION OF LENDERS ACROSS DEFAULT RATE CLASSES, BY MSA

1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

MSA NAME	Total Lenders	<31 Loans	Raw Default Rates (Percent) for Lenders with > 30 Loans									
			0 to 0.5 %	>0.5 to 1.0 %	>1.0 to 1.5 %	>1.5 to 2 %	>2 to 3%	>3 to 4%	>4 to 7%	>7 to 10%	>10 to 15%	>15 %
ATLANTA, GA MSA	303	50.83%	13.86%	3.96%	6.93%	6.27%	7.59%	3.63%	5.61%	0.66%	0.33%	0.33%
BALTIMORE, MD PMSA	226	56.19	11.95	4.42	4.87	5.75	6.64	5.75	3.10	0.44	0.88	0.00
CHICAGO, IL PMSA	310	53.87	12.26	4.84	5.16	3.55	10.00	4.84	4.84	0.65	0.00	0.00
DALLAS, TX PMSA	252	51.19	9.13	4.76	6.35	6.75	10.32	4.76	5.95	0.40	0.40	0.00
DENVER, CO PMSA	259	44.40	29.34	11.97	7.34	2.70	2.70	0.77	0.77	0.00	0.00	0.00
DETROIT, MI PMSA	164	50.61	13.41	7.93	6.71	4.27	10.37	1.83	3.05	0.61	1.22	0.00
FORT LAUDERDALE, FL PMSA	238	66.81	7.14	1.26	2.52	2.94	7.98	3.78	5.88	1.26	0.42	0.00
FORT WORTH-ARLINGTON, TX PMSA	228	61.40	5.70	0.88	5.70	5.26	6.14	5.26	6.58	2.63	0.44	0.00
HOUSTON, TX PMSA	188	56.38	7.98	3.19	6.38	6.38	11.17	5.85	1.60	1.06	0.00	0.00
LOS ANGELES-LONG BEACH, CA PMSA	438	68.04	2.05	0.68	0.91	1.14	2.05	2.28	9.36	8.22	3.88	1.37
MEMPHIS, TN-AR-MS MSA	121	57.02	9.09	4.13	3.31	4.96	9.92	4.13	4.13	0.83	1.65	0.83
MIAMI, FL PMSA	279	59.86	11.47	1.43	2.87	3.94	4.66	7.17	6.09	2.51	0.00	0.00
MINNEAPOLIS-ST PAUL, MN-WI MSA	200	53.00	22.50	7.50	7.50	4.50	2.50	1.50	1.00	0.00	0.00	0.00
NORFOLK-VIRGINIA BEACH-NEWPORT	150	52.67	10.00	2.67	6.67	4.67	11.33	8.00	4.00	0.00	0.00	0.00
ORLANDO, FL MSA	174	57.47	6.90	4.02	1.72	1.72	10.34	6.90	9.77	0.57	0.57	0.00
PHILADELPHIA, PA-NJ PMSA	189	61.38	8.99	0.53	2.65	3.70	9.52	6.35	6.35	0.53	0.00	0.00
PHOENIX-MESA, AZ MSA	190	37.37	14.21	6.84	5.79	15.26	13.68	5.26	1.58	0.00	0.00	0.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	532	70.86	1.69	0.00	0.00	0.94	2.26	1.32	9.40	6.95	6.02	0.56
SACRAMENTO, CA PMSA	240	63.33	8.75	1.25	2.92	5.42	3.75	5.42	7.50	1.25	0.42	0.00
ST. LOUIS, MO-IL MSA	121	54.55	8.26	2.48	5.79	9.09	14.05	2.48	3.31	0.00	0.00	0.00
TAMPA-ST PETERSBURG-CLEARWATER	200	59.50	10.50	2.00	5.00	3.00	13.00	2.50	2.50	2.00	0.00	0.00
WASHINGTON, DC-MD-VA-WV, PMSA	282	53.90	10.99	3.19	6.74	7.80	10.28	3.90	2.84	0.00	0.35	0.00

TABLE 10

PERCENTAGE DISTRIBUTION AND OTHER CHARACTERISTICS OF LOANS IN EACH LENDER RELATIVE DEFAULT RATE CLASS ACROSS TRACTS CLASSIFIED BY RELATIVE DEFAULT RATE AND BY CENTRAL CITY/SUBURBAN STATUS
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (Lenders with > 30 Loans)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% Default Rate	0.89%	0.12%	0.64%	1.06%	1.59%	3.20%
% of Loans in High Default Tracts	27.29	18.23	22.73	23.50	23.38	25.46
% Default Rate in High Default Tracts	2.21	0.45	1.72	2.83	4.05	7.52
% of Loans in Non-High Default Tracts	65.78	74.93	72.32	72.04	71.31	69.86
% Default Rate in Non-High Default Tracts	0.35	0.05	0.98	0.49	0.78	1.59
% of Loans in Low Volume Tracts	6.93	6.84	4.95	4.46	5.31	4.68
% Default Rate in Low Volume Tracts	0.84	0.08	0.61	0.98	1.69	3.78
% of Loans in City Tracts	28.42	27.33	32.16	30.84	33.37	34.13
% Default Rate in City Tracts	1.27	0.17	0.74	1.32	1.95	4.48
% of Loans in Suburban Tracts	58.95	57.52	52.74	54.67	52.58	52.40
% Default Rate in Suburban Tracts	0.74	0.11	0.58	0.91	1.33	2.43
% of Loans in unknown City/Suburban Tracts	12.63	15.16	15.10	14.49	14.05	13.47
% Default Rate in unknown City/Suburban Tracts	0.71	0.10	0.67	1.08	1.75	2.97
% of Borrowers in High Default Tracts Who are Black	17.07	17.37	14.21	17.35	22.52	36.32
% of Borrowers in Non-High Default Tracts Who are Black	13.55	10.23	10.13	12.30	15.61	21.93
% of Borrowers in Low Volume Tracts Who are Black	11.49	9.66	11.64	12.68	16.88	23.81

TABLE 10

PERCENTAGE DISTRIBUTION AND OTHER CHARACTERISTICS OF LOANS IN EACH LENDER RELATIVE DEFAULT RATE CLASS ACROSS TRACTS CLASSIFIED BY RELATIVE DEFAULT RATE AND BY CENTRAL CITY/SUBURBAN STATUS
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (Lenders with > 30 Loans)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% Default Rate	3.00%	0.59%	1.86%	3.16%	4.27%	8.15%
% of Loans in High Default Tracts	30.66	16.28	20.79	26.30	24.93	33.61
% Default Rate in High Default Tracts	5.69	1.45	4.43	6.80	8.68	14.83
% of Loans in Non-High Default Tracts	62.41	76.99	73.87	68.79	70.32	62.01
% Default Rate in Non-High Default Tracts	1.69	0.40	4.02	1.78	2.68	4.34
% of Loans in Low Volume Tracts	6.93	6.73	5.34	4.91	4.75	4.38
% Default Rate in Low Volume Tracts	2.91	0.68	1.90	2.95	4.69	10.88
% of Loans in City Tracts	28.42	26.97	30.60	32.58	31.13	47.59
% Default Rate in City Tracts	3.58	0.66	2.14	3.40	4.84	10.04
% of Loans in Suburban Tracts	58.95	57.45	53.98	53.09	55.92	42.69
% Default Rate in Suburban Tracts	2.71	0.56	1.73	3.02	3.95	6.06
% of Loans in unknown City/Suburban Tracts	12.63	15.59	15.42	14.33	12.95	9.72
% Default Rate in unknown City/Suburban Tracts	3.07	0.58	1.74	3.14	4.30	8.08
% of Borrowers in High Default Tracts Who are Black	20.79	21.66	21.04	23.53	33.95	53.03
% of Borrowers in Non-High Default Tracts Who are Black	11.53	7.61	8.55	10.56	14.48	21.82
% of Borrowers in Low Volume Tracts Who are Black	11.49	9.11	11.20	13.03	18.48	36.18

TABLE 10

PERCENTAGE DISTRIBUTION AND OTHER CHARACTERISTICS OF LOANS IN EACH LENDER RELATIVE DEFAULT RATE CLASS ACROSS TRACTS CLASSIFIED BY RELATIVE DEFAULT RATE AND BY CENTRAL CITY/SUBURBAN STATUS
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (Lenders with > 30 Loans)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% Default Rate	2.38%	0.57%	1.94%	2.99%	4.38%	8.71%
% of Loans in High Default Tracts	26.4	15.41	19.7	22.64	23.42	36.43
% Default Rate in High Default Tracts	5.28	1.43	4.83	7.06	9.52	14.67
% of Loans in Non-High Default Tracts	66.67	78.08	75.38	71.72	72	57.18
% Default Rate in Non-High Default Tracts	1.28	0.4	4.56	1.76	2.69	4.4
% of Loans in Low Volume Tracts	6.93	6.51	4.92	5.63	4.58	6.39
% Default Rate in Low Volume Tracts	2.02	0.5	1.89	2.38	4.63	13.26
% of Loans in City Tracts	28.42	28.32	30.37	32.05	30.64	47.58
% Default Rate in City Tracts	2.95	0.66	2.16	3.58	5.13	10.63
% of Loans in Suburban Tracts	58.95	58.21	54.88	52.45	54.5	38.72
% Default Rate in Suburban Tracts	1.91	0.48	1.77	2.59	3.81	6.18
% of Loans in unknown City/Suburban Tracts	12.63	13.47	14.75	15.5	14.87	13.69
% Default Rate in unknown City/Suburban Tracts	3.32	0.73	2.12	3.15	4.91	9.19
% of Borrowers in High Default Tracts Who are Black	20.44	20.66	19.93	24.93	31.30	52.84
% of Borrowers in Non-High Default Tracts Who are Black	12.26	7.84	9.20	10.44	14.24	21.46
% of Borrowers in Low Volume Tracts Who are Black	11.49	8.73	10.23	13.24	19.82	25.59

TABLE 11

CHARACTERISTICS OF LENDERS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

Characteristic	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (> 30 Loans Per Lender)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Lenders in Default Rate Class	60.84%	18.32%	6.03%	5.71%	6.34%	2.76%
% of All Loans in Default Rate Class	4.32	25.59	28.40	23.81	15.31	2.56
% of All Defaults in Default Rate Class	4.62	3.75	22.03	30.37	29.38	9.85
Default Rate (%) in Class	0.89	0.12	0.64	1.06	1.59	3.20
FHA % Black	14.36	11.49	11.13	13.50	17.30	25.68
FHA % Hispanic	18.23	10.09	12.45	13.18	14.58	11.76
First Time (%)	39.98	44.01	45.78	43.20	48.25	53.01
% LTV .97 +	25.35	23.73	24.57	24.73	27.29	35.67
% Front end .29+	23.61	18.29	19.49	19.23	18.99	16.26
% Back end .41+	17.86	16.92	16.74	16.17	16.18	14.17
Income-MSA average	173.48	54.51	30.34	-19.72	-117.22	-213.65
Mortgage-MSA average	5083.77	-252.70	1551.38	258.79	-2697.53	-7792.57
Assets-MSA average	813.15	309.79	377.85	-103.32	-999.44	-1265.98
FHA/Tot originations (%)	35.50	34.51	37.60	38.15	37.09	41.11
Black FHA/Blk originations (%)	39.64	38.45	40.64	41.29	41.28	45.05
Hispanic FHA/Hisp originations (%)	41.33	39.32	42.91	42.90	41.37	43.28
Conventional denials/applications (%)	17.93	14.77	15.87	16.55	16.68	17.48
Census % Black	14.91	9.25	10.55	10.77	11.18	10.01
Census % Hispanic	13.60	11.82	11.51	13.17	15.59	22.13
Census Unemp Rate (%)	7.89	7.06	6.83	7.09	7.84	9.58
Census Income Ratio	1.03	1.04	1.04	1.03	1.01	0.96
Census Poverty Rate (%)	9.67	8.05	8.40	8.79	9.22	10.58
Census Home Ownership Rate (%)	67.11	69.37	68.20	68.26	67.67	67.30

TABLE 11

CHARACTERISTICS OF LENDERS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Characteristic	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (> 30 Loans Per Lender)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Lenders in Default Rate Class	60.84%	11.81%	10.92%	8.33%	6.69%	1.41%
% of All Loans in Default Rate Class	4.32	17.63	37.64	26.78	12.33	1.30
% of All Defaults in Default Rate Class	5.38	4.31	29.00	35.08	21.84	4.40
Default Rate (%) in Class	3.00	0.59	1.86	3.16	4.27	8.15
FHA % Black	14.36	10.00	11.29	14.09	19.53	32.94
FHA % Hispanic	18.23	9.37	11.44	15.19	13.08	11.68
First Time (%)	39.98	39.69	43.35	48.30	50.88	59.81
% LTV .97 +	25.35	21.64	24.50	24.66	30.53	39.28
% Front end .29+	23.61	16.77	19.40	20.12	18.26	13.57
% Back end .41+	17.86	16.40	16.38	17.10	16.00	12.28
Income-MSA average	173.48	53.16	53.73	-18.56	-163.25	-450.65
Mortgage-MSA average	5083.77	-1383.87	1709.29	1162.72	-5244.91	-14422.89
Assets-MSA average	813.15	561.81	341.68	-144.99	-1090.71	-3286.62
FHA/Tot originations (%)	35.50	33.70	36.74	38.52	37.71	45.29
Black FHA/Blk originations (%)	39.64	37.68	40.12	41.84	41.44	48.28
Hispanic FHA/Hisp originations (%)	41.33	38.77	41.56	63.94	41.36	43.44
Conventional denials/applications (%)	17.93	14.97	15.47	16.40	17.19	19.62
Census % Black	13.60	11.06	11.87	13.16	16.95	25.85
Census % Hispanic	14.91	9.43	9.85	11.64	10.43	9.43
Census Unemp Rate (%)	7.89	6.71	7.05	7.41	7.44	10.83
Census Income Ratio	1.03	1.05	1.04	1.03	1.00	0.92
Census Poverty Rate (%)	9.67	7.90	8.30	9.01	9.20	12.13
Census Home Ownership Rate (%)	67.11	69.17	68.78	67.76	67.81	67.17

TABLE 11

CHARACTERISTICS OF LENDERS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

Characteristic	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (> 30 Loans Per Lender)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Lenders in Default Rate Class	60.84%	12.63%	10.57%	7.88%	6.82%	1.26%
% of All Loans in Default Rate Class	4.32	16.94	35	28.41	13.98	1.35
% of All Defaults in Default Rate Class	4.19	3.91	27.65	34.59	24.89	4.77
Default Rate (%) in Class	2.38	0.57	1.94	2.99	4.38	8.71
FHA % Black	14.36	9.87	11.37	13.88	18.49	33.16
FHA % Hispanic	18.23	10.24	11.14	14.57	13.43	10.68
First Time (%)	39.98	39.54	42.65	48.67	49.61	67.44
% LTV .97 +	25.35	24.13	24.51	24.36	27.61	38.35
% Front end .29+	23.61	18.46	18.98	19.85	18.11	13.67
% Back end .41+	17.86	17.11	17.25	16.25	15.29	10.9
Income-MSA average	173.48	104.9	19.78	-2.45	-123.2	-500.88
Mortgage-MSA average	5083.77	857.69	356.08	1305.63	-3413.99	-17272.76
Assets-MSA average	813.15	646.24	162.85	-178.44	-531.5	-2595.1
FHA/Tot originations (%)	35.5	34.84	36.57	37.68	37.96	46.1
Black FHA/Blk originations (%)	39.64	38.58	40.25	41.04	41.15	49.06
Hispanic FHA/Hisp originations (%)	41.33	40.06	41.65	42.71	42.04	40.33
Conventional denials/applications (%)	17.93	14.93	15.86	15.85	17.03	19.73
Census % Black	14.91	9.63	9.89	11.17	10.85	9.04
Census % Hispanic	13.6	10.66	11.53	13.55	16.58	28.91
Census Unemp Rate (%)	7.89	6.7	6.69	7.76	7.44	12.14
Census Income Ratio	1.03	1.06	1.05	1.01	1	0.88
Census Poverty Rate (%)	9.67	7.8	8.25	9.01	9.13	13.62
Census Home Ownership Rate (%)	67.11	69.2	68.85	67.88	67.63	66.61

TABLE 12

CHI-SQUARE TESTS OF INDEPENDENCE BETWEEN TRACTS AND DEFAULTS

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

MSA NAME	CHI-SQUARE	DEGREES OF FREEDOM	PROBABILITY
ATLANTA, GA MSA	1.412	1	0.234804
BALTIMORE, MD PMSA	0.890	1	0.345435
CHICAGO, IL PMSA	0.463	1	0.496071
DALLAS, TX PMSA	4.977	3	0.173502
DENVER, CO PMSA	0.000	0	.
DETROIT, MI PMSA	2.762	1	0.096509
FORT LAUDERDALE, FL PMSA	0.833	1	0.361444
FORT WORTH-ARLINGTON, TX PMSA	0.281	2	0.868970
HOUSTON, TX PMSA	6.670	1	0.009807
LOS ANGELES-LONG BEACH, CA PMSA	63.451	11	0.000000
MEMPHIS, TN-AR-MS MSA	0.000	0	.
MIAMI, FL PMSA	3.836	1	0.050177
MINNEAPOLIS-ST PAUL, MN-WI MSA	0.000	0	.
NORFOLK-VIRGINIA BEACH-NEWPORT	0.000	0	.
ORLANDO, FL MSA	0.000	0	.
PHILADELPHIA, PA-NJ PMSA	0.000	0	.
PHOENIX-MESA, AZ MSA	0.541	1	0.462022
RIVERSIDE-SAN BERNARDINO, CA PMSA	68.837	27	0.000016
SACRAMENTO, CA PMSA	0.000	0	.
ST. LOUIS, MO-IL MSA	0.000	0	.
TAMPA-ST PETERSBURG-CLEARWATER	0.000	0	.
WASHINGTON, DC-MD-VA-WV, PMSA	3.976	1	0.046146

TABLE 12

CHI-SQUARE TESTS OF INDEPENDENCE BETWEEN TRACTS AND DEFAULTS

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	CHI-SQUARE	DEGREES OF FREEDOM	PROBABILITY
ATLANTA, GA MSA	66.888	23	0.000004
BALTIMORE, MD PMSA	27.957	12	0.005612
CHICAGO, IL PMSA	53.628	14	0.000001
DALLAS, TX PMSA	90.188	20	0.000000
DENVER, CO PMSA	7.860	1	0.005055
DETROIT, MI PMSA	4.205	1	0.040297
FORT LAUDERDALE, FL PMSA	21.013	10	0.021002
FORT WORTH-ARLINGTON, TX PMSA	20.253	17	0.261479
HOUSTON, TX PMSA	16.966	4	0.001962
LOS ANGELES-LONG BEACH, CA PMSA	169.003	54	0.000000
MEMPHIS, TN-AR-MS MSA	105.811	20	0.000000
MIAMI, FL PMSA	68.183	18	0.000000
MINNEAPOLIS-ST PAUL, MN-WI MSA	7.163	1	0.007441
NORFOLK-VIRGINIA BEACH-NEWPORT	3.728	5	0.589146
ORLANDO, FL MSA	14.382	12	0.277004
PHILADELPHIA, PA-NJ PMSA	50.123	4	0.000000
PHOENIX-MESA, AZ MSA	11.655	13	0.556081
RIVERSIDE-SAN BERNARDINO, CA PMSA	343.769	168	0.000000
SACRAMENTO, CA PMSA	0.457	3	0.928288
ST. LOUIS, MO-IL MSA	56.659	4	0.000000
TAMPA-ST PETERSBURG-CLEARWATER	8.192	1	0.004208
WASHINGTON, DC-MD-VA-WV, PMSA	59.238	16	0.000001

TABLE 12

CHI-SQUARE TESTS OF INDEPENDENCE BETWEEN TRACTS AND DEFAULTS

1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

MSA NAME	CHI-SQUARE	DEGREES OF FREEDOM	PROBABILITY
ATLANTA, GA MSA	62.887	22	0.000008
BALTIMORE, MD PMSA	21.048	8	0.007021
CHICAGO, IL PMSA	67.009	12	0.000000
DALLAS, TX PMSA	97.972	23	0.000000
DENVER, CO PMSA	0.205	1	0.650695
DETROIT, MI PMSA	0.507	1	0.476626
FORT LAUDERDALE, FL PMSA	6.261	6	0.394566
FORT WORTH-ARLINGTON, TX PMSA	13.013	20	0.876805
HOUSTON, TX PMSA	6.497	5	0.260788
LOS ANGELES-LONG BEACH, CA PMSA	237.119	43	0.000000
MEMPHIS, TN-AR-MS MSA	93.155	20	0.000000
MIAMI, FL PMSA	19.105	11	0.059243
MINNEAPOLIS-ST PAUL, MN-WI MSA	0.477	1	0.489912
NORFOLK-VIRGINIA BEACH-NEWPORT	5.045	6	0.538101
ORLANDO, FL MSA	15.057	12	0.238348
PHILADELPHIA, PA-NJ PMSA	3.969	5	0.553839
PHOENIX-MESA, AZ MSA	34.439	27	0.153661
RIVERSIDE-SAN BERNARDINO, CA PMSA	540.324	184	0.000000
SACRAMENTO, CA PMSA	9.081	3	0.028236
ST. LOUIS, MO-IL MSA	30.361	9	0.000381
TAMPA-ST PETERSBURG-CLEARWATER	0.504	1	0.477723
WASHINGTON, DC-MD-VA-WV, PMSA	19.713	16	0.233413

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL A: 1992 ORIGINATIONS, CLAIMS AT TWO YEARS

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	460	2.39%	3.48%	94.13%
BALTIMORE, MD PMSA	428	1.64	3.27	95.09
CHICAGO, IL PMSA	993	2.32	2.22	95.47
DALLAS, TX PMSA	455	5.05	0.66	94.29
DENVER, CO PMSA	386	2.33	2.33	95.34
DETROIT, MI PMSA	851	1.53	1.65	96.83
FORT LAUDERDALE, FL PMSA	130	2.31	2.31	95.38
FORT WORTH-ARLINGTON, TX PMSA	279	3.94	1.08	94.98
HOUSTON, TX PMSA	449	2.00	1.34	96.66
LOS ANGELES-LONG BEACH, CA PMSA	452	2.43	2.21	95.35
MEMPHIS, TN-AR-MS MSA	179	3.91	2.79	93.30
MIAMI, FL PMSA	180	2.22	1.67	96.11
MINNEAPOLIS-ST PAUL, MN-WI MSA	601	2.00	2.66	95.34
NORFOLK-VIRGINIA BEACH-NEWPORT	297	2.36	3.03	94.61
ORLANDO, FL MSA	205	3.90	0.98	95.12
PHILADELPHIA, PA-NJ PMSA	644	1.09	1.71	97.20
PHOENIX-MESA, AZ MSA	466	3.43	2.36	94.21
RIVERSIDE-SAN BERNARDINO, CA PMSA	306	4.58	1.63	93.79
SACRAMENTO, CA PMSA	212	0.94	2.83	96.23
ST. LOUIS, MO-IL MSA	347	1.73	2.31	95.97
TAMPA-ST PETERSBURG-CLEARWATER	302	1.32	2.65	96.03
WASHINGTON, DC-MD-VA-WV, PMSA	692	2.17	2.46	95.38

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL B: 1994 ORIGINATIONS, CLAIMS AT TWO YEARS

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	398	3.02%	1.76%	95.23%
BALTIMORE, MD PMSA	399	3.01	1.75	95.24
CHICAGO, IL PMSA	886	2.37	1.81	95.82
DALLAS, TX PMSA	400	1.75	3.75	94.50
DENVER, CO PMSA	357	2.52	0.84	96.64
DETROIT, MI PMSA	591	3.38	1.02	95.60
FORT LAUDERDALE, FL PMSA	134	3.73	2.24	94.03
FORT WORTH-ARLINGTON, TX PMSA	246	1.63	4.07	94.31
HOUSTON, TX PMSA	382	3.40	2.09	94.50
LOS ANGELES-LONG BEACH, CA PMSA	659	3.19	1.52	95.30
MEMPHIS, TN-AR-MS MSA	166	3.01	3.01	93.98
MIAMI, FL PMSA	179	2.23	1.12	96.65
MINNEAPOLIS-ST PAUL, MN-WI MSA	559	2.33	2.15	95.53
NORFOLK-VIRGINIA BEACH-NEWPORT	254	1.97	1.57	96.46
ORLANDO, FL MSA	191	2.62	1.57	95.81
PHILADELPHIA, PA-NJ PMSA	655	1.68	1.53	96.79
PHOENIX-MESA, AZ MSA	410	2.68	1.22	96.10
RIVERSIDE-SAN BERNARDINO, CA PMSA	274	2.19	1.82	95.99
SACRAMENTO, CA PMSA	205	2.93	2.44	94.63
ST. LOUIS, MO-IL MSA	338	2.07	0.59	97.34
TAMPA-ST PETERSBURG-CLEARWATER	299	1.67	2.01	96.32
WASHINGTON, DC-MD-VA-WV, PMSA	630	2.06	2.54	95.40

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL C: 1992 AND 1994 ORIGINATIONS, CLAIMS AT TWO YEARS

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	476	4.20%	1.47%	94.33%
BALTIMORE, MD PMSA	460	2.83	2.83	94.35
CHICAGO, IL PMSA	1083	2.86	2.59	94.55
DALLAS, TX PMSA	489	4.29	2.04	93.66
DENVER, CO PMSA	396	3.54	1.26	95.20
DETROIT, MI PMSA	941	3.08	1.49	95.43
FORT LAUDERDALE, FL PMSA	140	4.29	1.43	94.29
FORT WORTH-ARLINGTON, TX PMSA	295	3.73	3.73	92.54
HOUSTON, TX PMSA	499	2.00	1.40	96.59
LOS ANGELES-LONG BEACH, CA PMSA	729	2.74	2.47	94.79
MEMPHIS, TN-AR-MS MSA	187	3.21	5.35	91.44
MIAMI, FL PMSA	203	2.96	0.99	96.06
MINNEAPOLIS-ST PAUL, MN-WI MSA	612	2.94	2.12	94.93
NORFOLK-VIRGINIA BEACH-NEWPORT	311	2.57	2.89	94.53
ORLANDO, FL MSA	215	4.19	0.93	94.88
PHILADELPHIA, PA-NJ PMSA	726	1.52	1.38	97.11
PHOENIX-MESA, AZ MSA	475	4.00	3.16	92.84
RIVERSIDE-SAN BERNARDINO, CA PMSA	316	4.43	2.22	93.35
SACRAMENTO, CA PMSA	255	3.14	1.96	94.90
ST. LOUIS, MO-IL MSA	366	3.01	1.91	95.08
TAMPA-ST PETERSBURG-CLEARWATER	340	1.76	1.47	96.76
WASHINGTON, DC-MD-VA-WV, PMSA	755	2.78	2.65	94.57

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL D: 1992 ORIGINATIONS, UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	460	3.04%	3.70%	93.26%
BALTIMORE, MD PMSA	428	3.50	1.87	94.63
CHICAGO, IL PMSA	993	4.43	2.01	93.55
DALLAS, TX PMSA	455	4.62	3.52	91.87
DENVER, CO PMSA	386	2.85	0.78	96.37
DETROIT, MI PMSA	851	2.47	1.41	96.12
FORT LAUDERDALE, FL PMSA	130	2.31	1.54	96.15
FORT WORTH-ARLINGTON, TX PMSA	279	4.66	1.79	93.55
HOUSTON, TX PMSA	449	2.45	2.45	95.10
LOS ANGELES-LONG BEACH, CA PMSA	452	3.10	2.88	94.03
MEMPHIS, TN-AR-MS MSA	179	7.82	5.03	87.15
MIAMI, FL PMSA	180	5.00	2.78	92.22
MINNEAPOLIS-ST PAUL, MN-WI MSA	601	3.00	2.66	94.34
NORFOLK-VIRGINIA BEACH-NEWPORT	297	2.69	3.03	94.28
ORLANDO, FL MSA	205	1.95	3.90	94.15
PHILADELPHIA, PA-NJ PMSA	644	1.86	2.33	95.81
PHOENIX-MESA, AZ MSA	466	3.00	3.22	93.78
RIVERSIDE-SAN BERNARDINO, CA PMSA	306	4.90	2.94	92.16
SACRAMENTO, CA PMSA	212	1.89	2.36	95.75
ST. LOUIS, MO-IL MSA	347	2.88	2.59	94.52
TAMPA-ST PETERSBURG-CLEARWATER	302	1.66	4.30	94.04
WASHINGTON, DC-MD-VA-WV, PMSA	692	3.32	2.31	94.36

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL E: 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	398	4.77%	3.52%	91.71%
BALTIMORE, MD PMSA	399	4.76	4.01	91.23
CHICAGO, IL PMSA	886	5.08	3.27	91.65
DALLAS, TX PMSA	400	3.50	2.50	94.00
DENVER, CO PMSA	357	2.52	2.24	95.24
DETROIT, MI PMSA	591	5.25	1.18	93.57
FORT LAUDERDALE, FL PMSA	134	3.73	0.75	95.52
FORT WORTH-ARLINGTON, TX PMSA	246	1.63	3.25	95.12
HOUSTON, TX PMSA	382	2.09	3.40	94.50
LOS ANGELES-LONG BEACH, CA PMSA	659	2.88	3.34	93.78
MEMPHIS, TN-AR-MS MSA	166	6.63	2.41	90.96
MIAMI, FL PMSA	179	5.59	1.68	92.74
MINNEAPOLIS-ST PAUL, MN-WI MSA	559	3.76	2.15	94.10
NORFOLK-VIRGINIA BEACH-NEWPORT	254	4.33	2.76	92.91
ORLANDO, FL MSA	191	6.28	2.09	91.62
PHILADELPHIA, PA-NJ PMSA	655	2.44	2.14	95.42
PHOENIX-MESA, AZ MSA	410	4.15	1.46	94.39
RIVERSIDE-SAN BERNARDINO, CA PMSA	274	5.84	3.28	90.88
SACRAMENTO, CA PMSA	205	2.93	3.90	93.17
ST. LOUIS, MO-IL MSA	338	2.96	2.07	94.97
TAMPA-ST PETERSBURG-CLEARWATER	299	2.68	3.34	93.98
WASHINGTON, DC-MD-VA-WV, PMSA	630	3.97	2.54	93.49

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL F: 1992 AND 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	476	6.93%	3.99%	89.08%
BALTIMORE, MD PMSA	460	6.74	2.83	90.43
CHICAGO, IL PMSA	1083	5.91	2.95	91.14
DALLAS, TX PMSA	489	5.93	2.66	91.41
DENVER, CO PMSA	396	4.55	2.02	93.43
DETROIT, MI PMSA	941	4.46	1.06	94.47
FORT LAUDERDALE, FL PMSA	140	6.43	2.14	91.43
FORT WORTH-ARLINGTON, TX PMSA	295	5.08	3.73	91.19
HOUSTON, TX PMSA	499	2.61	2.20	95.19
LOS ANGELES-LONG BEACH, CA PMSA	729	3.84	2.61	93.55
MEMPHIS, TN-AR-MS MSA	187	9.63	2.67	87.70
MIAMI, FL PMSA	203	5.91	2.96	91.13
MINNEAPOLIS-ST PAUL, MN-WI MSA	612	5.88	1.63	92.48
NORFOLK-VIRGINIA BEACH-NEWPORT	311	7.07	2.57	90.35
ORLANDO, FL MSA	215	7.44	2.33	90.23
PHILADELPHIA, PA-NJ PMSA	726	3.17	2.75	94.08
PHOENIX-MESA, AZ MSA	475	4.84	3.16	92.00
RIVERSIDE-SAN BERNARDINO, CA PMSA	316	6.33	2.85	90.82
SACRAMENTO, CA PMSA	255	2.35	3.92	93.73
ST. LOUIS, MO-IL MSA	366	5.74	1.64	92.62
TAMPA-ST PETERSBURG-CLEARWATER	340	3.82	2.35	93.82
WASHINGTON, DC-MD-VA-WV, PMSA	755	4.90	2.78	92.32

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL G: 1992 ORIGINATIONS, UNCURED DELINQUENCIES AT 12/95

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	460	6.30%	3.70%	90.00%
BALTIMORE, MD PMSA	428	5.37	3.74	90.89
CHICAGO, IL PMSA	993	6.04	3.12	90.84
DALLAS, TX PMSA	455	5.71	3.08	91.21
DENVER, CO PMSA	386	2.85	2.59	94.56
DETROIT, MI PMSA	851	2.94	2.12	94.95
FORT LAUDERDALE, FL PMSA	130	2.31	3.85	93.85
FORT WORTH-ARLINGTON, TX PMSA	279	5.73	2.15	92.11
HOUSTON, TX PMSA	449	3.34	1.56	95.10
LOS ANGELES-LONG BEACH, CA PMSA	452	5.31	1.11	93.58
MEMPHIS, TN-AR-MS MSA	179	9.50	3.91	86.59
MIAMI, FL PMSA	180	2.78	2.78	94.44
MINNEAPOLIS-ST PAUL, MN-WI MSA	601	3.83	2.83	93.34
NORFOLK-VIRGINIA BEACH-NEWPORT	297	4.38	3.70	91.92
ORLANDO, FL MSA	205	4.88	3.90	91.22
PHILADELPHIA, PA-NJ PMSA	644	2.48	3.42	94.10
PHOENIX-MESA, AZ MSA	466	5.15	3.00	91.85
RIVERSIDE-SAN BERNARDINO, CA PMSA	306	6.86	2.94	90.20
SACRAMENTO, CA PMSA	212	3.30	2.36	94.34
ST. LOUIS, MO-IL MSA	347	4.90	3.17	91.93
TAMPA-ST PETERSBURG-CLEARWATER	302	2.98	1.66	95.36
WASHINGTON, DC-MD-VA-WV, PMSA	692	4.05	2.60	93.35

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL H: 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT 12/95

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	398	5.53%	3.52%	90.95%
BALTIMORE, MD PMSA	399	5.01	1.50	93.48
CHICAGO, IL PMSA	886	4.18	3.05	92.78
DALLAS, TX PMSA	400	4.00	2.00	94.00
DENVER, CO PMSA	357	2.80	1.40	95.80
DETROIT, MI PMSA	591	4.06	1.18	94.75
FORT LAUDERDALE, FL PMSA	134	2.99	2.24	94.78
FORT WORTH-ARLINGTON, TX PMSA	246	1.63	3.66	94.72
HOUSTON, TX PMSA	382	2.36	2.36	95.29
LOS ANGELES-LONG BEACH, CA PMSA	659	3.49	2.28	94.23
MEMPHIS, TN-AR-MS MSA	166	5.42	2.41	92.17
MIAMI, FL PMSA	179	2.79	1.68	95.53
MINNEAPOLIS-ST PAUL, MN-WI MSA	559	2.68	1.61	95.71
NORFOLK-VIRGINIA BEACH-NEWPORT	254	1.57	1.57	96.85
ORLANDO, FL MSA	191	4.19	2.62	93.19
PHILADELPHIA, PA-NJ PMSA	655	1.83	2.60	95.57
PHOENIX-MESA, AZ MSA	410	1.95	2.93	95.12
RIVERSIDE-SAN BERNARDINO, CA PMSA	274	4.74	2.92	92.34
SACRAMENTO, CA PMSA	205	2.44	1.95	95.61
ST. LOUIS, MO-IL MSA	338	2.66	2.37	94.97
TAMPA-ST PETERSBURG-CLEARWATER	299	2.68	2.34	94.98
WASHINGTON, DC-MD-VA-WV, PMSA	630	3.33	2.54	94.13

TABLE 13

EXACT PROBABILITY CALCULATIONS ASSUMING THAT TRACT DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH TRACT

PERCENTAGE OF TRACTS BY PROBABILITY OF OUTCOME , BY MSA

PANEL I: 1992 AND 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT 12/95

MSA NAME	TOTAL TRACTS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	476	9.03%	3.36%	87.61%
BALTIMORE, MD PMSA	460	6.74	3.26	90.00
CHICAGO, IL PMSA	1083	6.93	2.22	90.86
DALLAS, TX PMSA	489	5.52	3.27	91.21
DENVER, CO PMSA	396	4.04	1.77	94.19
DETROIT, MI PMSA	941	3.83	1.91	94.26
FORT LAUDERDALE, FL PMSA	140	5.00	0.00	95.00
FORT WORTH-ARLINGTON, TX PMSA	295	6.10	2.03	91.86
HOUSTON, TX PMSA	499	2.81	1.80	95.39
LOS ANGELES-LONG BEACH, CA PMSA	729	4.80	0.82	94.38
MEMPHIS, TN-AR-MS MSA	187	10.70	2.67	86.63
MIAMI, FL PMSA	203	2.46	3.45	94.09
MINNEAPOLIS-ST PAUL, MN-WI MSA	612	5.07	1.80	93.14
NORFOLK-VIRGINIA BEACH-NEWPORT	311	6.11	2.89	91.00
ORLANDO, FL MSA	215	6.05	5.12	88.84
PHILADELPHIA, PA-NJ PMSA	726	3.03	3.17	93.80
PHOENIX-MESA, AZ MSA	475	5.68	3.79	90.53
RIVERSIDE-SAN BERNARDINO, CA PMSA	316	9.18	4.43	86.39
SACRAMENTO, CA PMSA	255	5.10	3.53	91.37
ST. LOUIS, MO-IL MSA	366	6.01	2.73	91.26
TAMPA-ST PETERSBURG-CLEARWATER	340	3.53	2.35	94.12
WASHINGTON, DC-MD-VA-WV, PMSA	755	5.03	2.91	92.05

TABLE 14

PERCENTAGE OF TRACTS IDENTIFIED AS HIGH DEFAULT IN ONE, BOTH, OR NEITHER ORIGINATION YEAR, BY MSA

PANEL A: CLAIMS AT TWO YEARS

MSA NAME	NUMBER OF TRACTS	HIGH DEFAULT IN:		
		BOTH YEARS	ONE YEAR	NEITHER YEAR
ATLANTA, GA MSA	384	0.26%	4.69%	95.05%
BALTIMORE, MD PMSA	373	0.00	4.83	95.17
CHICAGO, IL PMSA	809	0.00	5.19	94.81
DALLAS, TX PMSA	369	0.27	6.50	93.22
DENVER, CO PMSA	348	0.57	3.16	96.26
DETROIT, MI PMSA	514	0.58	4.47	94.94
FORT LAUDERDALE, FL PMSA	124	0.81	4.84	94.35
FORT WORTH-ARLINGTON, TX PMSA	232	0.00	6.03	93.97
HOUSTON, TX PMSA	346	0.29	4.91	94.80
LOS ANGELES-LONG BEACH, CA PMSA	392	0.26	6.38	93.37
MEMPHIS, TN-AR-MS MSA	158	0.00	7.59	92.41
MIAMI, FL PMSA	158	0.63	3.80	95.57
MINNEAPOLIS-ST PAUL, MN-WI MSA	548	0.73	3.10	96.17
NORFOLK-VIRGINIA BEACH-NEWPORT	241	0.41	3.73	95.85
ORLANDO, FL MSA	183	0.00	7.10	92.90
PHILADELPHIA, PA-NJ PMSA	586	0.00	2.90	97.10
PHOENIX-MESA, AZ MSA	402	0.25	5.72	94.03
RIVERSIDE-SAN BERNARDINO, CA PMSA	264	0.76	5.30	93.94
SACRAMENTO, CA PMSA	165	0.00	4.24	95.76
ST. LOUIS, MO-IL MSA	323	0.31	3.10	96.59
TAMPA-ST PETERSBURG-CLEARWATER	262	0.00	3.05	96.95
WASHINGTON, DC-MD-VA-WV, PMSA	572	0.17	4.02	95.80

TABLE 14

PERCENTAGE OF TRACTS IDENTIFIED AS HIGH DEFAULT IN ONE, BOTH, OR NEITHER ORIGINATION YEAR, BY MSA

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	NUMBER OF TRACTS	HIGH DEFAULT IN:		
		BOTH YEARS	ONE YEAR	NEITHER YEAR
ATLANTA, GA MSA	384	0.78%	6.77%	92.45%
BALTIMORE, MD PMSA	373	0.54	7.51	91.96
CHICAGO, IL PMSA	809	1.24	8.28	90.48
DALLAS, TX PMSA	369	0.54	7.86	91.60
DENVER, CO PMSA	348	0.29	4.89	94.83
DETROIT, MI PMSA	514	1.17	6.61	92.22
FORT LAUDERDALE, FL PMSA	124	0.81	4.84	94.35
FORT WORTH-ARLINGTON, TX PMSA	232	0.86	4.74	94.40
HOUSTON, TX PMSA	346	0.00	4.05	95.95
LOS ANGELES-LONG BEACH, CA PMSA	392	0.51	6.38	93.11
MEMPHIS, TN-AR-MS MSA	158	1.90	10.76	87.34
MIAMI, FL PMSA	158	1.27	8.86	89.87
MINNEAPOLIS-ST PAUL, MN-WI MSA	548	0.36	6.20	93.43
NORFOLK-VIRGINIA BEACH-NEWPORT	241	0.00	6.22	93.78
ORLANDO, FL MSA	183	0.55	7.65	91.80
PHILADELPHIA, PA-NJ PMSA	586	0.00	4.61	95.39
PHOENIX-MESA, AZ MSA	402	0.50	6.47	93.03
RIVERSIDE-SAN BERNARDINO, CA PMSA	264	1.89	6.82	91.29
SACRAMENTO, CA PMSA	165	0.00	4.85	95.15
ST. LOUIS, MO-IL MSA	323	0.00	5.88	94.12
TAMPA-ST PETERSBURG-CLEARWATER	262	0.38	3.82	95.80
WASHINGTON, DC-MD-VA-WV, PMSA	572	0.17	7.34	92.48

TABLE 14

PERCENTAGE OF TRACTS IDENTIFIED AS HIGH DEFAULT IN ONE, BOTH, OR NEITHER ORIGINATION YEAR, BY MSA

PANEL C: UNCURED DELINQUENCIES AT 12/95

MSA NAME	NUMBER OF TRACTS	HIGH DEFAULT IN:		
		BOTH YEARS	ONE YEAR	NEITHER YEAR
ATLANTA, GA MSA	384	0.52%	11.46%	88.02%
BALTIMORE, MD PMSA	373	1.34	8.31	90.35
CHICAGO, IL PMSA	809	1.48	8.41	90.11
DALLAS, TX PMSA	369	0.54	8.94	90.51
DENVER, CO PMSA	348	0.29	5.17	94.54
DETROIT, MI PMSA	514	1.75	5.45	92.80
FORT LAUDERDALE, FL PMSA	124	0.81	4.03	95.16
FORT WORTH-ARLINGTON, TX PMSA	232	1.29	5.17	93.53
HOUSTON, TX PMSA	346	0.00	4.91	95.09
LOS ANGELES-LONG BEACH, CA PMSA	392	1.02	7.91	91.07
MEMPHIS, TN-AR-MS MSA	158	1.90	10.76	87.34
MIAMI, FL PMSA	158	0.63	5.06	94.30
MINNEAPOLIS-ST PAUL, MN-WI MSA	548	0.36	6.20	93.43
NORFOLK-VIRGINIA BEACH-NEWPORT	241	0.41	4.15	95.44
ORLANDO, FL MSA	183	0.00	9.29	90.71
PHILADELPHIA, PA-NJ PMSA	586	0.00	4.27	95.73
PHOENIX-MESA, AZ MSA	402	0.25	6.72	93.03
RIVERSIDE-SAN BERNARDINO, CA PMSA	264	2.65	6.44	90.91
SACRAMENTO, CA PMSA	165	0.00	4.85	95.15
ST. LOUIS, MO-IL MSA	323	0.62	6.50	92.88
TAMPA-ST PETERSBURG-CLEARWATER	262	0.00	5.73	94.27
WASHINGTON, DC-MD-VA-WV, PMSA	572	0.70	5.94	93.36

TABLE 15

CHI-SQUARE TESTS OF INDEPENDENCE BETWEEN LENDERS AND DEFAULTS

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

MSA NAME	CHI-SQUARE	DEGREES OF FREEDOM	PROBABILITY
ATLANTA, GA MSA	26.218	15	0.035796
BALTIMORE, MD PMSA	14.929	7	0.036924
CHICAGO, IL PMSA	51.953	12	0.000001
DALLAS, TX PMSA	33.003	19	0.024021
DENVER, CO PMSA	6.332	4	0.175672
DETROIT, MI PMSA	79.625	14	0.000000
FORT LAUDERDALE, FL PMSA	0.088	2	0.956744
FORT WORTH-ARLINGTON, TX PMSA	46.625	15	0.000042
HOUSTON, TX PMSA	18.263	4	0.001096
LOS ANGELES-LONG BEACH, CA PMSA	67.047	32	0.000279
MEMPHIS, TN-AR-MS MSA	12.307	8	0.138010
MIAMI, FL PMSA	13.153	5	0.021985
MINNEAPOLIS-ST PAUL, MN-WI MSA	16.918	11	0.110329
NORFOLK-VIRGINIA BEACH-NEWPORT	12.547	6	0.050826
ORLANDO, FL MSA	0.56	3	0.905594
PHILADELPHIA, PA-NJ PMSA	19.697	2	0.000053
PHOENIX-MESA, AZ MSA	85.133	31	0.000001
RIVERSIDE-SAN BERNARDINO, CA PMSA	88.964	43	0.000048
SACRAMENTO, CA PMSA	1.501	2	0.472226
ST. LOUIS, MO-IL MSA	21.003	8	0.007140
TAMPA-ST PETERSBURG-CLEARWATER	9.781	4	0.044279
WASHINGTON, DC-MD-VA-WV, PMSA	44.621	15	0.000088

TABLE 15

CHI-SQUARE TESTS OF INDEPENDENCE BETWEEN LENDERS AND DEFAULTS

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	CHI-SQUARE	DEGREES OF FREEDOM	PROBABILITY
ATLANTA, GA MSA	169.636	43	0.000000
BALTIMORE, MD PMSA	100.978	40	0.000000
CHICAGO, IL PMSA	449.632	52	0.000000
DALLAS, TX PMSA	141.771	45	0.000000
DENVER, CO PMSA	26.968	13	0.012567
DETROIT, MI PMSA	838.719	27	0.000000
FORT LAUDERDALE, FL PMSA	30.678	18	0.031357
FORT WORTH-ARLINGTON, TX PMSA	194.122	33	0.000000
HOUSTON, TX PMSA	71.353	24	0.000001
LOS ANGELES-LONG BEACH, CA PMSA	195.478	73	0.000000
MEMPHIS, TN-AR-MS MSA	18.414	16	0.300221
MIAMI, FL PMSA	128.098	25	0.000000
MINNEAPOLIS-ST PAUL, MN-WI MSA	58.754	21	0.000020
NORFOLK-VIRGINIA BEACH-NEWPORT	78.522	30	0.000003
ORLANDO, FL MSA	49.586	23	0.001044
PHILADELPHIA, PA-NJ PMSA	85.048	33	0.000002
PHOENIX-MESA, AZ MSA	148.660	48	0.000000
RIVERSIDE-SAN BERNARDINO, CA PMSA	262.803	90	0.000000
SACRAMENTO, CA PMSA	10.050	11	0.525877
ST. LOUIS, MO-IL MSA	44.548	20	0.001270
TAMPA-ST PETERSBURG-CLEARWATER	63.558	20	0.000002
WASHINGTON, DC-MD-VA-WV, PMSA	254.827	56	0.000000

TABLE 15

CHI-SQUARE TESTS OF INDEPENDENCE BETWEEN LENDERS AND DEFAULTS

1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

MSA NAME	CHI-SQUARE	DEGREES OF FREEDOM	PROBABILITY
ATLANTA, GA MSA	243.599	43	0.000000
BALTIMORE, MD PMSA	121.799	36	0.000000
CHICAGO, IL PMSA	367.020	49	0.000000
DALLAS, TX PMSA	153.624	48	0.000000
DENVER, CO PMSA	17.450	12	0.133436
DETROIT, MI PMSA	649.338	27	0.000000
FORT LAUDERDALE, FL PMSA	46.839	17	0.000129
FORT WORTH-ARLINGTON, TX PMSA	249.603	37	0.000000
HOUSTON, TX PMSA	107.843	30	0.000000
LOS ANGELES-LONG BEACH, CA PMSA	274.561	69	0.000000
MEMPHIS, TN-AR-MS MSA	32.725	16	0.008036
MIAMI, FL PMSA	124.794	22	0.000000
MINNEAPOLIS-ST PAUL, MN-WI MSA	57.783	21	0.000027
NORFOLK-VIRGINIA BEACH-NEWPORT	82.190	30	0.000001
ORLANDO, FL MSA	69.657	23	0.000001
PHILADELPHIA, PA-NJ PMSA	142.355	37	0.000000
PHOENIX-MESA, AZ MSA	182.005	50	0.000000
RIVERSIDE-SAN BERNARDINO, CA PMSA	404.432	99	0.000000
SACRAMENTO, CA PMSA	17.813	15	0.272632
ST. LOUIS, MO-IL MSA	81.611	23	0.000000
TAMPA-ST PETERSBURG-CLEARWATER	44.328	16	0.000176
WASHINGTON, DC-MD-VA-WV, PMSA	211.883	54	0.000000

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL A: 1992 ORIGINATIONS, CLAIMS AT TWO YEARS

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	195	3.59%	1.03%	95.38%
BALTIMORE, MD PMSA	126	2.38	2.38	95.24
CHICAGO, IL PMSA	168	2.38	1.79	95.83
DALLAS, TX PMSA	153	3.92	5.23	90.85
DENVER, CO PMSA	157	2.55	1.91	95.54
DETROIT, MI PMSA	93	4.30	1.08	94.62
FORT LAUDERDALE, FL PMSA	137	2.92	2.19	94.89
FORT WORTH-ARLINGTON, TX PMSA	127	4.72	2.36	92.91
HOUSTON, TX PMSA	104	2.88	0.00	97.12
LOS ANGELES-LONG BEACH, CA PMSA	210	2.86	1.90	95.24
MEMPHIS, TN-AR-MS MSA	63	4.76	3.17	92.06
MIAMI, FL PMSA	155	2.58	2.58	94.84
MINNEAPOLIS-ST PAUL, MN-WI MSA	129	2.33	2.33	95.35
NORFOLK-VIRGINIA BEACH-NEWPORT	85	2.35	1.18	96.47
ORLANDO, FL MSA	93	2.15	1.08	96.77
PHILADELPHIA, PA-NJ PMSA	87	2.30	4.60	93.10
PHOENIX-MESA, AZ MSA	107	5.61	6.54	87.85
RIVERSIDE-SAN BERNARDINO, CA PMSA	263	2.28	3.42	94.30
SACRAMENTO, CA PMSA	113	0.88	3.54	95.58
ST. LOUIS, MO-IL MSA	56	3.57	1.79	94.64
TAMPA-ST PETERSBURG-CLEARWATER	109	0.92	3.67	95.41
WASHINGTON, DC-MD-VA-WV, PMSA	175	4.57	2.29	93.14

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL B: 1994 ORIGINATIONS, CLAIMS AT TWO YEARS

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	230	2.17%	2.61%	95.22%
BALTIMORE, MD PMSA	160	3.75	4.38	91.88
CHICAGO, IL PMSA	236	3.39	1.27	95.34
DALLAS, TX PMSA	191	2.62	3.14	94.24
DENVER, CO PMSA	197	2.54	2.03	95.43
DETROIT, MI PMSA	136	2.94	0.74	96.32
FORT LAUDERDALE, FL PMSA	187	3.21	0.53	96.26
FORT WORTH-ARLINGTON, TX PMSA	158	5.06	1.27	93.67
HOUSTON, TX PMSA	125	0.80	2.40	96.80
LOS ANGELES-LONG BEACH, CA PMSA	345	2.61	2.90	94.49
MEMPHIS, TN-AR-MS MSA	81	0.00	3.70	96.30
MIAMI, FL PMSA	202	3.47	2.48	94.06
MINNEAPOLIS-ST PAUL, MN-WI MSA	142	3.52	2.11	94.37
NORFOLK-VIRGINIA BEACH-NEWPORT	102	1.96	1.96	96.08
ORLANDO, FL MSA	138	1.45	2.17	96.38
PHILADELPHIA, PA-NJ PMSA	136	2.21	0.00	97.79
PHOENIX-MESA, AZ MSA	161	0.62	3.73	95.65
RIVERSIDE-SAN BERNARDINO, CA PMSA	384	4.69	2.34	92.97
SACRAMENTO, CA PMSA	169	1.78	4.73	93.49
ST. LOUIS, MO-IL MSA	94	2.13	1.06	96.81
TAMPA-ST PETERSBURG-CLEARWATER	145	0.00	2.76	97.24
WASHINGTON, DC-MD-VA-WV, PMSA	206	1.94	3.40	94.66

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL C: 1992 AND 1994 ORIGINATIONS, CLAIMS AT TWO YEARS

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	276	3.62%	1.45%	94.93%
BALTIMORE, MD PMSA	200	5.00	1.50	93.50
CHICAGO, IL PMSA	272	2.94	0.74	96.32
DALLAS, TX PMSA	231	3.03	3.46	93.51
DENVER, CO PMSA	234	2.99	0.85	96.15
DETROIT, MI PMSA	155	3.87	0.65	95.48
FORT LAUDERDALE, FL PMSA	231	2.16	2.16	95.67
FORT WORTH-ARLINGTON, TX PMSA	193	7.25	1.04	91.71
HOUSTON, TX PMSA	156	3.21	1.28	95.51
LOS ANGELES-LONG BEACH, CA PMSA	402	3.23	3.23	93.53
MEMPHIS, TN-AR-MS MSA	99	2.02	3.03	94.95
MIAMI, FL PMSA	242	3.72	1.24	95.04
MINNEAPOLIS-ST PAUL, MN-WI MSA	179	3.91	2.23	93.85
NORFOLK-VIRGINIA BEACH-NEWPORT	121	1.65	4.96	93.39
ORLANDO, FL MSA	162	1.85	1.85	96.30
PHILADELPHIA, PA-NJ PMSA	156	2.56	1.92	95.51
PHOENIX-MESA, AZ MSA	177	5.65	1.13	93.22
RIVERSIDE-SAN BERNARDINO, CA PMSA	451	3.77	2.66	93.57
SACRAMENTO, CA PMSA	195	2.05	4.62	93.33
ST. LOUIS, MO-IL MSA	106	1.89	1.89	96.23
TAMPA-ST PETERSBURG-CLEARWATER	177	1.69	2.26	96.05
WASHINGTON, DC-MD-VA-WV, PMSA	257	4.67	1.17	94.16

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL D: 1992 ORIGINATIONS, UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	195	5.13%	0.51%	94.36%
BALTIMORE, MD PMSA	126	3.17	2.38	94.44
CHICAGO, IL PMSA	168	3.57	1.79	94.64
DALLAS, TX PMSA	153	6.54	4.58	88.89
DENVER, CO PMSA	157	1.27	5.10	93.63
DETROIT, MI PMSA	93	3.23	1.08	95.70
FORT LAUDERDALE, FL PMSA	137	6.57	1.46	91.97
FORT WORTH-ARLINGTON, TX PMSA	127	7.87	0.79	91.34
HOUSTON, TX PMSA	104	2.88	1.92	95.19
LOS ANGELES-LONG BEACH, CA PMSA	210	4.29	2.38	93.33
MEMPHIS, TN-AR-MS MSA	63	11.11	1.59	87.30
MIAMI, FL PMSA	155	7.74	2.58	89.68
MINNEAPOLIS-ST PAUL, MN-WI MSA	129	6.20	3.10	90.70
NORFOLK-VIRGINIA BEACH-NEWPORT	85	2.35	2.35	95.29
ORLANDO, FL MSA	93	3.23	2.15	94.62
PHILADELPHIA, PA-NJ PMSA	87	3.45	3.45	93.10
PHOENIX-MESA, AZ MSA	107	7.48	0.93	91.59
RIVERSIDE-SAN BERNARDINO, CA PMSA	263	4.56	3.80	91.63
SACRAMENTO, CA PMSA	113	2.65	0.88	96.46
ST. LOUIS, MO-IL MSA	56	3.57	7.14	89.29
TAMPA-ST PETERSBURG-CLEARWATER	109	3.67	0.00	96.33
WASHINGTON, DC-MD-VA-WV, PMSA	175	5.14	3.43	91.43

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL E: 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	230	6.52%	3.04%	90.43%
BALTIMORE, MD PMSA	160	5.63	4.38	90.00
CHICAGO, IL PMSA	236	7.63	1.27	91.10
DALLAS, TX PMSA	191	4.71	3.14	92.15
DENVER, CO PMSA	197	4.57	2.03	93.40
DETROIT, MI PMSA	136	4.41	2.94	92.65
FORT LAUDERDALE, FL PMSA	187	3.74	4.28	91.98
FORT WORTH-ARLINGTON, TX PMSA	158	6.33	3.80	89.87
HOUSTON, TX PMSA	125	3.20	0.80	96.00
LOS ANGELES-LONG BEACH, CA PMSA	345	4.64	4.06	91.30
MEMPHIS, TN-AR-MS MSA	81	3.70	1.23	95.06
MIAMI, FL PMSA	202	5.45	3.47	91.09
MINNEAPOLIS-ST PAUL, MN-WI MSA	142	4.93	3.52	91.55
NORFOLK-VIRGINIA BEACH-NEWPORT	102	5.88	2.94	91.18
ORLANDO, FL MSA	138	2.90	2.90	94.20
PHILADELPHIA, PA-NJ PMSA	136	4.41	2.21	93.38
PHOENIX-MESA, AZ MSA	161	3.11	4.35	92.55
RIVERSIDE-SAN BERNARDINO, CA PMSA	384	4.17	4.43	91.41
SACRAMENTO, CA PMSA	169	4.14	4.14	91.72
ST. LOUIS, MO-IL MSA	94	2.13	2.13	95.74
TAMPA-ST PETERSBURG-CLEARWATER	145	4.14	0.69	95.17
WASHINGTON, DC-MD-VA-WV, PMSA	206	6.80	2.43	90.78

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL F: 1992 AND 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	276	7.25%	4.71%	88.04%
BALTIMORE, MD PMSA	200	5.00	2.50	92.50
CHICAGO, IL PMSA	272	6.25	1.84	91.91
DALLAS, TX PMSA	231	7.36	2.16	90.48
DENVER, CO PMSA	234	5.56	1.71	92.74
DETROIT, MI PMSA	155	6.45	0.00	93.55
FORT LAUDERDALE, FL PMSA	231	3.90	3.46	92.64
FORT WORTH-ARLINGTON, TX PMSA	193	9.33	3.11	87.56
HOUSTON, TX PMSA	156	3.85	1.92	94.23
LOS ANGELES-LONG BEACH, CA PMSA	402	5.47	1.99	92.54
MEMPHIS, TN-AR-MS MSA	99	7.07	2.02	90.91
MIAMI, FL PMSA	242	6.20	2.48	91.32
MINNEAPOLIS-ST PAUL, MN-WI MSA	179	6.15	5.03	88.83
NORFOLK-VIRGINIA BEACH-NEWPORT	121	5.79	2.48	91.74
ORLANDO, FL MSA	162	3.09	4.94	91.98
PHILADELPHIA, PA-NJ PMSA	156	5.13	3.21	91.67
PHOENIX-MESA, AZ MSA	177	4.52	3.39	92.09
RIVERSIDE-SAN BERNARDINO, CA PMSA	451	5.10	3.10	91.80
SACRAMENTO, CA PMSA	195	3.08	4.10	92.82
ST. LOUIS, MO-IL MSA	106	3.77	6.60	89.62
TAMPA-ST PETERSBURG-CLEARWATER	177	3.95	0.56	95.48
WASHINGTON, DC-MD-VA-WV, PMSA	257	7.39	1.95	90.66

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL G: 1992 ORIGINATIONS, UNCURED DELINQUENCIES AT 12/95

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	195	8.72%	1.54%	89.74%
BALTIMORE, MD PMSA	126	6.35	3.17	90.48
CHICAGO, IL PMSA	168	5.36	1.79	92.86
DALLAS, TX PMSA	153	9.80	1.96	88.24
DENVER, CO PMSA	157	4.46	0.64	94.90
DETROIT, MI PMSA	93	4.30	1.08	94.62
FORT LAUDERDALE, FL PMSA	137	5.84	3.65	90.51
FORT WORTH-ARLINGTON, TX PMSA	127	7.87	3.94	88.19
HOUSTON, TX PMSA	104	1.92	1.92	96.15
LOS ANGELES-LONG BEACH, CA PMSA	210	6.67	1.43	91.90
MEMPHIS, TN-AR-MS MSA	63	9.52	0.00	90.48
MIAMI, FL PMSA	155	5.81	1.94	92.26
MINNEAPOLIS-ST PAUL, MN-WI MSA	129	6.20	5.43	88.37
NORFOLK-VIRGINIA BEACH-NEWPORT	85	3.53	2.35	94.12
ORLANDO, FL MSA	93	4.30	2.15	93.55
PHILADELPHIA, PA-NJ PMSA	87	6.90	3.45	89.66
PHOENIX-MESA, AZ MSA	107	8.41	0.93	90.65
RIVERSIDE-SAN BERNARDINO, CA PMSA	263	4.56	2.66	92.78
SACRAMENTO, CA PMSA	113	1.77	7.08	91.15
ST. LOUIS, MO-IL MSA	56	8.93	1.79	89.29
TAMPA-ST PETERSBURG-CLEARWATER	109	4.59	0.00	95.41
WASHINGTON, DC-MD-VA-WV, PMSA	175	6.29	1.14	92.57

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL H: 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT 12/95

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	230	5.22%	0.87%	93.91%
BALTIMORE, MD PMSA	160	5.63	3.75	90.63
CHICAGO, IL PMSA	236	5.08	1.69	93.22
DALLAS, TX PMSA	191	3.66	2.62	93.72
DENVER, CO PMSA	197	2.54	2.03	95.43
DETROIT, MI PMSA	136	2.94	1.47	95.59
FORT LAUDERDALE, FL PMSA	187	2.67	3.21	94.12
FORT WORTH-ARLINGTON, TX PMSA	158	6.33	1.27	92.41
HOUSTON, TX PMSA	125	2.40	0.00	97.60
LOS ANGELES-LONG BEACH, CA PMSA	345	3.77	2.90	93.33
MEMPHIS, TN-AR-MS MSA	81	2.47	1.23	96.30
MIAMI, FL PMSA	202	3.47	3.96	92.57
MINNEAPOLIS-ST PAUL, MN-WI MSA	142	2.11	3.52	94.37
NORFOLK-VIRGINIA BEACH-NEWPORT	102	5.88	0.00	94.12
ORLANDO, FL MSA	138	2.90	1.45	95.65
PHILADELPHIA, PA-NJ PMSA	136	3.68	1.47	94.85
PHOENIX-MESA, AZ MSA	161	3.73	2.48	93.79
RIVERSIDE-SAN BERNARDINO, CA PMSA	384	3.91	2.60	93.49
SACRAMENTO, CA PMSA	169	4.14	1.18	94.67
ST. LOUIS, MO-IL MSA	94	2.13	0.00	97.87
TAMPA-ST PETERSBURG-CLEARWATER	145	4.14	0.00	95.86
WASHINGTON, DC-MD-VA-WV, PMSA	206	4.37	2.43	93.20

TABLE 16

EXACT PROBABILITY CALCULATIONS ASSUMING THAT LENDER DEFAULT PROBABILITY EQUALS MSA DEFAULT RATE FOR EACH LENDER

PERCENTAGE OF LENDERS BY PROBABILITY OF OUTCOME , BY MSA

PANEL I: 1992 AND 1994 ORIGINATIONS, UNCURED DELINQUENCIES AT 12/95

MSA NAME	TOTAL LENDERS	PROBABILITY OF OUTCOME		
		5% OR LESS	5% TO 10%	>10%
ATLANTA, GA MSA	276	7.61%	2.90%	89.49%
BALTIMORE, MD PMSA	200	6.50	3.00	90.50
CHICAGO, IL PMSA	272	4.78	1.10	94.12
DALLAS, TX PMSA	231	8.23	1.30	90.48
DENVER, CO PMSA	234	3.85	3.42	92.74
DETROIT, MI PMSA	155	3.87	0.65	95.48
FORT LAUDERDALE, FL PMSA	231	5.63	1.30	93.07
FORT WORTH-ARLINGTON, TX PMSA	193	8.81	4.15	87.05
HOUSTON, TX PMSA	156	4.49	1.28	94.23
LOS ANGELES-LONG BEACH, CA PMSA	402	5.97	2.24	91.79
MEMPHIS, TN-AR-MS MSA	99	5.05	1.01	93.94
MIAMI, FL PMSA	242	4.96	2.48	92.56
MINNEAPOLIS-ST PAUL, MN-WI MSA	179	5.03	3.35	91.62
NORFOLK-VIRGINIA BEACH-NEWPORT	121	4.96	2.48	92.56
ORLANDO, FL MSA	162	4.32	1.85	93.83
PHILADELPHIA, PA-NJ PMSA	156	5.77	1.92	92.31
PHOENIX-MESA, AZ MSA	177	6.21	3.95	89.83
RIVERSIDE-SAN BERNARDINO, CA PMSA	451	7.32	2.88	89.80
SACRAMENTO, CA PMSA	195	3.08	4.10	92.82
ST. LOUIS, MO-IL MSA	106	4.72	1.89	93.40
TAMPA-ST PETERSBURG-CLEARWATER	177	5.08	1.69	93.22
WASHINGTON, DC-MD-VA-WV, PMSA	257	4.67	1.56	93.77

TABLE 17

PERCENTAGE OF LENDERS IDENTIFIED AS HIGH DEFAULT LENDERS IN ONE, BOTH, OR NEITHER ORIGINATION YEAR, BY MSA

PANEL A: CLAIMS AT TWO YEARS

MSA NAME	NUMBER OF LENDERS	IDENTIFIED AS HIGH DEFAULT IN:		
		BOTH YEARS	ONE YEAR	NEITHER YEAR
ATLANTA, GA MSA	150	1.33%	4.67%	94.00%
BALTIMORE, MD PMSA	89	0.00	6.74	93.26
CHICAGO, IL PMSA	133	1.50	4.51	93.98
DALLAS, TX PMSA	113	0.00	7.96	92.04
DENVER, CO PMSA	121	0.00	3.31	96.69
DETROIT, MI PMSA	77	3.90	1.30	94.81
FORT LAUDERDALE, FL PMSA	99	0.00	7.07	92.93
FORT WORTH-ARLINGTON, TX PMSA	94	2.13	3.19	94.68
HOUSTON, TX PMSA	74	1.35	1.35	97.30
LOS ANGELES-LONG BEACH, CA PMSA	159	0.00	6.29	93.71
MEMPHIS, TN-AR-MS MSA	48	0.00	4.17	95.83
MIAMI, FL PMSA	120	0.00	7.50	92.50
MINNEAPOLIS-ST PAUL, MN-WI MSA	96	0.00	4.17	95.83
NORFOLK-VIRGINIA BEACH-NEWPORT	66	0.00	4.55	95.45
ORLANDO, FL MSA	74	0.00	4.05	95.95
PHILADELPHIA, PA-NJ PMSA	69	1.45	4.35	94.20
PHOENIX-MESA, AZ MSA	92	1.09	4.35	94.57
RIVERSIDE-SAN BERNARDINO, CA PMSA	203	0.49	8.37	91.13
SACRAMENTO, CA PMSA	90	0.00	3.33	96.67
ST. LOUIS, MO-IL MSA	44	2.27	4.55	93.18
TAMPA-ST PETERSBURG-CLEARWATER	82	0.00	1.22	98.78
WASHINGTON, DC-MD-VA-WV, PMSA	126	0.79	4.76	94.44

TABLE 17

PERCENTAGE OF LENDERS IDENTIFIED AS HIGH DEFAULT LENDERS IN ONE, BOTH, OR NEITHER ORIGINATION YEAR, BY MSA

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

MSA NAME	NUMBER OF LENDERS	IDENTIFIED AS HIGH DEFAULT IN:		
		BOTH YEARS	ONE YEAR	NEITHER YEAR
ATLANTA, GA MSA	150	2.00%	10.00%	88.00%
BALTIMORE, MD PMSA	89	0.00	11.24	88.76
CHICAGO, IL PMSA	133	3.76	7.52	88.72
DALLAS, TX PMSA	113	0.00	14.16	85.84
DENVER, CO PMSA	121	0.00	6.61	93.39
DETROIT, MI PMSA	77	2.60	2.60	94.81
FORT LAUDERDALE, FL PMSA	99	2.02	10.10	87.88
FORT WORTH-ARLINGTON, TX PMSA	94	2.13	7.45	90.43
HOUSTON, TX PMSA	74	1.35	2.70	95.95
LOS ANGELES-LONG BEACH, CA PMSA	159	0.00	10.69	89.31
MEMPHIS, TN-AR-MS MSA	48	0.00	18.75	81.25
MIAMI, FL PMSA	120	2.50	11.67	85.83
MINNEAPOLIS-ST PAUL, MN-WI MSA	96	1.04	8.33	90.63
NORFOLK-VIRGINIA BEACH-NEWPORT	66	1.52	7.58	90.91
ORLANDO, FL MSA	74	0.00	6.76	93.24
PHILADELPHIA, PA-NJ PMSA	69	0.00	11.59	88.41
PHOENIX-MESA, AZ MSA	92	1.09	10.87	88.04
RIVERSIDE-SAN BERNARDINO, CA PMSA	203	2.46	6.40	91.13
SACRAMENTO, CA PMSA	90	0.00	8.89	91.11
ST. LOUIS, MO-IL MSA	44	0.00	9.09	90.91
TAMPA-ST PETERSBURG-CLEARWATER	82	2.44	3.66	93.90
WASHINGTON, DC-MD-VA-WV, PMSA	126	3.97	7.14	88.89

TABLE 17

PERCENTAGE OF LENDERS IDENTIFIED AS HIGH DEFAULT LENDERS IN ONE, BOTH, OR NEITHER ORIGINATION YEAR, BY MSA

PANEL C: UNCURED DELINQUENCIES AT 12/95

MSA NAME	NUMBER OF LENDERS	IDENTIFIED AS HIGH DEFAULT IN:		
		BOTH YEARS	ONE YEAR	NEITHER YEAR
ATLANTA, GA MSA	150	2.67%	13.33%	84.00%
BALTIMORE, MD PMSA	89	1.12	11.24	87.64
CHICAGO, IL PMSA	133	3.01	7.52	89.47
DALLAS, TX PMSA	113	0.88	13.27	85.84
DENVER, CO PMSA	121	0.00	8.26	91.74
DETROIT, MI PMSA	77	2.60	3.90	93.51
FORT LAUDERDALE, FL PMSA	99	0.00	10.10	89.90
FORT WORTH-ARLINGTON, TX PMSA	94	2.13	11.70	86.17
HOUSTON, TX PMSA	74	1.35	1.35	97.30
LOS ANGELES-LONG BEACH, CA PMSA	159	0.00	13.84	86.16
MEMPHIS, TN-AR-MS MSA	48	0.00	14.58	85.42
MIAMI, FL PMSA	120	1.67	9.17	89.17
MINNEAPOLIS-ST PAUL, MN-WI MSA	96	1.04	6.25	92.71
NORFOLK-VIRGINIA BEACH-NEWPORT	66	1.52	10.61	87.88
ORLANDO, FL MSA	74	0.00	8.11	91.89
PHILADELPHIA, PA-NJ PMSA	69	1.45	10.14	88.41
PHOENIX-MESA, AZ MSA	92	1.09	14.13	84.78
RIVERSIDE-SAN BERNARDINO, CA PMSA	203	0.49	8.37	91.13
SACRAMENTO, CA PMSA	90	0.00	5.56	94.44
ST. LOUIS, MO-IL MSA	44	4.55	4.55	90.91
TAMPA-ST PETERSBURG-CLEARWATER	82	1.22	6.10	92.68
WASHINGTON, DC-MD-VA-WV, PMSA	126	2.38	7.94	89.68

TABLE 18

CROSS TABULATION OF HIGH DEFAULT TRACTS AS IDENTIFIED IN THIS STUDY VERSUS HIGH DEFAULT TRACTS AS IDENTIFIED USING NTIC METHODOLOGY*
1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

NTIC METHODOLOGY	This Study: Non-High Default	This Study: High Default	Total
Non-High Default	4278	1	4279
	99.98	0.02	100
	77.33	0.43	74.22
High Default	1254	232	1486
	84.39	15.61	100
	22.67	99.57	25.78
Total	5532	233	5765
	95.96	4.04	100
	100	100	100

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

NTIC METHODOLOGY	This Study: Non-High Default	This Study: High Default	Total
Non-High Default	4368	6	4374
	99.86	0.14	100
	81.68	1.44	75.87
High Default	980	411	1391
	70.45	29.55	100
	18.32	98.56	24.13
Total	5348	417	5765
	92.77	7.23	100
	100	100	100

PANEL C: UNCURED DELINQUENCIES AT 12/95

NTIC METHODOLOGY	This Study: Non-High Default	This Study: High Default	Total
Non-High Default	4353	2	4355
	99.95	0.05	100
	81.62	0.46	75.54
High Default	980	430	1410
	69.5	30.5	100
	18.38	99.54	24.46
Total	5333	432	5765
	92.51	7.49	100
	100	100	100

*Restricted to tracts with more than 30 loans.

TABLE 19

CROSS TABULATION OF LOANS IN HIGH DEFAULT TRACTS AS IDENTIFIED IN THIS STUDY VERSUS LOANS IN HIGH DEFAULT TRACTS AS IDENTIFIED USING NTIC METHODOLOGY
1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

NTIC METHODOLOGY	This Study: Non-High Default	This Study: High Default	Total
Non-High Default	397736	1729	399465
	99.57	0.43	100
	78.04	5.83	74.07
High Default	111932	27929	139861
	80.03	19.97	100
	21.96	94.17	25.93
Total	509668	29658	539326
	94.5	5.5	100
	100	100	100

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

NTIC METHODOLOGY	This Study: Non-High Default	This Study: High Default	Total
Non-High Default	404849	3868	408717
	99.05	0.95	100
	84.3	6.55	75.78
High Default	75398	55211	130609
	57.73	42.27	100
	15.7	93.45	24.22
Total	480247	59079	539326
	89.05	10.95	100
	100	100	100

PANEL C: UNCURED DELINQUENCIES AT 12/95

NTIC METHODOLOGY	This Study: Non-High Default	This Study: High Default	Total
Non-High Default	417927	1015	418942
	99.76	0.24	100
	84.58	2.25	77.68
High Default	76206	44178	120384
	63.3	36.7	100
	15.42	97.75	22.32
Total	494133	45193	539326
	91.62	8.38	100
	100	100	100

*Restricted to tracts with more than 30 loans.

TABLE 20

CROSS TABULATION OF HIGH DEFAULT LENDERS AS IDENTIFIED IN THIS STUDY VERSUS TEN LENDERS WITH HIGHEST DEFAULT VOLUME*
1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

Default Volume	This Study: Non-High Default	This Study: High Default	Total
Non-High Default Volume	1911	63	1974
	96.81	3.19	100
	92.19	52.07	89.97
High Default Volume	162	58	220
	73.64	26.36	100
	7.81	47.93	10.03
Total	2073	121	2194
	94.48	5.52	100
	100	100	100

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Default Volume	This Study: Non-High Default	This Study: High Default	Total
Non-High Default Volume	1851	123	1974
	93.77	6.23	100
	93.02	60.29	89.97
High Default Volume	139	81	220
	63.18	36.82	100
	6.98	39.71	10.03
Total	1990	204	2194
	90.7	9.3	100
	100	100	100

PANEL C: UNCURED DELINQUENCIES AT 12/95

Default Volume	This Study: Non-High Default	This Study: High Default	Total
Non-High Default Volume	1844	130	1974
	93.41	6.59	100
	93.23	60.19	89.97
High Default Volume	134	86	220
	60.91	39.09	100
	6.77	39.81	10.03
Total	1978	216	2194
	90.15	9.85	100
	100	100	100

*Restricted to lenders with more than 30 loans.

TABLE 21

CROSS TABULATION OF LOANS MADE BY HIGH DEFAULT LENDERS AS IDENTIFIED IN THIS STUDY VERSUS LOANS MADE BY TEN LENDERS WITH HIGHEST DEFAULT VOLUME*
1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

Default Volume		This Study: Non-High Default	This Study: High Default	Total
Non-High Default Volume		393719	8917	402636
		97.79	2.21	100
		67.16	18.2	63.38
High Default Volume		192545	40075	232620
		82.77	17.23	100
		32.84	81.8	36.62
Total		586264	48992	635256
		92.29	7.71	100
		100	100	100

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Default Volume		This Study: Non-High Default	This Study: High Default	Total
Non-High Default Volume		370153	19848	390001
		94.91	5.09	100
		68.4	21.09	61.39
High Default Volume		170994	74261	245255
		69.72	30.28	100
		31.6	78.91	38.61
Total		541147	94109	635256
		85.19	14.81	100
		100	100	100

PANEL C: UNCURED DELINQUENCIES AT 12/95

Default Volume		This Study: Non-High Default	This Study: High Default	Total
Non-High Default Volume		360345	24641	384986
		93.6	6.4	100
		67.77	23.79	60.6
High Default Volume		171350	78920	250270
		68.47	31.53	100
		32.23	76.21	39.4
Total		531695	103561	635256
		83.7	16.3	100
		100	100	100

*Restricted to lenders with more than 30 loans.

TABLE 22

CROSS TABULATION OF HIGH DEFAULT LENDERS AS IDENTIFIED IN THIS STUDY VERSUS TEN WORST LENDERS IDENTIFIED IN NTIC STUDY*

1992 AND 1994 ORIGINATIONS

TEN MSAs

PANEL A: CLAIMS AT TWO YEARS

NTIC Ten Worst Lenders	This Study: Non-High Default	This Study: High Default	Total
Not in 10 Worst	889	36	925
	96.11	3.89	100
	89.71	69.23	88.69
In 10 Worst	102	16	118
	86.44	13.56	100
	10.29	30.77	11.31
Total	991	52	1043
	95.01	4.99	100
	100	100	100

*Restricted to lenders with more than 30 loans.

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

NTIC Ten Worst Lenders	This Study: Non-High Default	This Study: High Default	Total
Not in 10 Worst	863	62	925
	93.3	6.7	100
	90.65	68.13	88.69
In 10 Worst	89	29	118
	75.42	24.58	100
	9.35	31.87	11.31
Total	952	91	1043
	91.28	8.72	100
	100	100	100

PANEL C: UNCURED DELINQUENCIES AT 12/95

NTIC Ten Worst Lenders	This Study: Non-High Default	This Study: High Default	Total
Not in 10 Worst	873	52	925
	94.38	5.62	100
	91.99	55.32	88.69
In 10 Worst	76	42	118
	64.41	35.59	100
	8.01	44.68	11.31
Total	949	94	1043
	90.99	9.01	100
	100	100	100

TABLE 23

CROSS TABULATION OF LOANS MADE BY HIGH DEFAULT LENDERS AS IDENTIFIED IN THIS STUDY VERSUS LOANS MADE BY TEN WORST LENDERS IDENTIFIED IN NTIC STUDY*

1992 AND 1994 ORIGINATIONS

TEN MSAs

PANEL A: CLAIMS AT TWO YEARS

NTIC Ten Worst Lenders	This Study: Non-High Default	This Study: High Default	Total
Not in 10 Worst	190787	9000	199787
	95.5	4.5	100
	61.68	34.8	59.61
In 10 Worst	118536	16860	135396
	87.55	12.45	100
	38.32	65.2	40.39
Total	309323	25860	335183
	92.28	7.72	100
	100	100	100

*Restricted to lenders with more than 30 loans.

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

NTIC Ten Worst Lenders	This Study: Non-High Default	This Study: High Default	Total
Not in 10 Worst	184271	15516	199787
	92.23	7.77	100
	64.26	32.04	59.61
In 10 Worst	102487	32909	135396
	75.69	24.31	100
	35.74	67.96	40.39
Total	286758	48425	335183
	85.55	14.45	100
	100	100	100

PANEL C: UNCURED DELINQUENCIES AT 12/95

NTIC Ten Worst Lenders	This Study: Non-High Default	This Study: High Default	Total
Not in 10 Worst	188486	11301	199787
	94.34	5.66	100
	66.88	21.19	59.61
In 10 Worst	93358	42038	135396
	68.95	31.05	100
	33.12	78.81	40.39
Total	281844	53339	335183
	84.09	15.91	100
	100	100	100

TABLE 24

Probability of Meeting NTIC High Default Tract Criterion if Tract Default Probability Equals MSA Default Rate Assuming Average Loan Counts

City	MSA Default Rate	High Default Tract Definition	Average number of loans in High Default Tracts	Probability of Meeting Criterion
Albany	3.14%	4.71%	50	0.207118
Atlanta	2.85	4.28	50	0.170509
Baltimore	2.65	3.98	69	0.276382
Buffalo	3.03	4.56	67	0.14558
Chicago	3.00	4.5	51	0.196867
Cleveland	3.30	4.95	33	0.297461
Denver	0.90	1.34	251	0.191695
Detroit	2.76	4.14	72	0.319792
Los Angeles	8.36	12.55	55	0.173389
Minneapolis	1.25	1.88	113	0.168626
St. Paul	1.25	1.88	144	0.269037
Newark	5.28	7.93	15	0.186171
Philadelphia	3.95	5.92	45	0.262111
Rochester	3.00	4.5	59	0.260394
St. Louis	1.91	2.87	87	0.231833
San Antonio	0.18	2.7	76	0.157441
Syracuse	2.37	3.56	51	0.341409
St. Petersburg	2.73	4.1	86	0.208551
Tampa	2.73	4.1	58	0.210846
Wichita	1.55	2.33	75	0.324236

Source: First three columns of numbers are reported in NTIC study; fourth column has been calculated.

TABLE 25

ESTIMATES OF A LOGIT MODEL OF DEFAULT

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

Number of obs = 354133
chi2(62) =9886.02
Prob > chi2 = 0.0000
Pseudo R2 = 0.1126
Log Likelihood = -15247.388

Variable	Coefficient Estimate	Std. Error	z	P>|z|	[95% Conf.	Interval]
_94	0.0887313	0.1106224	0.802	0.422	-0.1280846	0.3055472
cin92	1.0063080	0.0795592	12.649	0.000	0.8503752	1.1622420
cin94	0.9569128	0.0615967	15.535	0.000	0.8361855	1.0776400
ctin92	1.3926430	0.0913686	15.242	0.000	1.2135640	1.5717220
ctin94	1.3432710	0.0691699	19.420	0.000	1.2077010	1.4788420
ltv95_	0.0333088	0.0054950	6.062	0.000	0.0225388	0.0440787
ltv95	0.0307009	0.0168657	1.820	0.069	-0.0023552	0.0637569
age_	-0.0641061	0.0085288	-7.516	0.000	-0.0808221	-0.0473900
age30	0.0975520	0.0133229	7.322	0.000	0.0714396	0.1236645
age40	-0.0325009	0.0094660	-3.433	0.001	-0.0510539	-0.0139479
incdiff	-0.0000504	0.0000385	-1.309	0.191	-0.0001258	0.0000251
less15	-0.1910639	0.1826044	-1.046	0.295	-0.5489620	0.1668341
back_	-0.0203705	0.0042718	-4.769	0.000	-0.0287431	-0.0119979
back36	0.0194378	0.0053586	3.627	0.000	0.0089351	0.0299405
front_	0.0407415	0.0082816	4.920	0.000	0.0245098	0.0569731
front27	-0.0400420	0.0091293	-4.386	0.000	-0.0579350	-0.0221490
asst	-0.0001838	0.0000127	-14.507	0.000	-0.0002087	-0.0001590
asst6k	0.0000896	0.0000259	3.460	0.001	0.0000388	0.0001404
asst10k	0.0000941	0.0000176	5.363	0.000	0.0000597	0.0001285
mtgdiff	0.0000029	0.0000017	1.725	0.084	-0.0000004	0.0000061
intdiff	0.2713601	0.0256632	10.574	0.000	0.2210612	0.3216591
sepmale	0.2462861	0.2298885	1.071	0.284	-0.2042872	0.6968594
sepfmle	-0.0613977	0.1845745	-0.333	0.739	-0.4231572	0.3003617
sglmale	0.1999668	0.0456171	4.384	0.000	0.1105591	0.2893746
sglfmle	-0.0297756	0.0515608	-0.577	0.564	-0.1308328	0.0712817
armflag	0.5324133	0.0612268	8.696	0.000	0.4124110	0.6524155
condo	-0.2120031	0.1236719	-1.714	0.086	-0.4543957	0.0303895
firstime	0.0716581	0.0458849	1.562	0.118	-0.0182746	0.1615909
black	0.3443884	0.0573034	6.010	0.000	0.2320759	0.4567010
hispan	-0.1597086	0.0614649	-2.598	0.009	-0.2801776	-0.0392397
avgrate	0.0608177	0.1514249	0.402	0.688	-0.2359697	0.3576052
house	-0.0060778	0.0042749	-1.422	0.155	-0.0144564	0.0023007
cnincdif	-0.0000116	0.0000031	-3.748	0.000	-0.0000177	-0.0000056
blkcen	0.0018534	0.0012056	1.537	0.124	-0.0005095	0.0042163
hspcen	-0.0027035	0.0017498	-1.545	0.122	-0.0061330	0.0007259
unempcen	0.0140436	0.0081809	1.717	0.086	-0.0019907	0.0300779
fhaorig	0.0005102	0.0013520	0.377	0.706	-0.0021397	0.0031601
cnvadeny	0.0065441	0.0021081	3.104	0.002	0.0024123	0.0106759
hasasset	0.8005878	0.1479501	5.411	0.000	0.5106110	1.0905650
hashum	-0.0462551	0.1407246	-0.329	0.742	-0.3220703	0.2295600
hascen	-0.1281665	0.1365355	-0.939	0.348	-0.3957711	0.1394381
constant	-7.4176130	0.9550075	-7.767	0.000	-9.2893940	-5.5458330

TABLE 25

ESTIMATES OF A LOGIT MODEL OF DEFAULT

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Number of obs = 354133
chi2(62) =9886.02
Prob > chi2 = 0.0000
Pseudo R2 = 0.1126
Log Likelihood-38975.28

Variable	Coefficient Estimate	Std. Error	z	P>|z|	[95% Conf.	Interval]
_94	0.5144924	0.0672595	7.649	0.000	0.3826661	0.6463187
nin92	0.6636435	0.0471494	14.075	0.000	0.5712324	0.7560546
nin94	0.5292066	0.0296403	17.854	0.000	0.4711127	0.5873006
ntin92	0.9608048	0.0587558	16.352	0.000	0.8456455	1.0759640
ntin94	0.7498132	0.0362932	20.660	0.000	0.6786798	0.8209466
ltv95_	0.0216751	0.0028673	7.559	0.000	0.0160553	0.0272949
ltv95	0.0274889	0.0099548	2.761	0.006	0.0079778	0.0470001
age_	-0.0547511	0.0049725	-11.011	0.000	-0.0644970	-0.0450052
age30	0.0810891	0.0076470	10.604	0.000	0.0661011	0.0960770
age40	-0.0305493	0.0054721	-5.583	0.000	-0.0412743	-0.0198242
incdiff	-0.0000300	0.0000216	-1.388	0.165	-0.0000723	0.0000124
less15	-0.5607026	0.1268646	-4.420	0.000	-0.8093526	-0.3120525
back_	-0.0075802	0.0025378	-2.987	0.003	-0.0125542	-0.0026062
back36	0.0069902	0.0031669	2.207	0.027	0.0007833	0.0131972
front_	0.0386733	0.0048109	8.039	0.000	0.0292441	0.0481025
front27	-0.0381488	0.0053049	-7.191	0.000	-0.0485462	-0.0277514
asst	-0.0001611	0.0000073	-21.988	0.000	-0.0001754	-0.0001467
asst6k	0.0000487	0.0000144	3.376	0.001	0.0000204	0.0000770
asst10k	0.0001125	0.0000096	11.709	0.000	0.0000937	0.0001313
mtgdiff	0.0000029	0.0000009	3.101	0.002	0.0000011	0.0000047
intdiff	0.2620646	0.0141545	18.515	0.000	0.2343224	0.2898069
sepmale	0.2861053	0.1253959	2.282	0.023	0.0403339	0.5318767
sepfmle	-0.0837290	0.0999695	-0.838	0.402	-0.2796656	0.1122076
sglmale	0.0749316	0.0263862	2.840	0.005	0.0232156	0.1266475
sglfmle	-0.1418927	0.0292969	-4.843	0.000	-0.1993135	-0.0844719
armflag	0.5642643	0.0335318	16.828	0.000	0.4985432	0.6299853
condo	-0.1078490	0.0642981	-1.677	0.093	-0.2338710	0.0181729
firstime	0.1271473	0.0261566	4.861	0.000	0.0758813	0.1784132
black	0.5533958	0.0317025	17.456	0.000	0.4912601	0.6155315
hispan	-0.1349360	0.0354821	-3.803	0.000	-0.2044797	-0.0653924
avgrate	0.1463765	0.0919119	1.593	0.111	-0.0337675	0.3265204
house	-0.0137896	0.0026530	-5.198	0.000	-0.0189894	-0.0085899
cnincdif	-0.0000096	0.0000017	-5.510	0.000	-0.0000130	-0.0000062
blkcen	0.0011677	0.0006694	1.744	0.081	-0.0001443	0.0024797
hspcen	-0.0036610	0.0010179	-3.597	0.000	-0.0056560	-0.0016660
unempcen	0.0048172	0.0047239	1.020	0.308	-0.0044415	0.0140760
fhaorig	0.0029270	0.0008101	3.613	0.000	0.0013392	0.0045148
cnvadeny	0.0053575	0.0013923	3.848	0.000	0.0026286	0.0080863
hasasset	0.8756642	0.0906221	9.663	0.000	0.6980482	1.0532800
hashum	-0.1460711	0.0887402	-1.646	0.100	-0.3199987	0.0278564
hascen	-0.0056533	0.0865515	-0.065	0.948	-0.1752910	0.1639845
constant	-6.4436040	0.5604585	-11.497	0.000	-7.5420820	-5.3451250

TABLE 25

ESTIMATES OF A LOGIT MODEL OF DEFAULT

1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

Number of obs = 354133
chi2(62) =10369.36
Prob > chi2 = 0.0000
Pseudo R2 = 0.1208
Log Likelihood = -37725.266

Variable	Coefficient Estimate	Std. Error	z	P>|z|	[95% Conf.	Interval]
_94	0.2065987	0.0877472	2.354	0.019	0.0346173	0.37858
n95in92	0.5048966	0.0322440	15.659	0.000	0.4416995	0.5680938
n95in94	0.7026949	0.0418826	16.778	0.000	0.6206065	0.7847834
n95tin92	0.7987794	0.0391497	20.403	0.000	0.7220474	0.8755114
n95tin94	0.9494882	0.0485754	19.547	0.000	0.8542820	1.0446940
months	0.0578008	0.0044097	13.108	0.000	0.0491580	0.0664435
ltv95_	0.0207302	0.0026969	7.687	0.000	0.0154443	0.0260161
ltv95	0.0404708	0.0102290	3.956	0.000	0.0204223	0.0605193
age_	-0.0414396	0.0051025	-8.122	0.000	-0.0514403	-0.0314390
age30	0.0691444	0.0078005	8.864	0.000	0.0538557	0.0844332
age40	-0.0345420	0.0056093	-6.158	0.000	-0.0455361	-0.0235479
incdiff	-0.0000372	0.0000219	-1.695	0.090	-0.0000801	0.0000058
less15	-0.7146449	0.1233555	-5.793	0.000	-0.9564172	-0.4728726
back_	-0.0087702	0.0025187	-3.482	0.000	-0.0137067	-0.0038337
back36	0.0083330	0.0031418	2.652	0.008	0.0021751	0.0144909
front_	0.0359565	0.0047848	7.515	0.000	0.0265785	0.0453345
front27	-0.0359048	0.0052492	-6.840	0.000	-0.0461931	-0.0256165
asst	-0.0001578	0.0000077	-20.581	0.000	-0.0001728	-0.0001428
asst6k	0.0000600	0.0000148	4.060	0.000	0.0000310	0.0000890
asst10k	0.0000976	0.0000096	10.143	0.000	0.0000787	0.0001164
mtgdiff	0.0000018	0.0000010	1.819	0.069	-0.0000001	0.0000037
intdiff	0.1766359	0.0154829	11.408	0.000	0.1462900	0.2069818
sepmale	0.1340126	0.1239810	1.081	0.280	-0.1089856	0.3770108
sepfmle	0.0609849	0.0957787	0.637	0.524	-0.1267379	0.2487076
sglmale	0.0575319	0.0269225	2.137	0.033	0.0047647	0.1102990
sglfmle	-0.1476750	0.0300764	-4.910	0.000	-0.2066237	-0.0887262
armflag	0.4577823	0.0376579	12.156	0.000	0.3839742	0.5315905
condo	-0.1785667	0.0680833	-2.623	0.009	-0.3120074	-0.0451260
firstime	0.1275654	0.0262359	4.862	0.000	0.0761440	0.1789868
black	0.5190919	0.0332099	15.631	0.000	0.4540016	0.5841821
hispan	-0.1520870	0.0364886	-4.168	0.000	-0.2236033	-0.0805706
avgrate	-0.0205098	0.1044016	-0.196	0.844	-0.2251331	0.1841135
house	-0.0342629	0.0026854	-12.759	0.000	-0.0395261	-0.0289996
cnincdif	-0.0000130	0.0000018	-7.238	0.000	-0.0000165	-0.0000095
blkcen	0.0011909	0.0006835	1.742	0.081	-0.0001488	0.0025305
hspcen	-0.0045633	0.0010665	-4.279	0.000	-0.0066536	-0.0024729
unempcen	0.0002414	0.0048263	0.050	0.960	-0.0092179	0.0097007
fhaorig	0.0026677	0.0007809	3.416	0.001	0.0011373	0.0041982
cnvadeny	0.0046052	0.0011725	3.928	0.000	0.0023071	0.0069033
hasasset	0.9671916	0.0780014	12.400	0.000	0.8143117	1.1200720
hashum	-0.1936544	0.0691810	-2.799	0.005	-0.3292466	-0.0580622
hascen	0.1392862	0.0683211	2.039	0.041	0.0053793	0.2731931
constant	-7.2638550	0.5332888	-13.621	0.000	-8.3090820	-6.2186280

TABLE 26

Raw and Adjusted Odds Ratios for High-Default Tracts and High-Default Lenders from MSA-Specific Logits

Panel A: Claims at Two Years

MSA Name	Tracts								Lenders							
	1992				1994				1992				1994			
	raw	Z	adjusted	Z	raw	Z	adjusted	Z	raw	Z	adjusted	Z	raw	Z	adjusted	Z
ATLANTA, GA MSA	6.82	5.47	5.53	3.43	12.10	6.08	6.84	4.11	2.87	3.65	1.40	0.87	2.83	2.60	3.36	2.92
BALTIMORE, MD PMSA	11.12	4.82	6.21	3.36	6.35	5.78	5.65	5.02	3.99	3.03	1.71	0.95	2.76	4.00	2.40	2.99
CHICAGO, IL PMSA	8.78	7.76	5.11	5.36	8.16	9.42	6.31	7.73	3.34	5.29	2.93	4.33	3.38	6.76	1.96	3.41
DALLAS, TX PMSA	2.16	2.11	2.18	1.53	8.87	3.55	5.71	2.68	5.71	5.96	6.02	5.06	3.58	3.98	2.95	3.13
DENVER, CO PMSA	18.63	7.04	12.90	5.25	8.18	6.61	6.15	5.10	6.04	2.41	8.06	2.77	2.73	3.42	2.63	3.00
DETROIT, MI PMSA	7.22	6.31	5.44	4.89	3.06	4.76	2.37	3.20	8.35	7.72	3.04	3.47	6.26	10.04	2.15	3.43
FORT LAUDERDALE, FL PMSA	5.99	1.71	3.20	1.06	2.20	0.76	0.70	-0.32					6.59	5.67	6.60	5.25
FORT WORTH-ARLINGTON, TX PMSA	6.37	3.36	3.13	1.56	1.96	0.65	1.45	0.26	3.15	1.51	0.85	-0.14	9.16	6.43	3.64	2.92
HOUSTON, TX PMSA	2.68	1.62			3.45	3.32	6.90	3.33	2.39	2.25	1.48	0.73	3.30	3.12	1.94	1.39
LOS ANGELES-LONG BEACH, CA PMSA	1.99	1.90	2.98	2.84	3.66	8.09	2.65	5.45	4.60	4.36	4.33	3.84	2.05	3.52	1.70	2.33
MEMPHIS, TN-AR-MS MSA	7.61	4.05	6.50	3.36	6.28	4.36	3.31	2.57	3.92	3.75	2.98	2.67				
MIAMI, FL PMSA	3.16	1.09	2.98	0.96	7.17	5.03	7.42	4.57	10.03	4.62	14.37	4.76	3.92	5.05	2.55	2.91
MINNEAPOLIS-ST PAUL, MN-WI MSA	13.16	5.75	17.90	6.08	9.95	7.42	7.92	6.17	5.78	2.39	4.80	2.05	3.70	3.39	4.48	3.37
ORLANDO, FL MSA	5.72	2.32	1.36	0.36	6.61	4.62	5.99	3.95	2.21	1.07	2.19	1.01	3.86	2.15	6.03	2.69
PHILADELPHIA, PA-NJ PMSA	9.27	2.96	6.74	2.28	3.66	3.90	7.28	2.28	3.31	2.34	3.55	2.40	3.10	3.40	2.15	1.65
PHOENIX-MESA, AZ MSA	7.02	7.14	5.47	5.66	10.58	8.90	7.28	6.45	2.16	2.93	2.16	2.73	3.54	3.21	2.45	1.86
RIVERSIDE-SAN BERNARDINO, CA PMSA	3.53	6.35	4.33	6.36	3.28	5.33	3.16	4.92	2.27	3.75	2.00	2.63	4.15	8.16	2.43	4.35
SACRAMENTO, CA PMSA					9.19	5.98	9.75	5.56	2.43	0.85	4.13	1.30				
ST. LOUIS, MO-IL MSA	7.28	3.21	3.88	2.12	3.15	4.07	1.77	0.53	3.10	2.49	3.17	2.46	2.60	3.57	2.11	2.38
TAMPA-ST PETERSBURG-CLEARWATER	5.67	2.30	5.31	2.15	2.98	1.80	5.62	2.57	6.85	4.14	6.05	3.37				
WASHINGTON, DC-MD-VA-WV, PMSA	5.82	2.39	5.15	2.13	8.86	8.12	6.35	6.23	3.39	2.74	2.34	1.73	2.37	4.14	2.06	3.18

Panel B: Uncured Delinquencies at Two Years

MSA Name	Tracts								Lenders							
	1992				1994				1992				1994			
	raw	Z	adjusted	Z	raw	Z	adjusted	Z	raw	Z	adjusted	Z	raw	Z	adjusted	Z
ATLANTA, GA MSA	5.35	6.66	3.12	4.08	2.92	5.42	1.97	3.11	2.54	5.38	1.63	2.41	2.26	6.85	1.79	4.50
BALTIMORE, MD PMSA	7.70	7.19	4.18	4.79	3.60	6.86	2.09	3.63	2.95	3.66	1.55	1.29	2.08	6.12	1.57	3.42
CHICAGO, IL PMSA	4.91	11.05	2.56	5.96	3.78	13.90	2.06	6.70	1.95	5.54	1.41	2.60	2.06	9.96	1.59	5.78
DALLAS, TX PMSA	4.15	6.53	2.70	3.77	5.48	8.64	3.08	4.95	3.62	7.52	2.79	4.82	2.52	5.28	1.73	2.87
DENVER, CO PMSA	14.89	8.90	8.41	6.27	4.95	6.89	3.95	5.44	5.85	2.86	6.46	2.90	2.18	4.28	2.03	3.64
DETROIT, MI PMSA	4.67	6.10	2.74	3.62	3.44	8.29	1.71	3.14	3.88	6.16	1.30	1.06	5.02	12.05	2.15	4.93
FORT LAUDERDALE, FL PMSA	5.08	2.58	2.41	1.13	1.91	2.17	1.89	2.02	2.15	1.82	1.95	1.52	2.31	3.80	2.06	2.97
FORT WORTH-ARLINGTON, TX PMSA	4.09	2.80	2.52	1.45	2.19	2.84	0.72	-0.44	4.16	4.63	2.50	2.37	5.84	7.27	3.22	4.04
HOUSTON, TX PMSA	0.90	-0.14			2.26	3.45	4.40	3.87	2.38	3.31	1.94	2.04	1.58	1.96	1.02	0.07
LOS ANGELES-LONG BEACH, CA PMSA	1.63	2.11	1.78	2.35	2.35	8.56	1.99	5.77	2.98	6.60	2.78	5.53	2.17	6.29	2.10	5.57
MEMPHIS, TN-AR-MS MSA	3.58	4.93	1.91	2.18	3.84	8.54	2.17	4.34	2.47	3.78	1.82	2.26	1.45	1.67	1.42	1.38
MIAMI, FL PMSA	3.45	3.18	2.72	2.44	2.90	7.34	2.91	5.38	5.10	6.49	3.75	4.89	2.81	8.07	2.10	5.05
MINNEAPOLIS-ST PAUL, MN-WI MSA	11.39	9.34	7.32	7.04	4.40	6.33	3.77	5.35	3.58	4.94	3.26	4.17	1.87	3.43	1.82	3.02
ORLANDO, FL MSA	1.38	0.32	1.67	0.49	4.28	6.89	2.45	3.55	2.79	2.50	2.70	2.32	1.84	3.80	1.29	1.36
PHILADELPHIA, PA-NJ PMSA					2.05	5.63	1.46	1.63	5.06	4.02	3.55	2.98	1.68	4.43	1.41	2.59
PHOENIX-MESA, AZ MSA	4.69	6.39	3.69	4.95	3.83	7.42	3.35	6.26	1.72	2.87	1.58	2.20	1.69	3.33	1.39	1.92
RIVERSIDE-SAN BERNARDINO, CA PMSA	2.64	7.95	2.23	5.43	2.19	7.06	1.99	5.76	1.96	5.12	1.88	4.23	1.52	4.83	1.44	3.80
SACRAMENTO, CA PMSA					4.03	4.84	2.68	2.90	3.69	1.75	2.39	0.81	3.89	3.54	4.23	3.36
ST. LOUIS, MO-IL MSA	6.65	4.30	3.19	2.45	2.41	4.85	2.04	2.10	2.90	2.03	2.17	1.42	2.66	4.14	1.99	2.66
TAMPA-ST PETERSBURG-CLEARWATER					1.79	2.65	2.74	3.16	3.38	4.71	2.82	3.62	2.34	5.17	1.75	3.05
WASHINGTON, DC-MD-VA-WV, PMSA	5.69	6.48	2.72	3.00	2.48	9.07	2.63	6.63	2.23	4.70	1.86	3.27	2.25	9.03	1.73	5.51

TABLE 26

Raw and Adjusted Odds Ratios for High-Default Tracts and High-Default Lenders from MSA-Specific Logits

Panel C: Uncured Delinquencies at 12/95

MSA Name	Tracts								Lenders							
	1992				1994				1992				1994			
	raw	Z	adjusted	Z	raw	Z	adjusted	Z	raw	Z	adjusted	Z	raw	Z	adjusted	Z
ATLANTA, GA MSA	2.97	7.04	1.80	3.60	4.04	7.15	2.23	3.84	2.34	6.90	1.53	3.29	3.46	8.02	2.47	5.66
BALTIMORE, MD PMSA	3.11	6.16	1.91	3.23	5.11	7.50	3.65	5.61	2.12	5.23	1.73	3.70	2.52	5.54	1.93	3.82
CHICAGO, IL PMSA	3.79	13.58	2.13	7.14	4.60	11.65	2.39	6.18	2.18	7.87	1.38	3.12	2.18	7.32	1.65	4.59
DALLAS, TX PMSA	3.90	8.74	2.42	5.13	6.72	7.94	4.69	6.16	2.22	5.94	1.69	3.68	3.21	4.82	2.08	2.92
DENVER, CO PMSA	7.83	7.05	5.42	5.37	6.30	6.98	4.88	5.70	3.18	4.54	2.73	3.87	4.08	3.45	4.44	3.59
DETROIT, MI PMSA	4.60	8.68	2.20	4.05	3.88	7.08	2.04	3.58	2.73	7.18	1.13	0.74	5.94	11.10	1.96	3.89
FORT LAUDERDALE, FL PMSA	1.31	0.26	0.62	-0.45	2.52	1.26	1.29	0.33	2.28	2.72	1.69	1.62	3.70	4.35	3.66	4.14
FORT WORTH-ARLINGTON, TX PMSA	3.07	3.31	1.50	1.10	3.17	2.25	1.25	0.38	2.39	3.45	1.46	1.38	7.66	7.14	3.44	3.92
HOUSTON, TX PMSA	2.56	4.29	2.08	2.98	2.84	3.15	3.03	2.72	2.27	3.88	2.14	3.37	2.03	2.05	1.60	1.32
LOS ANGELES-LONG BEACH, CA PMSA	1.93	4.95	2.20	4.74	3.13	8.21	2.59	5.97	1.76	5.09	1.71	4.74	2.07	4.31	1.93	3.83
MEMPHIS, TN-AR-MS MSA	3.82	6.99	1.84	2.78	4.69	7.52	2.63	4.35	2.46	5.16	1.62	2.60	1.52	2.05	1.24	1.02
MIAMI, FL PMSA	3.74	3.16	2.34	1.91	3.55	4.38	1.66	1.54	3.79	6.38	2.38	3.84	2.83	5.30	1.87	3.00
MINNEAPOLIS-ST PAUL, MN-WI MSA	6.23	9.40	3.22	5.50	7.56	6.62	4.50	4.65	2.01	3.58	1.86	3.10	1.98	2.90	1.98	2.83
ORLANDO, FL MSA	2.57	3.77	1.87	2.30	4.71	5.38	3.34	3.86	1.75	2.96	1.53	2.13	3.12	4.19	2.48	3.17
PHILADELPHIA, PA-NJ PMSA	3.07	4.62	2.28	3.28	1.85	2.75	1.73	1.36	2.17	6.20	1.92	4.96	1.93	3.86	1.76	3.30
PHOENIX-MESA, AZ MSA	4.89	10.60	4.07	8.37	5.01	5.36	2.92	3.36	1.61	3.71	1.48	2.97	1.96	3.34	1.58	2.22
RIVERSIDE-SAN BERNARDINO, CA PMSA	1.97	7.89	1.95	7.33	2.56	6.64	2.32	5.73	1.73	6.33	1.61	5.36	2.20	3.74	1.76	2.62
SACRAMENTO, CA PMSA	1.63	1.18	3.79	1.01	6.94	4.31	5.84	3.70	3.04	1.99	2.94	1.81	4.61	2.07	4.08	1.88
ST. LOUIS, MO-IL MSA	4.62	7.09	1.27	0.93	3.29	5.40	3.97	4.56	1.52	2.31	1.25	1.18	2.70	3.39	1.59	1.47
TAMPA-ST PETERSBURG-CLEARWATER	2.67	2.68	2.12	1.90	2.34	1.61	4.22	2.55	2.87	5.54	2.45	4.42	3.72	5.14	3.06	4.18
WASHINGTON, DC-MD-VA-WV, PMSA	3.61	7.61	2.60	5.37	2.42	6.16	2.18	4.61	2.04	6.22	1.66	4.25	2.74	8.07	2.11	5.83

TABLE 27

TYPE OF LENDER ACTION TO RESOLVE DELINQUENCIES BY LENDER DEFAULT CLASS*

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

Lender Action	Lender Default Class: Non-High Default Lender	Lender Default Class: High Default Lender	Total
Alternative to Foreclosure	1289	254	1543
	83.54	16.46	100
	8.3	10.55	8.6
Foreclosure	14246	2154	16400
	86.87	13.13	100
	91.7	89.45	91.4
Total	15535	2408	17943
	86.58	13.42	100
	100	100	100

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Lender Action	Lender Default Class: Non-High Default Lender	Lender Default Class: High Default Lender	Total
Alternative to Foreclosure	1182	361	1543
	76.6	23.4	100
	8.78	8.05	8.6
Foreclosure	12279	4121	16400
	74.87	25.13	100
	91.22	91.95	91.4
Total	13461	4482	17943
	75.02	24.98	100
	100	100	100

PANEL C: UNCURED DELINQUENCIES AT 12/95

Lender Action	Lender Default Class: Non-High Default Lender	Lender Default Class: High Default Lender	Total
Alternative to Foreclosure	1088	455	1543
	70.51	29.49	100
	8.53	8.78	8.6
Foreclosure	11671	4729	16400
	71.16	28.84	100
	91.47	91.22	91.4
Total	12759	5184	17943
	71.11	28.89	100
	100	100	100

* Restricted to lenders with more than 30 loans.

APPENDIX C

A SEQUEL

September 30, 2000

Introduction

The purpose of this document is to update some of the information presented in the body of this report, which was written much earlier. In the time since that report was completed, we have received credit history data for many of the FHA-insured loans that formed the basis for some of the tables and the discussion in the body of the report. The credit history data consist of FICO scores provided by Trans Union. Here we update and discuss four of the tables to account for the addition of credit history data.

Characteristics of Tracts with Relatively High Default Rates

Table 6 in the original report provided a variety of characteristics of tracts classified by the default rate within the tract. Table C-1 below updates Table 6 in the original report by adding a row to each of the three panels. Each of these new rows shows, for a particular default definition, the percentage of loans with borrower FICO scores below 620, by tract default rate category. All endorsed, purchase money loans with FICO scores supplied by Trans Union are included in the calculations.[1]

Note that as might be expected, the fraction of borrowers with scores below 620 increases as one moves rightward across each panel, *i.e.,* as one moves to tracts in higher default rate categories. The increase in the percentage appears more dramatic for the default definitions used in Panels B and C than for the definition used in Panel A.

Characteristics of Lenders with Relatively High Default Rates

Table 11 in the original report provided characteristics for lenders classified by the default rates on the loans they originated. Table C-2 below updates Table 11 in the original report by adding a row to each of the three panels. Each of the new rows shows, for a particular default definition, the fraction of loans with borrower FICO scores below 620, by lender default rate category. All endorsed, purchase money loans with FICO scores supplied by Trans Union are included in the calculation.

Not surprisingly, the fraction of borrowers with scores below 620 increases as one moves

---

[1] Approximately 170,000 loans had FICO scores and are included in the FICO calculations in Tables C-1 and C-2.

to the right across each panel, *i.e.*, as one moves to tracts in higher default rate categories. The increase in the percentage appears more dramatic for the default definitions used in Panels B and C than for the definition used in Panel A, and the increase is especially impressive in Panel B.

Estimates of Default Logits Using Pooled Data

Table C-3 updates Table 25 from the original report. For each panel of Table C-3 (corresponding to a particular default definition), logits pooled across MSAs and across origination years have been rerun to incorporate FICO scores or the absence thereof.

Using the distinctions suggested by other work on mortgage scoring, the following eight variables have been added to the Table 25 specification:

Indicator for borrower configuration:
noco: indicator =1 for case with no coborrower (zero otherwise)

Indicators for presence of scores:
sentout: indicator =1 if case was sent out to TU for scoring (zero otherwise)
nocomiss: indicator =1 for case with no coborrrower and missing FICO (for any reason) (zero otherwise)
co1: indicator = 1 for case with coborrower but score for only one of the parties (zero otherwise)
co2: indicator = 1 for case with coborrower and scores for both parties (zero otherwise)

FICO scores for cases with at least one score from Trans Union (set to zero otherwise):
ficonoco: FICO score for cases with no coborrower
fico: FICO score for cases with a coborrower and only one score
ficoave: average of FICO scores for cases with both borrower and coborrower scores

Three aspects of Table C-3 are noteworthy. First, FICO scores work as might be anticipated with higher FICO score readings associated with lower default probabilities. Sensitivities to FICO scores appear to differ, however. Average FICO scores for borrower/coborrower pairs have a bigger effect on default than does the FICO score of a single borrower, which in turn has a larger effect on default than does the FICO score for a borrower/coborrower pair having one missing FICO score.

Second, a comparison of the coefficients in each panel of Table C-3 with the corresponding coefficients in Table 25 in the report shows that virtually all qualitative findings remain unchanged with the introduction of FICO scores.

Third, comparing the estimated impacts of high default tracts and lenders in Table C-3 to those in Table 25, we see that all effects are reduced slightly by controlling for FICO scores. The reduction is generally on the order of only one or two percentage points.

Adjusted Odds Ratios of Default for High-Default Tracts and Lenders

Table 26 in the body of the paper presents raw odds ratios of default for high-default

tracts and lenders, as well as odds ratios after adjusting for the explanatory variables used in Table 25 via an MSA-specific logit. For each panel (default definition), Table C-4 extends the analysis of Table 26 by recalculating the adjusted odds ratios using more complete MSA-specific logit specifications in which FICO scores are included among the explanatory variables, when possible (as in Table C-3). To demonstrate how the results are modified by the inclusion of FICO scores, two columns have been added to each of the old Table 26 subpanels. These new columns show the new adjusted differential and the new test statistic when the adjustment factors include the FICO and related variables. In each subpanel, the third and fourth columns of numbers are the adjusted differentials and test statistics calculated without FICO controls; these columns are denoted by "adjusted 1" and "z 1." The fifth and sixth columns of numbers give the adjusted differentials and test statistics that adjust for FICO scores; these columns are denoted by "adjusted 2" and "z 2."

Because the first four columns of each six-column subpanel of Table C-4 show the raw differential and test statistic, as well as the adjusted differential and test statistic presented in the earlier work (*i.e.,* the columns "adjusted 1" and "z 1" that do not incorporate FICOs and related variables), these first four columns of each subpanel should be identical to those in Table 26. We have discovered, however, that Panels A and B of Table 26 in the report contained an error because the wrong output was copied into the paper. As a result, the raw and adjusted figures in the first four columns in Table C-4 subpanels do not match those in the paper. They are generally not too different, however. In particular, in the vast majority of the cases --- especially in Panels B and C --- the adjusted differentials in the third column ("adjusted 1") of each subpanel are lower than the raw differentials in the first column.

The final two columns of Table C-4 show the adjusted odds ratios of default (and z-scores) after introducing FICO scores as additional adjustment factors. In the majority of the cases — especially for lenders in Panels B and C — the inclusion of FICO scores further reduces the adjusted odds ratios for high-default tracts and lenders. The differences occasioned by the inclusion of the FICO scores are not as large as one might have imagined however, and the newly adjusted differentials ("adjusted 2") often remain statistically significant.

One possible reason that the introduction of FICO scores has only modest impacts on adjusted differentials is that the FICO score may not be a perfect measure of relevant past credit performance for FHA borrowers. The FICO score is not tailored specifically to the FHA borrower population, and there may be other aspects of credit history that are predictive of default for this population. In addition, the FICO score may not overcome the omission of a host of other relevant borrower or loan characteristics, as well as the errors that are no doubt present in those measures that are included.

TABLE C-1

CHARACTERISTICS OF TRACTS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

Characteristic	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract) 0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Tracts in Default Rate Class	46.71%	32.54%	3.51%	3.79%	7.46%	5.99%
% of All Loans in Default Rate Class	9.54	44.79	12.18	10.86	14.97	7.65
% of All Defaults in Default Rate Class	9.50	1.35	12.03	18.08	32.93	26.11
Default Rate (%) in Class	0.83	0.03	0.82	1.38	1.83	2.84
FHA % Black	14.01	9.98	11.54	13.27	17.51	25.71
FHA % Hispanic	14.35	9.92	16.59	17.36	13.34	11.27
First Time (%)	52.80	43.59	42.46	43.76	45.06	49.51
% LTV .97 +	22.27	24.59	22.02	23.72	27.58	34.30
% Front end .29+	20.30	18.05	21.17	21.85	19.01	16.97
% Back end .41+	16.71	16.30	17.76	18.00	16.23	14.41
% FICO score below 620	15.10	13.16	13.34	14.73	15.60	18.94
Income-MSA average	132.10	65.36	98.76	-9.01	-156.73	-378.23
Mortgage-MSA average	3452.04	1328.26	4028.98	876.91	-4526.29	-10637.42
Assets-MSA average	815.92	388.81	356.88	-0.69	-830.41	-2195.38
FHA/Tot originations (%)	11.36	25.26	33.62	36.85	34.42	35.24
Black FHA/Blk originations (%)	30.72	43.71	45.67	51.21	51.04	52.76
Hispanic FHA/Hisp originations (%)	23.03	40.13	42.46	52.92	49.51	48.42
Conventional denials/applications (%)	15.55	11.76	14.92	16.73	16.73	16.42
Census % Black	15.14	11.24	10.74	18.38	21.88	40.17
Census % Hispanic	16.08	9.68	24.96	18.06	15.15	9.38
Census Unemp Rate (%)	7.71	6.24	6.99	7.70	8.34	11.55
Census Income Ratio	1.02	1.07	1.10	1.03	0.99	0.90
Census Poverty Rate (%)	13.33	8.24	10.59	12.60	12.73	18.13
Census Home Ownership Rate (%)	57.49	66.29	65.94	61.44	59.83	57.55

TABLE C-1

CHARACTERISTICS OF TRACTS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Characteristic	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract) 0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Tracts in Default Rate Class	46.71%	21.21%	10.75%	8.98%	9.18%	3.17%
% of All Loans in Default Rate Class	9.54	30.54	21.34	18.36	16.29	3.94
% of All Defaults in Default Rate Class	9.88	3.82	17.94	26.39	30.41	11.57
Default Rate (%) in Class	2.50	0.30	2.03	3.47	4.50	7.09
FHA % Black	14.01	5.64	10.16	14.68	24.37	34.40
FHA % Hispanic	14.35	9.07	14.14	15.79	12.97	10.51
First Time (%)	52.80	41.63	43.58	44.63	47.50	51.91
% LTV .97 +	22.27	22.87	22.61	24.86	31.10	39.27
% Front end .29+	20.30	17.36	20.68	20.79	18.62	15.28
% Back end .41+	16.71	16.04	17.56	17.26	16.10	12.97
% FICO score below 620	15.10	11.43	13.33	15.50	17.94	22.31
Income-MSA average	132.10	122.76	90.46	-9.74	-237.47	-657.26
Mortgage-MSA average	3452.04	2102.14	3616.56	988.76	-6694.90	-19306.42
Assets-MSA average	815.92	881.43	507.72	-253.44	-1496.62	-3632.94
FHA/Tot originations (%)	11.36	23.17	29.16	34.50	37.20	44.48
Black FHA/Blk originations (%)	30.72	39.75	43.64	47.45	52.39	56.56
Hispanic FHA/Hisp originations (%)	23.03	37.46	42.32	49.78	51.64	53.14
Conventional denials/applications (%)	15.55	11.00	13.42	15.58	17.57	22.42
Census % Hispanic	16.08	10.32	15.22	14.21	13.51	8.86
Census % Black	15.14	7.01	11.22	18.58	29.86	50.28
Census % Unemp Rate (%)	7.71	5.74	6.46	7.54	9.36	14.50
Census Income Ratio	1.02	1.12	1.06	1.03	0.93	0.79
Census Poverty Rate (%)	13.33	7.37	9.15	10.98	14.99	21.73
Census Home Ownership Rate (%)	57.49	66.76	65.16	63.11	60.34	54.13

TABLE C-1

CHARACTERISTICS OF TRACTS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

Characteristic	Tracts With <31 Loans	Default Rate of Tract Relative to MSA Rate (> 30 Loans Per Tract)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Tracts in Default Rate Class	46.71%	20.50%	10.85%	8.91%	9.70%	3.33%
% of All Loans in Default Rate Class	9.54	31.17	22.65	16.52	16.02	4.11
% of All Defaults in Default Rate Class	9.94	4.55	18.75	22.04	32.31	12.41
Default Rate (%) in Class	2.56	0.36	2.03	3.28	4.96	7.43
FHA % Black	14.01	6.10	10.67	13.10	24.43	36.75
FHA % Hispanic	14.35	9.54	14.50	14.39	13.26	10.98
First Time (%)	52.80	41.95	44.44	44.38	46.23	51.43
% LTV .97 +	22.27	23.12	25.59	24.23	28.36	36.01
% Front end .29+	20.30	18.38	20.01	20.05	18.35	16.01
% Back end .41+	16.71	16.74	17.43	16.88	15.49	12.60
% FICO score below 620	15.10	11.91	13.71	14.40	17.84	21.52
Income-MSA average	132.10	169.52	43.60	-17.73	-267.75	-664.21
Mortgage-MSA average	3452.04	4118.75	1572.44	106.83	-7181.44	-18986.32
Assets-MSA average	815.92	920.97	96.19	-183.78	-1362.55	-3200.99
FHA/Tot originations (%)	11.36	23.39	29.93	33.53	38.71	47.41
Black FHA/Blk originations (%)	30.72	39.56	44.62	47.16	52.57	57.74
Hispanic FHA/Hisp originations (%)	23.03	37.33	43.20	50.01	50.81	55.56
Conventional denials/applications (%)	15.55	10.94	13.78	15.55	18.48	23.16
Census % Black	15.14	6.68	11.85	16.10	31.27	55.84
Census % Hispanic	16.08	10.78	14.02	15.29	13.39	8.70
Census Unemp Rate (%)	7.71	5.63	6.48	7.37	9.98	14.56
Census Income Ratio	1.02	1.13	1.06	1.02	0.92	0.75
Census Poverty Rate (%)	13.33	7.04	8.84	11.33	15.80	22.44
Census Home Ownership Rate (%)	57.49	66.90	66.05	63.33	58.73	53.32

TABLE C-2

CHARACTERISTICS OF LENDERS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL A: CLAIMS AT TWO YEARS

Characteristic	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (> 30 Loans Per Lender)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Lenders in Default Rate Class	60.84%	18.32%	6.03%	5.71%	6.34%	2.76%
% of All Loans in Default Rate Class	4.32	25.59	28.40	23.81	15.31	2.56
% of All Defaults in Default Rate Class	4.62	3.75	22.03	30.37	29.38	9.85
Default Rate (%) in Class	0.89	0.12	0.64	1.06	1.59	3.20
FHA % Black	14.36	11.49	11.13	13.50	17.30	25.68
FHA % Hispanic	18.23	10.09	12.45	13.18	14.58	11.76
First Time (%)	39.98	44.01	45.78	43.20	48.25	53.01
% LTV .97 +	25.35	23.73	24.57	24.73	27.29	35.67
% Front end .29+	23.61	18.29	19.49	19.23	18.99	16.26
% Back end .41+	17.86	16.92	16.74	16.17	16.18	14.17
% FICO score below 620	16.62	13.28	12.92	13.87	17.32	23.83
Income-MSA average	173.48	54.51	30.34	-19.72	-117.22	-213.65
Mortgage-MSA average	5083.77	-252.70	1551.38	258.79	-2697.53	-7792.57
Assets-MSA average	813.15	309.79	377.85	-103.32	-999.44	-1265.98
FHA/Tot originations (%)	35.50	34.51	37.60	38.15	37.09	41.11
Black FHA/Blk originations (%)	39.64	38.45	40.64	41.29	41.28	45.05
Hispanic FHA/Hisp originations (%)	41.33	39.32	42.91	42.90	41.37	43.28
Conventional denials/applications (%)	17.93	14.77	15.87	16.55	16.68	17.48
Census % Black	14.91	9.25	10.55	10.77	11.18	10.01
Census % Hispanic	13.60	11.82	11.51	13.17	15.59	22.13
Census Unemp Rate (%)	7.89	7.06	6.83	7.09	7.84	9.58
Census Income Ratio	1.03	1.04	1.04	1.03	1.01	0.96
Census Poverty Rate (%)	9.67	8.05	8.40	8.79	9.22	10.58
Census Home Ownership Rate (%)	67.11	69.37	68.20	68.26	67.67	67.30

TABLE C-2

CHARACTERISTICS OF LENDERS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL B: UNCURED DELINQUENCIES AT TWO YEARS

Characteristic	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (> 30 Loans Per Lender)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Lenders in Default Rate Class	60.84%	11.81%	10.92%	8.33%	6.69%	1.41%
% of All Loans in Default Rate Class	4.32	17.63	37.64	26.78	12.33	1.30
% of All Defaults in Default Rate Class	5.38	4.31	29.00	35.08	21.84	4.40
Default Rate (%) in Class	3.00	0.59	1.86	3.16	4.27	8.15
FHA % Black	14.36	10.00	11.29	14.09	19.53	32.94
FHA % Hispanic	18.23	9.37	11.44	15.19	13.08	11.68
First Time (%)	39.98	39.69	43.35	48.30	50.88	59.81
% LTV .97 +	25.35	21.64	24.50	24.66	30.53	39.28
% Front end .29+	23.61	16.77	19.40	20.12	18.26	13.57
% Back end .41+	17.86	16.40	16.38	17.10	16.00	12.28
% FICO score below 620	16.62	11.73	13.13	15.13	17.09	29.76
Income-MSA average	173.48	53.16	53.73	-18.56	-163.25	-450.65
Mortgage-MSA average	5083.77	-1383.87	1709.29	1162.72	-5244.91	-14422.89
Assets-MSA average	813.15	561.81	341.68	-144.99	-1090.71	-3286.62
FHA/Tot originations (%)	35.50	33.70	36.74	38.52	37.71	45.29
Black FHA/Blk originations (%)	39.64	37.68	40.12	41.84	41.44	48.28
Hispanic FHA/Hisp originations (%)	41.33	38.77	41.56	63.94	41.36	43.44
Conventional denials/applications (%)	17.93	14.97	15.47	16.40	17.19	19.62
Census % Black	13.60	11.06	11.87	13.16	16.95	25.85
Census % Hispanic	14.91	9.43	9.85	11.64	10.43	9.43
Census Unemp Rate (%)	7.89	6.71	7.05	7.41	7.44	10.83
Census Income Ratio	1.03	1.05	1.04	1.03	1.00	0.92
Census Poverty Rate (%)	9.67	7.90	8.30	9.01	9.20	12.13
Census Home Ownership Rate (%)	67.11	69.17	68.78	67.76	67.81	67.17

TABLE C-2

CHARACTERISTICS OF LENDERS IN VARIOUS RELATIVE DEFAULT RATE CLASSES
ALL MSAs

1992 AND 1994 ORIGINATIONS

PANEL C: UNCURED DELINQUENCIES AT 12/95

Characteristic	Lenders With <31 Loans	Default Rate of Lender Relative to MSA Rate (> 30 Loans Per Lender)				
		0 to < 0.5	0.5 to < 1.0	1.0 to <1.5	1.5 to <3.0	3.0+
% of All Lenders in Default Rate Class	60.84%	12.63%	10.57%	7.88%	6.82%	1.26%
% of All Loans in Default Rate Class	4.32	16.94	35	28.41	13.98	1.35
% of All Defaults in Default Rate Class	4.19	3.91	27.65	34.59	24.89	4.77
Default Rate (%) in Class	2.38	0.57	1.94	2.99	4.38	8.71
FHA % Black	14.36	9.87	11.37	13.88	18.49	33.16
FHA % Hispanic	18.23	10.24	11.14	14.57	13.43	10.68
First Time (%)	39.98	39.54	42.65	48.67	49.61	67.44
% LTV .97 +	25.35	24.13	24.51	24.36	27.61	38.35
% Front end .29+	23.61	18.46	18.98	19.85	18.11	13.67
% Back end .41+	17.86	17.11	17.25	16.25	15.29	10.9
% FICO score below 620	16.62	12.47	12.74	15.31	16.35	25.33
Income-MSA average	173.48	104.9	19.78	-2.45	-123.2	-500.88
Mortgage-MSA average	5083.77	857.69	356.08	1305.63	-3413.99	-17272.76
Assets-MSA average	813.15	646.24	162.85	-178.44	-531.5	-2595.1
FHA/Tot originations (%)	35.5	34.84	36.57	37.68	37.96	46.1
Black FHA/Blk originations (%)	39.64	38.58	40.25	41.04	41.15	49.06
Hispanic FHA/Hisp originations (%)	41.33	40.06	41.65	42.71	42.04	40.33
Conventional denials/applications (%)	17.93	14.93	15.86	15.85	17.03	19.73
Census % Black	14.91	9.63	9.89	11.17	10.85	9.04
Census % Hispanic	13.6	10.66	11.53	13.55	16.58	28.91
Census Unemp Rate (%)	7.89	6.7	6.69	7.76	7.44	12.14
Census Income Ratio	1.03	1.06	1.05	1.01	1	0.88
Census Poverty Rate (%)	9.67	7.8	8.25	9.01	9.13	13.62
Census Home Ownership Rate (%)	67.11	69.2	68.85	67.88	67.63	66.61

Estimates of a Logit Model of Default

1992 and 1994 Originations

Panel A: Claims at Two Years

Number of obs = 354133
chi2(70) =4496.51
Prob > chi2 = 0.0000
Pseudo R2 = 0.1313

Log Likelihood = -14875.738

Variable	Coefficient Estimate	Std. Err.	z	P>|z|	[95% Conf. Interval]	
_94	0.2355733	0.1135048	2.075	0.038	0.013108	0.4580386
cin92	0.9867724	0.0797816	12.368	0.000	0.8304033	1.143141
cin94	0.9360322	0.0617645	15.155	0.000	0.8149759	1.057088
ctin92	1.355797	0.0916683	14.79	0.000	1.176131	1.535464
ctin94	1.328984	0.0695354	19.112	0.000	1.192697	1.465271
ltv95_	0.0306073	0.005484	5.581	0.000	0.0198588	0.0413558
ltv95	0.0276651	0.0168488	1.642	0.101	-0.005358	0.0606881
age_	-0.0651351	0.008575	-7.596	0.000	-0.0819419	-0.0483283
age30	0.0953901	0.0133339	7.154	0.000	0.0692561	0.121524
age40	-0.026653	0.0095213	-2.799	0.005	-0.0453144	-0.0079916
incdiff	-0.0000352	0.0000375	-0.937	0.349	-0.0001087	0.0000384
less15	-0.095611	0.1827544	-0.523	0.601	-0.4538029	0.262581
back_	-0.0146618	0.0042788	-3.427	0.001	-0.023048	-0.0062755
back36	0.0146963	0.0052621	2.793	0.005	0.0043828	0.0250098
front_	0.0296828	0.0082129	3.614	0.000	0.0135858	0.0457798
front27	-0.0301463	0.009096	-3.314	0.001	-0.0479742	-0.0123184
asst	-0.0001717	0.0000127	-13.483	0.000	-0.0001967	-0.0001467
asst6k	0.0000869	0.0000259	3.350	0.001	0.0000361	0.0001378
asst10k	0.0000846	0.0000177	4.796	0.000	0.0000501	0.0001192
mtgdiff	0.00000461	0.00000164	2.813	0.005	0.0000014	0.00000782
intdiff	0.2263071	0.0258703	8.748	0.000	0.1756022	0.277012
sepmale	0.0531569	0.2316604	0.229	0.819	-0.4008892	0.507203
sepfmle	-0.2538628	0.1861259	-1.364	0.173	-0.6186628	0.1109372
sglmale	0.0453961	0.0504839	0.899	0.369	-0.0535505	0.1443428
sglfmle	-0.1768739	0.0570595	-3.100	0.002	-0.2887084	-0.0650394
armflag	0.4203208	0.061568	6.827	0.000	0.2996496	0.5409919
condo	-0.2022116	0.123789	-1.634	0.102	-0.4448335	0.0404103
firstime	0.046462	0.0459588	1.011	0.312	-0.0436155	0.1365396
black	0.2434443	0.0570984	4.264	0.000	0.1315335	0.3553551
hispan	-0.1964774	0.061891	-3.175	0.002	-0.3177816	-0.0751733
avgrate	0.2352368	0.1540175	1.527	0.127	-0.0666319	0.5371054
house	-0.0031696	0.0042807	-0.740	0.459	-0.0115597	0.0052204
cnincdif	-0.000011	0.00000309	-3.543	0.000	-0.000017	-0.0000049
blkcen	0.0016765	0.0012011	1.396	0.163	-0.0006776	0.0040306
hspcen	-0.0026887	0.0017521	-1.535	0.125	-0.0061228	0.0007454
unempcen	0.0132886	0.0082046	1.620	0.105	-0.0027922	0.0293693
fhaorig	0.0003092	0.0013516	0.229	0.819	-0.0023399	0.0029584
cnvadeny	0.0059551	0.0021241	2.804	0.005	0.001792	0.0101183
hasasset	0.545895	0.1496223	3.648	0.000	0.2526406	0.8391494
hashum	-0.0317412	0.1401059	-0.227	0.821	-0.3063437	0.2428614
hascen	-0.1767317	0.1356302	-1.303	0.193	-0.442562	0.0890986
ficonoco	-0.0094766	0.0008092	-11.710	0.000	-0.0110626	-0.0078905
noco	5.692456	0.5211235	10.923	0.000	4.671072	6.713839
nocomiss	-5.367816	0.5202959	-10.317	0.000	-6.387577	-4.348054
fico	-0.008338	0.0008876	-9.394	0.000	-0.0100776	-0.0065984
co1	5.003401	0.5793671	8.636	0.000	3.867862	6.13894
co2	6.725935	0.8592723	7.827	0.000	5.041792	8.410077
ficoavg	-0.0116843	0.0013154	-8.883	0.000	-0.0142624	-0.0091061
sentout	0.5239541	0.0635089	8.250	0.000	0.399479	0.6484293
_cons	-7.815003	0.9664884	-8.086	0.000	-9.709285	-5.920721

Estimates of a Logit Model of Default

1992 and 1994 Originations

Panel B: Uncured Delinquencies at Two Years

Number of obs = 354133
chi2(50) =12355.51
Prob > chi2 = 0.0000
Log Likelihood = -36732.193 Pseudo R2 = 0.1440

Variable	Coefficient Estimate	Std. Err.	z	P>|z|	[95% Conf.	Interval]
_94	0.6214661	0.0691575	8.986	0.000	0.4859198	0.7570123
nin92	0.6290199	0.0473337	13.289	0.000	0.5362475	0.7217922
nin94	0.5120388	0.0298322	17.164	0.000	0.4535688	0.5705089
ntin92	0.9496638	0.0589749	16.103	0.000	0.834075	1.065253
ntin94	0.7388285	0.0365529	20.213	0.000	0.6671863	0.8104708
ltv95_	0.0206562	0.0028782	7.177	0.000	0.015015	0.0262974
ltv95	0.0233602	0.0099838	2.34	0.019	0.0037924	0.0429281
age_	-0.0566948	0.0050136	-11.308	0.000	-0.0665212	-0.0468684
age30	0.0802648	0.0076785	10.453	0.000	0.0652152	0.0953145
age40	-0.0242518	0.0055231	-4.391	0.000	-0.0350769	-0.0134267
incdiff	-0.0000179	0.0000213	-0.841	0.400	-0.0000597	0.0000238
less15	-0.4721426	0.1272025	-3.712	0.000	-0.721455	-0.2228302
back_	-0.0033564	0.0025488	-1.317	0.188	-0.008352	0.0016392
back36	0.0036453	0.0031411	1.161	0.246	-0.002511	0.0098017
front_	0.0303373	0.0048024	6.317	0.000	0.0209248	0.0397498
front27	-0.0309015	0.0053182	-5.811	0.000	-0.0413249	-0.0204781
asst	-0.000149	0.00000739	-20.179	0.000	-0.0001635	-0.0001346
asst6k	0.0000497	0.0000145	3.425	0.001	0.0000213	0.0000782
asst10k	0.0000994	0.00000969	10.259	0.000	0.0000804	0.0001184
mtgdiff	0.00000426	0.000000925	4.603	0.000	0.00000245	0.00000607
intdiff	0.2185247	0.0143619	15.216	0.000	0.1903759	0.2466736
sepmale	0.1198118	0.1267489	0.945	0.345	-0.1286114	0.368235
sepfmle	-0.2497399	0.1010777	-2.471	0.013	-0.4478486	-0.0516312
sglmale	-0.0440161	0.0288834	-1.524	0.128	-0.1006264	0.0125943
sglfmle	-0.2582634	0.0322465	-8.009	0.000	-0.3214653	-0.1950615
armflag	0.4571806	0.0338921	13.489	0.000	0.3907534	0.5236078
condo	-0.0894656	0.0646124	-1.385	0.166	-0.2161036	0.0371724
firstime	0.1097841	0.0262947	4.175	0.000	0.0582474	0.1613209
black	0.4307539	0.0317325	13.575	0.000	0.3685594	0.4929484
hispan	-0.1738297	0.0358251	-4.852	0.000	-0.2440456	-0.1036137
avgrate	0.2902304	0.0937327	3.096	0.002	0.1065177	0.4739431
house	-0.0113102	0.0026633	-4.247	0.000	-0.0165302	-0.0060902
cnincdif	-0.00000918	0.00000174	-5.268	0.000	-0.0000126	-0.00000577
blkcen	0.0010535	0.00067	1.572	0.116	-0.0002597	0.0023667
hspcen	-0.0036138	0.001021	-3.539	0.000	-0.0056149	-0.0016126
unempcen	0.0040183	0.0047525	0.846	0.398	-0.0052965	0.0133331
fhaorig	0.0026842	0.0008126	3.303	0.001	0.0010916	0.0042768
cnvadeny	0.0044085	0.0014059	3.136	0.002	0.001653	0.007164
hasasset	0.6657481	0.0917039	7.26	0.000	0.4860118	0.8454844
hashum	-0.1212824	0.0885652	-1.369	0.171	-0.294867	0.0523023
hascen	-0.0403564	0.0861539	-0.468	0.639	-0.2092151	0.1285022
ficonoco	-0.0102509	0.0004479	-22.886	0.000	-0.0111288	-0.009373
noco	6.297695	0.2873814	21.914	0.000	5.734438	6.860952
nocomiss	-6.004385	0.2869264	-20.927	0.000	-6.56675	-5.442019
fico	-0.0094154	0.0004791	-19.654	0.000	-0.0103543	-0.0084764
co1	5.827262	0.3111194	18.73	0.000	5.21748	6.437045
co2	8.534707	0.4501814	18.958	0.000	7.652367	9.417046
ficoavg	-0.0142745	0.0006972	-20.474	0.000	-0.015641	-0.012908
sentout	0.4205894	0.0351915	11.951	0.000	0.3516153	0.4895634
_cons	-6.832515	0.5688963	-12.01	0.000	-7.947532	-5.717499

Estimates of a Logit Model of Default

1992 and 1994 Originations

Panel C: Uncured Delinquencies at 12/95

Number of obs = 354133
chi2(50) =12355.51
Prob > chi2 = 0.0000
Log Likelihood = -36732.193 Pseudo R2 = 0.1440

Variable	Coefficient Estimate	Std. Err.	z	P>|z|	[95% Conf. Interval]	
_94	0.4994999	0.0940738	5.310	0.000	0.3151187	0.6838812
n95in92	0.48567	0.0322466	15.061	0.000	0.4224678	0.5488723
n95in94	0.6920928	0.0412879	16.763	0.000	0.6111699	0.7730157
n95tin92	0.789085	0.0392628	20.098	0.000	0.7121314	0.8660385
n95tin94	0.9252378	0.0483766	19.126	0.000	0.8304214	1.020054
months	0.0653473	0.0038575	16.940	0.000	0.0577867	0.072908
ltv95_	0.0186514	0.0026725	6.979	0.000	0.0134133	0.0238895
ltv95	0.031973	0.0099959	3.199	0.001	0.0123814	0.0515646
age_	-0.0411561	0.0051393	-8.008	0.000	-0.0512289	-0.0310833
age30	0.0671114	0.0078293	8.572	0.000	0.0517663	0.0824566
age40	-0.0301417	0.0056599	-5.326	0.000	-0.0412349	-0.0190486
incdiff	-0.000038	0.0000204	-1.861	0.063	-0.000078	0.00000202
less15	-0.6077362	0.1234854	-4.922	0.000	-0.849763	-0.3657093
back_	-0.0059422	0.0025242	-2.354	0.019	-0.0108894	-0.0009949
back36	0.0058756	0.0031313	1.876	0.061	-0.0002616	0.0120129
front_	0.0273434	0.0044168	6.191	0.000	0.0186866	0.0360001
front27	-0.0276103	0.0050198	-5.500	0.000	-0.0374489	-0.0177716
asst	-0.0001523	0.00000758	-20.088	0.000	-0.0001671	-0.0001374
asst6k	0.0000626	0.0000147	4.253	0.000	0.0000337	0.0000914
asst10k	0.0000894	0.0000096	9.317	0.000	0.0000706	0.0001083
mtgdiff	0.00000348	0.000000914	3.804	0.000	0.00000169	0.00000527
intdiff	0.1385994	0.0150745	9.194	0.000	0.1090539	0.1681448
sepmale	-0.020946	0.1252068	-0.167	0.867	-0.2663468	0.2244548
sepfmle	-0.1046269	0.0967484	-1.081	0.280	-0.2942504	0.0849966
sglmale	-0.0429279	0.0298892	-1.436	0.151	-0.1015097	0.0156538
sglfmle	-0.2415423	0.0335958	-7.190	0.000	-0.3073889	-0.1756957
armflag	0.3370807	0.0349552	9.643	0.000	0.2685698	0.4055917
condo	-0.1635513	0.0676704	-2.417	0.016	-0.2961829	-0.0309198
firstime	0.0975988	0.0261434	3.733	0.000	0.0463588	0.1488389
black	0.4104146	0.0326006	12.589	0.000	0.3465185	0.4743106
hispan	-0.1985766	0.036833	-5.391	0.000	-0.270768	-0.1263852
avgrate	0.1528386	0.0117014	13.062	0.000	0.1299043	0.1757728
house	-0.0307227	0.0013685	-22.449	0.000	-0.033405	-0.0280404
cnincdif	-0.00000944	0.0000017	-5.547	0.000	-0.0000128	-0.0000061
blkcen	0.00144	0.0006353	2.267	0.023	0.0001948	0.0026852
hspcen	-0.0028624	0.0009567	-2.992	0.003	-0.0047375	-0.0009873
unempcen	-0.0020537	0.004503	-0.456	0.648	-0.0108794	0.006772
fhaorig	0.002525	0.0007005	3.605	0.000	0.001152	0.0038979
cnvadeny	0.0061272	0.0010845	5.650	0.000	0.0040017	0.0082527
hasasset	0.8360587	0.0787144	10.621	0.000	0.6817813	0.9903361
hashum	-0.2259576	0.0692452	-3.263	0.001	-0.3616757	-0.0902395
hascen	0.1052037	0.0664434	1.583	0.113	-0.0250229	0.2354304
ficonoco	-0.0100672	0.0004539	-22.179	0.000	-0.0109568	-0.0091775
noco	6.138485	0.2937233	20.899	0.000	5.562798	6.714172
nocomiss	-5.920231	0.2932779	-20.186	0.000	-6.495045	-5.345417
fico	-0.0087052	0.0004741	-18.362	0.000	-0.0096344	-0.007776
co1	5.401941	0.3115378	17.340	0.000	4.791338	6.012544
co2	7.696231	0.4515744	17.043	0.000	6.811161	8.5813
ficoavg	-0.0129273	0.0006908	-18.715	0.000	-0.0142812	-0.0115735
sentout	0.3826259	0.0364334	10.502	0.000	0.3112178	0.454034
_cons	-8.077748	0.3626182	-22.276	0.000	-8.788467	-7.36703

C-4

Raw and Adjusted Odds Ratios for High-Default Tracts and High-Default Lenders from MSA-Specific Logits

Panel A: Calims at Two Years

	Tracts											
	1992						1994					
MSA Name	raw	z	adjusted 1	z1	adjusted 2	z2	raw	z	adjusted 1	z1	adjusted 2	z2
ATLANTA, GA MSA	7.049	5.548	5.089	4.105	5.070	4.019	12.070	6.066	6.845	4.175	7.640	4.359
BALTIMORE, MD PMSA	10.852	4.762	5.249	3.068	5.417	3.114	6.301	5.751	6.164	5.315	6.767	5.445
CHICAGO, IL PMSA	8.967	7.809	5.081	5.383	4.903	5.201	8.133	9.407	6.130	7.617	5.802	7.351
DALLAS, TX PMSA	2.154	2.103	1.593	1.163	1.481	0.978	8.866	3.550	6.018	2.803	5.976	2.736
DENVER, CO PMSA	18.613	7.035	10.783	5.287	11.101	5.286	8.176	6.601	5.636	4.921	5.789	4.966
DETROIT, MI PMSA	7.215	6.308	4.960	4.799	5.067	4.848	3.061	4.757	2.348	3.192	2.228	2.996
FORT LAUDERDALE, FL P	6.563	1.786	3.260	1.070	3.326	1.061	2.155	0.744	0.762	-0.241	0.699	-0.313
FORT WORTH-ARLINGTON, TX PMSA	6.330	3.346	3.621	2.118	3.287	1.939	1.957	0.650	2.042	0.559	2.136	0.564
HOUSTON, TX PMSA	2.675	1.615	3.066	1.626	3.344	1.726	3.448	3.313	5.678	3.232	6.145	3.334
LOS ANGELES-LONP	2.059	1.992	2.589	2.494	2.486	2.367	3.605	7.928	2.653	5.476	2.587	5.306
MEMPHIS, TN-AR-MS MSA	7.395	3.990	5.453	3.112	4.791	2.831	6.255	4.345	3.154	2.505	3.475	2.697
MIAMI, FL PMSA	3.015	1.044	1.597	0.419	1.493	0.348	6.996	4.955	7.204	4.513	6.703	4.256
MINNEAPOLIS-ST PAUL, MN-WI MSA	13.941	5.846	16.992	6.044	15.196	5.703	9.967	7.421	8.186	6.326	8.731	6.384
ORLANDO, FL MSA	5.546	2.283	1.339	0.345	1.377	0.373	6.578	4.609	5.717	3.883	5.362	3.634
PHILADELPHIA, PA-NJ PMSA	9.223	2.952	7.029	2.383	7.844	2.464	3.653	3.892	8.565	2.681	7.793	2.575
PHOENIX-MESA, AZ MSA	6.997	7.129	5.618	5.812	5.400	5.610	10.679	8.923	6.408	6.102	6.130	5.890
RIVERSIDE-SAN BERNARDINO, CA PMSA	3.549	6.379	3.803	6.256	3.570	5.909	3.276	5.329	3.089	4.840	3.110	4.819
SACRAMENTO, CA PMSA							9.184	5.983	9.380	5.509	9.553	5.486
ST. LOUIS, MO-IL MSA	7.150	3.178	3.996	2.176	3.898	2.109	3.150	4.066	3.055	1.542	3.912	2.033
TAMPA-ST PETERSBURG-CLEARWATER	5.640	2.297	4.823	2.049	4.117	1.803	3.032	1.829	5.368	2.503	5.039	2.385
WASHINGTON, DC-MD-VA-WV, PMSA	5.942	2.421	5.253	2.165	5.687	2.257	8.966	8.156	6.038	6.084	6.122	6.099

	Lenders											
	1992						1994					
MSA Name	raw	z	adjusted 1	z1	adjusted 2	z2	raw	z	adjusted 1	z1	adjusted 2	z2
ATLANTA, GA MSA	2.663	3.298	2.064	2.347	1.977	2.189	2.871	2.629	2.999	2.676	3.018	2.677
BALTIMORE, MD PMSA	4.098	3.084	2.443	1.863	2.624	2.022	2.744	3.979	2.495	3.322	2.467	3.221
CHICAGO, IL PMSA	3.503	5.439	3.026	4.726	2.975	4.636	3.370	6.743	2.304	4.422	2.226	4.222
DALLAS, TX PMSA	5.723	5.969	5.070	5.421	5.156	5.435	3.575	3.976	2.576	2.800	2.647	2.869
DENVER, CO PMSA	6.032	2.407	5.276	2.160	5.481	2.218	2.729	3.418	2.515	2.976	2.581	3.038
DETROIT, MI PMSA	8.339	7.714	2.925	3.529	2.978	3.562	6.259	10.038	2.051	3.394	2.060	3.407
FORT LAUDERDALE, FL P							6.430	5.598	6.129	5.119	5.957	4.962
FORT WORTH-ARLINGTON, TX PMSA	3.131	1.499	1.570	0.580	1.694	0.668	9.122	6.416	2.978	2.693	2.823	2.525
HOUSTON, TX PMSA	2.405	2.263	1.879	1.540	1.870	1.522	3.300	3.114	2.676	2.434	2.611	2.349
LOS ANGELES-LONP	4.797	4.463	4.196	3.958	4.176	3.901	2.051	3.536	1.883	3.018	1.772	2.715
MEMPHIS, TN-AR-MS MSA	3.994	3.800	2.929	2.789	2.779	2.631						
MIAMI, FL PMSA	10.072	4.623	10.630	4.430	10.487	4.376	3.956	5.080	2.927	3.604	2.769	3.352
MINNEAPOLIS-ST PAUL, MN-WI MSA	5.986	2.434	4.294	1.916	4.287	1.915	3.695	3.387	4.267	3.520	4.343	3.465
ORLANDO, FL MSA	2.180	1.051	2.323	1.100	2.436	1.144	3.834	2.135	5.342	2.532	5.624	2.524
PHILADELPHIA, PA-NJ PMSA	3.329	2.346	3.181	2.216	3.429	2.346	3.114	3.413	3.764	3.841	3.704	3.752
PHOENIX-MESA, AZ MSA	2.170	2.948	1.852	2.296	1.739	2.041	3.559	3.220	2.928	2.567	2.724	2.351
RIVERSIDE-SAN BERNARDINO, CA PMSA	2.181	3.517	2.416	3.892	2.381	3.809	4.149	8.157	2.568	5.116	2.584	5.125
SACRAMENTO, CA PMSA	2.420	0.852	2.599	0.901	3.087	1.056						
ST. LOUIS, MO-IL MSA	3.053	2.461	3.202	2.494	3.516	2.673	2.594	3.568	1.974	2.445	1.865	2.212
TAMPA-ST PETERSBURG-CLEARWATER	6.808	4.130	6.646	3.850	6.133	3.629						
WASHINGTON, DC-MD-VA-WV, PMSA	3.390	2.742	3.025	2.445	2.901	2.338	2.429	4.259	2.155	3.616	2.227	3.752

C-4

Raw and Adjusted Odds Ratios for High-Default Tracts and High-Default Lenders from MSA-Specific Logits

Panel B: Uncured Delinquencies at Two Years

	Tracts											
	1992						1994					
MSA Name	raw	z	adjusted 1	z1	adjusted 2	z2	raw	z	adjusted 1	z1	adjusted 2	z2
ATLANTA, GA MSA	5.418	6.705	3.18	4.287	3.166	4.224	3.031	5.587	1.987	3.155	2.112	3.41
BALTIMORE, MD PMSA	7.602	7.123	4.171	4.784	4.353	4.892	3.622	6.881	2.091	3.636	2.061	3.480
CHICAGO, IL PMSA	4.838	10.872	2.543	6.090	2.534	6.042	3.769	13.879	2.013	6.549	2.000	6.453
DALLAS, TX PMSA	4.140	6.514	2.642	4.110	2.410	3.694	5.470	8.634	2.952	4.877	2.907	4.754
DENVER, CO PMSA	14.881	8.901	10.158	7.260	10.195	7.180	4.945	6.882	3.785	5.299	3.941	5.369
DETROIT, MI PMSA	4.667	6.097	2.587	3.523	2.509	3.395	3.443	8.294	1.687	3.104	1.679	3.059
FORT LAUDERDALE, FL P	3.279	1.573	2.380	1.120	2.468	1.154	1.902	2.152	1.944	2.104	1.834	1.905
FORT WORTH-ARLINGTON, TX PMSA	4.068	2.796	2.517	1.726	2.302	1.553	2.187	2.828	1.889	1.705	2.056	1.848
HOUSTON, TX PMSA	0.898	-0.148	0.872	-0.177	0.831	-0.238	2.260	3.452	2.886	2.981	3.068	3.177
LOS ANGELES-LONP	1.652	2.160	1.560	1.835	1.532	1.751	2.337	8.502	1.999	5.828	1.968	5.656
MEMPHIS, TN-AR-MS MSA	3.512	4.855	1.735	2.008	1.815	2.161	3.959	8.689	2.117	4.240	2.150	4.279
MIAMI, FL PMSA	3.376	3.118	2.479	2.246	2.448	2.209	2.962	7.394	2.895	5.558	2.934	5.564
MINNEAPOLIS-ST PAUL, MN-WI MSA	11.864	9.460	7.188	7.034	6.461	6.525	4.393	6.329	3.775	5.370	4.179	5.722
ORLANDO, FL MSA	1.341	0.287	1.645	0.479	1.743	0.531	4.270	6.879	2.297	3.312	2.179	3.058
PHILADELPHIA, PA-NJ PMSA							2.062	5.669	1.456	1.751	1.428	1.637
PHOENIX-MESA, AZ MSA	4.677	6.379	3.635	4.975	3.456	4.738	3.850	7.448	3.213	6.086	3.157	5.940
RIVERSIDE-SAN BERNARDINO, CA PMSA	2.613	7.831	2.488	6.877	2.443	6.688	2.186	7.063	1.996	5.861	1.942	5.575
SACRAMENTO, CA PMSA							4.065	4.870	2.702	2.946	2.468	2.657
ST. LOUIS, MO-IL MSA	6.695	4.313	3.219	2.488	3.008	2.317	2.412	4.842	2.400	2.825	2.453	2.886
TAMPA-ST PETERSBURG-CLEARWATER							1.792	2.649	2.234	2.737	2.424	2.978
WASHINGTON, DC-MD-VA-WV, PMSA	5.730	6.480	3.390	4.322	3.568	4.459	2.502	9.139	2.402	6.334	2.459	6.446

	Lenders											
	1992						1994					
MSA Name	raw	z	adjusted 1	z1	adjusted 2	z2	raw	z	adjusted 1	z1	adjusted 2	z2
ATLANTA, GA MSA	2.484	5.208	1.574	2.495	1.468	2.099	2.242	6.736	1.664	4.069	1.617	3.806
BALTIMORE, MD PMSA	3.047	3.763	1.970	2.207	1.850	1.993	2.068	6.077	1.514	3.308	1.395	2.611
CHICAGO, IL PMSA	1.982	5.654	1.430	2.887	1.377	2.569	2.056	9.932	1.552	5.818	1.498	5.320
DALLAS, TX PMSA	3.611	7.505	2.882	5.908	2.755	5.615	2.520	5.283	1.599	2.528	1.581	2.447
DENVER, CO PMSA	5.847	2.858	6.024	2.790	6.526	2.803	2.174	4.267	1.967	3.618	1.934	3.494
DETROIT, MI PMSA	3.880	6.155	1.306	1.120	1.295	1.084	5.011	12.041	2.097	4.981	2.032	4.756
FORT LAUDERDALE, FL P	2.397	2.071	1.889	1.456	1.865	1.417	2.366	3.894	2.309	3.622	2.301	3.569
FORT WORTH-ARLINGTON, TX PMSA	4.131	4.612	2.237	2.429	2.285	2.469	5.818	7.259	2.663	3.611	2.470	3.286
HOUSTON, TX PMSA	2.392	3.331	1.880	2.293	1.830	2.187	1.576	1.956	1.231	0.849	1.197	0.728
LOS ANGELES-LONP	3.028	6.668	3.148	6.740	3.185	6.749	2.167	6.294	2.031	5.555	1.905	5.000
MEMPHIS, TN-AR-MS MSA	2.502	3.826	1.743	2.256	1.657	2.043	1.518	1.867	1.549	1.877	1.569	1.912
MIAMI, FL PMSA	5.161	6.488	3.552	4.805	3.292	4.488	2.882	8.141	2.044	5.106	1.948	4.713
MINNEAPOLIS-ST PAUL, MN-WI MSA	3.521	4.766	3.390	4.542	3.385	4.502	1.869	3.425	1.838	3.259	1.905	3.415
ORLANDO, FL MSA	2.769	2.485	2.705	2.341	2.821	2.398	1.808	3.675	1.386	1.858	1.425	2.004
PHILADELPHIA, PA-NJ PMSA	5.107	4.034	3.555	2.999	3.611	2.999	1.670	4.374	1.421	2.897	1.362	2.531
PHOENIX-MESA, AZ MSA	1.728	2.883	1.505	2.099	1.431	1.832	1.703	3.365	1.413	2.125	1.442	2.240
RIVERSIDE-SAN BERNARDINO, CA PMSA	1.948	5.060	1.848	4.599	1.766	4.233	1.523	4.817	1.358	3.394	1.395	3.656
SACRAMENTO, CA PMSA	3.680	1.744	3.729	1.669	4.500	1.823	3.925	3.556	4.423	3.704	4.148	3.456
ST. LOUIS, MO-IL MSA	2.929	2.048	2.139	1.402	2.056	1.324	2.654	4.138	1.683	2.053	1.732	2.141
TAMPA-ST PETERSBURG-CLEARWATER	3.364	4.688	2.868	3.952	2.704	3.703	2.332	5.135	1.978	3.937	1.942	3.775
WASHINGTON, DC-MD-VA-WV, PMSA	2.249	4.740	1.737	3.139	1.674	2.908	2.260	9.072	1.722	5.827	1.710	5.709

C-4

Raw and Adjusted Odds Ratios for High-Default Tracts and High-Default Lenders from MSA-Specific Logits

Panel C: Uncured Delinquencies at 12/95

	Tracts											
	1992						1994					
MSA Name	raw	z	adjusted 1	z1	adjusted 2	z2	raw	z	adjusted 1	z1	adjusted 2	z2
ATLANTA, GA MSA	2.972	7.043	1.800	3.602	1.770	3.460	4.037	7.146	2.233	3.842	2.370	4.090
BALTIMORE, MD PMSA	3.108	6.155	1.905	3.229	1.850	3.060	5.112	7.495	3.648	5.605	3.470	5.300
CHICAGO, IL PMSA	3.793	13.580	2.125	7.135	2.110	7.030	4.598	11.649	2.389	6.184	2.330	5.990
DALLAS, TX PMSA	3.903	8.744	2.416	5.129	2.320	4.850	6.722	7.936	4.693	6.159	4.640	6.040
DENVER, CO PMSA	7.831	7.054	5.422	5.373	5.460	5.330	6.296	6.982	4.878	5.702	4.820	5.600
DETROIT, MI PMSA	4.604	8.678	2.200	4.053	2.100	3.800	3.884	7.081	2.038	3.583	2.100	3.720
FORT LAUDERDALE, FL P	1.310	0.261	0.623	-0.446	0.650	-0.400	2.516	1.256	1.293	0.332	1.300	0.340
FORT WORTH-ARLINGTON, TX PMSA	3.069	3.312	1.503	1.102	1.470	1.020	3.166	2.253	1.247	0.376	1.130	0.210
HOUSTON, TX PMSA	2.563	4.289	2.084	2.978	2.050	2.880	2.840	3.153	3.032	2.718	3.400	2.940
LOS ANGELES-LONP	1.932	4.950	2.196	4.737	2.190	4.670	3.128	8.205	2.589	5.970	2.590	5.940
MEMPHIS, TN-AR-MS MSA	3.815	6.992	1.840	2.782	1.980	3.050	4.692	7.522	2.627	4.347	2.670	4.370
MIAMI, FL PMSA	3.735	3.155	2.335	1.911	2.210	1.800	3.546	4.383	1.657	1.537	1.680	1.580
MINNEAPOLIS-ST PAUL, MN-WI MSA	6.232	9.396	3.216	5.503	3.120	5.220	7.561	6.622	4.502	4.647	4.430	4.580
ORLANDO, FL MSA	2.568	3.774	1.865	2.304	2.000	2.520	4.714	5.384	3.337	3.864	3.070	3.530
PHILADELPHIA, PA-NJ PMSA	3.067	4.623	2.282	3.283	2.550	3.660	1.846	2.746	1.730	1.356	1.690	1.250
PHOENIX-MESA, AZ MSA	4.893	10.604	4.071	8.373	3.940	8.100	5.007	5.360	2.922	3.356	2.720	3.120
RIVERSIDE-SAN BERNARDINO, CA PMSA	1.968	7.893	1.945	7.327	1.890	6.940	2.556	6.635	2.318	5.726	2.270	5.550
SACRAMENTO, CA PMSA	1.628	1.184	3.786	1.008	5.230	1.190	6.936	4.313	5.840	3.703	5.470	3.510
ST. LOUIS, MO-IL MSA	4.618	7.092	1.271	0.933	1.280	0.940	3.287	5.401	3.967	4.556	4.020	4.630
TAMPA-ST PETERSBURG-CLEARWATER	2.669	2.678	2.122	1.895	2.340	2.120	2.338	1.613	4.221	2.546	3.960	2.400
WASHINGTON, DC-MD-VA-WV, PMSA	3.606	7.606	2.596	5.371	2.650	5.400	2.424	6.160	2.181	4.607	2.240	4.650

	Lenders											
	1992						1994					
MSA Name	raw	z	adjusted 1	z1	adjusted 2	z2	raw	z	adjusted 1	z1	adjusted 2	z2
ATLANTA, GA MSA	2.344	6.896	1.534	3.287	1.440	2.760	3.458	8.016	2.465	5.659	2.380	5.410
BALTIMORE, MD PMSA	2.122	5.227	1.733	3.695	1.690	3.510	2.517	5.536	1.925	3.816	1.800	3.380
CHICAGO, IL PMSA	2.179	7.873	1.382	3.115	1.340	2.790	2.178	7.320	1.651	4.588	1.570	4.130
DALLAS, TX PMSA	2.224	5.936	1.693	3.676	1.670	3.530	3.213	4.822	2.077	2.915	1.990	2.710
DENVER, CO PMSA	3.177	4.537	2.727	3.867	2.710	3.810	4.078	3.454	4.436	3.587	4.220	3.450
DETROIT, MI PMSA	2.726	7.179	1.125	0.739	1.090	0.570	5.939	11.098	1.961	3.887	1.930	3.810
FORT LAUDERDALE, FL P	2.278	2.720	1.686	1.619	1.620	1.470	3.701	4.352	3.663	4.136	3.710	4.150
FORT WORTH-ARLINGTON, TX PMSA	2.386	3.452	1.459	1.382	1.430	1.320	7.680	7.139	3.435	3.919	3.340	3.800
HOUSTON, TX PMSA	2.272	3.884	2.135	3.372	2.180	3.450	2.025	2.047	1.598	1.324	1.540	1.220
LOS ANGELES-LONP	1.757	5.088	1.713	4.744	1.720	4.710	2.070	4.309	1.930	3.833	1.850	3.550
MEMPHIS, TN-AR-MS MSA	2.459	5.159	1.615	2.602	1.530	2.290	1.522	2.047	1.239	1.024	1.250	1.070
MIAMI, FL PMSA	3.792	6.377	2.375	3.837	2.170	3.420	2.828	5.302	1.867	2.996	1.850	2.940
MINNEAPOLIS-ST PAUL, MN-WI MSA	2.008	3.578	1.860	3.095	1.730	2.690	1.977	2.898	1.978	2.827	2.020	2.900
ORLANDO, FL MSA	1.752	2.955	1.528	2.133	1.490	1.980	3.116	4.186	2.475	3.174	2.410	3.030
PHILADELPHIA, PA-NJ PMSA	2.171	6.201	1.917	4.957	1.860	4.650	1.929	3.856	1.764	3.295	1.720	3.120
PHOENIX-MESA, AZ MSA	1.609	3.709	1.480	2.970	1.410	2.560	1.961	3.339	1.581	2.222	1.590	2.250
RIVERSIDE-SAN BERNARDINO, CA PMSA	1.727	6.326	1.609	5.357	1.530	4.740	2.204	3.737	1.755	2.618	1.830	2.790
SACRAMENTO, CA PMSA	3.042	1.994	2.935	1.812	3.790	2.120	4.612	2.068	4.083	1.877	4.570	1.990
ST. LOUIS, MO-IL MSA	1.520	2.312	1.247	1.176	1.190	0.930	2.698	3.387	1.586	1.466	1.610	1.510
TAMPA-ST PETERSBURG-CLEARWATER	2.873	5.537	2.445	4.420	2.340	4.170	3.720	5.136	3.064	4.181	3.060	4.140
WASHINGTON, DC-MD-VA-WV, PMSA	2.039	6.215	1.664	4.249	1.640	4.050	2.743	8.071	2.105	5.834	2.100	5.780