

**Statement of**

**Edward J Pinto**

**Before the Subcommittee on Housing and Community Opportunity  
of the Financial Services Committee**

**United States House of Representatives**

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**Submitted testimony by Edward Pinto, real estate financial services consultant, former chief credit officer of Fannie Mae (1987-1989), and expert in sustainable affordable housing programs**

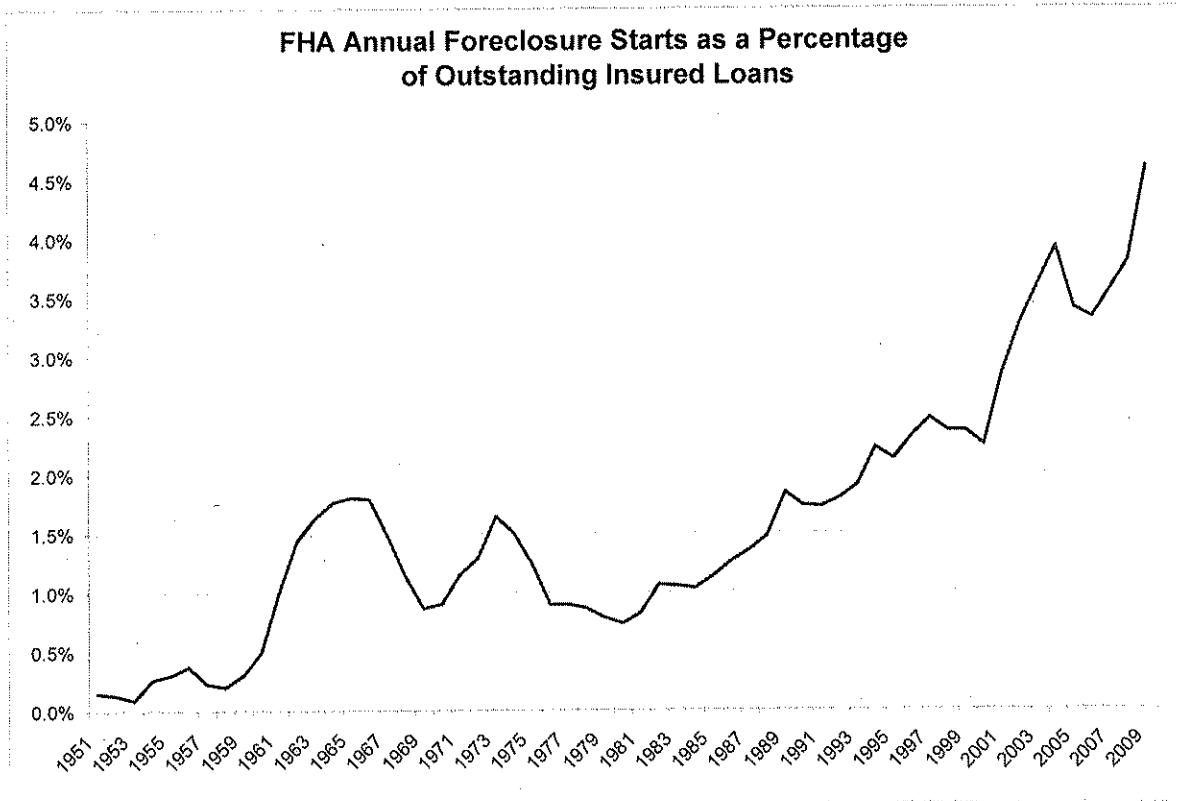
**Chairman Waters and Ranking Member Capito, thank you for the opportunity to testify today. I am an expert in the field of affordable lending, having 15 years experience both on the state and national level. I have designed and implemented sustainable affordable housing programs. I am also an expert in credit risk methodologies and loan performance metrics. I was Fannie Mae's chief credit officer from 1987 to 1989. Since leaving Fannie, I have consulted extensively on loan performance risk characteristics.**

**My purpose in testifying today is to advise you of the growing fiscal crisis facing the Federal Housing Administration (the FHA). Many witnesses over the years have made repeated warnings to this and other congressional committees. By my testifying today, this subcommittee will not be able to say that no one told them of the magnitude of the impending losses at FHA.**

**A. FHA's experience over 65+ years:**

**FHA's annual percentage of new foreclosure starts has steadily increased over the last 60 years, from 0.15% in 1951 to 2.36% in 1998 to an estimated 4.4% in 2009.**

**CHART 1**



Sources: FDIC, MBA, and Edward Pinto

**I fear that this trend will continue as the millions of recently insured high risk loans become seasoned and start foreclosing in much greater numbers. Ultimately this trend is unsustainable. There is no amount of insurance premium that is sufficient to cover the losses incurred by deliberately insuring loans based on poor underwriting standards.**

**Before continuing on about the problems facing FHA, I must tell you that FHA's high risk lending practices negatively impact the entire housing finance marketplace and the neighborhoods in all of your districts. I have included as attachments research by the FDIC (Attachment #1: *The Rising Long-Term Trend of Single-Family Mortgage Foreclosure Rates* (1998)), Fannie Mae Foundation (Attachment #2: *The External Costs of Foreclosure: The Impact of Single-Family Mortgage Foreclosures on Property Values* (2006)), and The Federal Reserve Bank of New York (Attachment #3: *Examining the Rising Foreclosure Rate* (2003)). Please note that these papers (or the research upon which they are based) pre-date the so called**

subprime crisis of 2004-2006. Please keep Chart 1 in mind as you read these articles.

**B. Factors driving the likelihood of a bailout:**

**Back to FHA – I believe it appears destined for a taxpayer bailout in the next 24 – 36 months. There are five drivers supporting my conclusion:**

1. **FHA risks being adversely selected:** This is a risk facing both the FHA and the Veterans Administration (VA) as they now account for over 90% of all the high LTV (>90% LTV) loans being made, most of which have an effective loan-to-value (LTV) in excess of 96%.
  - Adding to the risk of this high market share is the fact that insuring high LTV loans in a housing market where prices have yet to stabilize, poses a high risk of lending into a vacuum as other lenders have exited high LTV lending. This helps explain FHA's seven-fold increase in market share since 2006;
  - Total high LTV lending in the first half of 2009 was equal to 23% of all originations by all lenders. It was only 17% of originations in 2006, a year notorious for its high risk lending;
  - FHA allows up to 6% in seller concessions before requiring an appraisal adjustment. This amount is excessive and further distorts a loan's effective LTV. In 1985 Fannie Mae limited seller concessions on 95% loans to a maximum of 2% after finding that higher concessionary amounts greatly increased default risk;
  - The heavy use of the \$8000 first-time homebuyer credit may result in price and other distortions that effectively eliminate FHA's protection from its small downpayment requirement. FHA's recent experience with another type of downpayment assistance program resulted in default levels 2-3 times normal. Eighty percent of FHA's purchase money loans are to first time homebuyers.

2. **FHA's dollar volume has exploded:** FHA's dollar volume in 2009 is running four times its volume in 2006. As a result FHA and VA loans will constitute about 10% of all outstanding first mortgages by year end 2009, with about half of these made since year end 2006.
- Millions of new ultra-low downpayment loans are being added to a housing finance marketplace that is already a sea of borrowers with low equity or negative equity; and
  - At the end of Q.1:09, the average equity of all 53 million homeowners with a mortgage was only 10%, the lowest level in our history;
3. **FHA is making much larger loans than it has in the past:** Its top dollar limit is now \$729,750 versus its old top of \$362,000 in 2008. This is both a new price segment and involves new areas of the country such as California. Wells Fargo and Bank of America are the two largest FHA lenders with a combined share of 46%. On a combined basis these two lenders have seen their California FHA loan volume increase from 3% of loan volume two years ago to 10% of loans today. This higher end of the market will likely come under increasing stress as foreclosures continue to increase in this segment;
4. **Higher FICOs are not a panacea:** FHA's FICO score has increased from an average of 631 (FY 2007) to an average 672 (FY to date 2009), an increase of 41 points. In August 2009 the average was 692 evidencing an increase of 61 over the FY 2007 average (source: FHA Outlook <http://www.hud.gov/offices/hsg/comp/rpts/ooe/olcurr.pdf>). It is troubling that FHA's FICO average in August 2009 about equals Fannie Mae's FICO average of 695 on its portfolio of loans with downpayments of 5% or less, a portfolio that is performing quite poorly<sup>1</sup>, as will be noted in greater detail below.

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<sup>1</sup> [http://www.fanniemae.com/ir/pdf/sec/2009/q2credit\\_summary.pdf;jsessionid=T4PT1BIIACGWXJ2FQSI5FGA](http://www.fanniemae.com/ir/pdf/sec/2009/q2credit_summary.pdf;jsessionid=T4PT1BIIACGWXJ2FQSI5FGA)

Also troubling is the fact that the Fair Isaac Corporation (the producer of FICO scores) reports that a 690 FICO score on a mortgage originated in October 2008 performs like a 645 FICO score on a mortgage originated in October 2007 and a 630 FICO originated in 2005-2007<sup>2</sup>. As a result, on a FICO risk basis FHA's risk has not improved; and

5. **FHA has had a long history of fraud:** This history along with an inability to monitor, control, and discipline its lenders poses additional risks. FHA has added thousands of new lenders/correspondents over the last two years. By the time these lenders/correspondents demonstrate a track record, it may be too late.

### **C. FHA's early warning database indicates that loan performance is deteriorating:**

**The above observations are supported by a review of FHA's early warning database, which demonstrates that loan performance is deteriorating:**

1. **FHA's early warning default rate (here defined as 90 days or more delinquent) on loans with at least ONE default within 24 months of origination continues to be about the same as three years ago, but with almost 3 times the volume (source: <https://entp.hud.gov/sfnw/public/>). Note: this rapid increase in volume understates the poor performance of the more recent loan cohorts due to a significant "denominator effect"<sup>3</sup>:**

*FHA Loan Performance definition: total defaults (90 days or more delinquent) within the first two year of origination divided by total loans originated during the same two year period:*

As of 8.31.09: **5.73%** of 2.759 million loans endorsed within the prior 24 mo. had at least one default since origination.

For the quarter ending 6.30.08: **4.68%** of 1.179 million loans endorsed within the prior 24 mo. had at least one default since origination.

For the quarter ending 6.30.07: **4.94%** of 0.818 million loans endorsed within the

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<sup>2</sup> See Attachments #4 and #5

<sup>3</sup> Mortgage default statistics are susceptible to the "denominator effect" when the denominator (representing volume) is growing at a faster pace than in the past, while the numerator (representing the development of an event such as a serious delinquency) is growing more slowly given that a new or unseasoned loan usually has a lower delinquency rate for the first 1-2 years after origination compared to its later years.

prior 24 mo. had at least one default since origination.

For the quarter ending 6.30.06: **5.80%** of 0.958 million loans endorsed within the prior 24 mo. had at least one default since origination.

**This indicates that overall quality has not improved, but has in fact declined over the last 26 months.**

- 2. At the same time the early warning default rate (here defined as 90 days or more delinquent plus those loans that had already gone to claim) on loans in default as of the last day of the 8.31.09 reporting period has increased by 57% since three years ago (6.30.06), again with almost 3 times the volume:**

As of 8.31.09: **4.82%** of 2.759 million loans endorsed within the prior 24 mo. were in default or had already gone to claim on the last day of the period.

For the quarter ending 6.30.08: **3.48%** of 1.179 million loans endorsed within the prior 24 mo. were in default or had already gone to claim on the last day of the period.

For the quarter ending 6.30.07: **3.22%** of 0.818 million loans endorsed within the prior 24 mo. were in default or had already gone to claim on the last day of the period.

For the quarter ending 6.30.06: **3.07%** of 0.958 million loans endorsed within the prior 24 mo. were in default or had already gone to claim on the last day of the period.

- 3. The above two data sets indicate that the non-cure rate has increased dramatically:**

**This conclusion is supported by comparing the non-cure rate for early warning defaults:**

**2006:** 50% of the loans originated during the 2 year period 7.1.04 -6.30.06 that suffered at least one default (90 days or more delinquent) during that period, were still delinquent or had gone to claim as of 6.30.06.

**2009:** 81% of the loans originated during the 2 year period 9.1.07 -8.31.09 that suffered at least one default (90 days or more delinquent) during that period, were still delinquent or had gone to claim as of 6.30.09.

It is clear from the above that past tightening by FHA has had no effect. Further, the minor additional tightening announced on September 18, 2009, such as the increase in lender net worth, while long overdue, are at this point little more than Band-Aids. For the month of August 2009, just four lenders were responsible for over 85% of all FHA loans added. These four lenders are: Wells Fargo, Bank of America, Chase Home Finance, and CitiMortgage. Net worth is no longer the issue. The issue has moved on to the implications of having FHA's business concentrated among four lenders, lenders that are universally acknowledged to be "too big to fail".

FHA is an agency that is growing by leaps and bounds, with thousands of new lender and broker relationships, exposures to new risks, antiquated systems, high turnover, a history of fraud and escalating default rates, and a rapidly declining capital level.

#### D. Status of Reserve Funds:

FHA states that it has two reserve funds (Capital Reserve Account and Financing Account) that hold a combined \$30 plus billion. This amount is designed to cover expected losses over the remaining term of its mortgage insurance book of risk-in-force. Putting aside the fact that this "money" is merely a bookkeeping entry at the U.S. Treasury and that much of it has been spent to reduce the federal deficit, I estimate that the losses imbedded in FHA's \$725 billion in single-family risk-in-force is well in excess of \$30 billion.

FHA's book is largely unseasoned, consists of high risk loans, and was originated under adverse circumstances. I believe that is reasonable to assume that FHA's book will perform similarly to Fannie Mae's 2006 high LTV book of business. I estimate Fannie's ultimate cumulative default rate on its 2006 high LTV book be about 20% of insured loans. Applying this default rate to FHA's current book of 5.8 million loans yields 1.2 million new foreclosures. Fannie is experiencing a loss rate per default of an estimated 50% of principal on its high LTV defaults. This would amount to total losses of 10% on its \$725 billion book of insurance or \$70-plus billion in losses. Based on my analysis FHA is short \$40 billion in its Financing Account as of 9.30.09. Since this shortage would leave no reserves to cover its Capital Reserve account requirement of 2%, it would also be short the additional \$14 billion necessary to meet this requirement. Please note: I assume the FY 2009 annual audit study will not project shortfalls of this magnitude because the assumptions used will be overly optimistic relative to loss mitigation resulting from both loan modifications and recent and expected underwriting changes.



### **E. Will FHA's loan modification program reduce its overall losses?**

An issue related to any projection of ultimate losses is the eventual success of FHA's loan modification program. FHA has had a loan modification program since 1996. Over the last 13 years it has continually become more expansive and expensive. Yet it has failed over this period to stem the growing tide of foreclosures, as evidenced by Chart 1.

During Q.2:09 (as reported in the September 2009 OCC and OTS Mortgage Metrics Report) the FHA and VA modified 25,721 loans out of 4,778,162 loans reporting. FHA loans account for the overwhelming share of these loans. This yields a 2.1% (annualized) modification rate:

- In 95% of the cases, overdue interest was added to the outstanding principal thereby increasing the loan-to-value and ultimately increasing risk;
- In 77% of the cases, the interest rate on the loan was reduced. FHA absorbs the cost of this rate reduction by way of a partial insurance claim;
- In 46% of the cases, the loan term is extended, thereby reducing near-term amortization and ultimately increasing risk; and
- After 12 months, FHA and VA modified loans are experiencing the highest 60+ day re- default rate of any loan type category, a rate of 59.1%.

These statistics do not bode well for either the success of FHA's modification efforts or the goal of limiting FHA's ultimate losses.

Effective August 15, 2009 FHA announced its latest in a long series of modification programs, the FHA-Home Affordable Modification Program (FHA-HAMP). Based on FHA's dismal experience with its own loan modifications and the poor experience that the FDIC is having with IndyMac's similarly structured modification program<sup>4</sup>, FHA-HAMP does not hold out much promise of reducing FHA's ultimate losses.

### **F. Outlook under current and proposed policies:**

The combination of an increasing default rate, a soaring non-cure rate, and an extraordinarily high re-default rate on loan modifications is proof that FHA is merely postponing much of its expected losses, and is likely adding to its ultimate level of losses.

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<sup>4</sup> I have been following the performance of IndyMac's "Mod in a Box" program since its inception in August 2008. Once again the publicly available data suffers from the denominator effect. After adjusting for this, the re-default rates continue to be unacceptably high. IndyMac is now called OneWest Bank.

**Unfortunately FHA's past is destined to be its future. An insurer, even a government backed one, cannot lend on a high risk basis into markets with declining home values without getting excessively high rates of default along with soaring non-cure and re-default rates.**

**G. Proposals for ending FHA's nightmare of foreclosures:**

- 1. Raise the minimum FHA downpayment on home purchase loans to 10%, with reduced seller concession amounts and tightening of other gimmicks that distort home values<sup>5</sup>;**
- 2. Limit FHA's volume of low downpayment loans to a 5% - 10% market share so as not to distort the housing market;**
- 3. Reduce FHA's dollar limit back to a level commensurate with its low and moderate income housing mission; and**
- 4. Require FHA lenders to have real skin in the game through a coinsurance requirement of perhaps 10%, backed by adequate capital requirements.**

**These steps will provide more consumer protection, reduce defaults to a more acceptable level, police FHA lenders and reduce fraud far more effectively than other suggested methods.**

**H. Conclusion:**

**FHA needs to take material steps now to protect taxpayers from another bailout. Failing to take action now will further increase FHA's and the taxpayers' losses.**

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<sup>3</sup> A major goal of single family AH is wealth building through homeownership and equity build-up. Clearly past efforts have not worked out well for many, if not most AH borrowers.

The lack of significant equity by large numbers of borrowers in neighborhoods is both a major cause and a continuing contributor to housing price instability. Real estate is fundamentally cyclical and borrowers (particularly those of low and moderate income) need staying power in the form of equity, fixed interest rates, good credit habits, and debt ratios that allow for some cushion.

A homeowner without the requisite 10% down would be encouraged to participate in a 5-year downpayment savings plan:

- a. Establish a five year savings plan based on saving \$25 - \$35/week would be established. \$6500 - \$9100 would be saved over 5 years. Add in interest earnings at 3% and an employer match through a 401k or a foundation grant and the total grows to \$15,000 - \$20,000 at the end of 5 years, enough for a 10% downpayment on a home that sells for 80% of the median; and
- b. At the end of five years, the prospective homeowner has accomplished much, having saved a substantial downpayment, established a banking relationship and savings pattern, hopefully established a solid credit history and is now in a position to buy a home. The bank holding the saving plan account would be a suitable lender.

The Rising Long-Term Trend of Single-Family  
Mortgage Foreclosure Rates\*

Peter J. Elmer

and

Steven A. Seelig

Federal Deposit Insurance Corporation  
Division of Research and Statistics  
550 17th St., N.W.  
Washington, D.C. 20429  
Phone: 202-898-7366  
Fax: 202-898-7222  
e-mail: pelmer@fdic.gov

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Abstract

This paper identifies and analyzes the long-term rising trend in single-family mortgage foreclosure rates. Traditional measures of mortgage risk, such as house appreciation rates and loan-to-value ratios (LTVs), appear to explain some, but not all, of the long-term trend. In an effort to explain the remaining part of the trend, several non-traditional hypotheses are explored. One is the notion that the incidence of shocks to individual lifestyles or "trigger events," such as divorce, have increased, thereby increasing the likelihood of mortgage default. The second is that the risk posture of individuals has increased, especially as individuals increasingly leverage their homes as part of a broader strategy of managing their overall wealth portfolio. The third is the possibility that structural changes in servicing, arising from the trend toward securitization, have increased foreclosure rates. While evidence exists supporting these hypotheses, the risk posture hypothesis appears more consistent with a variety of disparate incentives and trends relating to household financial management.

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## The Rising Long-Term Trend of Single-Family Mortgage Foreclosure Rates

The long-term trend in single-family mortgage foreclosure rates is rising. As shown in Figure 1, industry statistics produced by the Mortgage Bankers Association (MBA) and other sources suggest that foreclosure rates over the past decade are noticeably higher than rates experienced at any time in the past 50 years.<sup>1</sup> Moreover, the long-term trend, although rising gradually, translates into a dramatic increase in foreclosures over the course of a generation. The long-term trend is reflected in foreclosure rates both on mortgages insured by the Federal Housing Authority (FHA) and on conventional mortgages, i.e., those not insured by either the FHA or the Veterans Administration (VA).

During the 1950s foreclosure rates on conventional mortgages fluctuated within a narrow band, ranging from a low of 0.04 percent in 1953 to a high of 0.12 in 1959. These rates rose in the early 1960s, peaked at 0.78 percent in 1966, then declined in the late 1960s to the relatively low levels experienced throughout the 1970s. But between the early 1980s and the present, rates increased more than 300 percent, rising from 0.31 percent in 1980 to 1.04 percent in 1997. This represents an approximately ninefold increase since the early 1950s, with a threefold increase occurring after 1980. FHA foreclosure rates reflect a similar pattern, although these rates are currently approximately 11 times higher than the rates of the early 1950s.

The long-term foreclosure rate trend is surprising in the light of strong aggregate economic conditions experienced throughout most of the 1980s and 1990s. Although individuals who default commonly cite unemployment as the reason for their default, the rising trend has continued throughout extended economic expansion during the 1980s and the 1990s.<sup>2</sup> The experience of the 1990s is even

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<sup>1</sup> Construction of the long-term foreclosure rate series is described in the appendix.

<sup>2</sup> Gardner and Mills (1989) and Ambrose and Capone (1996) provide panel data on borrower motivations for default. Business cycle data from the National Bureau of Economic Research (NBER) record the 1980s expansion as lasting 91 months and the 1990s expansion as 86 months as of May 1998. These expansions rank as the second and third longest since NBER records began in 1921.

more remarkable, given that declining unemployment and continuing economic prosperity have been accompanied by relatively stable prices.<sup>3</sup>

This study examines the rising aggregate trend of mortgage foreclosure rates with an eye toward exploring the roles of traditional determinants of mortgage default alongside nontraditional measures relating to household risk. Section I reviews several of the most widely recognized determinants of mortgage default and examines their relationships to the aggregate trend. Section II describes aggregate movements of individual financial shocks, or “trigger events,” that might correlate with the long-term trend. Section III extends the discussion to variables relating to household risk posture and their relationship to the trend. Section IV examines the growth in third-party servicing that has accompanied the trend toward securitization. Section V tests the empirical content of traditional versus nontraditional variables for explaining the long-term trend. Section VI summarizes the results and concludes.

## **I. Traditional Measures of Mortgage Risk**

Determinants of mortgage default have been studied for many years and have been widely tested with respect to their ability to explain default at the level of the individual loan, city, state, and region.<sup>4</sup> The interesting question is, do previously identified determinants of default explain the rising long-term aggregate trend?

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<sup>3</sup> As is discussed below, house appreciation rates have remained in the 2–6 percent range for most indexes and in most years following 1982.

<sup>4</sup> All studies confirm the importance of homeowner equity, with most also finding a role for shocks to borrower income, such as loss of employment or divorce. Recent academic work along these lines includes Quigley and Van Order (1995), Phillips, Rosenblatt and Vanderhoff (1996), Case and Shiller (1996), Deng (1997), and Capozza, Kazarian, and Thompson (1997). Rating agency and other practitioner research, such as Wilson (1995), Jones et al. (1995), and Monsen (1996), tend to take a broader perspective that includes mortgage type, credit, or other effects alongside those emphasized by academic research.

As noted above, it is natural to expect unemployment rates to explain the foreclosure rate trend. However, the opposite is actually observed. As can be seen in Figure 2, unemployment rates exhibit the anticipated upward “spike” at each of the eight recessions, over the past 50 years, and decline during the nine expansions. Nevertheless, the long-term trend in unemployment rates bears at best a weak relation to that of foreclosure rates. While unemployment rates tended to be higher between the mid-1970s and the mid-1980s, they began declining in 1984 and, by 1995, had returned to levels found in the early 1970s and other previous periods. Moreover, foreclosure rates only occasionally contain the recession “spike” regularly observed in unemployment rates.

A second seemingly unrelated variable is nominal interest rates. Academic models emphasizing the option-like characteristics of mortgage default often stress that declining (rising) interest rates should provide a strong incentive to default (not default), especially in areas characterized by weak or declining (rising) house prices.<sup>5</sup> Unfortunately, interest rate movements over the past 35 years fail to reflect a consistent inverse or negative relationship between changes in interest rates and mortgage foreclosure rates (see Figure 2). Indeed, prior to the early 1980s the relationship appears to be positive, with almost no relationship observed during the “hump” in foreclosure rates in the mid-1960s. More recently, two periods of sharply declining rates, 1985–86 and 1991–93, are closely associated with record mortgage prepayments, but are not closely related to spikes in foreclosure rates (e.g., foreclosure rates increased slightly in the 1986–87 period and declined in 1992–93).

All theories of mortgage default stress a key role for homeowner equity, and empirical analysis supports this emphasis. Since the most direct measure of equity is the loan-to-value ratio (LTV), we expect to observe a strong positive relationship between LTVs and foreclosure rates, although the

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<sup>5</sup> A sample of literature relating to treatment of mortgage default as an option can be found in Hendershott and Van Order (1987), Kau and Keenan (1995), and Vandell (1995). Several recent

relationship may not surface until several years after mortgage origination. As Figure 3 illustrates, rising LTVs explain several, but not all, aspects of the foreclosure rate trend. In the early 1950s mortgage lending was remarkably conservative, as witnessed by an average LTV of only 58 percent in 1952. Rising LTVs throughout the 1950s suggest a transition to modern-era lending practices, when LTVs have averaged over 70 percent. This transition explains the exceptionally low default rates of the 1950s as well as rising rates in the early 1960s. Unfortunately, LTV trends fail to track foreclosure rates for the two decades after the mid-1960s. A possible relation reappears in the late 1980s and 1990s, as slowly rising LTVs again follow rising foreclosure rates. However, this most recent relationship is questionable because of the close relationship between conventional and FHA rate trends, as noted in Figure 1. That is, since FHA mortgages have had high LTVs for many years, and the FHA patterns in Figure 1 are very similar to conventional patterns, it seems unlikely that rising LTVs are solely responsible for the rising long-term trend in mortgage foreclosure rates.

A second variable that affects homeowner equity is the rate of appreciation in house prices. High home appreciation expedites the buildup of equity by reducing the current LTV, i.e., loan to current value. Other variables being equal, high home appreciation is expected to reduce defaults as current LTVs decline and wealth increases.<sup>6</sup> As shown in Figure 4, two indexes of house appreciation increased in the late 1960s, remained high until the early 1980s, then dropped to much lower levels until the present time.<sup>7</sup> These trends suggest that house appreciation is especially useful in explaining the

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alternatives to the option model include Elmer (1997), Archer, Ling, and McGill (1996), or Yang, Buist, and Megbolugbe (1998).

<sup>6</sup> The caveat “other variables being equal” is significant. Homeowners may consume an appreciation-induced increase in real LTV through second mortgages, home equity lines, or other types of borrowings. Such a move would leave the individual’s risk of insolvency unchanged in spite of the fact that LTV, based solely on the first mortgage, is higher.

<sup>7</sup> The two indexes shown in Figure 4 were chosen because they are among the longest time series of house prices available. A more appealing “repeat sales” index is published by the Office of Federal

relatively low rates in the 1970s and some rise in rates in the early 1980s. However, the relative stability of appreciation rates through most of the 1980s and 1990s is difficult to reconcile with the continued rising trend in foreclosure rates as well as with the plateau apparent in the mid-1990s.

In summary, several traditional determinants of mortgage default appear to explain some, but not all, of the long-term foreclosure rate trend. Rising LTVs associated with the transition to modern mortgage finance explain exceptionally low rates in the 1950s along with rising rates in the early 1960s. Increasing home appreciation explains falling rates in the late 1960s as well as modest rates throughout the 1970s. However, these variables stop short of explaining the secular rise during the 1980s and 1990s.

## **II. Trigger Events**

Over the past several years it has become common to consider unexpected catastrophic events in an individual's life as "triggering" mortgage default. Elmer (1997) defines these "trigger events" as shocks that cause an "unanticipated shortfall in income such that income is no longer sufficient to meet periodic debt obligations."<sup>8</sup> Per this definition, a wide variety of income- or expense-related shocks, such as unemployment or divorce, may lead to insolvency and mortgage default. Is it possible that the incidence of trigger events could have increased sufficiently to explain the rising foreclosure rate trend?

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Housing Enterprise Oversight (OFHEO), but it does not begin until 1980. As a check, we compared the OFHEO index to the two series in Figure 4 and found it had a comparable long-term trend. For example, the average OFHEO appreciation rate during the 1980–97 period was 4.26 percent, whereas the CPI rate was 4.68 percent and the NAR rate was 4.15 percent.

<sup>8</sup> This approach suggests that trigger events imply that solvency can be maintained only by an individual's borrowing against future income or wealth. Insolvency occurs if it is not possible to borrow sufficient funds to support current contractual debt obligations. Thus the incidence of trigger events relates to the accumulation of household debt, which is discussed in the next section.



Although Figure 2 eliminated unemployment rates as an explanation of the rising foreclosure rate trend, portions of the business sector have continued to experience problems even as unemployment rates have fallen. In this regard, Figure 5 points out that business failure rates rose dramatically in the early 1980s and have since remained at surprisingly high levels. Although the household effect of business failures should be reflected in unemployment rates, persistently high failure rates coincident with low unemployment add another dimension to the issue. As households increasingly rely on income from self-employment, they become more susceptible to the success or failure of these ventures. Since 1970 the number of workers classifying themselves as proprietors has more than doubled to over 25 million, and the proportion of the labor force composed of proprietors rose from 13.9 percent in 1975 to 16.4 percent in 1995. Since the bulk of business failures typically occur among small firms, the growth in the number of such firms in the 1980s helps explain the persistence of high business failure rates. More to the point, a rise in business failure rates coincident with an increase in household dependency on small business success suggests more than a casual linkage between business failures and residential mortgage foreclosure rates.

Divorce can motivate a variety of financial problems that last for many years, especially when alimony or child support payments are involved. Shelter, living, and other expenses typically increase dramatically without any increase in income. Ownership of the home may be contested or simply not resolved for years as the legal terms of the divorce are ironed out. Thus it is reasonable to expect a host of financial problems to develop from a rising trend in the divorce rate. As can be seen in Figure 6, divorce rates approximately doubled during the 1970s and have since remained high. This increase in rates almost certainly helped to ratchet foreclosure rates to higher levels in the 1980s. However, the gradual drop in divorce rates from the early 1980s onward makes it difficult to closely associate recent divorce rate trends with foreclosure rate trends.

A rarely cited source of problems is gambling, yet this activity, when practiced in excess, can easily lead to insolvency. Over the past twenty years facilities for casino gambling have come within driving distance of most major population centers. This has been the result of actions to legalize casino gambling on riverboats and Indian reservations as well as in specific geographic areas, such as Atlantic City. Thus it is not surprising that Figure 7 suggests a geometric growth rate for gambling as a percentage of consumption. Before 1975, casino gambling represented less than one-tenth of 1 percent of disposable income, yet by 1996 this percentage had increased by a factor of five to over 0.5 percent. Moreover, this increase does not include wagers placed in state lotteries or through illegal outlets. However, although gambling has increased sharply and appears to follow the general trend in foreclosures, it does not mirror periodic fluctuations in the foreclosure rate.

In fairness, although some trends appear to support the trigger event hypothesis, others seem to work against it. For example, death rates in the key earning ages 20–50 have declined steadily, and other developments have reduced the likelihood of unexpected births as well as the birthrate in general. Real disposable income has increased, so that at least a portion of the financial strains that plagued prior generations has been reduced. These factors suggest that one should at least consider additional perspectives before concluding the list of factors that might explain the foreclosure rate trend.

### **III. Household Risk Posture**

A topic closely related to trigger events, but nevertheless distinct, is the financial risk posture of households. Individuals choose, of their own volition, their preferred levels of leverage, savings, insurance, and other variables that affect the extent to which they can absorb unexpected shocks. Of course, trigger events can be sufficiently severe so as to overwhelm even conservative individuals. However, the likelihood of a given event's causing problems increases as individuals increase leverage

and/or reduce their insurance against catastrophe. The financial risk profile of a borrower also affects the way lenders react to delinquency. For example, traditionally lenders might forbear foreclosure if they believed a recently unemployed borrower would return to work. However, if borrowers have taken on too much debt or do not have readily available savings, lenders will be less likely to grant forbearance.

Savings represent a way for households to protect themselves against unforeseen financial shocks. Financial planners often counsel families to avoid high levels of debt and to “save for a rainy day,” but Figure 8 shows that American families have not followed this advice. Consumer debt as a percentage of disposable income has reached historical highs and, on average, has been high since the early 1980s. Perhaps more pronounced is the drop in the personal savings rate. This rate fluctuated between a low of 6.6 percent and a high of 9.5 percent during the period 1950–81. However, it began a relatively steady secular decline in 1981 and had dropped to 3.8 percent by 1997.

Compounding the problem of lower savings rates is the fact that an increasing proportion of savings are being held in relatively illiquid forms, such as 401(k) and IRA types of retirement savings plans. Although one can make “hardship” withdrawals from a 401(k) plan to protect a home from foreclosure, the penalties are severe. The IRS requires the plan sponsor, or trustee, to withhold the estimated income tax on the withdrawn amount plus a penalty equal to 10 percent of the withdrawn amount. Thus, for example, a borrower who needs \$1,000 to meet a mortgage obligation, and pays a 20 percent tax rate, would have to withdraw \$1,428.57 to receive the amount needed. Hence, this type of tax-sheltered saving, while ideal for retirement, is not effective as a safety net for adverse shocks to income.

Rising household financial risk is also reflected in the debt-to-assets ratios found in Figure 9. These data show a secular increase in household leverage going back to the early 1950s, with interim

fluctuations consistent with the foreclosure rate trend. Through 1966 the ratio rose from 7.3 percent to 12.2 percent, a high point coinciding with the peaking of the foreclosure rate in 1966. The ratio then remained relatively stable until 1972, whereas the foreclosure rate declined significantly. The remainder of the 1970s saw the beginning of a secular upward trend in both foreclosure rates and the leverage ratio. Only in the past several years, when the extraordinary rise in equity market prices led to large increases in household assets, did assets grow faster than debt, thus yielding a decline in the leverage ratio while the foreclosure rate rose.<sup>9</sup>

Not surprisingly, the vast majority (approximately 65 percent) of the increase in debt has been in the form of mortgage debt, which comports with the rising LTVs noted in Figure 3. Of course, the tax deductibility of mortgage interest stimulates individuals to rely on mortgage debt as a primary form of leverage. But how can tax incentives be motivating higher leverage if they have been in place for many years? Engen and Gale (1997) suggest a fresh perspective on this issue that provides an economic rationale for recent trends in increased mortgage borrowings. That is, their study finds that increased savings in 401(k) plans are associated with increased mortgage debt and a reduction in home equity. In essence, the financial advantages of 401(k) plans may be causing individuals to substitute savings in 401(k) plans for savings in home equity, thereby causing both mortgage leverage and the likelihood of default to increase.

In addition to savings, insurance provides individuals with a financial tool for guarding against the ill effects of unexpected problems. In this regard, Figure 10 emphasizes that a significant portion of the population is not covered by health insurance and that this percentage has increased by more than

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<sup>9</sup> The ratio declined from 15.89 percent in 1994 to 14.87 percent in 1997. Between 1996 and 1997 household total assets grew by 11.48 percent while liabilities grew by 7.50 percent. Within the asset category, household holdings of corporate equities and mutual funds grew by 23.87 percent. See *Flow of Funds Accounts of the United States*.

one-third since the data were first reported for 1978. Moreover, this statistic understates the magnitude of the problem by including population segments that are covered by health insurance in their entirety, such as the military and senior citizens covered by Medicare. Thus, the increase in the portion of the population without health insurance constitutes a significant increase in the overall risk profile of households.

One can perform an intuitive test of the financial risk theme by comparing personal bankruptcy rates with foreclosure rates. Bankruptcy occurs when an individual's liabilities exceed his or her assets or when there is insufficient income to service debt obligations. Although there are many legal issues at the nexus between mortgage default and personal bankruptcy,<sup>10</sup> the two events nevertheless share a close association with financial distress. That is, both events can be motivated by shocks to income and/or by excessive leverage. Households faced with the burden of excessive debt or unanticipated financial hardship (illness, accident with no insurance, etc.) may try to resolve their problems by choosing personal bankruptcy and/or mortgage default.

If increasing household risk is causing an increase in the likelihood of financial distress, then personal bankruptcy rates should mimic increasing foreclosure rates. In fact, that is exactly what is observed. As Figure 11 shows, personal bankruptcy and mortgage foreclosure rates have tended upward for most of the past 25 years. With the exception of 1997, when personal bankruptcy rates spiked up, and the early 1980s when they trended downward, personal bankruptcy and mortgage foreclosure rates have moved in a comparable manner.

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<sup>10</sup> Mortgages are treated differently from other types of debt in personal bankruptcy because the lender has a security interest in the real estate collateral. Moreover, most states have homestead exemptions that allow homeowners who declare bankruptcy to keep at least a portion of the equity in their principal residence subject to the first mortgage lien. In these instances, individuals experiencing financial hardship might find it advantageous to default on all obligations except their mortgage, and declare bankruptcy. Therefore, although mortgage foreclosure and personal bankruptcy are both distress-related events, they are not necessarily coterminous events.

The coincident rise in mortgage default and personal bankruptcy rates is also intriguing from the standpoint of society's attitudes toward leverage and financial risk. That is, the trends are consistent with the notion that households have increased their risk posture by opting for greater leverage and lower net savings. Of course, these trends also reflect the willingness of lenders to take on greater risk by increasing the availability of credit to highly leveraged households. Lenders and borrowers must both embrace these changing attitudes toward risk before an increase in risk can be contracted at market prices.

#### **IV. Structural Change in Servicing Relationships**

During the 1950s and 1960s most single-family mortgages were originated by "traditional" lenders, primarily savings and loan associations and mutual savings banks. In addition, mortgage bankers served as correspondents for insurance companies that invested in mortgages and for thrifts in capital-surplus areas, such as some cities in the Northeast. These "traditional" lenders performed all or most of the mortgage lending functions, including mortgage origination, servicing, portfolio management, and investment in the mortgages.<sup>11</sup> They were headquartered in the local markets, where they originated loans and typically had other business relationships with the mortgage borrowers.

The advent of mortgage securitization in the 1970s changed the borrower/lender relationship by breaking apart the various functions that had been performed by banks and thrifts. In particular, it became much less common for the same organization to both originate a mortgage and retain it as a portfolio investment. Lenders with traditional ties to the borrowers were replaced by national servicing

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<sup>11</sup> Traditional banks and thrifts were the primary, but not the only, mortgage market participants before securitization. Mortgage bankers commonly originated FHA/VA products, and life insurance companies invested in whole loans. Figure 12 suggests that prior to the late 1970s these non-lender-serviced mortgages held a relatively stable 25 percent share of the mortgage market.

organizations with no tie to the borrower apart from the mortgage and with servicing policies based on national rather than local standards.

The “breakup” of the mortgage management function resulting from the shift toward mortgage securitization may have contributed to the rising trend in foreclosure rates by decreasing the likelihood that servicers would forbear foreclosing on delinquent borrowers. That is, the close relationship between borrower and lender found in the “traditional” local origination/servicing relationship may have been associated with a higher likelihood of forbearance (a lower likelihood of foreclosure) compared with modern relationships. Traditional lenders, with their greater knowledge of local economic conditions and better information about a borrower’s financial problems, might have been more likely to forbear and/or restructure a mortgage.

At first impression, the servicing structure change hypothesis is easily supported by the well-known fact that securitization activity exploded during the past two decades and led to a significant change in mortgage management relationships. As shown in Figure 12, the portion of the mortgage market serviced by third parties rose dramatically during the 1980s and 1990s, a rise that corresponds to the most recent increase in mortgage foreclosure rates. The growth in third-party servicing is directly attributable to the growth in securitization, as the portion of the mortgage market funded through government-sponsored enterprises and federally sponsored pools rose from less than 2 percent in 1980 to about 50 percent in the mid-1990s.

The servicer structural change hypothesis is explored further in Figure 13, which compares the relationship between foreclosures and mortgages delinquent 90 or more days. If the hypothesis is valid, the rising trend in Figure 12 should be accompanied by an increased likelihood that delinquent loans are foreclosed on as soon as possible, and the ratio of foreclosures to delinquencies should rise.

Unfortunately, the foreclosure/delinquency ratios shown in Figure 13 do not consistently support the

hypothesis. For example, while the ratio for conventional loans jumped after 1988, it was relatively stable until the mid-1980s. Also, the trend in the conventional ratio does not comport with that of the FHA ratio despite the close relationship between FHA and conventional foreclosure rates presented in Figure 1. Indeed, the FHA foreclosure/delinquency ratio is highest in the early 1970s, a period of relatively low foreclosure rates. Therefore, only limited evidence supports the view that securitization-induced structural changes in mortgage servicing account for the rising long-term trend in foreclosure rates.

## **V. Empirical Results**

The discussion to this point suggests that the mortgage foreclosure rate trend could be related to a number of factors. Although several traditional determinants of default, notably house appreciation and LTV, appear to explain portions of the long-term trend, they fall short of explaining the more recent, and unsettling, rising trend. Turning to other explanations, one sees that a noticeable increase has occurred in the incidence of several trigger events, such as gambling and the percentage of households without health insurance. Moreover, the risk posture of households appears to have increased along with their financial exposure to unexpected problems.

Consistent with the discussion found in sections I–III, we consider the effect of three sets of variables. First, traditional determinants of default, such as LTV, unemployment rate, and house appreciation, reflect the roles of variables that are widely known to affect default at the loan level. Second, variables associated with trigger events, such as business failure and divorce rates, capture the role of unexpected financial shocks. The third group of variables gauges consumers' risk posture, such as consumer debt burden, and the last measures structural changes in mortgage servicing policies. That is, the regressions take the following general form:



**foreclosure rate =  $f$ (traditional determinants, trigger events,  
risk posture, servicing structural change).**

This general specification can be used to test for the relative contribution of various economic forces on aggregate default patterns.<sup>12</sup>

The four economic themes can be examined with regression analysis that explains mortgage foreclosure rates (FOR) during the 1951–97 period. The first equation explains these rates with a traditional model containing four variables: unemployment (UN), current and lagged loan-to-value ratio (LTV and LTV1, respectively), and the personal savings rate (PSAV).<sup>13</sup>

$$\text{FOR} = 0.05 \text{ UN} + 0.30 \text{ LTV} + 0.23 \text{ LTV1} - 0.04 \text{ PSAV} \quad (1)$$

(2.64)\*    (3.04)\*    (2.52)\*\*    (-2.15)\*\*

Reg.  $R^2 = 0.74$ , Total  $R^2 = 0.96$ , D-W = 0.86 , df = 41

This model suppresses the intercept because the foreclosure rate approaches zero in the 1950s. Also, since autocorrelation is common in these types of time series, the regressions were estimated with Yule-Walker equations to correct for autoregressive characteristics.<sup>14</sup> Several other traditional variables were attempted, such as house appreciation and long-term interest rates, but none was consistently found significant.

Equation 1 suggests that traditional variables explain at least a portion of the foreclosure rate time series but fail to provide a robust explanation of the global trend. While all of the variables are

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<sup>12</sup> For a full discussion of various empirical specifications and theoretical constructs, as well as a more detailed set of empirical results, see Elmer and Seelig (1998).

<sup>13</sup> A single asterisk (“\*”) signifies significance at the 1 percent level, whereas “\*\*” signifies significance at the 5 percent level.

<sup>14</sup> See Judge et.al. (1985) for a discussion of this technique for dealing with autocorrelation.

significant and have their expected signs, several do not hold up during the past two decades. As shown in Figure 2, the unemployment rate has fallen dramatically during the past several years, yet the foreclosure rate has continued to rise. Similarly, LTVs rose modestly in the 1990s but remained at approximately the same level throughout most of the 1970s and 1980s. Therefore, although traditional variables can be shown to appear significant in regression-based tests, this finding does not necessarily imply that they adequately explain the long-term trend.

Adding the liabilities-to-assets ratio (LI/AS) to equation (1) enables us to test the marginal effect of a broader measure of household leverage while sensitizing the results from equation 1 for the inclusion of an additional variable.

$$\text{FOR} = 0.02 \text{ UN} - 0.03 \text{ LTV} - 0.11 \text{ LTV1} - 0.03 \text{ PSAV} + 6.23 \text{ LI/AS} \quad (2)$$

$$(1.25) \quad (-0.27) \quad (-1.15) \quad (-2.35)** \quad (4.54)*$$

$$\text{Reg. } R^2 = .81, \text{ Total } R^2 = .97, \text{ D-W} = 1.24, \text{ df} = 40$$

In this case, the newly added liability variable is significant at the highest level, while the traditional unemployment and LTV variables become insignificant. Personal savings remains significant, thereby providing support to the household risk theme.

A third equation adds several trigger events, the business failure rate (BFAIL) and the divorce rate (DIV), to the liabilities-to-assets and personal savings variables found significant in equation 2.

$$\text{FOR} = -0.03 \text{ PSAV} + 5.28 \text{ LI/AS} + 0.01 \text{ BFAIL} - 0.01 \text{ DIV} \quad (3)$$

$$(-3.18)* \quad (3.27)* \quad (3.92)* \quad (-1.13)$$

$$\text{Reg. } R^2 = .87, \text{ Total } R^2 = .98, \text{ D-W} = 1.48, \text{ df} = 41$$

The results confirm the significance of the household risk variables from equation 2 and add at least one significant trigger event, the business failure rate. The divorce rate variable is not significant, although this result is not surprising in light of the 1970s run-up, and the subsequent slight downward trend, noted in Figure 6.

The inclusion of the share of mortgages serviced by someone other than the owner (SHSERV) to equation 3 allows us to test the hypothesis that a structural change in servicing relationships, caused by the growth in mortgage securitization, is responsible for the rising trend in foreclosure rates.

$$\text{FOR} = -0.04 \text{ PSAV} + 5.01 \text{ LI/AS} + 0.003 \text{ BFAIL} - 0.01 \text{ DIV} + 0.004 \text{ SHSERV} \quad (4)$$

$$\begin{matrix} (-2.75)^* & (2.72)^* & (2.62)^{**} & (-1.49) & (1.04) \end{matrix}$$

$$\text{Reg. } R^2 = .90, \text{ Total } R^2 = .98, \text{ D-W.} = 1.16, \text{ df} = 39$$

The SHSERV variable was not statistically significant. This, therefore, further supports the view that one should reject the hypothesis that a structural change in servicing relationships explains the rising long-term trend in foreclosure rates.

As regards the long-term trend, the regression results are generally consistent with the notion that household risk is rising and that the rising risk is contributing to the rising long-term trend. Broader measures of household debt and savings tend to be more significant than narrower or traditional measures of risk, such as unemployment and LTV. Also, substituting the broader household risk variables for the more traditional variables tends to improve the explanatory power of the regressions. Some significance appears to accrue to trigger events, although the regression results offer only limited support in this area. Alternative specifications containing a broader range of variables are presented in Elmer and Seelig (1998).

Although the results in equation 3 are encouraging and support the notion that household risk may help to explain the foreclosure rate trend, they are nevertheless limited in several respects. Figures 1–13 clearly illustrate the fact that many of the long-term time series are severely autocorrelated.<sup>15</sup> Although the Yule-Walker equations are used to correct for this problem, it would be naïve to think that the problem has been entirely eliminated. A second problem is that a number of seemingly relevant variables discussed in previous sections, such as health insurance coverage and gambling, do not extend throughout the 1950–97 period. The tests are necessarily limited by their inability to include the full range of variables that might influence foreclosure rates. Finally, the availability of some variables is somewhat misleading because they do not accurately measure the intended effects. Most notably, although the shelter component of the CPI serves as an approximate index of house prices and extends back to the early 1950s, other house price indexes are generally preferred. Unfortunately, two preferred indexes, the NAR median sales price and OFHEO repeat sales indexes, extend back only to the late 1960s and early 1980s, respectively. Thus the value of a longer sample must be weighed against the cost of using less-appealing inputs.

## **VI. Conclusion**

The advantage of examining economic trends over very long periods is that one can identify elements of trends that can be lost in shorter-term or cross-sectional analyses. Such is the case with the rising long-term trend in single-family mortgage foreclosures. This trend clearly suggests a secular rise in mortgage default risk that is not discussed in the myriad previous studies and bears almost no relation to very basic explanatory forces, such as the rate of interest. The consistency of the trend over the past two decades points to a need to examine its causes.

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<sup>15</sup> While problems of nonstationarity in some of the data series make interpretation of the results

The rising long-term trend in foreclosure rates is at least partially explained by a variety of variables. Although several traditional determinants of default, notably house appreciation and LTV, explain some portion of the long-term trend, they appear to stop short of explaining the more recent, and unsettling, rising trend. In an effort to explain the remaining portion of the trend, we have explored the notion that the incidence of shocks to individual lifestyles or “trigger events,” such as divorce, have increased. A related, but distinct, hypothesis is that the risk posture of individuals has increased, especially as individuals increasingly leverage their homes as part of a broader strategy of managing their overall wealth portfolio. Although evidence exists supporting both hypotheses, the risk posture hypothesis appears more consistent with a variety of disparate incentives and trends relating to household financial management.

## **Appendix**

### **Extension of MBA FHA and Conventional Foreclosure Rates**

The foreclosure rate series presented in Table A comes from several sources. Approximately half of the data are annualized rates of foreclosures started each quarter as published by Mortgage Bankers Association beginning in 1972 for loans insured by the FHA, loans insured by the VA, and conventional

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difficult, first difference estimates support the role of broader risk measures.

(non-FHA/VA) mortgages. The MBA data provide an excellent starting point for constructing a continuous time series because they constitute one of the longest time series of aggregate mortgage foreclosure rates.<sup>16</sup>

The post-1972 MBA data are extended to the earlier 1950–71 period with a two-step procedure. The first step involves extending MBA FHA foreclosure rates, found in column 1 of Table A, using aggregate FHA foreclosure rates published by the Department of Housing and Urban Development (HUD), found in column 2. The HUD FHA rates cannot be used directly before 1972, because they are reported on an “annual loans foreclosed” basis, which differs from the “foreclosures started” basis of MBA data. Since many more foreclosures are started than are consummated, the MBA FHA rates tend to be higher than the HUD FHA foreclosure rates, suggesting that the HUD rates must be adjusted upward to make them comparable to MBA rates. One makes this adjustment by finding the average MBA FHA foreclosure rate ratio during a period in which the two series overlapped. The period 1972–79 represents such a period, and the ratio during this period is 1.49. The MBA FHA data are thereby extended to 1950–71 as follows:

$$1950\text{--}71 \text{ Extended MBA FHA} = 1.49 (1950\text{--}71 \text{ HUD FHA}), \quad \text{A-1}$$

with the entire series shown in column 3.

In the second step, post-1972 MBA conventional foreclosure rates, shown in column 4 of Table A, are extended to the 1950–71 period on the basis of the pre-1972 MBA FHA rates calculated in step 1.

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<sup>16</sup> The MBA series is calculated from a very large sample (currently over 20 million) of mortgages serviced by members of the MBA. A longer time series is available from the American Council of Life Insurance (ACLI). Although the ACLI series begins in 1965, in more recent years it is problematic because the underlying database of mortgages, from which the series is constructed, has dwindled as life insurance companies have moved out of single-family mortgages. For example, in 1970 these mortgages represented about one-third (about \$75 billion) of ACLI sample respondent holdings, but in 1997 they had dropped to only 3 percent (about \$4 billion). While the ACLI series exhibits the same long-term rising trend observed in the MBA data (see Figure 1), its declining sample reduces its reliability as an aggregate index.

This is accomplished with the assistance of conventional foreclosure rates published by the Federal Home Loan Bank Board (FHLBB) beginning in 1963 and shown in column 5. The FHLBB rates are convenient because they have often been reported with, and compared to, the HUD FHA rates in column 2.<sup>17</sup> The ratio of these two series thereby provides a basis for estimating pre-1972 conventional foreclosure rates. Specifically, one estimates 1963–71 MBA-consistent conventional foreclosure rates by multiplying pre-1972 extended MBA FHA foreclosure rates from column 3 by the ratio of the 1963–71 yearly FHLBB conventional and HUD FHA rates:

$$1963-71 \text{ Extended MBA Conventional} = 1963-71 \text{ Extended MBA FHA (1963-71} \\ \text{FHLBB Conventional / HUD FHA)}. \quad \text{A-2}$$

Before 1963, the pre-1972 MBA FHA series is multiplied by the average long-term ratio of MBA conventional and FHA foreclosure rates for the 1963–97 period, which equals 0.41:

$$1950-62 \text{ Extended MBA Conventional} = 0.41 (1950-62 \text{ Extended MBA FHA}). \quad \text{A-3}$$

This approach ensures that conventional foreclosure rates lie below FHA rates while following the same aggregate trend. The final extended MBA conventional series is shown in column 6.

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<sup>17</sup> For example, see 1964, 1966, and 1970 FHLBB *Annual Reports* for early data, and the *FHLBB Journal* throughout the 1970s for later data. The FHLBB data also have an intuitive appeal because their FHA and conventional rates follow the same general trends, but with the FHA rates considerably higher than the conventional rates in every period reported.

**Table A**

Extended MBA FHA and Conventional Foreclosure Rates: 1950-97

Year	MBA FHA Rate (1)	HUD FHA Rate (2)	Extended MBA FHA Rate (3)	MBA Convent. Rate (4)	FHLBB Convent. Rate (5)	Extended MBA Convent. Rate (6)
1950	N/A	0.20	0.00	N/A	N/A	0.00
1951	N/A	0.10	0.15	N/A	N/A	0.06
1952	N/A	0.09	0.13	N/A	N/A	0.05
1953	N/A	0.06	0.09	N/A	N/A	0.04
1954	N/A	0.18	0.26	N/A	N/A	0.11
1955	N/A	0.20	0.30	N/A	N/A	0.12
1956	N/A	0.25	0.37	N/A	N/A	0.15
1957	N/A	0.15	0.23	N/A	N/A	0.09
1958	N/A	0.13	0.20	N/A	N/A	0.08
1959	N/A	0.20	0.30	N/A	N/A	0.12
1960	N/A	0.33	0.49	N/A	N/A	0.20
1961	N/A	0.67	1.00	N/A	N/A	0.41
1962	N/A	0.97	1.44	N/A	N/A	0.59
1963	N/A	1.09	1.63	N/A	0.43	0.63
1964	N/A	1.18	1.76	N/A	0.46	0.69
1965	N/A	1.21	1.80	N/A	0.51	0.76
1966	N/A	1.20	1.79	N/A	0.52	0.78
1967	N/A	0.99	1.48	N/A	0.45	0.67
1968	N/A	0.76	1.13	N/A	0.29	0.43
1969	N/A	0.57	0.86	N/A	0.17	0.26
1970	N/A	0.60	0.90	N/A	0.14	0.21
1971	N/A	0.77	1.15	N/A	0.12	0.18
1972	1.29	0.95	1.29	0.16	0.10	0.16
1973	1.64	1.16	1.64	0.23	0.10	0.23
1974	1.50	1.15	1.50	0.31	0.11	0.31
1975	1.24	0.94	1.24	0.38	0.14	0.38
1976	0.89	0.64	0.89	0.32	0.14	0.32
1977	0.89	0.58	0.89	0.30	0.11	0.30
1978	0.86	0.52	0.86	0.25	0.09	0.25
1979	0.78	0.40	0.78	0.25	0.09	0.25
1980	0.73	N/A	0.73	0.31	0.12	0.31
1981	0.82	N/A	0.82	0.40	0.18	0.40
1982	1.06	N/A	1.06	0.52	0.33	0.52
1983	1.05	N/A	1.05	0.62	0.39	0.62
1984	1.03	N/A	1.03	0.62	N/A	0.62
1985	1.13	N/A	1.13	0.68	N/A	0.68



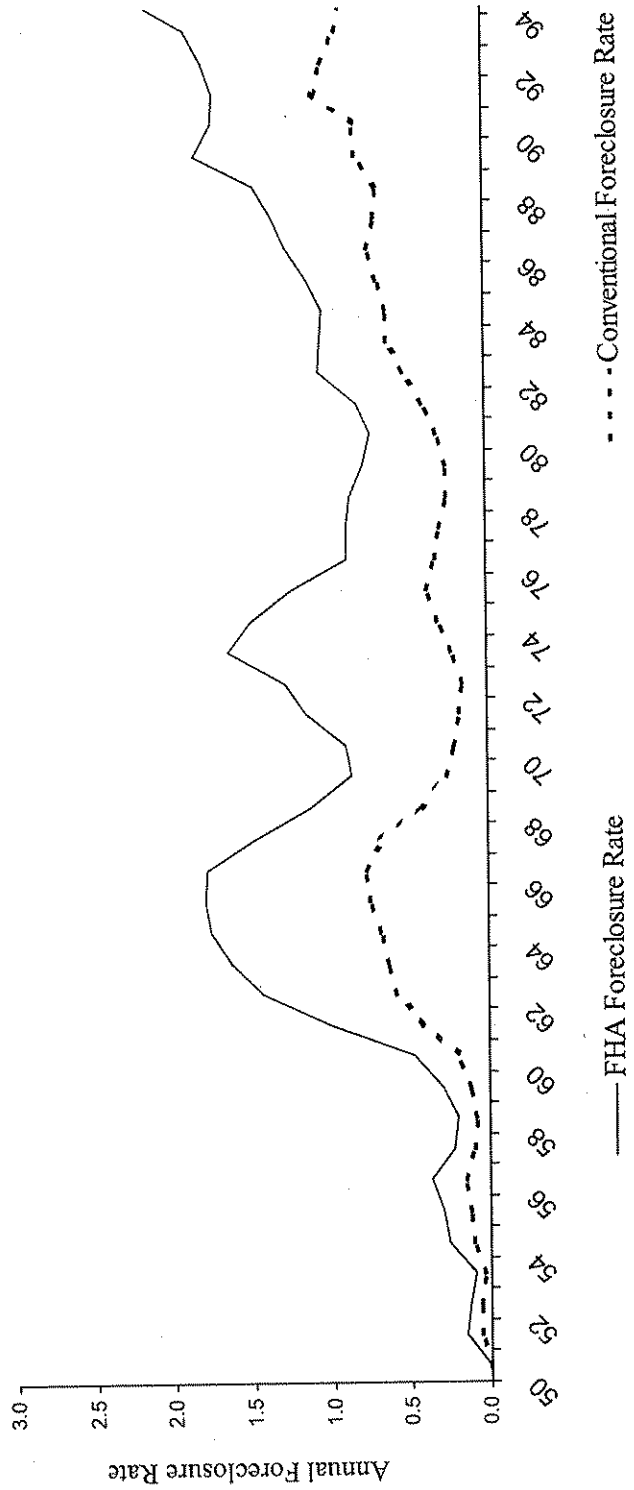
1986	1.26	N/A	1.26	0.75	N/A	0.75
1987	1.35	N/A	1.35	0.70	N/A	0.70
1988	1.47	N/A	1.47	0.69	N/A	0.69
1989	1.84	N/A	1.84	0.82	N/A	0.82
1990	1.73	N/A	1.73	0.83	N/A	0.83
1991	1.72	N/A	1.72	1.07	N/A	1.07
1992	1.79	N/A	1.79	1.03	N/A	1.03
1993	1.90	N/A	1.90	0.94	N/A	0.94
1994	2.22	N/A	2.22	0.90	N/A	0.90
1995	2.12	N/A	2.12	0.90	N/A	0.90
1996	2.31	N/A	2.31	0.99	N/A	0.99
1997	2.47	N/A	2.47	1.04	N/A	1.04

## References

- Ambrose, Brent W., and Charles A. Capone. 1996. Resolution of Single-Family Borrower Default: Modeling the Conditional Probability of Foreclosure. Paper presented at the Mid-Year AREUEA Meetings, Washington, D.C.
- Archer, Wayne R., David C. Ling, and Gary A. McGill. 1996. The Effect of Income and Collateral Constraints on Residential Mortgage Terminations. *Regional Science and Urban Economics* 26:235–61.
- Capozza, Dennis R., Dick Kazarian, and Thomas A. Thompson. 1997. Mortgage Default in Local Markets. *Real Estate Economics* 24(4):631–55.
- Case, Karl E., and Robert J. Shiller. 1996. Mortgage Default Risk and Real Estate Prices: The Use of Index-Based Futures and Options in Real Estate. *Journal of Housing Research* 7(2): 243–58.
- Deng, Yongheng. 1997. Mortgage Termination: An Empirical Hazard Model with a Stochastic Term Structure. *The Journal of Real Estate Finance and Economics* 14(3):309–31.
- Elmer, Peter J. 1997. A Choice-Theoretic Model of Single-Family Mortgage Default. FDIC Working Paper 97-1.
- Elmer, Peter J., and Steven A. Seelig. 1998. Insolvency and Trigger Events in the Theory of Single-Family Mortgage Default. FDIC Working Paper 98-3.
- Engen, Eric M., and William G. Gale. 1997. Debt, Taxes, and the Effects of 401(k) Plans on Household Wealth Accumulation. Mimeo, Federal Reserve Board and The Brookings Institution.
- Gardner, Mona J., and Dixie L. Mills. 1989. Evaluating the Likelihood of Default on Delinquent Loans. *Financial Management* 18(4):55–63.
- Hendershott, Patric H., and Robert Van Order. 1987. Pricing Mortgages: An interpretation of the Models and Results. *Journal of Financial Services Research* 1(1):19–55.
- Jones, Andrew B., Henry W. Hayssen, and Jennifer E. Schneider. 1995. Rating of Residential Mortgage-Backed Securities. *The Journal of Fixed Income* 4(4):12–36.
- Judge, George G., W. E. Griffiths, R. Carter Hill, Helmu Lutkepohl, and Tsong-Chao Lee. 1985. *The Theory and Practice of Econometrics*, 2d ed. John Wiley and Sons.
- Kau, James B., and Donald C. Keenan. 1995. An Overview of the Option-Theoretic Pricing of Mortgages. *Journal of Housing Research* 6(2):217–44.
- Monsen, Gordon. 1996. A Poor Performance. *Mortgage Banking* 56(9):14–22.

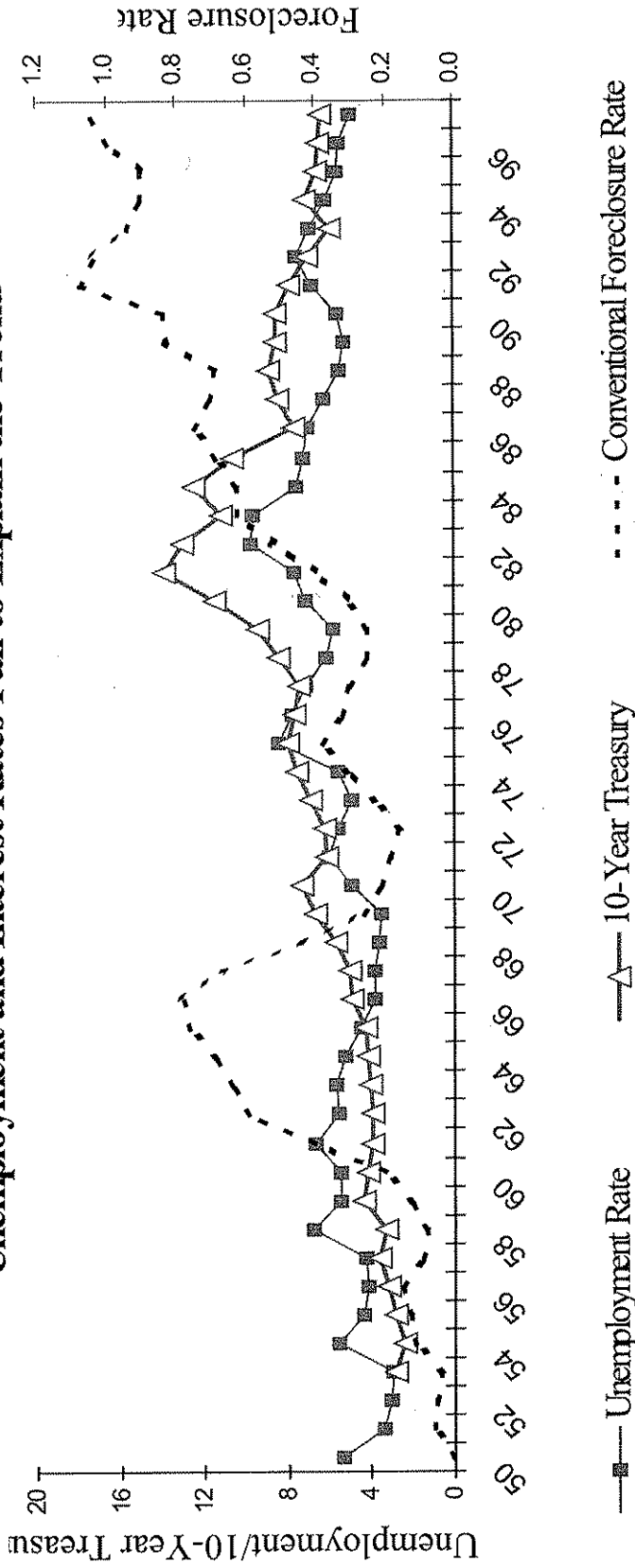
- Phillips, Richard A., Eric Rosenblatt, and James H. Vanderhoff. 1996. The Probability of Fixed and Adjustable-Rate Mortgage Termination. *The Journal of Real Estate Finance and Economics* 13(2):95–104.
- Quigley, John M., and Robert Van Order. 1995. Explicit Tests of Contingent Claims Models of Mortgage Default. *The Journal of Real Estate Finance and Economics* 1(2):99–117.
- Vandell, Kerry D. 1995. How Ruthless is Mortgage Default? A Review and Synthesis of the Evidence. *Journal of Housing Research* 6(2):245–64.
- Wilson, Donald G. 1995. Residential Loss Severity in California: 1992-1995. *The Journal of Fixed Income* 5(3):35–48.
- Yang, Tyler T., Henry Buist, and Isaac F. Megbolugbe. 1998. An Analysis of the Ex-Ante Probabilities of Mortgage Prepayment and Default. *Real Estate Economics* (forthcoming).

**Figure 1**  
**Long-Term Trends for Conventional and FHA Foreclosure Rates Are Rising**



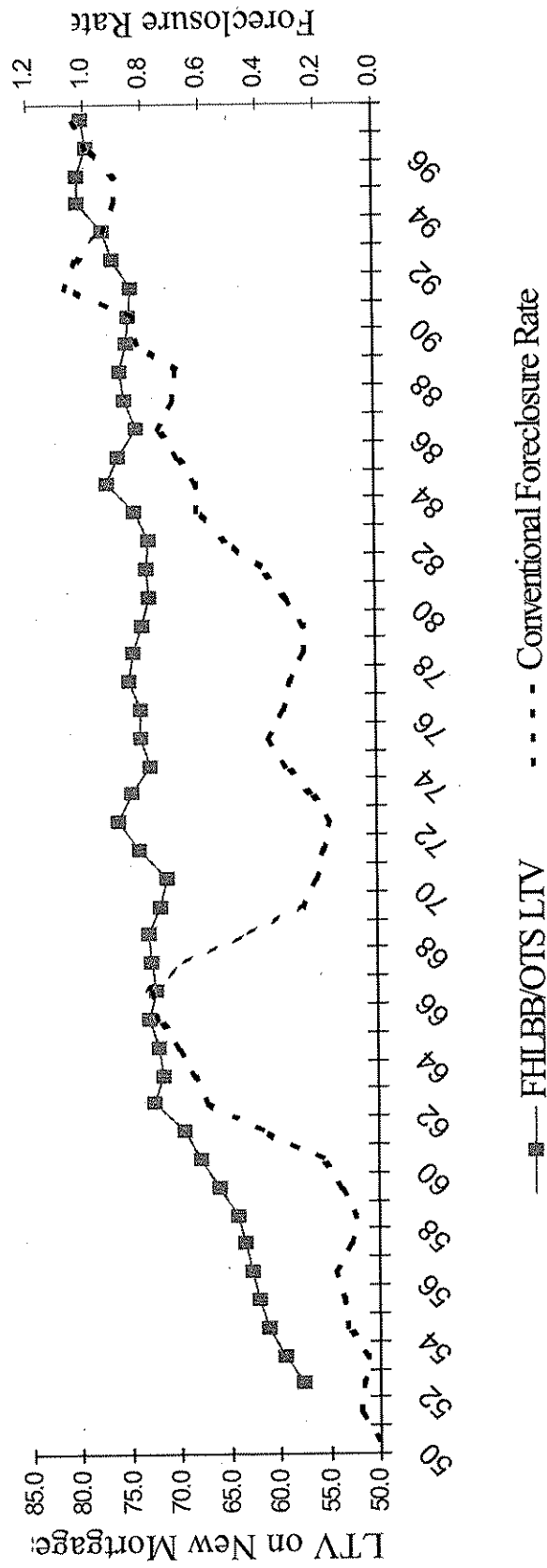


**Figure 2**  
**Unemployment and Interest Rates Fail to Explain the Trend**



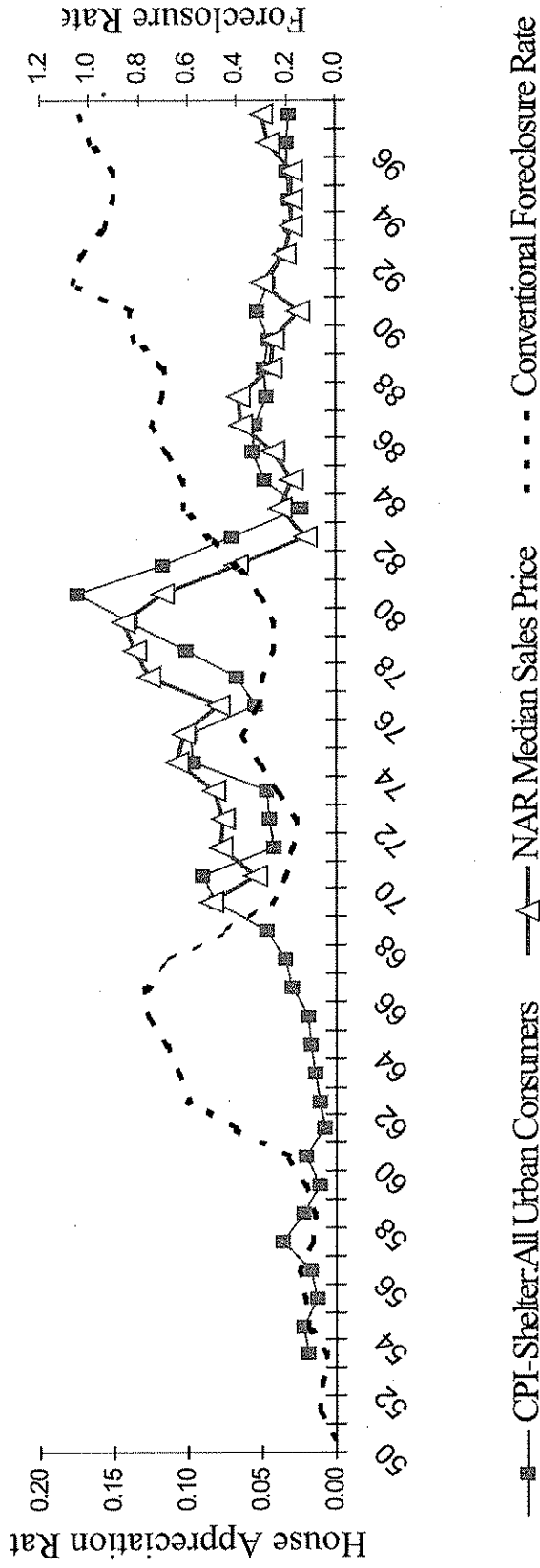
Source: MBA/FHLBB/HUD, Federal Reserve, Conference Board, NBER.

**Figure 3**  
**LTV Explains Some, But Not All, of the Trend**



Source: MBA/FHLBB/HUD, FHLBB/Office of Thrift Supervision (OTS).

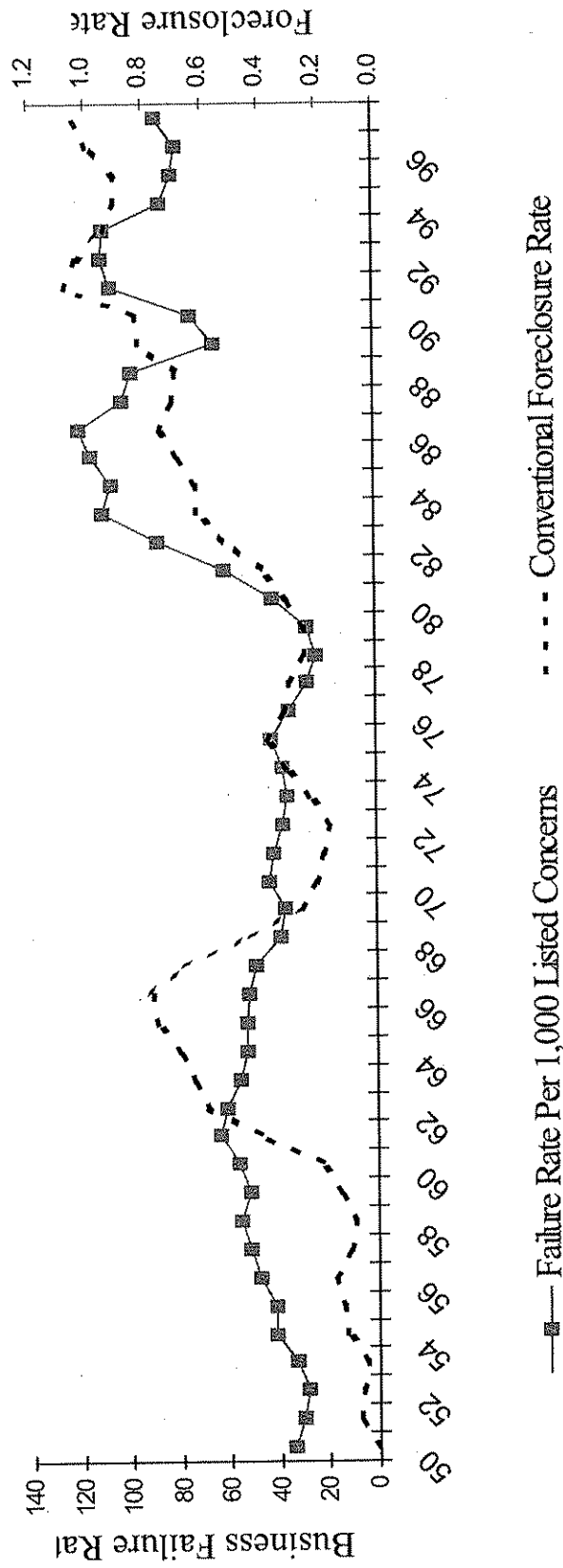
**Figure 4**  
**House Appreciation Rate Explains Some, But Not All, of the Trend**



Source: MBA/FHLBB/HUD, BLS, National Association of Realtors (NAR).

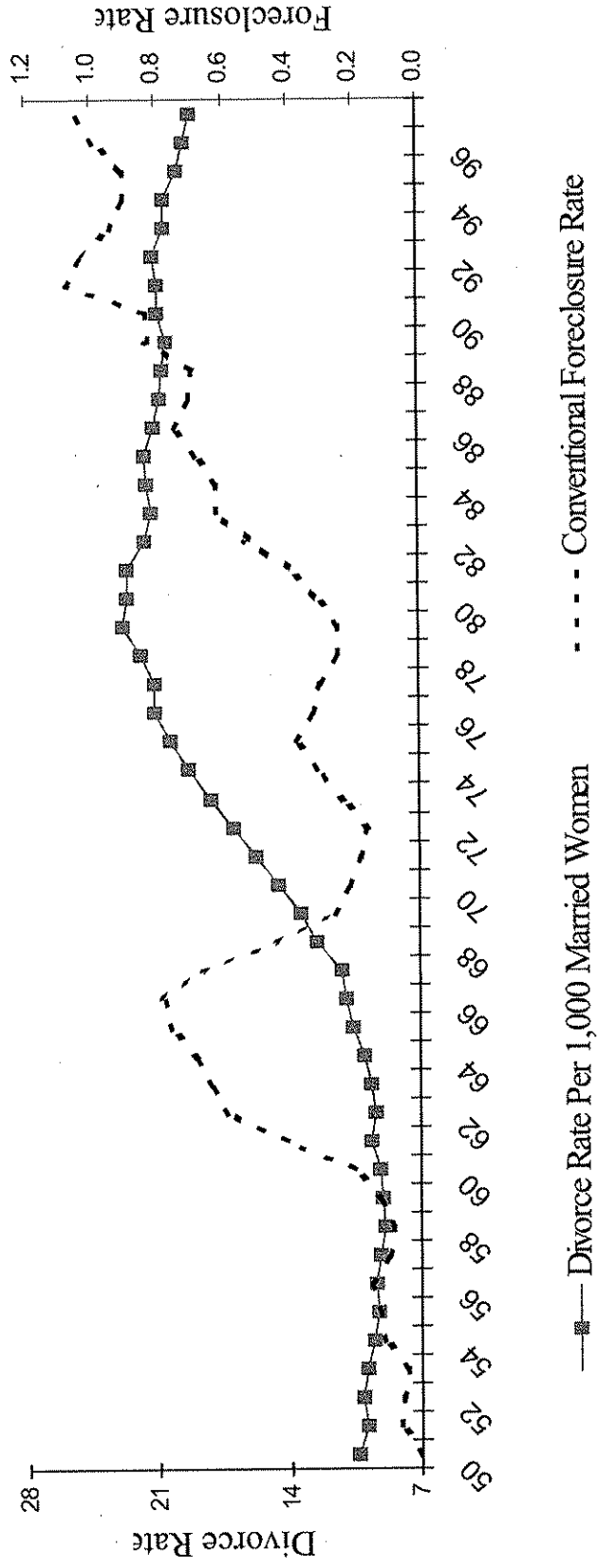


**Figure 5**  
**Business Failure Rates Remain High Despite Good Economic Health**

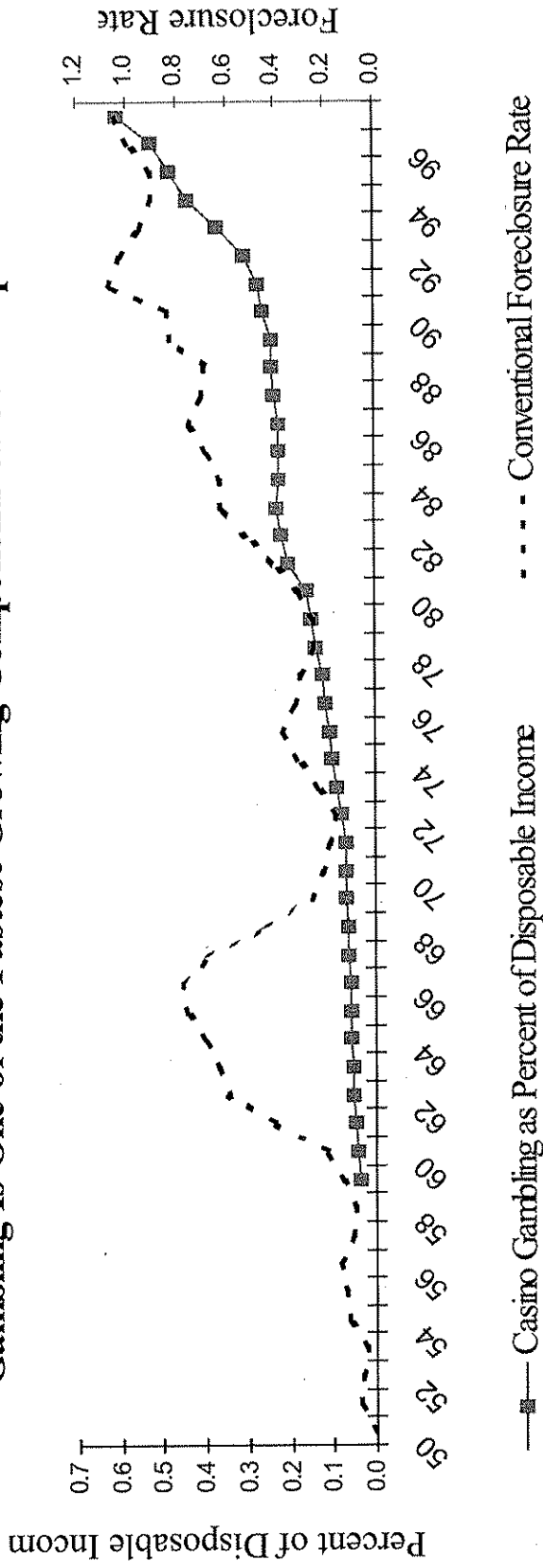


Source: MBA/FHLBB/HUD, Dunn and Bradstreet.

**Figure 6**  
**Divorce Rates Doubled in the 1970s and Have Remained High Since**

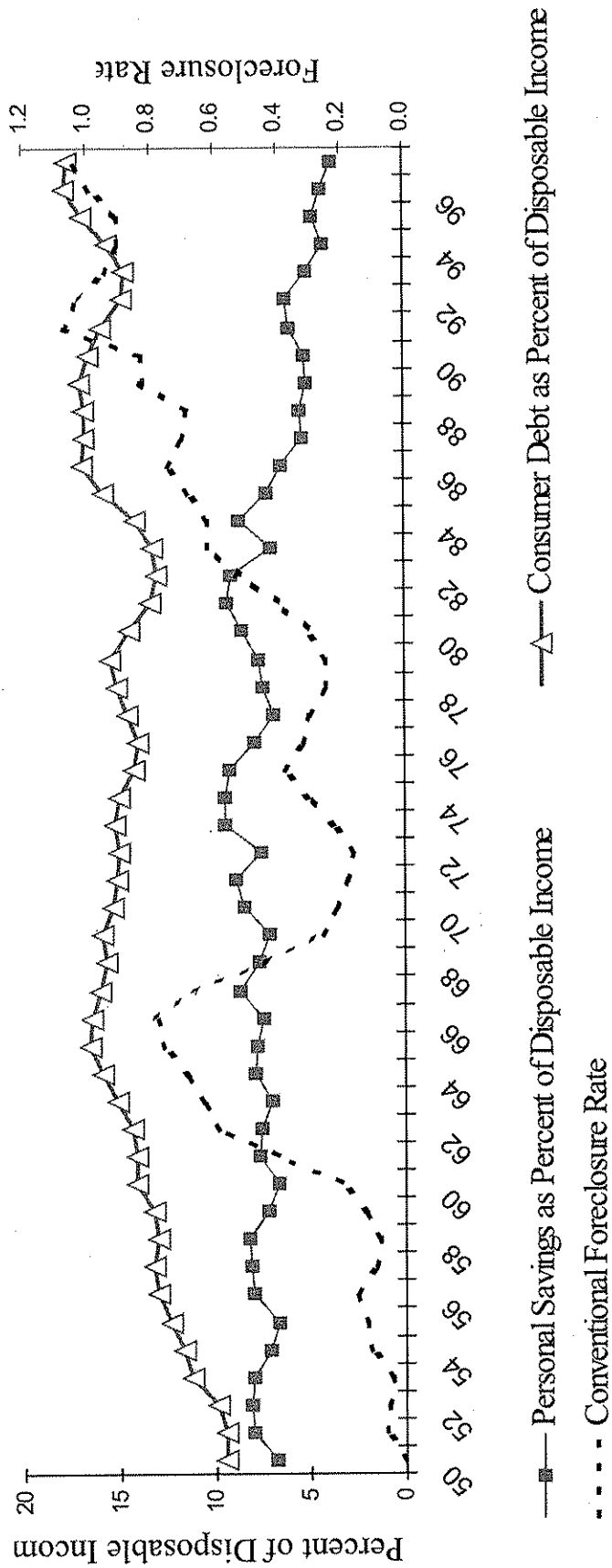


**Figure 7**  
**Gambling Is One of the Fastest-Growing Components of Consumption**

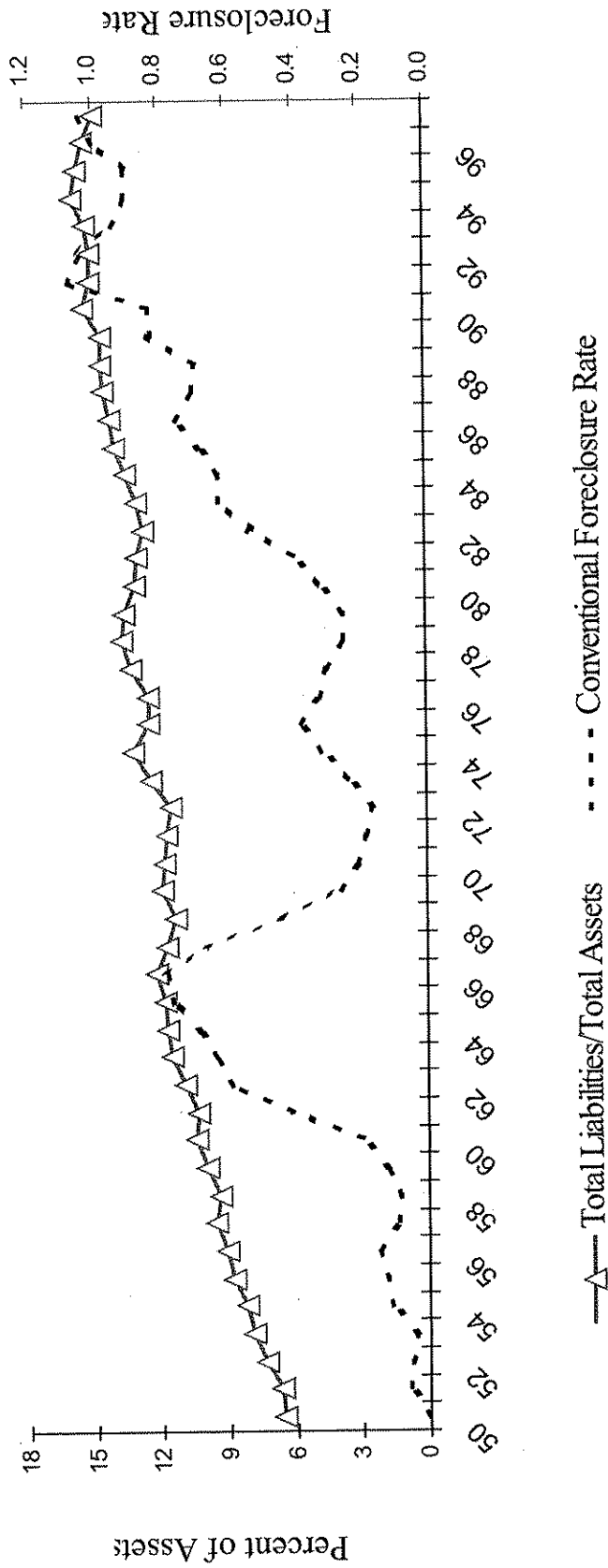


Source: MBA/FHLBB/HUD, Bureau of Economic Analysis (BEA).

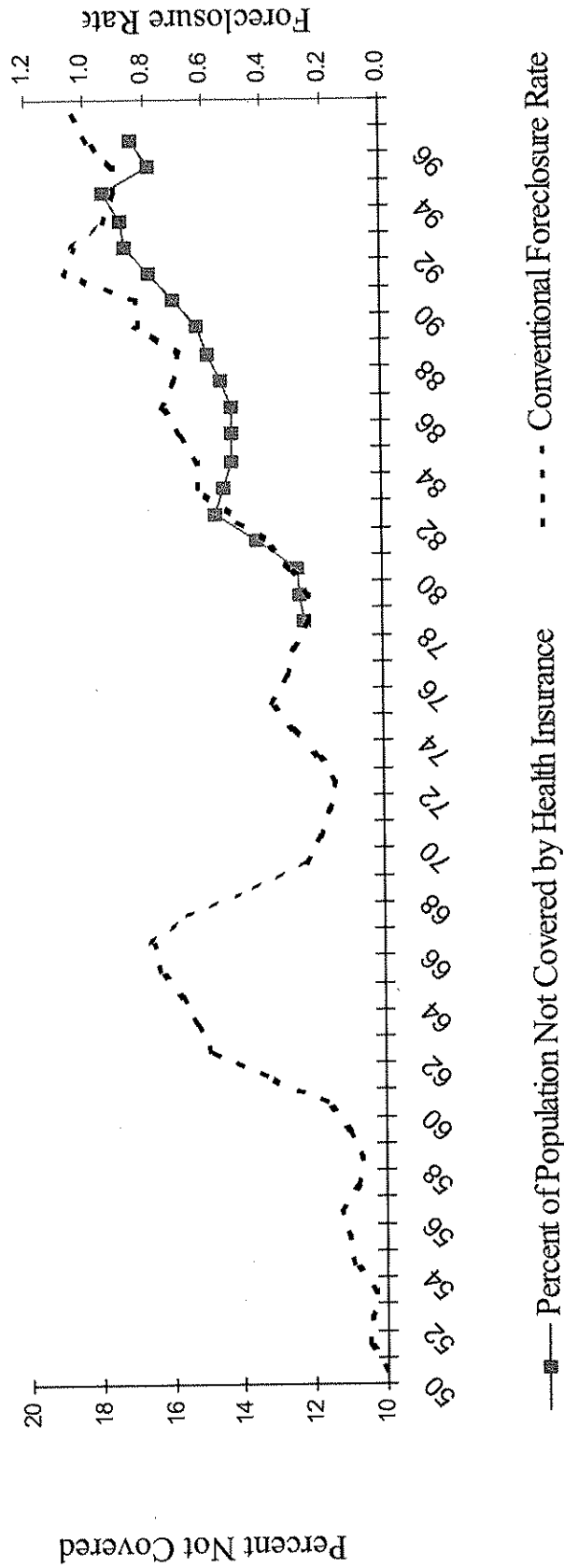
**Figure 8**  
**Consumer Debt Is at Historic Highs,**  
**While Savings Rates Are at Historic Lows**



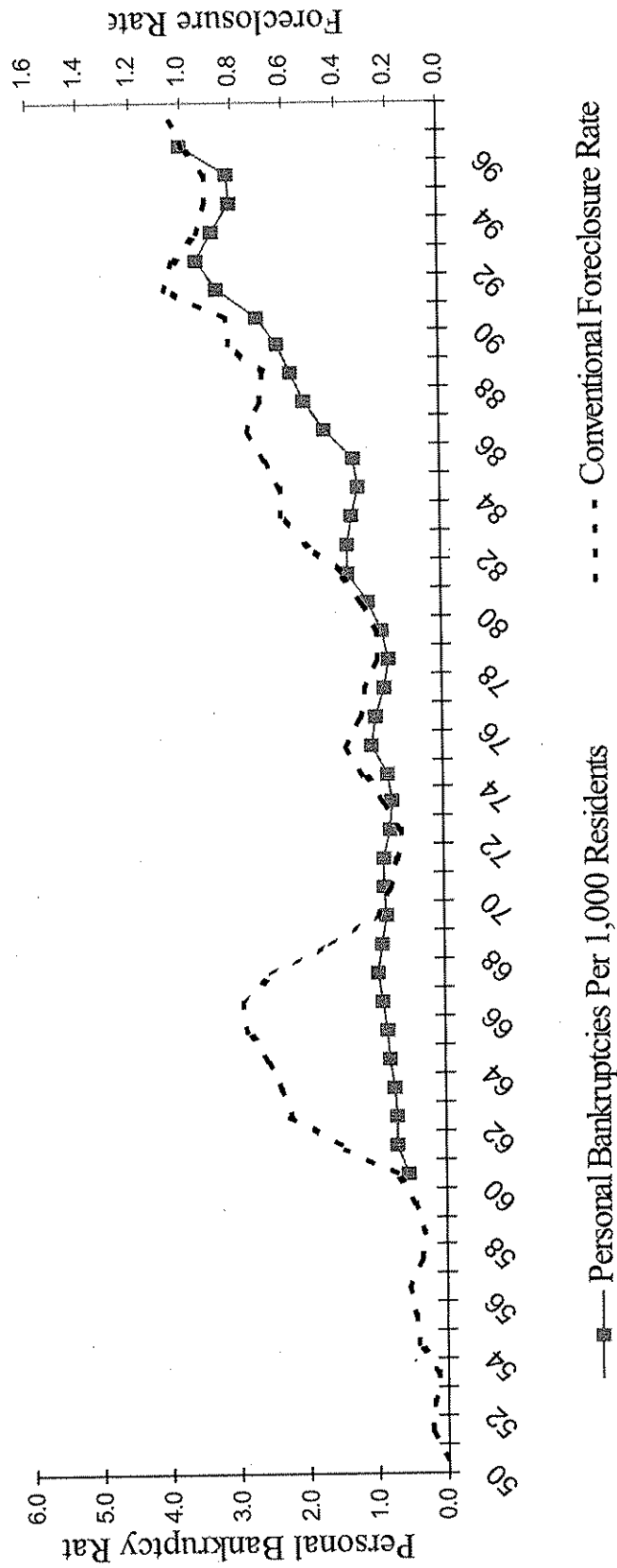
**Figure 9**  
**Total Personal Liabilities Steadily**  
**Increased Vis-a-Vis Total Assets**



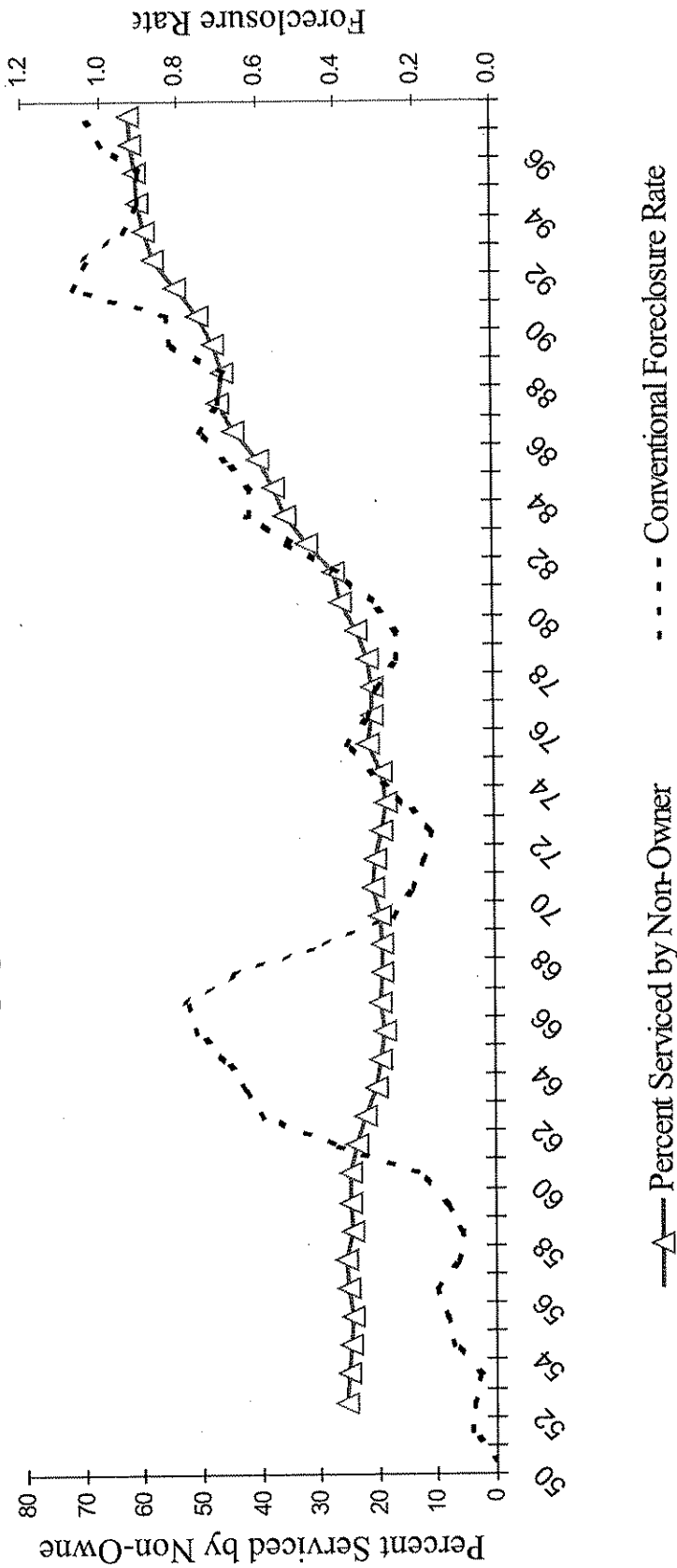
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**Percentage of Population Not Covered by Health Insurance**  
**Rose Throughout the 1980s**



**Figure 11**  
**Personal Bankruptcy and Mortgage Foreclosure**  
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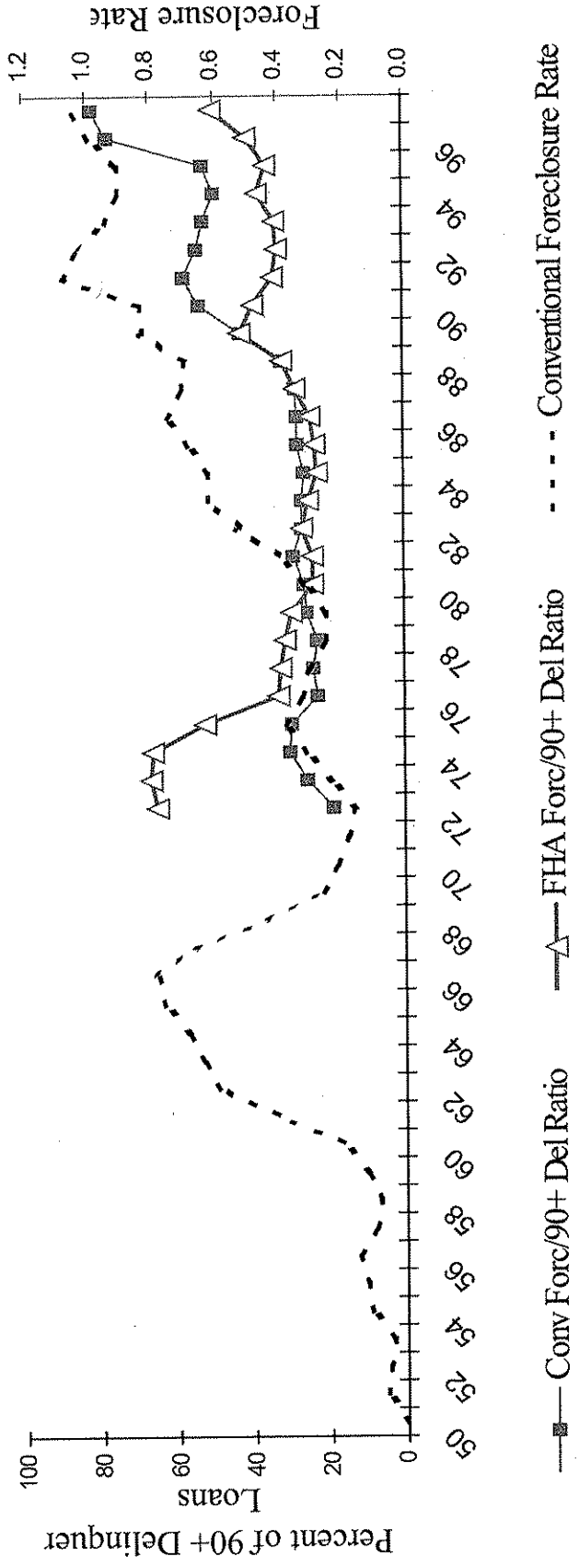
**Figure 12**  
**Share of Mortgages Not Serviced by Owner Rose Steadily After 1980**



Source: MBA/FHLBB/HUD, FRB.



**Figure 13**  
**Inconsistent Behavior for Conventional and FHA Foreclosure Rates**  
**Relative to Delinquencies Over 90 Days in the 1980s**



Source: MBA/FHLBB/HUD.

# The External Costs of Foreclosure: The Impact of Single-Family Mortgage Foreclosures on Property Values

**Dan Immergluck**

*Georgia Institute of Technology*

**Geoff Smith**

*Woodstock Institute*

## *Abstract*

To measure the impact of foreclosures on nearby property values, we use a database that combines data on 1997 and 1998 foreclosures with data on neighborhood characteristics and more than 9,600 single-family property transactions in Chicago in 1999. After controlling for some 40 characteristics of properties and their respective neighborhoods, we find that foreclosures of conventional single-family (one- to four-unit) loans have a significant impact on nearby property values. Our most conservative estimates indicate that each conventional foreclosure within an eighth of a mile of a single-family home results in a decline of 0.9 percent in value.

Cumulatively, this means that, for the entire city of Chicago, the 3,750 foreclosures that occurred in 1997 and 1998 are estimated to have reduced nearby property values by more than \$598 million, for an average of \$159,000 per foreclosure. This does not include effects on the value of condominiums, multifamily rental properties, and commercial buildings.

**Keywords:** Foreclosure; Homeownership; Mortgages

## **Introduction**

Since at least the late 1960s, foreclosures of single-family homes (one- to four-unit) have been viewed as a serious threat to neighborhood stability and community well-being. Foreclosures, particularly in lower-income neighborhoods, can lead to vacant, boarded-up, or abandoned properties. These properties, in turn, contribute to physical disorder in a community, create a haven for criminal activity, discourage the formation of social capital, and lead to further disinvestment. If foreclosures lead to such negative effects, then we would expect them to also lead to lower property values in the immediate vicinity, especially for residential property.

In this article, we measure the impact of foreclosures on nearby property values by using a unique database that combines data on 1997 and 1998 foreclosures with data on neighborhood characteristics and more than 9,600 single-family property transactions in Chicago in 1999. Even after controlling for over 40 characteristics of properties and their respective neighborhoods, we find that foreclosures of conventional single-family loans have a significant impact on nearby property values. Our most conservative estimates indicate that each conventional foreclosure within an eighth of a mile of a single-family home results in a 0.9 percent decline in the value of that home. Cumulatively, this means that for the entire city of Chicago, the 3,750 foreclosures that occurred in 1997 and 1998 are estimated to have reduced nearby property values by more than \$598 million, or an average of \$159,000 per foreclosure. This does not include effects on the value of condominiums, larger multifamily rental properties, and commercial buildings.

Less conservative estimates suggest that each conventional foreclosure within an eighth of a mile of a property results in a 1.136 percent decline in that property's value and that each foreclosure between an eighth and a quarter of a mile away results in a 0.325 percent decline in value. This less conservative finding corresponds to a citywide loss in property values (again, not considering multifamily or commercial values) of just over \$1.39 billion—or an average of more than \$371,000 per foreclosure.

### **The private and social costs of foreclosures**

Foreclosures can mean significant costs and hardships for those most directly affected in that they can involve not only the loss of accumulated home equity and the cost of acquiring the home, but also access to stable, decent housing. Moreover, foreclosures can damage credit ratings, hurting owners' prospects in credit, labor and insurance, and rental housing markets. There are potential psychological and emotional costs as well. For the holders of the loan, foreclosures are estimated to cost an average of \$58,792 and take 18 months to resolve (Cutts and Green 2004).

But economic and social costs can have implications for surrounding neighborhoods and for larger communities as well as the parties directly involved. (For example, cities, counties, and school districts may lose tax revenue from abandoned homes.) The neighborhood and municipal costs of concentrated foreclosures are beginning to be recognized and quantified. These costs increase significantly for properties that are not quickly returned to the market via regular mechanisms.

In examining Federal Housing Administration (FHA) foreclosures, Moreno (1995) estimated average city costs of \$27,000 and neighborhood costs of \$10,000 for a foreclosure. Apgar and Duda (2005) found that the direct costs to Chicago city government involve more than a dozen agencies and two dozen specific municipal activities, generating government costs that exceed \$30,000 per property in some cases.

One potential impact of increased foreclosures in a community is crime. Vacant and abandoned buildings are often considered a component of neighborhood physical disorder (as opposed to social disorder). Physical disorder involves “signs of negligence and unchecked decay” in a neighborhood (Skogan 1990, 4). Several observers and researchers have argued that physical and social disorder causes crime (Kelling and Coles 1996; Wilson and Kelling 1982) and that disorder undermines the ways in which communities maintain social control. Fewer residents are concerned about or take responsibility for disorder in public spaces outside their own households. Criminals flock to such communities because they do not fear being caught. Thus, social and physical disorder leads to more serious crime.

Skogan (1990) argues that abandoned buildings can harm a neighborhood in various ways. First, they can harbor decay. They may be havens for trash, rats, or other stray animals; squatters; or even criminals. Abandoned houses may also serve as places where drugs are sold and used or can be taken over by criminals who may attack neighborhood residents. Finally, abandoned or vacant homes may be targets for vandalism, the theft of wiring or other building components, or arson. Moreover, theft of property from such ostensibly unoccupied buildings may be less likely to be reported. Indirectly, the presence of boarded-up and abandoned buildings may lead neighborhood residents to exhibit a lack of collective concern over neighborhood crime.

In examining the relationship between neighborhood foreclosures and crime, Immergluck and Smith (2006) find that higher levels of foreclosures do contribute to higher levels of violent crime, although the results for property crime are not statistically significant. An increase of one standard deviation in the foreclosure rate (about 2.8 foreclosures for every 100 owner-occupied properties in one year) corresponds to an increase in neighborhood violent crime of approximately 6.7 percent.

Despite the persistence of the problem of concentrated foreclosures and their perceived ill effects, little systematic research has directly measured their impact on nearby property values. Some recent literature has addressed the impact of deteriorated or vacant residential buildings on property values or, conversely, the impact of rehabilitation on property values. Shlay and Whitman (2004) examined the impact of vacant housing units on nearby home values in

Philadelphia and found that properties located within 150 feet of an abandoned unit sold for over \$7,000 less than other properties. Ding, Simons, and Baku (2000) found that housing rehabilitation and, especially, new construction have a positive effect on nearby property values and that this effect is larger in lower-income neighborhoods and in predominantly white neighborhoods.

In assessing the societal, as well as the individual, risks and costs of mortgage lending policies and programs, regulators and policy makers need to have better information on the spillover costs of foreclosures on neighborhoods and communities. A significant portion of the neighborhood costs of foreclosures should be capitalized into local property values. In this article, we seek to estimate such capitalized impacts.

### **Short- and long-term increases in foreclosures**

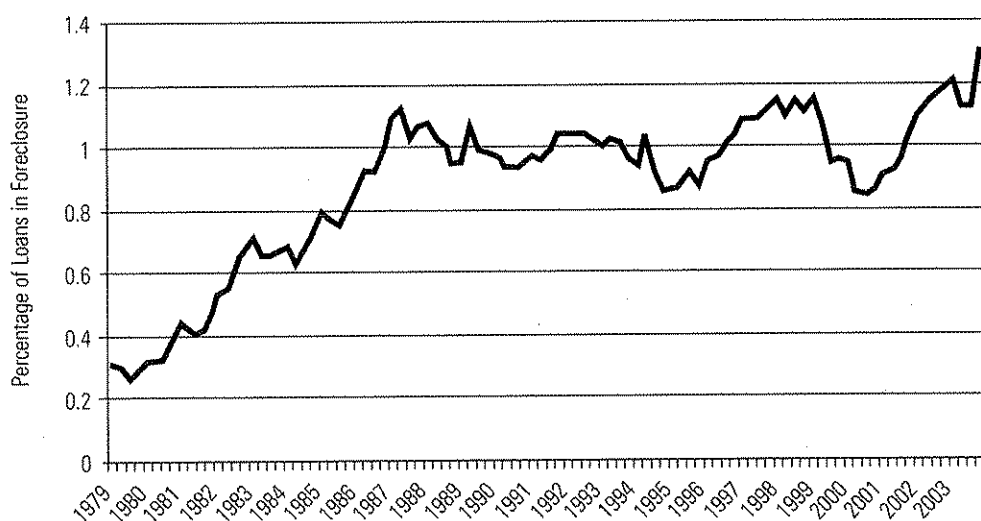
In the past decade, many cities have experienced substantial growth in foreclosures, with particularly large increases occurring during recent economic downturns. These increases have been particularly steep in low- and moderate-income and minority neighborhoods.

Nationally, foreclosure rates have ebbed and flowed, but over the long term, the trend has been decidedly upward. Figure 1 tracks foreclosure rates on all mortgage loans since 1979. In the early 1980s, foreclosure rates on conventional loans were on the order of 0.3 to 0.4 percent. They rose significantly over that decade to exceed 1 percent. Even as the economy grew in the late 1990s, foreclosure rates increased, exceeding 1.1 percent by late 1997. In the late 1990s and early 2000s, foreclosure levels reached historic highs (1.3 percent in late 2003) (Federal Deposit Insurance Corporation [FDIC] 2004).

At the state level, 23 states saw foreclosures increase more than 24 percent from the end of 2001 to the end of 2003, and 8 saw increases of more than 50 percent over the same period (FDIC 2004). States like Indiana, Ohio, Kentucky, South Carolina, Pennsylvania, and Mississippi all had foreclosure rates above 2 percent in late 2003. Increases have been particularly large in regions with weak economies. In Indiana, rates climbed steadily from less than 0.5 percent in 1995 to over 2 percent by 2003. In Pennsylvania, rates increased from less than 1 percent in 2000 to more than 1.5 percent by 2003 (National Association of Realtors, Research Division 2004).

However, economic conditions do not provide a sufficient explanation for why some regions and cities have experienced particularly severe increases. Using multiple regression to identify factors that explain state-level foreclosure rates for prime and subprime loans, Goldstein et al. (2005) found that income, average credit score, unemployment rate, owner-occupancy rate, and a number

**Figure 1.** Percentage of Outstanding Mortgages in Foreclosure at End of Quarter, 1979 to 2003

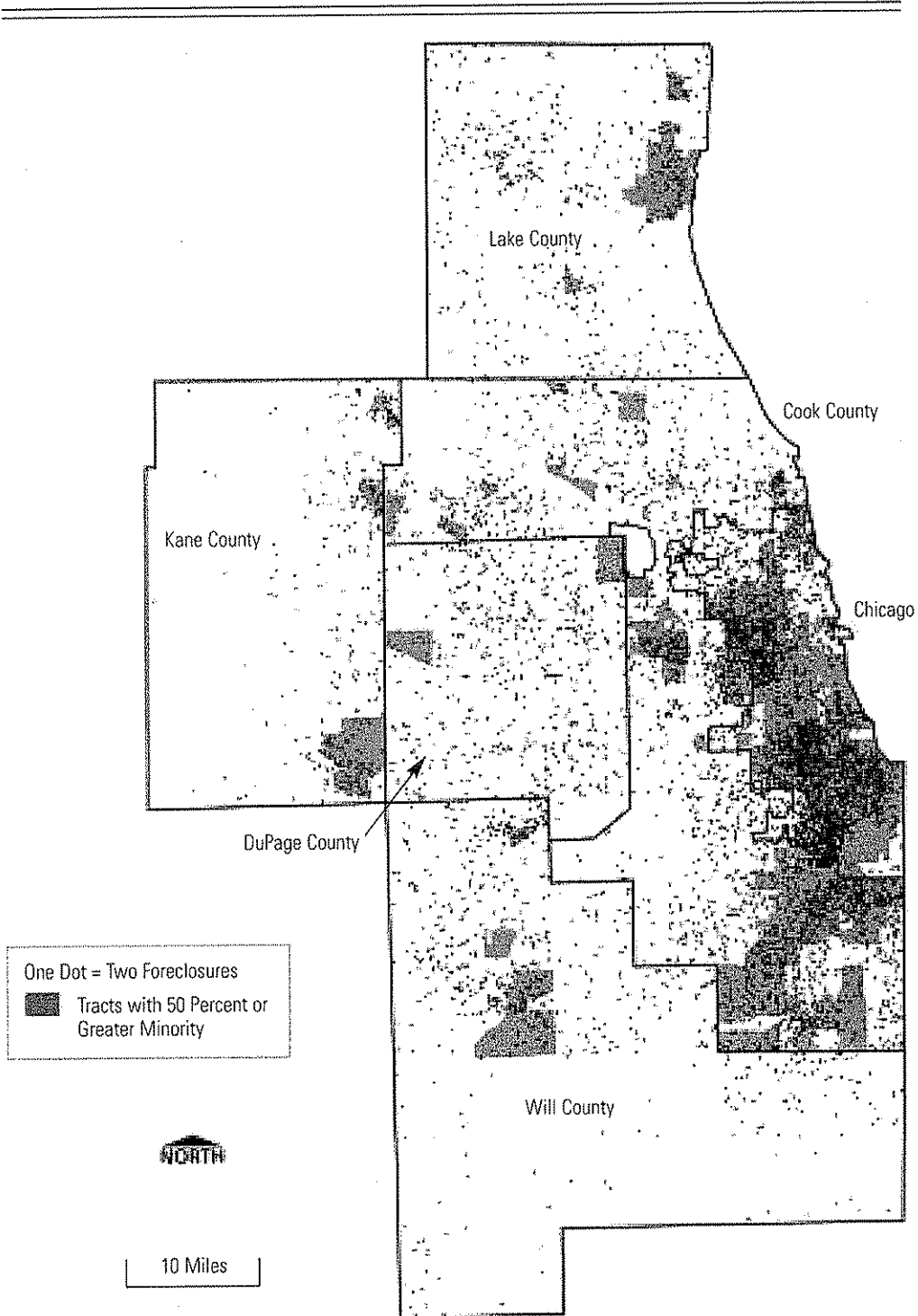


Source: National Association of Realtors, Research Division 2004.

of other demographic factors all have predictable impacts on the rate. But even after accounting for many independent variables, there was still substantial unexplained variance among state foreclosure rates, although the model explained a greater proportion of the variance among prime rates than among subprime rates (0.595 versus 0.453). States with large, positive standardized residuals (the standardized difference between the actual and predicted foreclosure rates) included Ohio, Indiana, Pennsylvania, Georgia, Maryland, South Dakota, and Missouri; there, the standardized residuals exceeded 1.0.

Cities, and especially lower-income and minority neighborhoods, have accounted for a disproportionate share of the increase in foreclosures. In the Chicago area, total foreclosures rose 238 percent from 1995 to 2002. In census tracts where less than 10 percent of the 2000 population consisted of minorities, there was an increase of 215 percent, while in tracts where 90 percent or more of the population consisted of minorities, there was an increase of 544 percent. Specifically, tracts with 90 percent or more minority residents in 2000 accounted for 40 percent of the 1995–2002 increase in conventional foreclosures. These same tracts represent only 9.2 percent of the owner-occupied housing units in the region. Tracts with minority populations of 50 percent or more accounted for over 61 percent of the increase in conventional foreclosures. Figure 2 illustrates the distribution of foreclosures in the Chicago metropolitan area in 2002.

**Figure 2.** Foreclosure Starts in the Chicago Area, 2002



### **Subprime lending and foreclosures**

More than 30 years ago, when the FHA's loan programs began experiencing large increases in defaults, community activists recognized foreclosures as a threat to neighborhood and community stability. Despite some well-intentioned efforts to reverse the FHA redlining practices of previous decades, neglect and hostility toward the agency by various administrations and fundamental design flaws in its programs led to high levels of foreclosures in many older, working-class, and inner-city neighborhoods. FHA programs that worked fairly well when borrowers had options in the conventional lending market broke down in a system of "reverse redlining."

Unlike the FHA's earlier problems, today's foreclosures—and particularly the growth in foreclosures—are increasingly driven by conventional loans. In particular, high-risk subprime lending is resulting in substantially higher levels of foreclosures, with much of the increase concentrated in minority and lower-income communities. In the Chicago area, while foreclosures of government-guaranteed mortgages rose by 105 percent from 1995 to 2002, foreclosures of conventional mortgages increased 350 percent. As a result, while conventional loans accounted for only slightly more than half of foreclosures in 1995, they accounted for almost three out of four just seven years later.

Quercia, Stegman, and Davis (2005) found that 20.7 percent of all first-lien subprime refinancing loans originated in 1999 had entered foreclosure by December 2003 and that the rate at which subprime loans entered foreclosure in late 2003 was more than 10 times the rate for prime loans. In examining foreclosures in Philadelphia, Goldstein et al. (2005) estimated that some 40 percent of subprime loans made in 1998 or 1999 were in foreclosure between 2000 and 2003, compared with less than 3 percent of prime loans. In neighboring Montgomery County (PA), approximately 20 percent of subprime loans made in 1998 or 1999 were in foreclosure during the same period, compared with less than 0.4 percent of prime loans.

In the case of refinance lending, for example, Immergluck and Smith (2005) found that, other things being equal, 100 more subprime loans in a census tract over a five-year period led to almost eight foreclosures in a single year following this period. They also found that the effect of subprime lending on foreclosures is generally on the order of 20 to 30 times the effect of prime lending.

While the specific magnitude of foreclosure rates varies by the type of data, the way they are measured, and the timeframes and geographies involved, it is clear that in recent years, subprime loans had a propensity for foreclosure 10 to 40 times higher than prime loans did, with the lower differential frequently occurring in areas where prime foreclosure rates were already quite high.



### Measuring the effect of foreclosures on nearby property values

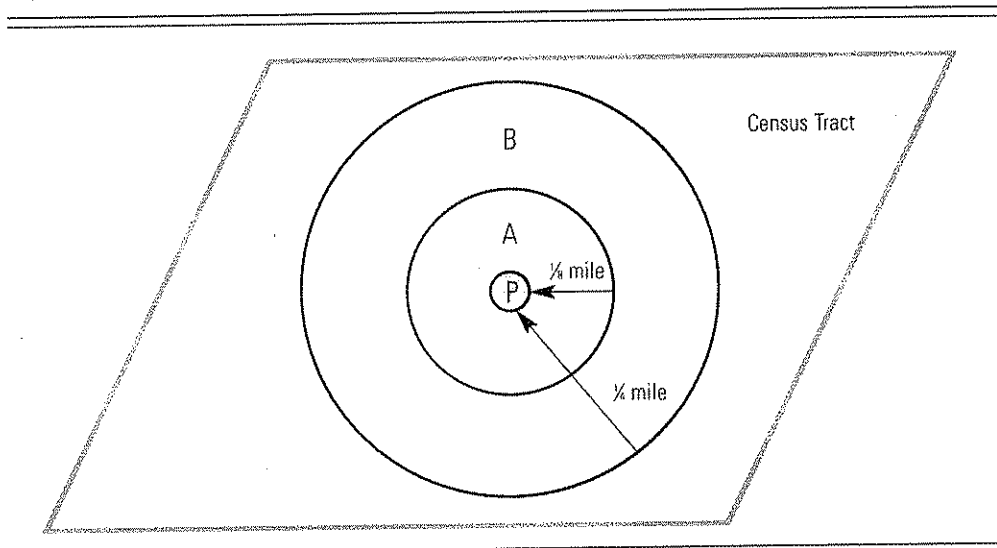
We use a hedonic regression model to estimate the impact of foreclosures on the value of nearby single-family properties and to discern the independent effect (that is, controlling for other explanatory variables) of a change in an attribute or location of a property on its price. Figure 3 provides a schematic representation of our hedonic model of housing values and nearby foreclosures. In this model, each property sale,  $p$ , is situated in 1 of the more than 800 census tracts in Chicago. Around each property, we draw two buffer areas, one with a radius of an eighth of a mile and one with a radius of a quarter of a mile. From the literature on the effects of proximate phenomena on property values, we assume that significant impacts of foreclosures on property values will occur within a quarter of a mile or less. We then measure the number of foreclosures within a buffer distance of an eighth of a mile (area A) and the number of foreclosures between a radius of an eighth of a mile and a quarter of a mile (area B).

To estimate the value of a property,  $p$ , we develop a pricing model as follows:

$$\begin{aligned} \text{Ln}(p_i) = & \alpha + \beta_1 X_i + \beta_2 Z_i + \beta_3 AC_i + \beta_4 BC_i + \beta_5 AG_i + \beta_6 BG_i \\ & + \beta_7 AO_i + \beta_8 BO_i + \varepsilon_i \end{aligned} \quad (1)$$

where  $\text{Ln}(p)$  is the natural log of the price of the property,  $X$  is a vector of property characteristics (e.g., square footage, garage, construction, etc.), and  $Z$  is a vector of neighborhood characteristics (population density, income, race, etc.,

**Figure 3.** Modeling the Impact of Foreclosures on Property Values



as well as locational measures such as longitude and latitude), as measured by 2000 census tract data. The remaining variables measure the phenomena of interest—foreclosures. Specifically we disaggregate the following types:

1. AC is the number of foreclosures of conventional single-family loans within an eighth of a mile from the property.
2. BC is the number of foreclosures of conventional single family loans between an eighth and a quarter of a mile from the property.
3. AG is the number of foreclosures of government-insured single-family loans within an eighth of a mile from the property.
4. BG is the number of foreclosures of government-insured single-family loans between an eighth and a quarter of a mile from the property.
5. AO is the number of other foreclosures (multifamily and commercial property) within an eighth of a mile from the property.
6. BO is the number of other foreclosures (multifamily and commercial property) between an eighth and a quarter of a mile from the property.

To estimate equation (1), we were able to obtain property characteristics and sales prices for over 9,600 detached, single-family properties that were sold in Chicago in 1999. These data do not include all single-family transactions in the city. The data were originally assembled by the Illinois Department of Revenue, which obtains them from state real estate transfer tax records. The department cleaned the data, eliminated transactions that have extreme ratios of sales price to assessed value, and then provided a 50 percent random sample of the remaining residential property sales.

Data on property characteristics are from the Cook County Assessor's office and are for the 1999 assessment year. Because we expect a lag between foreclosures and their effect on property values, we gathered data on foreclosures in the city in 1997 and 1998.

Before we estimate equation (1), it is helpful to examine the average values of the independent variables of interest for different types of neighborhoods. Table 1 breaks these variables out by the income level of the census tract. It shows that the average number of foreclosures surrounding a property within a radius of an eighth of a mile drops from 2.07 conventional and 1.08 government foreclosures in low-income tracts to 0.38 conventional foreclosures and 0.09 government foreclosures surrounding properties in upper-income tracts. Between an eighth and a quarter of a mile, the average number of conventional foreclosures drops from 5.49 for low-income tracts to 1.03 for upper-income tracts, and the average number of government-guaranteed foreclosures drops

**Table 1.** Average Number of Nearby Foreclosures (1997 and 1998) by Neighborhood Income, Chicago

Number of Foreclosures by Type and Radius	Income of the Census Tract, 1999			
	Low	Moderate	Middle	Upper
Conventional, within 1/8 mile	2.07	1.74	0.78	0.38
Government, within 1/8 mile	1.08	0.99	0.37	0.09
Conventional, 1/8 to 1/4 mile	5.49	4.50	2.23	1.03
Government, 1/8 to 1/4 mile	2.79	2.69	1.04	0.23
Other, within 1/8 mile	0.13	0.14	0.06	0.03
Other, 1/8 to 1/4 mile	0.60	0.46	0.18	0.15
Average sales price	\$99,117	\$113,286	\$147,987	\$294,408

*Note:* Low-income tracts are those where median family income is below 50 percent of the metropolitan median income. Moderate-income tracts are those where median family income is between 50 and 79 percent of the metropolitan median. Middle-income tracts are those where median family income is between 80 and 119 percent of the metropolitan median. Upper-income tracts are those where median family income is 120 percent or more of the metropolitan median.

from 2.79 to 0.23, respectively. Multifamily and commercial foreclosures (grouped here as “other”) exhibit similar patterns.

On average, the number of conventional foreclosures within a block (an eighth of a mile) of properties in low-income tracts is more than five times the number of conventional foreclosures within a block of properties in upper-income tracts. In the case of government-guaranteed loans, the difference is more than 11-fold. Similar differences occur when foreclosures between one and two blocks away are considered.

### Results of the multivariate analysis

The estimation of equation (1) is presented in table 2. Results are given for two versions of the equation. The first model includes all available property characteristics, neighborhood characteristics expected to influence property values, and the foreclosure variables. The second includes an additional independent variable: the median home value for the census tract in which the property is located. This variable, which is added to control for the possible effect of nearby property values on the central property value,  $p$ , also reduces the vulnerability of the results to concerns that there may be important variables that change across neighborhood space, that these are unmeasured or unobserved, and that they influence  $p$ .

The first model (without tract median property value) gives results for most property and neighborhood characteristics that are generally consistent with previous research on property values, as well as with theory. Most, but

**Table 2.** Regression Results for Estimation of Single-Family Property Values

	Without Tract Median Property Value		With Tract Median Property Value	
	Coefficient	Standard Error	Coefficient	Standard Error
(Constant)	8.20622	0.12882***	7.20178	0.12346***
LN(LAND AREA)	0.17683	0.01157***	0.21856	0.01088***
LN(BLDNG AREA)	0.46189	0.01668***	0.41050	0.01566***
AGE	-0.00205	0.00017***	-0.00210	0.00016***
# of BEDROOMS	0.00711	0.00562	0.01609	0.00526***
TWO STORY+ ?	-0.03792	0.00879***	-0.04633	0.00822***
MASONRY?	-0.01300	0.00863	0.00445	0.00808
FRAME/MASONRY?	-0.01795	0.01285	-0.00589	0.01202
SLAB?	0.02307	0.01017**	0.01771	0.00951*
BASMNT FINISHED?	0.01476	0.00809*	0.01199	0.00756
FULLATTIC?	-0.00301	0.00908	-0.00826	0.00849
PARTIAL ATTIC?	0.02498	0.01041**	0.00939	0.00974
ATTICFINISHED?	0.01077	0.01090	0.00385	0.01020
CENTRAL AIR?	0.02882	0.00897***	0.01686	0.00839**
1-CAR GARAGE?	0.03690	0.00859***	0.02222	0.00804***
2-CAR GARAGE?	0.07122	0.00843***	0.05355	0.00789***
FIREPLACE?	0.12510	0.01184***	0.08725	0.01112***
RAIL W/IN 1/8 ML?	-0.01845	0.00785***	-0.02662	0.00735***
MILES TO EL TRAIN	-0.04954	0.00567***	-0.04948	0.00530***
MILES TO HIWAY	0.00621	0.00367*	0.01130	0.00344***
APRL_JUN?	0.04891	0.00927***	0.04941	0.00867***
JULY_SEP?	0.07850	0.00921***	0.07393	0.00861***
OCT_DEC?	0.07465	0.01019***	0.07359	0.00953***
LATITUDE	2.22553	0.15494***	1.47511	0.14629***
LONGITUDE	-2.59858	0.23966***	-2.02806	0.22463***
LAT*LAT	-3.31249	0.77186***	0.88124	0.73055
LONG*LONG	5.52803	1.47679***	9.88299	1.38592***
LAT*LONG	-13.08793	1.43754***	-11.86481	1.34465***
POPENSITY	3.649E-06	6.288E-07***	3.633E-06	5.880E-07***
LOWINCOME	-0.53197	0.02574***	-0.26993	0.02509***
MODINCOME	-0.37888	0.01624***	-0.13476	0.01654***
MIDDLEINCOME	-0.20987	0.01065***	-0.03843	0.01097***
PPUBASSISTNCE	-1.42312	0.13112***	-1.01365	0.12310***
PPOWNOC	-0.34445	0.03045***	-0.21342	0.02869***
VCRIME/CAPITA	-3.71817	0.66097***	-3.15170	0.61826***
PPBLACK	-0.41891	0.02535***	-0.25280	0.02412***
PPHISPANIC	-0.43438	0.02405***	-0.21386	0.02326***
CNVL_1/8	-0.01136	0.00291***	-0.00907	0.00272***
CNVL_1/8-1/4	-0.00325	0.00158**	-0.00189	0.00148

**Table 2.** Regression Results for Estimation of Single-Family Property Values  
*Continued*

	Without Tract Median Property Value		With Tract Median Property Value	
	Coefficient	Standard Error	Coefficient	Standard Error
GOV_1/8	-0.00299	0.00422	-0.00331	0.00394
GOV_1/8-1/4	0.00063	0.00233	-0.00131	0.00217
OTHER_1/8	-0.05745	0.01042***	-0.04672	0.00975***
OTHER_1/8-1/4	-0.01618	0.00592***	-0.01015	0.00554*
Median home value			2.963E-06	7.977E-08***
R <sup>2</sup>	0.727		0.761	
N = 9,642				

*Note:* The dependent variable is the natural log of the sales price of a single-family property.  
\* $p < 0.10$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

not all, property characteristics are measured by dummy variables, with a 1 indicating the presence of the feature (e.g., masonry construction) and a zero indicating its absence. (Dummy variables are followed by a question mark.) An increase in the square footage of the home itself, or the land, results in increased value. Other things being equal, single-story buildings are more valuable than multistory ones. Amenities such as a finished basement, central air conditioning, a fireplace, and a one- or two-car garage add value. On the one hand, being located within a block or so of a railroad track reduces property values, while on the other, value declines as the distance from an elevated train or subway stop increases. The regression also controls for seasonality effects on prices, which prove to be significant.

Neighborhood characteristics prove to be quite significant predictors of property values. Lower incomes among residents, higher percentages of residents on public assistance, and higher levels of violent crime are among the variables that have negative effects on property values.

Four variables are included to control for the possibility that the impacts of the neighborhood and property characteristics on value vary across space. It may be that the attributes of a property contribute differently to value in some parts of the city as opposed to others. This phenomenon, sometimes called spatial submarket segmentation, can be accounted for by an econometric technique that controls for spatial location throughout the city.<sup>1</sup>

<sup>1</sup> This technique is referred to as spatial contextual expansion with quadratic trend. See Galster et al. (2004).

This method entails including the latitude, the longitude, the latitude squared, the longitude squared, and the product of the latitude and longitude as independent variables. They are generally highly significant, indicating the presence of spatial submarkets within the city.

The variables that indicate the effect of foreclosures on property values are the last six in the first regression (CNVL\_1/8 through OTHER\_1/8-1/4). The results of the first model indicate that nearby foreclosures generally have significant, negative effects on property values. However, the results for foreclosures of government-guaranteed loans are not significant, and the sign is somewhat ambiguous. Moreover, while the magnitude of the coefficients for the multi-family and commercial foreclosures combined is somewhat larger than for single-family foreclosures, table 1 shows that the incidence of such foreclosures is much lower, so that as a group, they are less important than single-family foreclosures.

When other things are held constant, for each additional conventional foreclosure within an eighth of a mile of a house, property value is expected to decrease by 1.136 percent. Given an average sales price of \$164,599 for homes in the city, this amounts to a decrease in value of approximately \$1,870 per property because of a single foreclosure within an eighth of a mile. For foreclosures in the band from an eighth to a quarter of a mile from a property, the effect is 0.325 percent per foreclosure. The marginal effect of a multifamily or commercial foreclosure is somewhat larger than the effect of a conventional single-family foreclosure simply because these buildings tend to be much larger and therefore have significantly more capacity for physical disorder.

In the second, expanded regression, most variables that were significant in the first regression remain so and tend to carry the same sign. In this more conservative estimate, the coefficient on conventional foreclosures within an eighth of a mile is somewhat smaller, but the impact of an additional foreclosure on property value remains close to a 1 percent reduction (0.9 percent). In this specification, the effect of foreclosures in the second band (an eighth to a quarter of a mile) remains negative, but becomes statistically insignificant. Government foreclosures are still statistically insignificant.

It is important to point out that the methods used in this analysis have certain limitations. First, while we have included a wide variety of structural and neighborhood characteristics, especially those that are found to be important in the literature on property values, the data on structural characteristics are limited by what the county assessor collects and reports. Second, while we did run a model using a regular, nonlogged version of sales prices and found similar results, there are other possible sensitivities to functional form that might be worth additional exploration. In particular, problems of multicollin-

earity prohibited us from testing for interactions between neighborhood attributes such as race and income. A larger, broader data set might reduce such problems.

Finally, there remains a possibility that the negative relationship between foreclosures and property values is as much the effect of property values on foreclosures as the other way around. If the lower value of the observed property (the centroid in figure 3) is highly correlated with those of nearby properties, then we may be measuring the impact of lower value on the likelihood of foreclosure. Other things being equal, a lower property value and, more important, lower owner equity are likely to positively affect the probability of foreclosure because the owner has less equity at risk.

We attempt to minimize the problem of reverse causation in two ways. First, the spatial structure of our model, as illustrated by figure 3, measures the effects of surrounding foreclosures on the value of a single property at the central focus of the foreclosures. Second—and related to the first point—is the addition of neighborhood median property value as an additional independent variable. Because nearby property values may affect foreclosures in areas A and B in figure 3, we control for such values, although perhaps imperfectly, via the median tract value.

The use of the median home value for the tract is by no means a perfect method for dealing with the potential endogeneity of the nearby foreclosures. Our data on nearby property values are measured at the census-tract level, which is larger than the eighth of a mile radius around each property. However, it was the best method available. We could not identify any appropriate instruments with which to address endogeneity via an instrumental variables approach. In addition, change-over-time analysis was precluded by the limited sales and property data available. Future research should aim to address these limitations.

### **Effects of foreclosures on property values in low- and moderate-income tracts**

Given that low- and moderate-income neighborhoods experience a substantially higher level of foreclosures and given that such foreclosures may be more likely in vacant, abandoned, or blighted property than in property in more affluent areas, it is useful to determine whether the effects of foreclosures in such neighborhoods differ from the effects for all transactions. To do this, we estimate equation (1), both the basic and expanded versions, for only the 2,265 property transactions in low- and moderate-income tracts in the city.

As seen in table 3, the results of the regression without median home value indicate that for each additional foreclosure within an eighth of a mile of a

**Table 3.** Regression Results for Estimation of Single-Family Property Values: Low and Moderate-Income Tracts Only

	Without Tract Median Property Value		With Tract Median Property Value	
	Coefficient	Standard Error	Coefficient	Standard Error
(Constant)	7.37096	0.34354***	6.99667	0.32539***
LN(LAND AREA)	0.30429	0.03274***	0.31818	0.03095***
LN(BLDNG AREA)	0.38210	0.04555***	0.26966	0.04358***
AGE	-0.00259	0.00042***	-0.00249	0.00040***
# of BEDROOMS	0.00451	0.01480	0.01623	0.01400
TWO STORY+ ?	-0.02011	0.02771	-0.02561	0.02619
MASONRY?	0.05343	0.02370**	0.05471	0.02239**
FRAME/MASONRY?	0.06078	0.03804	0.05468	0.03594
SLAB?	0.06074	0.02743**	0.04441	0.02594*
BASMNT FINISHED?	0.00628	0.02452	0.00517	0.02317
FULLATTIC?	-0.01264	0.02568	-0.02741	0.02428
PARTIAL ATTIC?	0.07808	0.03145**	0.03821	0.02982
ATTICFINISHED?	0.03305	0.03073	0.01771	0.02905
CENTRAL AIR?	0.05745	0.03678	0.05179	0.03475
1-CAR GARAGE?	0.04872	0.02279***	0.03378	0.02155
2-CAR GARAGE?	0.05765	0.02303***	0.04827	0.02177**
FIREPLACE?	0.20408	0.04046***	0.14086	0.03843***
RAIL W/IN 1/8 ML?	-0.07384	0.02051***	-0.05962	0.01939***
MILES TO EL TRAIN	-0.04295	0.01880**	-0.04099	0.01776**
MILES TO HIWAY	-0.03628	0.01670**	0.01183	0.01605
APRL_JUN?	0.06782	0.02606***	0.05872	0.02462**
JULY_SEP?	0.09813	0.02599***	0.08662	0.02456***
OCT_DEC?	0.08820	0.02754***	0.07850	0.02603***
LATITUDE	2.63795	0.58542***	1.96816	0.55464***
LONGITUDE	-0.22046	0.89249	-1.06925	0.84485
LAT*LAT	4.17514	2.53047*	6.58625	2.39543***
LONG*LONG	-2.65742	6.13045	7.36781	5.82458
LAT*LONG	-4.68975	7.56949	-10.11835	7.15967
POPDENSITY	-5.522E-07	1.310E-06	8.400E-07	1.241E-06
LOWINCOME	-0.06440	0.03031**	-0.08024	0.02866***
PPUBASSISTNCE	-0.35926	0.24600	0.19156	0.23485
PPOWNOCC	-0.07457	0.09109	0.03952	0.08634
VCRIME/CAPITA	-4.92566	1.24905***	-3.72182	1.18244***
PPBLACK	-0.77435	0.08212***	-0.49459	0.07945***
PPHISPANIC	-0.66048	0.08150***	-0.36556	0.07908***
CNVL_1/8	-0.01792	0.00594***	-0.01442	0.00561***
CNVL_1/8-1/4	-0.00033	0.00321	0.00045	0.00304
GOV_1/8	0.00709	0.00810	0.00446	0.00766



**Table 3.** Regression Results for Estimation of Single-Family Property Values: Low and Moderate-Income Tracts Only *Continued*

	Without Tract Median Property Value		With Tract Median Property Value	
	Coefficient	Standard Error	Coefficient	Standard Error
GOV_1/8-1/4	0.00500	0.00466	0.00175	0.00440
OTHER_1/8	-0.03761	0.02242*	-0.02923	0.02119
OTHER_1/8-1/4	-0.01350	0.01213	-0.00981	0.01146
Median home value			4.098E-06	2.502E-07***
R <sup>2</sup>	0.538		0.588	
N = 2,265				

Note: The dependent variable is the natural log of the sales price of a single-family property.

\* $p < 0.10$ . \*\* $p < 0.05$ . \*\*\* $p < 0.01$ .

house, property value drops by almost 1.8 percent. The average selling price in low- and moderate-income tracts is \$111,002, so this effect amounts to approximately \$1,989 for such a property. The more conservative estimate of the effect of close-in foreclosures, obtained in the expanded regression with median tract value included, is 1.44 percent or about \$1,600 for the average property.

### Summing up the effects of foreclosures and property values

The marginal impact on property values from one additional foreclosure on one nearby property can be used to estimate the cumulative effects of increased foreclosures on single-family property values throughout the city. We begin by estimating the impact of foreclosures at the tract level. For each tract, the impact of conventional single-family (one- to four-unit) foreclosures on the value of single-family (one- to four-unit) buildings is calculated. (These estimates do not include any effects on the value of condominiums, multifamily rental properties, or commercial properties.) We use the marginal effects (coefficient values) from table 2. For each tract, the cumulative effect of 1997 and 1998 foreclosures on property values within a quarter of a mile is then estimated as follows:

$$\begin{aligned} \text{Cumulative tract-level decline in the values of single-family} & \quad (2) \\ \text{properties} = & \text{[Number of foreclosures in the tract]} * \text{[median} \\ & \text{home value in the tract]} * \text{[(average number of single-family} \\ & \text{properties in the ring with the } \frac{1}{8}\text{-mile radius)} * (1.136\% \text{ value} \\ & \text{effect)} + \text{(average number of single-family properties in the} \\ & \text{rings with the } \frac{1}{8}\text{-mile and } \frac{1}{4}\text{-mile radii)} * (0.325\% \text{ value effect)}] \end{aligned}$$

The rings are assumed to have the same single-family housing densities as the tract as a whole.<sup>2</sup> Because foreclosures are more likely to occur in those parts of tracts where owner-occupied housing is denser, this assumption yields a conservative estimate of the number of homes that are close to foreclosures.

To provide an even more conservative estimate of the impact of foreclosures on property values, we also performed another calculation that assumes first that there is no effect on properties more than an eighth of a mile from a foreclosure and second that the effect on properties within an eighth of a mile is the smaller 0.907 percent effect shown in the expanded (right-hand side) results of table 2.

Equation (2) and its more conservative counterpart are calculated for every census tract in Chicago. The aggregate impact of foreclosures on one- to four-unit single-family properties in Chicago alone is then estimated by summing these values for all tracts. Under the less conservative assumption, the cumulative impact is estimated to exceed \$1.39 billion. The more conservative assumption yields an impact of more than \$598 million. Given that there were 3,750 conventional single-family foreclosures in the city in 1997 and 1998, this corresponds to average losses of between \$159,000 and \$371,000 per foreclosure.

Again, these estimates are only for the effects of 1997 and 1998 foreclosures. Levels have risen considerably since then. Also, these figures do not reflect the effects of foreclosures on all properties, particularly on condominiums, multifamily rental properties, and commercial buildings.

Figure 4 uses the more conservative figure to plot the estimated loss in the value of single-family properties by census tract because of 1997 and 1998 conventional single-family foreclosures. It shows that tracts with the highest levels of lost value tend to be in the south, southwest, and northwest parts of the city. Given the fact that these communities tend to be highly residential and contain mostly detached, single-family homes, this is not surprising. The building stock of neighborhoods closer to the lake and the central city tends to be more dominated by large, multifamily residential buildings and large commercial and industrial structures.

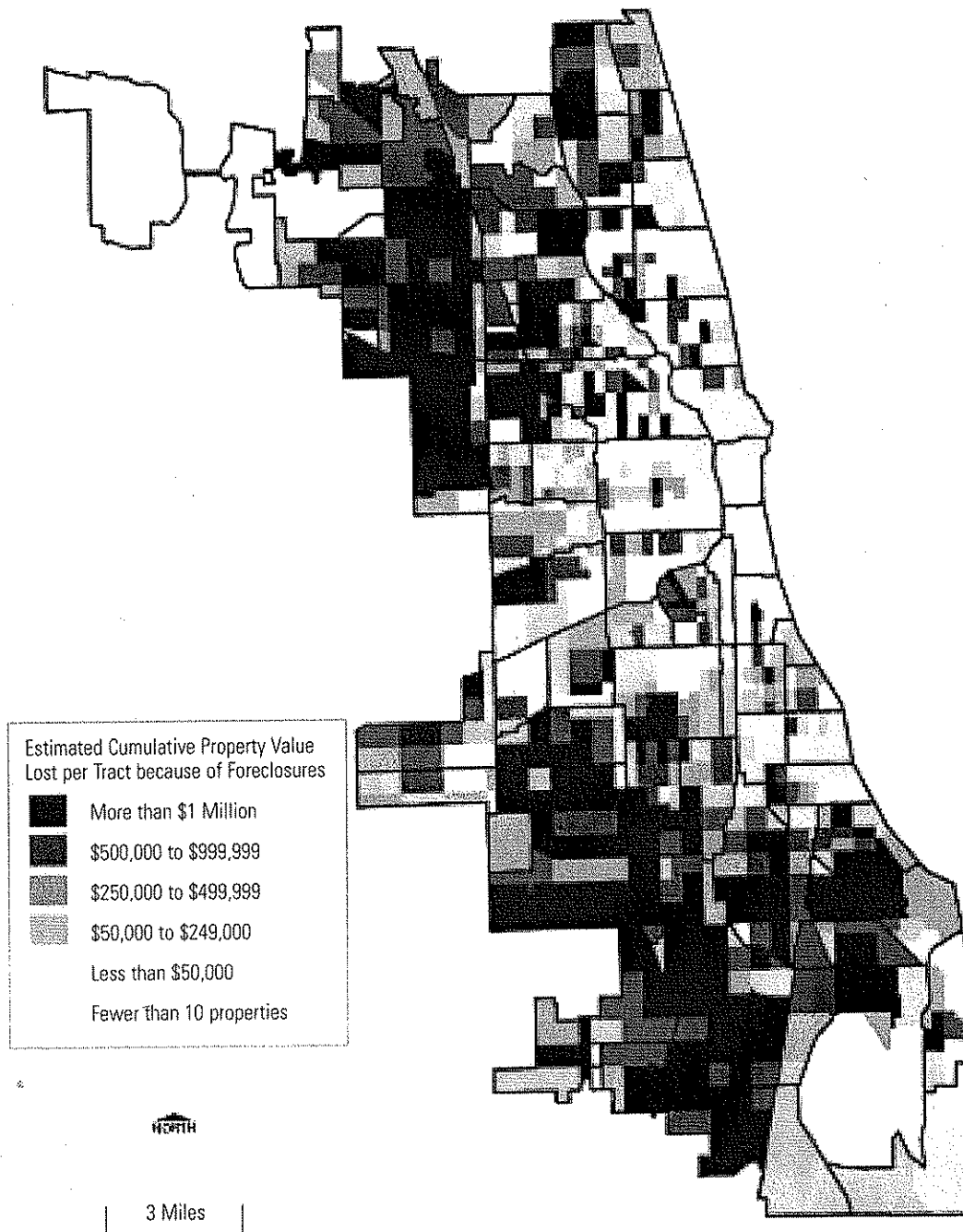
### **Policy implications and discussion**

Foreclosures, particularly in lower-income neighborhoods, can lead to vacant, boarded-up, or abandoned properties that in turn contribute to physi-

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<sup>2</sup> The inner ring has an area of 0.04908 square miles, while the outer ring has an area of 0.14727 square miles. The number of properties in these rings is estimated by multiplying the density of the properties in the tract by the corresponding area.

**Figure 4.** Cumulative Effect of 1997–1998 Foreclosures on Single-Family Property Values, City of Chicago



cal disorder in a community—disorder that can create a haven for criminal activity, discourage the formation of social capital, and lead to more disinvestment. Since foreclosures lead to such negative effects, we would expect them to also lead to lower property values in their immediate vicinity, especially for residential property.

Our findings demonstrate that conventional foreclosures have a statistically and economically significant effect on property values. We provide a relatively conservative measure of such effects by estimating only the effects on single-family properties and excluding condominiums, multifamily rental properties, and commercial buildings. The magnitude of the impact for Chicago is between \$598 million and \$1.39 billion.

These findings have implications for the regulation of subprime mortgage lending, the regulation of the growing segment of exotic mortgage products in the prime market, and policies that aim to expand homeownership to include a broader segment of lower-income households. There are also implications for community reinvestment policy and foreclosure law itself.

First, our findings have clear implications for the regulation of subprime mortgage lending. A variety of recent research demonstrates that foreclosures have been increasingly driven by subprime lending (Goldstein et al. 2005; Immergluck and Smith 2005; Quercia, Stegman, and Davis 2005). Moreover, such foreclosures are exacerbated by the highly concentrated nature of subprime lending in neighborhoods with large minority populations.

If policy makers are to make wise decisions about whether and how much to regulate subprime lending, they must consider not only any benefits or costs that might accrue to the lenders or borrowers who are directly involved, but also the significant costs of foreclosures borne by communities. Most of the residents of the affected communities—many of them lower-income and working-class neighborhoods—have no direct role in the foreclosures occurring around them. There are, of course, strong arguments for regulating market activity when poorly informed or unsophisticated borrowers are harmed by particular lending products or practices. The history of federal and state policy is full of precedents for protecting vulnerable citizens in economic transactions, especially ones as important as mortgage loans. However, when a certain outcome is shown to hurt parties external to the transaction, the arguments for policy intervention and for more direct policy intervention (e.g., limiting or outlawing certain practices versus simply requiring disclosure) become even more robust. Justification no longer depends on the limited financial literacy or impaired understanding of the borrowers. The substantial neighborhood harm caused by high-risk lending should be considered an important cost, regardless of the borrower's ability to make an informed financial decision.

Second, the negative impact of foreclosures on neighborhoods and cities also has implications for the regulation of the exotic, higher-risk prime mortgage products that have grown increasingly popular over the past few years. Interest-only loans, negative amortization products, and combinations of these and other higher-risk loan terms can increase the risk of default even for borrowers with strong credit histories. Moreover, the experience of the subprime market has shown that some of this risk may not be well understood until such loans are exposed to increasing interest rates, a weaker economy, or other adverse conditions.

Third, as Schwartz (2006) and others have argued, U.S. federal housing policy over the past 10 or 15 years has increasingly focused on expanding homeownership opportunities for lower-income and minority households. While this is a laudable goal from several perspectives, one risk of pushing homeownership too hard is that such policies may encourage higher-risk lending and borrowing to the point where costs outweigh benefits. Moreover, the distribution of the costs of higher-risk lending may be disproportionately borne by certain communities or neighborhoods. Of course, the challenge is to develop regulatory regimes that reduce such costs while preserving as many of the benefits of increased homeownership opportunities as possible. In the end, however, some limits on access to homeownership may have to be tolerated if concentrated foreclosures and their impacts are to be held to tolerable levels. The neighborhood costs of foreclosures we have noted suggest that policy makers would be wise to emphasize the sustainability and preservation of homeownership as much as its short-term growth.

Community reinvestment policy can be used to encourage lenders to address the problem of concentrated foreclosures. A number of activities that can be rewarded under the Community Reinvestment Act (CRA) could prove helpful in reducing foreclosures, especially those concentrated in lower-income areas. First, banks can be rewarded in their CRA examinations for offering or participating in the various types of anti-predatory lending programs being offered around the country. Such programs are usually organized by neighborhood-based community development organizations (Higgins 2005). Among those receiving the most attention is the NORMAL program of Chicago's Neighborhood Housing Services. In this program, borrowers at severe risk of foreclosure are provided with more affordable loans to refinance a predatory loan. To compensate for any predatory terms or fees, the payoff to the original lender is less than the outstanding balance. Banks can also receive credit under the CRA Investment or Service Test for supporting foreclosure prevention programs, including postpurchase counseling.

Second, CRA regulators can encourage more responsible lending and thus reduce local foreclosure rates by considering not only the quantity of lending that banks and their affiliates make in lower-income and minority neighborhoods, but also the nature and performance of those loans in bringing about sustainable homeownership. Of course, care should be taken not to adopt practices that might inadvertently discourage responsible lending in lower-income communities.

Reducing high and concentrated foreclosures is a policy objective that will serve the interests not only of consumers and neighborhoods, but of the mortgage banking industry as well. Such an objective is a natural target of bank regulatory policy in that it combines reinvestment and safety and soundness goals. For banks that make loans in impacted communities, concentrated foreclosures could adversely affect their lending markets and their collateral base by depressing property values.

Finally, the impact of foreclosures on property values and neighborhood vitality generally suggests that the nature of the default and foreclosure process itself should be considered. For example, the time that elapses between filing the foreclosure notice and the completed foreclosure sale varies greatly across states. In some states, such as Texas and Georgia, foreclosure periods can be as short as 25 to 35 days, while in others, they can last more than a year. In studying the costs of foreclosures to municipal governments, Apgar and Duda (2005) suggest that streamlining might reduce the negative effects of foreclosures by reducing opportunities for property deterioration and vandalism. Given the potential costs to individual homeowners, more research is needed to determine whether speedier or simpler foreclosure processes are likely to have the desired effects.

This article represents an initial attempt to measure the likely costs of foreclosures on neighborhood property values. More work is needed, including the development of larger databases that include more robust sales data over time. Moreover, additional program and policy development work is needed to identify the most promising methods to reduce foreclosures and to limit the negative impacts of mortgage defaults on neighborhoods and communities. Notwithstanding the need for additional research and program development, the existing evidence on the personal and social costs of foreclosures strongly suggests that policy makers should act aggressively in the near term to stem the continuing problem of high levels of foreclosures that plague so many communities around the country.

### Authors

Dan Immergluck is an Associate Professor in the City and Regional Planning Program in the College of Architecture at Georgia Institute of Technology. Geoff Smith is a Research Project Director at the Woodstock Institute.

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### References

- Apgar, William, and Mark Duda. 2005. *Collateral Damage: The Municipal Impact of Today's Mortgage Foreclosure Boom*. Washington, DC: Homeownership Preservation Foundation. World Wide Web page <<http://www.hpfonline.org/images/Apgar-Duda%20Study%20Final.pdf>> (accessed May 11).
- Cutts, Amy Crews, and Richard K. Green. 2004. *Innovative Servicing Technology: Smart Enough to Keep People in Their Houses?* Freddie Mac Working Paper No. 04-03. Washington, DC: Freddie Mac. World Wide Web page <[http://www.freddiemac.com/news/pdf/fmwp\\_0403\\_servicing.pdf](http://www.freddiemac.com/news/pdf/fmwp_0403_servicing.pdf)> (accessed August 12, 2005).
- Ding, Chengri, Robert Simons, and Esmail Baku. 2000. The Effect of Residential Investment on Nearby Property Values: Evidence from Cleveland, Ohio. *Journal of Real Estate Research* 19:23-48.
- Federal Deposit Insurance Corporation. 2004. *Economic Conditions and Emerging Risks in Banking*. April 26. World Wide Web page <<http://www.fdic.gov/deposit/insurance/risk/ceerb.pdf>> (accessed January 6, 2005).
- Galster, George, Kenneth Temkin, Chris Walker, and Noah Sawyer. 2004. Measuring the Impacts of Community Development Initiatives: A New Application of the Adjusted Interrupted Time-Series Method. *Evaluation Review* 28(6):502-38.
- Goldstein, Ira, Maggie McCullough, Al Parker, and Daniel Urevick-Ackelsberg. 2005. *Mortgage Foreclosure Filings in Pennsylvania*. Philadelphia: Reinvestment Fund. World Wide Web page <[http://www.trfund.com/policy/PA\\_Foreclosures.htm](http://www.trfund.com/policy/PA_Foreclosures.htm)> (accessed August 10).
- Higgins, Lindley. 2005. *Effective Community-Based Strategies for Preventing Foreclosures*. Neighborworks America. World Wide Web page <<http://www.nw.org/network/pubs/studies/documents/foreclosureReport092905.pdf>> (accessed December 30).
- Immergluck, Dan, and Geoff Smith. 2005. Measuring the Effects of Subprime Lending on Neighborhood Foreclosures: Evidence from Chicago. *Urban Affairs Review* 40:362-89.
- Immergluck, Dan, and Geoff Smith. 2005. *There Goes the Neighborhood: The Effect of Single-Family Mortgage Foreclosures on Property Values*. Working paper. Woodstock Institute.

- Immergluck, Dan, and Geoff Smith. 2006. The Impact of Single-Family Mortgage Foreclosures on Neighborhood Crime. *Housing Studies*, forthcoming.
- Kelling, George, and Catherine Coles. 1996. *Fixing Broken Windows: Restoring Order and Reducing Crime in Our Communities*. New York: Touchstone.
- Moreno, Anne. 1995. *The Cost-Effectiveness of Mortgage Foreclosure Prevention*. Minneapolis: Family Housing Fund.
- National Association of Realtors, Research Division. 2004. *Rising Foreclosure Rates in Indiana: An Explanatory Analysis of Contributing Factors*. March. World Wide Web page <[http://www.mibor.com/\\_pdfs/ForeclosureStudy2004.pdf](http://www.mibor.com/_pdfs/ForeclosureStudy2004.pdf)> (accessed August 25, 2005).
- Quercia, Roberto, Michael Stegman, and Walter Davis. 2005. The Impact of Predatory Loan Terms on Subprime Foreclosures: The Special Case of Prepayment Penalties and Balloon Payments. University of North Carolina–Chapel Hill, Center for Community Capitalism.
- Schwartz, Alex. 2006. *Housing Policy in the United States: An Introduction*. New York: Routledge.
- Shlay, Anne B., and Gordon Whitman. 2004. *Research for Democracy: Linking Community Organizing and Research to Leverage Blight Policy*. World Wide Web page <<http://comm-org.wisc.edu/papers2004/shlay/shlay.htm>> (accessed July 15, 2005).
- Skogan, Wesley. 1990. *Disorder and Decline: Crime and the Spiral of Decay in American Neighborhoods*. Berkeley, CA: University of California Press.
- Wilson, James Q., and George Kelling. 1982. Broken Windows: The Police and Neighborhood Safety. *Atlantic*, March, pp. 29–38.





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Buffalo Branch, Federal Reserve Bank of New York  
160 Delaware Avenue  
Buffalo, NY 14202  
Tel: (716) 849-5023  
Fax: (716) 849-5218  
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Barbara Walter  
Senior Vice President and  
Branch Manager

Reggie Melson  
Community Affairs  
Representative  
[reggie.melson@ny.frb.org](mailto:reggie.melson@ny.frb.org)

Richard Deitz, Ph.D.  
Regional Economist  
[richard.deitz@ny.frb.org](mailto:richard.deitz@ny.frb.org)



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# THE REGIONAL ECONOMY

## OF UPSTATE NEW YORK

### Examining the Rising Foreclosure Rate

Home ownership nationwide has reached a record level: 68 percent of households now own their homes. The latest recession, unlike those of the past, has seen strong home sales, rising home prices, and a generally buoyant housing market. Nonetheless, despite these encouraging trends, foreclosures on home loans are also reaching record highs.

Although the current weak economic conditions might be expected to lead to increased foreclosures, what is surprising is that foreclosures have been steadily escalating for the past twenty years—despite two strong expansions, rising incomes, and generally decreasing unemployment during the same period. The foreclosures involve only a small part of the overall housing market—less than one percent—but they likely signal serious difficulties for a significant segment of homeowners. Moreover, foreclosures raise special concern when they are concentrated in specific areas, particularly central cities, where they may be destabilizing—leading to vacancies and demolitions, damage to neighborhoods, and decline in housing values.

In this issue of *The Regional Economy of Upstate New York*, we examine the foreclosure rate in the U.S. economy and outline factors that may be contributing to its rise. We also investigate the behavior of foreclosure rates in New York State and six of its major metropolitan areas. Particular attention is given to Buffalo, where foreclosures increased fourfold in the 1990s.

While the causes of the escalating foreclosure rates remain unclear, we suggest a link to the increasing number of residential mortgages in which the amount of the loan is high relative to the value of the property. Our analysis of foreclosure rates in New York State indicates that the state rate, though below the national average during the 1980s, exceeded that average in the 1990s. Foreclosure rates in New York's metro areas were also high compared with other metro areas in the 1990s. Finally, our more detailed look at Buffalo's foreclosure patterns reveals a heavy concentration of foreclosures in three "outer-ring" city neighborhoods and a possible connection between the city's declining

property values and the sharp increase in foreclosures.

#### The Foreclosure Process

The record level of home ownership has brought a significant increase in the number of mortgages used to finance home purchases. Not all mortgages, of course, are steadily repaid. When a borrower misses a scheduled payment, the lender cannot know whether the borrower is delinquent—temporarily delaying payment—or in default, stopping repayment altogether. In this situation, the lender must decide whether to work with a delinquent borrower, possibly renegotiating the terms of the loan so that payments can be resumed, or pursue legal foreclosure proceedings to take possession of the property. Thus, the borrower's actions determine if a loan is delinquent, but the lender decides whether to consider the loan in default and initiate foreclosure.

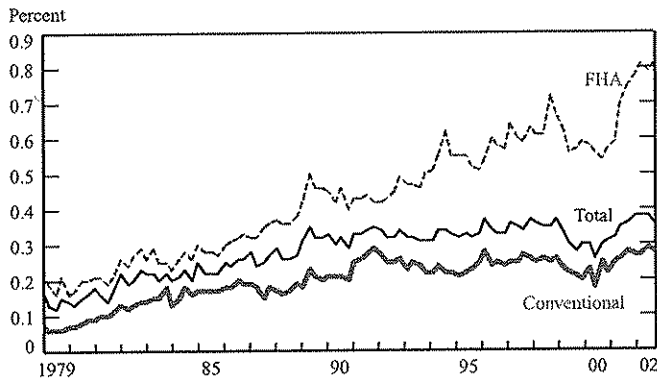
#### U.S. Foreclosure Trends

The percentage of home loans in foreclosure has generally risen over the past twenty years and, in 2002, reached a record high (Chart 1). Foreclosure rates differ, however, among the three main categories of mortgage loans: Federal Housing Authority (FHA) loans, Veterans Administration (VA) loans, and conventional loans. FHA loans, which account for approximately 14 percent of outstanding mortgages,<sup>1</sup> are insured by the government within specified loan-size limits. Lenders are, by and large, guaranteed against losses. VA loans are insured by the Veterans Administration for qualified veterans, and, like FHA loans, offer lenders protection from losses. Because VA loans account for less than 1 percent of mortgages, however, they are not examined further in this study. Conventional loans, although not insured by a government agency, may be covered by private mortgage insurance purchased by borrowers. Lenders typically require such insurance for loans when borrowers make a down payment of less than 20 percent.

The foreclosure rate on FHA loans has long been higher than that on conventional loans, and the gap between them has widened markedly (Chart 1). The fact that FHA loans tend to be made to a population with a higher

Chart 1

U.S. Foreclosure Rate



Source: Mortgage Bankers Association, National Delinquency Survey.

Notes: The National Delinquency Survey covers 25 million residential mortgage loans. The Mortgage Bankers Association defines the foreclosure rate as loans that entered the foreclosure process during the quarter as a percentage of all loans.

risk profile helps to explain this difference.<sup>2</sup> From 1980 to 1992, the foreclosure rates for conventional and FHA loans climbed steadily, increasing in economic expansions and contractions alike. During these years, the FHA rate doubled, while from 1979 to 1992, the conventional rate quadrupled. Thereafter, however, the rates diverged. While the conventional rate remained flat up through 2002, the FHA foreclosure rate doubled again between 1992 and 2002. Although the percentage of mortgages in foreclosure overall may appear small, the impact of foreclosure can be significant when concentrated in particular neighborhoods. Research on neighborhood effects is scant, but two recent studies in the cities of Buffalo and Rochester have uncovered neighborhood foreclosure concentrations (see box).<sup>3</sup>

**Why the Rise in Foreclosures?**

The reasons for the long-term increase in the aggregate foreclosure rate are not well understood—no significant studies explain this steady climb. There is, however, a large body of research that addresses the causes of delinquencies and defaults, and to a lesser extent foreclosures, on individual loans.

These studies have focused primarily on the relationship between delinquency or default and the mortgage’s loan-to-value (LTV) ratio. The LTV ratio is the amount of the loan divided by the property value. An LTV of 100 percent indicates a loan amount equal to the property value; an LTV of 80 percent indicates that the mortgagee has borrowed 80 percent of the value of the home. LTV ratios may also exceed 100 percent—in particular, when second mortgages or home-equity loans push loan amounts over the value of the mortgaged property.

Virtually every loan study finds a positive relationship between LTVs and loan payment delinquencies, defaults, and foreclosures.<sup>4</sup> The higher the LTV, the less equity a borrower has in the property and therefore the less to lose by defaulting on the loan and losing possession. Moreover, when borrowers with high-LTV loans—particularly loans whose LTV ratios approach 100 percent or more—experience serious financial difficulties or have to move, they may find that default is an economically attractive alternative to selling their property. They may not raise enough funds from the sale of the property to pay off the mortgage, and they will need additional cash to cover the

transaction costs of the sale. If these borrowers cannot cover their losses, default may be the only viable option.<sup>5</sup>

Some studies have also posited a link between borrowers’ economic difficulties and increased rates of delinquency and default. Foremost among these difficulties are financial crises: interruptions to income, job loss, the death of a spouse, divorce, unforeseen medical expenses, and other emergencies. In addition, high loan payments relative to income have been associated with a higher likelihood of default. Some research also points to increased default rates for low-income borrowers, although other studies fail to confirm this relationship.<sup>6</sup>

Another strand of the literature suggests that foreclosure rates may be influenced by the costs of foreclosure for lenders. After all, the lender ultimately decides whether or not to foreclose, and lenders who choose to take this step will incur expenses for legal proceedings as well as the transaction costs of selling the property. Studies indicate that foreclosure rates tend to be higher in states where laws make the foreclosure process faster and less expensive, such as those states that allow bypassing court-supervised foreclosures for a more streamlined process.<sup>7</sup>

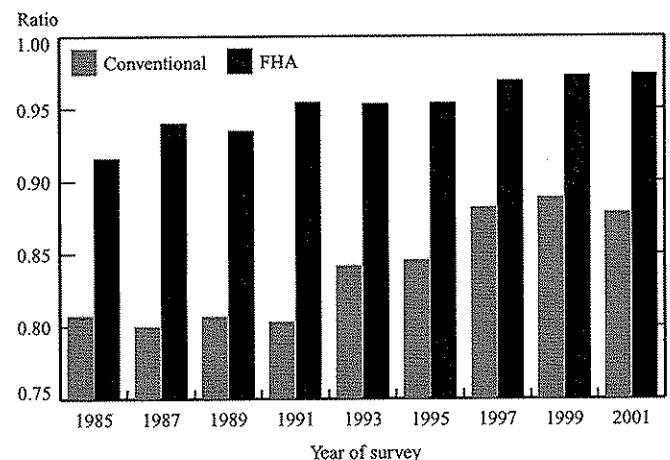
Yet even though these studies offer much insight into the causes of individual foreclosures, none examine the change in the aggregate foreclosure rate over time. Indeed, existing research leaves the long-term increase in the foreclosure rate unexplained. Nonetheless, the findings from loan-level research suggest some preliminary hypotheses about the reason for the rise in aggregate foreclosures.

First, LTV ratios have generally been increasing nationwide over the past twenty years (Chart 2). Loans with low down payments or no down payments and other high-LTV loans have proliferated over the past decade and increased average LTV ratios. Because studies strongly suggest that higher LTV ratios lead to increased foreclosures, it is likely that high-LTV loans have contributed to the burgeoning foreclosure rate.

Explaining the rising foreclosure rate in terms of borrowers’ economic circumstances, however, is much more problematic.

Chart 2

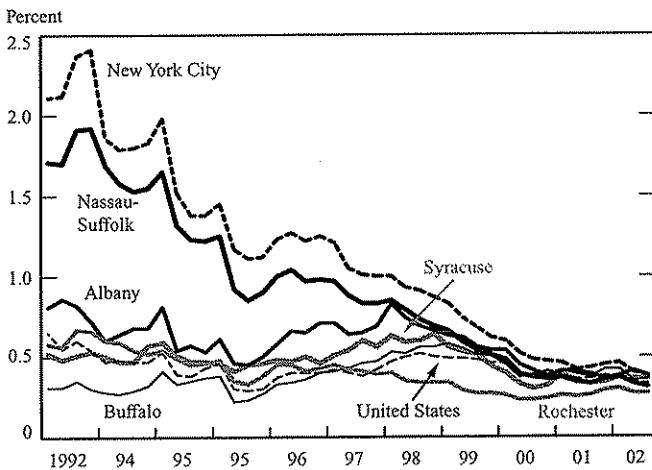
Median Loan-to-Value Ratio for U.S. Residential Mortgage Loans



Source: American Housing Survey.

Notes: The loan-to-value (LTV) ratio is calculated as the amount of a loan divided by the value of the property. The ratios plotted are based on loans made in the year of the survey and the year just prior to it. Pre-1985 data matching our criteria were not available. FHA loans are those insured by the Federal Housing Authority.

Chart 3  
Foreclosure Rates on Conventional Residential Mortgage Loans:  
New York State Metro Areas and the Nation

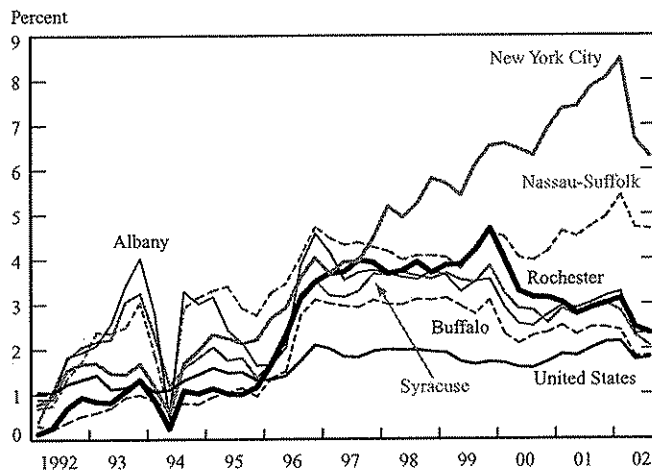


Source: Loanperformance.com.

Notes: Loanperformance.com calculates the foreclosure rate as the inventory of loans that are in foreclosure as a percentage of all loans. Data are for prime loans only; subprime loans are excluded. Except for New York City, the metro areas are those defined by the Bureau of the Census; New York City is defined as the five boroughs.

Some factors related to borrower economic status may contribute to increased delinquency and default, but it is difficult to determine precisely how these factors affect the aggregate foreclosure rate without knowing more about the circumstances of those who are delinquent. For example, although economic expansions in the 1980s and 1990s have improved economic circumstances for the broad population, some segments may not be faring as well. Moreover, it is not clear whether a segment of the homeownership population is facing an increased number

Chart 4  
Foreclosure Rates on FHA Residential Mortgage Loans:  
New York State Metro Areas and the Nation



Source: Loanperformance.com.

Notes: Loanperformance.com calculates the foreclosure rate as the inventory of loans that are in foreclosure as a percentage of all loans. FHA loans are those insured by the Federal Housing Authority. Data are for prime loans only; subprime loans are excluded. Except for New York City, the metro areas are those defined by the Bureau of the Census; New York City is defined as the five boroughs.

of economic crises. Another factor may be the increase in low-income home ownership, which rose most significantly in the 1990s. As we have seen, some research suggests that the low-income segment of the homeownership population may be more prone to delinquency and default.<sup>8</sup>

Thus, although research sheds some light on the determinants of individual defaults and foreclosures, extending that analysis to explain the long-term increase in the aggregate foreclosure rate is difficult. Rising LTV ratios have probably contributed to the increase, but we cannot readily evaluate how borrower economic circumstances are changing, and how these changes are affecting loan repayment. Furthermore, the causes of the higher LTV ratios are themselves complex and not well studied. Clearly, careful and comprehensive research is needed to control and isolate the effects of a multitude of factors on the foreclosure rate to better understand the forces behind its rise.

Table 1  
Foreclosure Rates for Selected Metropolitan Areas, 1992-2002

	Total	FHA Rank	Conventional Rank		Total	FHA Rank	Conventional Rank
Riverside	1.35	11	7	Sta Barbara	0.45	74	28
Newark	1.33	1	3	San Diego	0.44	71	36
Orange	1.32	3	1	Phoenix	0.44	61	45
New York	1.26	2	2	Dayton	0.42	41	50
Monmouth	1.24	8	4	Akron	0.41	21	51
Nassau-Suff.	1.07	4	8	Pittsburgh	0.40	44	46
New Haven	1.05	10	9	San Antonio	0.39	80	58
Berg-Passaic	1.04	13	6	Houston	0.39	72	42
Scranton	1.02	6	5	Richmond	0.39	40	80
Los Angeles	0.94	14	10	Tulsa	0.38	65	52
Philadelphia	0.93	5	16	Atlanta	0.38	45	61
Miami	0.88	16	14	Redding	0.38	58	43
Albany	0.88	18	15	Salt Lake Cty	0.38	59	57
Syracuse	0.84	15	22	Sta Rosa	0.37	69	39
Orlando	0.80	24	18	Chico-Yuba	0.36	76	49
Hartford	0.80	25	12	Greenville	0.36	46	53
Middlesex	0.80	27	11	Spokane	0.36	64	60
Allentown	0.79	9	17	Birmingham	0.35	52	75
Jacksonville	0.76	34	26	Nashville	0.35	53	79
Memphis	0.72	28	62	Oakland	0.35	66	38
New Orleans	0.70	29	29	Toledo	0.35	22	56
Rochester	0.68	12	25	Charlotte	0.34	51	65
Fairfield	0.68	20	13	Cincinnati	0.32	36	68
Fresno	0.68	42	31	St Louis	0.32	48	64
Norfolk	0.68	37	69	Louisville	0.29	62	70
Tampa	0.65	30	24	Tucson	0.29	81	67
W. Palm Beach	0.63	19	21	Kansas City	0.28	67	73
Baltimore	0.61	26	54	Minneapolis	0.27	68	77
Las Vegas	0.61	50	37	Greensboro	0.27	70	74
Honolulu	0.60	32	19	Monterey	0.25	79	59
Cleveland	0.60	7	35	Seattle	0.25	75	71
Modesto	0.59	49	27	Austin	0.24	82	78
Buffalo	0.58	31	32	Raleigh	0.22	63	83
Anaheim	0.53	43	20	Milwaukee	0.22	38	76
D.C.	0.53	35	47	Portland	0.21	78	72
Sacramento	0.52	56	33	Knoxville	0.21	77	85
Chicago	0.52	17	41	Denver	0.20	83	82
Columbus	0.50	23	44	San Jose	0.20	85	63
Boston	0.50	73	23	San Francisco	0.19	86	66
Indianapolis	0.50	33	55	Detroit	0.19	54	81
Okl. City	0.50	60	40	Omaha	0.18	84	84
Providence	0.47	39	34	Grand Rapids	0.16	55	86
Worcester	0.46	47	30				
Dallas	0.45	57	48	U.S.	0.54	38	29

Source: Loanperformance.com.

Notes: The foreclosure rate is calculated as the average of all quarterly rates from 1992 through the third quarter of 2002; data are collected on these 86 metro areas only.

**Foreclosures in New York State**

The foreclosure rate in New York State exceeded the national average for most of the 1990s, after remaining below average throughout the 1970s and 1980s. The rate rose dramatically during the 1990-91 recession—more than doubling between 1990 and 1992. That period saw a severe state recession that for some areas lasted into the early 1990s. Overall, New York State’s foreclosure rate ranked forty-fourth in the nation in the 1980s, but ninth in the nation in the 1990s.

To examine foreclosure rates within New York State, we use local foreclosure data collected by Loanperformance.com, an agency that collects loan data covering approximately 70 percent of the aggregated U.S. residential mortgage market. Data are available from 1992 to 2002 for eighty-six metropolitan areas, including New York City, Nassau-Suffolk, Buffalo, Rochester, Albany, and Syracuse.<sup>9</sup>

Foreclosure rates for New York’s metro areas were generally above the national rate during the ten-year period. The foreclosure rates for New York City and Nassau-Suffolk were among the ten highest rates for the eighty-six metro areas studied (see table). Albany and Syracuse also ranked high, with

Rochester and Buffalo ranking lower but above the national rate. FHA foreclosure rates in New York State were higher than conventional rates—the same pattern observed at the national level. While FHA foreclosure rates increased during the period, conventional foreclosure rates fell (Charts 3 and 4).

Downstate, the conventional foreclosure rates for New York City and Nassau-Suffolk were more than double those for most of the upstate metro areas during the early 1990s, but they fell steadily throughout the decade (Chart 3). Foreclosure rates for upstate metro areas fell slightly from 1992 to 1995, increased from 1995 to 1998, then increased throughout 2002. Conventional foreclosure rates for upstate and downstate metro areas converged and were essentially equivalent by 2000.

FHA foreclosure rates have behaved quite differently than conventional rates, climbing throughout much of the 1990s (Chart 4). In particular, all areas showed a sharp increase in these rates beginning in 1996. And while foreclosure rates flattened in the late 1990s for upstate metro areas, they continued to climb in New York City and Nassau-Suffolk. In New York City, the FHA foreclosure rate in 2002 was four times the national rate

*continued on last page*

**Foreclosures in the City of Buffalo**

Although the percentage of home loans that end in foreclosure has remained relatively small, the trends underlying the national and regional rise in foreclosures are worrisome. Recent studies of foreclosures in Rochester and Buffalo, conducted by the Rochester Housing Council and the Buffalo Branch of the Federal Reserve Bank of New York, indicate that during the 1990s, foreclosures quadrupled in both cities (see chart). Moreover, these increases were heavily concentrated in particular neighborhoods. In this box, we look more closely at the key findings of our study of foreclosures in Buffalo.<sup>1</sup>

We detected two patterns in the geographic distribution of foreclosures in the city (Exhibits 1 and 2). First, foreclosures increased dramatically in all parts of the city from 1990 to 2000. Second, foreclosures tended to spread into the outer ring of the city in clusters. By the year 2000, foreclosures were densely concentrated in three outer-ring neighborhoods—the Northeast, East Delavan, and the West Side. To understand the genesis

of these patterns, we matched neighborhood foreclosure rates with housing market characteristics and socioeconomic data and examined loan-level data in a sample of foreclosures.

**Declining Property Values**

Like many cities, Buffalo has some of the oldest housing in its metropolitan area and shows little growth in new homes.<sup>2</sup> The city has 28 percent of the metro area’s housing, yet more than half of the region’s pre-1939 housing stock and half of its housing vacancies. The city and metro area are losing population, and the city’s share of the metro area’s population has been declining. While the region has gained housing units, the city has experienced both a loss of housing units and an increase in vacancies.

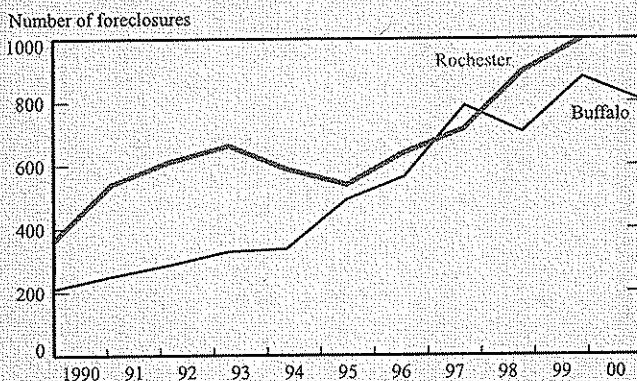
An important consequence of the reduced demand for city housing is a broad decline in property values (Table 1). Between 1998 and 2002, the median home price for existing-home sales dropped in most Buffalo neighborhoods and, in the city overall, fell 13 percent.

Such declining property values have, in turn, led to higher loan-to-value (LTV) ratios, an outcome strongly associated with a rise in foreclosures. In 2000, the median LTV of a foreclosed property in the city of Buffalo at the time of foreclosure was 119 percent.<sup>3</sup> In other words, the amount of the loan exceeded the value of the property by a significant margin. Homeowners in this predicament find that if they attempt to sell their homes, the funds raised will not cover the balance of the loan. Foreclosure will likely leave the homeowner in a better financial position than selling and may be the only viable option if there are no other funds available to cover the balance due.

**Socioeconomic Characteristics of Foreclosures**

In the Buffalo study, we examined foreclosure patterns in 2000 in relation to a number of neighborhood socioeconomic characteristics. We found that foreclosure rates were generally highest in city areas with higher incomes—although these

**Residential Foreclosures in Buffalo and Rochester, 1990-2000**



Sources: *Buffalo Law Journal*; Rochester Housing Council.

areas had incomes well below the metro area overall. Fifty-nine percent of all foreclosures were in higher-income census tracts. The foreclosure rate for stable higher-income tracts—meaning those that saw no significant change in income level from 1990 to 2000—was 0.64 percent, somewhat higher than the 0.44 percent rate for stable lower-income tracts. In addition, tracts that experienced a large decline in income experienced relatively high foreclosure rates.

Sixty-three percent of foreclosures occurred in minority census tracts, with the remaining 37 percent taking place in nonminority tracts. Furthermore, the highest foreclosure rates occurred in areas undergoing a change in racial composition, particularly a change from a white to a minority population. In these areas, the foreclosure rate was nearly double the citywide average. Census data indicate that the minority population is generally moving outward, with the greatest increase in minority population occurring in a concentric ring around the outer edges of the city. These foreclosure patterns mirror the patterns identified in a Fannie Mae study of New Orleans home loans.<sup>4</sup>

**Characteristics of Foreclosed Loans**

We also examined detailed loan records to determine the specific characteristics of foreclosed loans. We found that 38 percent of foreclosures were on homes with Federal Housing Authority (FHA) mortgages, even though FHA loans account for only 14 percent of mortgages nationwide. This result reflects both more FHA lending in the city than the nationwide average and the higher foreclosure rate on FHA loans. Most of the foreclosures were on mortgages that were used for a direct purchase, with only about one-third on mortgages used for refinancing loans. Most foreclosures occurred on relatively young loans; the average age of the loans when foreclosure proceedings were started was 5.6 years. In addition, we found that foreclosures were nearly evenly split between owner-occupied and investor-

Table 1  
City of Buffalo Housing Market, 1998-2002

	Existing Home Sales Percentage Change	Median Home Price Percentage Change	Median LTV in 2000 (Percent)	Foreclosure Rate in 2000 (Percent)
N. East	26	-11	119	1.03
E. Delavan	14	-37	125	0.96
East Side	44	-25	159	0.56
Riverside	46	-6	124	0.49
S. Buffalo-River	33	-15	110	0.48
W. Side-Central	75	-54	105	0.47
Ellicott-Masten	103	0	153	0.32
N. Buffalo-Elmwood	41	5	112	0.22
Buffalo total	35	-13	119	0.53

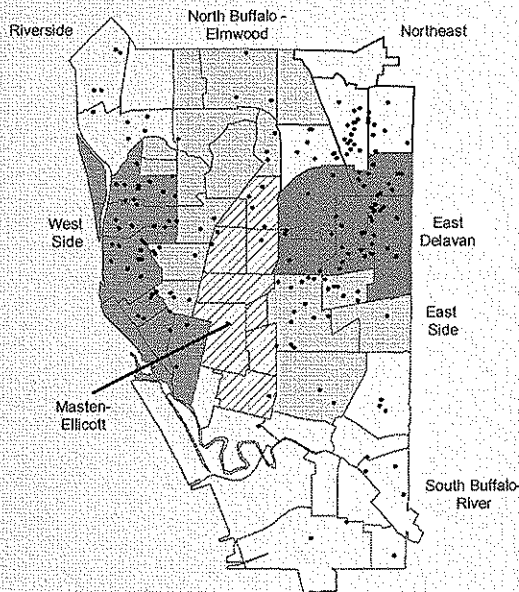
Sources: Buffalo Association of Realtors' City of Buffalo. Notes: Because overall loan data were unavailable for the city, we defined the foreclosure rate as total foreclosures divided by total housing units. The first year that data on median home prices by neighborhood were available was 1998, see footnote 3 regarding the computation of LTV.

owned properties. Owner-occupants, however, foreclosed at approximately a 50 percent faster rate, and new homeowners accounted for the majority of foreclosures.

The Buffalo study will be published by the Buffalo Branch of the Federal Reserve Bank of New York in June. Visit [www.newyorkfed.org](http://www.newyorkfed.org) for more details.

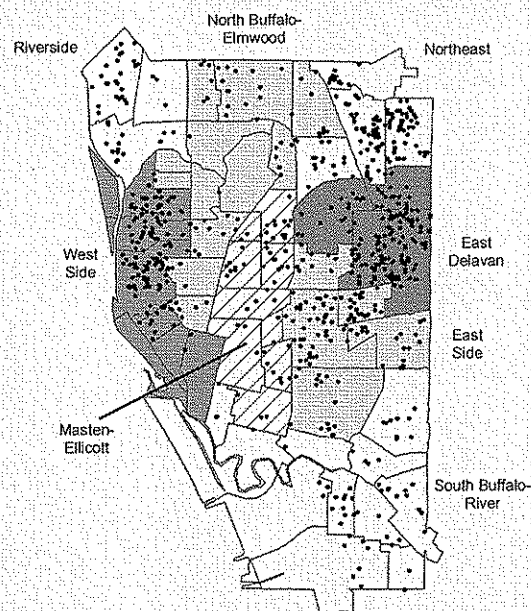
Notes:  
<sup>1</sup> Foreclosure data were gathered from individual records from the *Buffalo Law Journal*, the Erie County Clerk's office, and the City of Buffalo; some of the results presented are based on samples. For further details on methodology, see the complete report.  
<sup>2</sup> The Buffalo metropolitan area consists of Erie and Niagara counties.  
<sup>3</sup> Technically, our measure is not the median LTV ratio but the median judgment relative to the value of the foreclosed property. The judgment is the amount homeowners owed on their mortgages at foreclosure, and includes the outstanding balance on the loan's principal, plus interest, attorney and court fees.  
<sup>4</sup> See Mickey Lauria, "A New Model of Neighborhood Change: Reconsidering the Role of White Flight," *Housing Policy Debate* 9, no. 2 (1998): 395-424.

Exhibit 1  
Foreclosures by Neighborhood, Buffalo, 1990



Sources: City of Buffalo, Division of Planning, Buffalo Law Journal

Exhibit 2  
Foreclosures by Neighborhood, Buffalo, 2000



Sources: City of Buffalo, Division of Planning, Buffalo Law Journal

## THE REGIONAL ECONOMY

and, in Nassau-Suffolk, double the national rate. Overall, during the period from 1992 to 2002, New York City had the second-highest average FHA foreclosure rate of the eighty-eight metro areas studied. FHA foreclosure rates for New York State's metro areas ranked in the top quartile during the period from 1992 to 2002—with the exception of Buffalo.

Given the lack of research explaining the increase in foreclosures at the national level, it is difficult to assess the causes and pattern of New York State's relatively high foreclosure rates. Nonetheless, studies of foreclosures in Buffalo and Rochester suggest that property values have declined in the central cities of upstate metro areas. This decline has contributed to high LTV ratios and, in some cases, negative equity (see box). More detailed data on the geographic location and specific characteristics of foreclosures in individual metro areas, however, will be necessary to understand the sources and behavior of foreclosures in New York State.

### Conclusion

The U.S. foreclosure rate has been rising steadily for the past twenty years, reaching a level of 0.37 percent in 2002. Our analysis indicates that New York State has had an above-average foreclosure rate since the 1990-91 recession, with New York City and Nassau-Suffolk ranking particularly high among a peer group of metro areas from 1992 to 2002.

While research addressing the causes of rising foreclosure rates is negligible, the importance of understanding these causes is great, because foreclosures may well affect particular segments of homeowners disproportionately. Foreclosure studies in the cities

of Rochester and Buffalo, for example, have uncovered significant concentrations of foreclosures in specific neighborhoods. Further research into the causes and impacts of these trends is surely needed to identify effective responses to the clustering of foreclosures and the continued rise in the foreclosure rate.

### Notes:

<sup>1</sup> U.S. Census Bureau, American Housing Survey, 2001.

<sup>2</sup> FHA borrowers tend to be younger, more credit-constrained, and live in areas with below-average incomes; see Harold Bunce et al., *An Analysis of FHA's Single Family Insurance Program* (Washington, D.C.: U.S. Department of Housing and Urban Development, Office of Policy Development and Research, 1995).

<sup>3</sup> For an example in New Orleans, see Mickey Lauria, "A New Model of Neighborhood Change: Reconsidering the Role of White Flight," *Housing Policy Debate* 9, no. 2 (1998), 395-424.

<sup>4</sup> For a comprehensive review of these studies, see Roberto Quercia, "Residential Mortgage Default: A Review of the Literature," *Journal of Housing Research* 3, no. 2 (1992): 341-79.

<sup>5</sup> Default likely affects credit history, however. Borrowers who choose this course must reckon with this additional cost.

<sup>6</sup> See Nicolas Retsinas and Eric Belsky, eds., *Low-Income Homeownership: Examining the Unexamined Goal* (Washington, D.C.: Brookings Institution, 2002); and Roberto Quercia, "Residential Mortgage Default."

<sup>7</sup> See Terrence Claurette, "The Impact of Interstate Foreclosure Default Differences and the Value of Mortgages on Default Rates," *American Real Estate and Urban Economics Association Journal* 15, no. 3 (1987). New York State does not allow such nonjudicial foreclosures.

<sup>8</sup> See, for example, Belsky and Duda, "Anatomy of the Low-Income Homeownership Boom in the 1990s," in *Low-Income Homeownership: Examining the Unexamined Goal*.

<sup>9</sup> The data from Loanperformance.com cover only prime loans; subprime loans, made to those with poorly established credit or banking histories, are excluded. In this regard, the data differ from the Mortgage Bankers Association (MBA) foreclosure data. Moreover, Loanperformance.com tracks the inventory of loans in foreclosure, while MBA tracks only those loans that entered the foreclosure process during the immediate quarter. For this reason, the foreclosure rates calculated by Loanperformance.com will tend to be higher than those estimated by MBA.

*Richard Deitz and Ramon Garcia*

*Research support was provided by Anthony Kurdziel*

The views expressed in this newsletter are those of the authors and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.

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## FICO Score Trends in Today's Economic Uncertainty

New study explores changing risk dynamics and how lenders can respond

Number 18 — July 2009

As changing economic conditions continue to challenge financial institutions worldwide, many risk managers are trying to make sense of evolving bureau risk score trends and dynamics.

Many have turned to FICO with questions like: Are scores accurately reflecting increasing risk? Why is a 700 FICO® score performing like a 670? Are consumers scoring lower given increases in delinquency rates? Should I alter my cutoff given the riskier environment?

FICO conducted an analysis on recent bureau data to better understand potential changes in risk dynamics. Key findings included:

*FICO conducted an analysis on recent bureau data to better understand FICO® score trends and potential changes in risk dynamics. This paper highlights the most significant findings and provides guidance for best practices.*

- **FICO® scores continue to rank-order risk**—in other words, the higher the score, the lower the risk. This holds true on the general population, for industry segments (bankcard, auto and mortgage) and over time.
- **FICO® score distributions have remained relatively stable over time** for the general population. There is a slight movement toward the lower and higher ends of the score range in more recent time periods.
- **FICO® scores do move when there's a meaningful change in credit behavior.** If a consumer experiences a job loss or other hardship, for example, the FICO score reflects higher risk when the consumer's credit behavior itself changes and that change is reflected in their credit file.

- **The odds-to-score relationship has remained relatively stable** over time on the general population.
- **More recent data samples reflect increased consumer risk** when looking at various industry verticals. This is especially noticeable on the more recent mortgage vintages, reflecting the current stress of that industry segment.

This paper will explore these findings in more detail, answer common questions about FICO® score performance, and discuss best practices for using and tracking FICO scores.

» INSIGHTS

» **Does the FICO® score still assess risk effectively?**

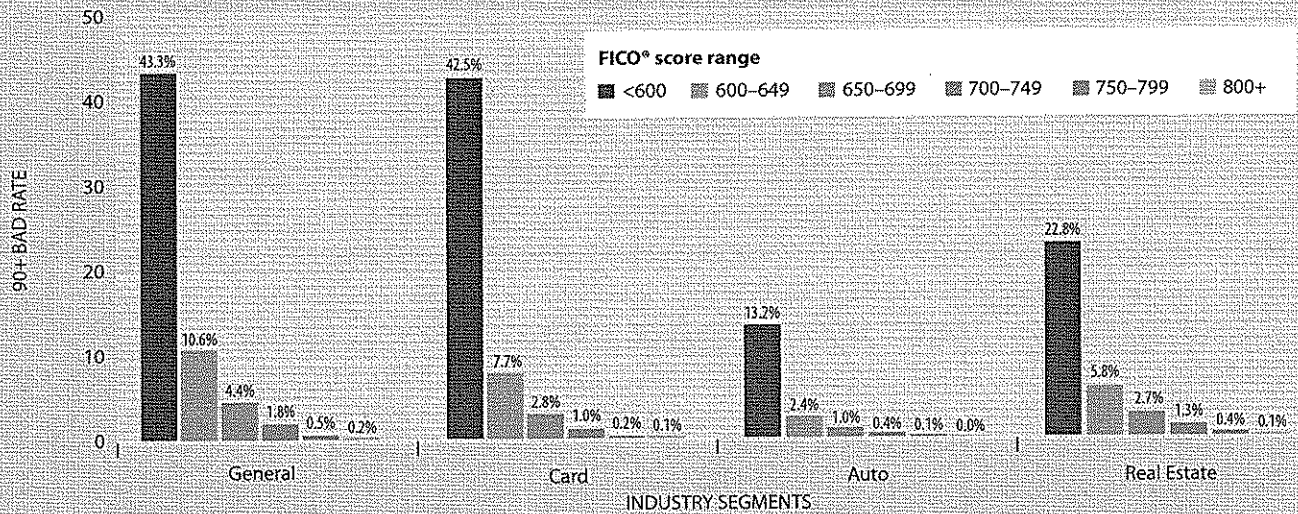
The FICO® score is designed to rank-order risk, and research shows that it continues to do so in the current economic climate. The scores remain an effective tool to help lenders identify consumers more likely at risk of default or too risky for new credit extension.

Research results show that higher-scoring consumers demonstrate better future performance (lower bad rates or more favorable odds) compared to consumers who score lower. This rank-ordering holds true for different industry segments (e.g., auto, mortgage, credit card, retail), across different time periods, as well as for different account sourcing strategies (direct mail, retail branch, internet) and product terms (30 year fixed, 5 year ARM).

Figure 1 illustrates this concept by industry segment. Consumers with an existing auto, bankcard or mortgage credit obligation are scored as of October 2008, and their performance is measured for that credit product over the subsequent six-month window.

Figure 1: FICO® scores continue to rank-order risk

90+ Bad Rate by Industry  
6 month performance (November 2008–April 2009)



The validation results show that those consumers identified as high risk by the FICO® score resulted in higher bad rates compared to those identified as lower risk. This holds true for the general population, as well as for credit cards, auto loans and mortgages.



**» INSIGHTS**
**» Why is a 700 FICO® score performing like a 670? Isn't performance fixed by score?**

The results in Figure 1 show that while the FICO® score effectively rank-orders risk within each industry segment, actual bad rates differ by industry segment.

This calls attention to a misconception in the industry—that performance (bad rate or odds-to-score ratio) by FICO® score range is static or “fixed” by design to always equate to the same result. For example, a FICO score of 700 will always equate to a 2% bad rate over time, across portfolios, lenders and credit products/product terms; or that the odds-to-score relationship doubles every 20 points on the FICO score scale.

However, the broad-based FICO® score is not designed to have a fixed performance at a given score.

Actual portfolio performance by score is unique by lender, driven by its targeting/marketing strategies and customer treatment approaches. In addition, macro-level events—such as changes in the economy, home prices or unemployment trends—may also impact consumers' credit behaviors and associated credit performance by score range.

For this reason, it is extremely important that all lenders conduct frequent monitoring and score validation analysis to understand performance dynamics for their overall portfolio and population segments of interest. The results of this analysis may indicate a need to adjust how FICO® scores are used within targeting, underwriting and customer management strategies.

FICO regularly analyzes FICO® score performance to help lenders identify industry-wide changes and trends in risk behavior. The next section provides insight on the most noteworthy trends in the current economic downturn.

**» Is FICO® score performance changing given today's economy?**

Given current economic challenges in the US economy, there is a continued industry interest in understanding how FICO® scores are performing. We analyzed data from 2005–2009 to better understand how FICO scores are trending over this time period. We looked at score distribution and score performance dynamics at the national level, as well as for various population segments of interest.

**Score Distribution Trends**

At an individual consumer level, the FICO® score is based on the most up-to-date information contained in a consumer's credit report at the time a request is made for the FICO score and credit report. The consumer's FICO score can change as information in the consumer's report changes. The more “dramatic” the change in the new information reported, the more impact it will have on that individual's score.

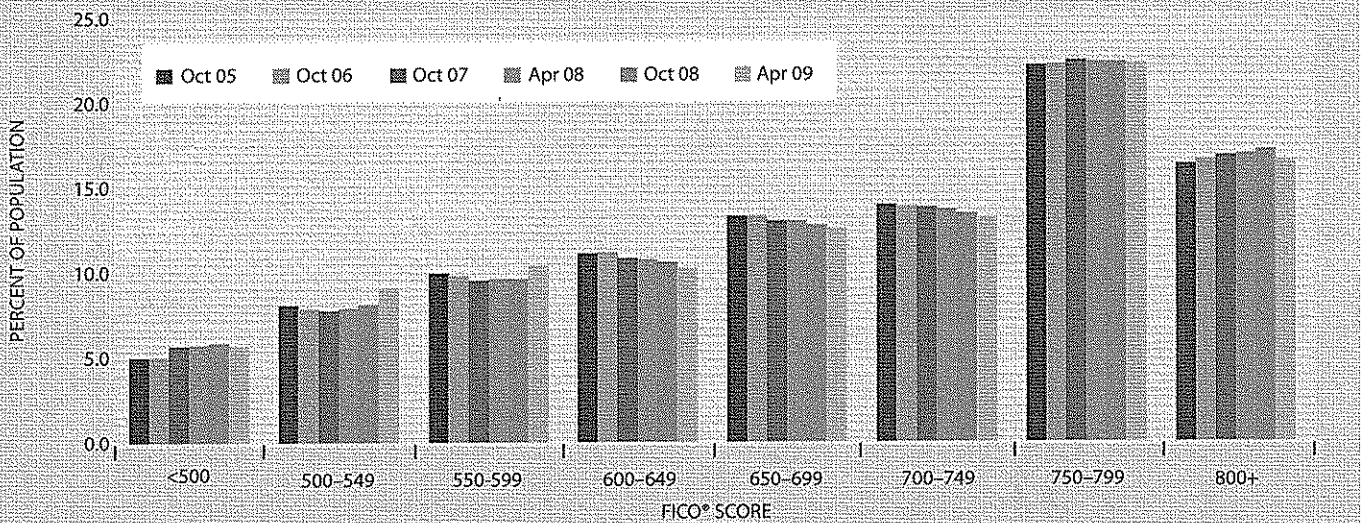
On a national level, the distribution of FICO® scores has remained relatively stable over time. Most US consumers continue to pay their credit obligations on time, are not heavily indebted and only apply for new credit when needed.

» INSIGHTS

However, as illustrated in Figure 2, there is a slight movement of population to both the higher and lower tail ends of the score range in the more recent time periods.

Figure 2: Score distributions remain stable, with slight shifts at extremes

General Population  
Interval Score Distribution (2005–2009)



At first, it may seem counter-intuitive that FICO® scores are increasing for any consumers, given that lenders are reporting higher levels of delinquency and unemployment is rising. What the data alludes to is that many risk-averse consumers are actually “retrenching” their credit activity—paying down balances and applying for less credit. In essence, these consumers are “tightening their belts” in anticipation of harder economic times, resulting in upward score movement for a percent of the population.

As expected, there is more movement into the lower scores, as a growing segment of the population struggle to make credit payments on time and build up credit balances. The score can decrease when negative information hits the consumer’s credit file, such as from credit behavior changes due to loss of income (recently unemployed, for example) or the inability to pay a recently increased adjustable-rate mortgage.

Some lenders may question why they are not seeing a more pronounced shift towards lower scores, given overall higher industry loss rates and increasing unemployment.

A FICO® score will change and reflect a different level of risk if a “trigger event” (i.e., a job loss or severe medical hardship) drives consumers to alter the way they manage their existing credit and/or seek new credit. By how much and when will be unique for each consumer based on how they respond to that trigger event and when that new behavior gets reflected in their credit file.

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It's important to note that FICO® scores do not have access to information on the trigger events themselves—only when the event triggers a change in credit behavior. For example, a consumer's employment status, level of income or depreciation of home value could provide predictive insight in understanding a consumer's overall risk dynamic. These items are not considered in the FICO score calculation because these data elements are either unreliably reported or not available on the consumer's credit file.

In addition, while delinquency rates have increased in more recent times, the majority of US consumers continue to meet their credit obligations on time. The vast majority of delinquencies originate from lower-scoring consumers. The incremental delinquency will have less dramatic impact on score movement when it occurs on a file where late payment behavior already exists.

**Score Distribution Trends—distressed consumers**

To further understand score distribution impacts under the current environment of increased risk, we analyzed the score movement for consumers who experienced some sign of financial duress.

This was measured by the appearance of new delinquency or substantial increased debt utilization between November 2008 and April of 2009.

Our analysis showed that 26% of all consumers experienced some level of financial duress during this period, as illustrated in Figure 3. The majority of these consumers—66% (17.17% of the 26%)—who experienced this new duress activity were already scoring 640 or lower. Only 14% of consumers who experienced new duress were in higher-scoring bands (720+).

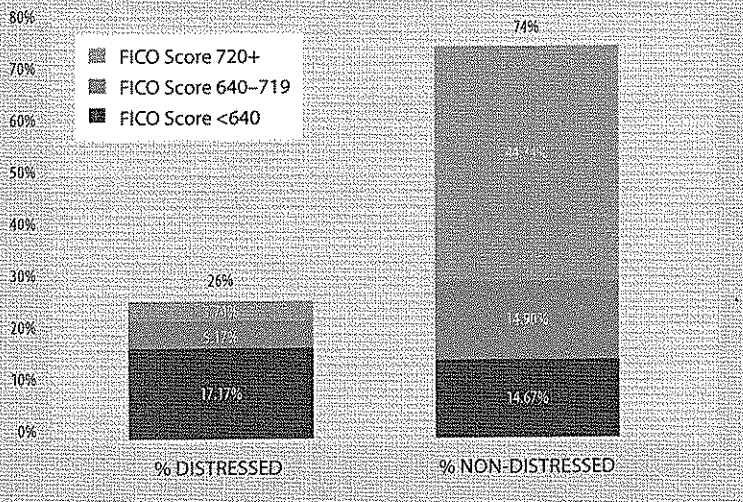
Figure 4 illustrates the impact this duress activity had on the consumers' FICO® scores as of April 2009. This is measured by average change in FICO score over the six-month period.

The new delinquency and increased debt utilization had a downward impact, on average, for all scores. The degree of impact is much greater, on average, for those consumers who were initially scoring in the high ranges before the new credit behaviors were reflected in the credit file.

Changes in score distributions can provide early insight into emerging problems—and opportunities—that lenders can explore more fully before taking action. We strongly recommend that lenders track and evaluate score distribution trends on their own applicants and customers as a whole, as well as on various sub-segments of interest.

Even better, coupling score distribution monitoring with review of other data elements (unemployment or home value movement, for example) provides a more complete understanding of the potential risk dynamics taking place within your environment.

**Figure 3: Majority of distressed consumers score 640 or lower**  
Presence of New Sign of Duress by Score Band at October 2008



**Figure 4: Impact of financial duress on FICO® scores**

Consumers with new delinquency and/or substantial increase in revolving utilization by FICO score band	Average change in FICO score (Oct 08–April 09)
<640	-6 points
640-719	-36 points
720+	-46 points
<b>Total Population</b>	<b>-18 points</b>

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**Score Performance Trends**

We know that delinquency rates are rising overall and for most lending segments. Are risk trends (bad rates or odds) by FICO® score also changing?

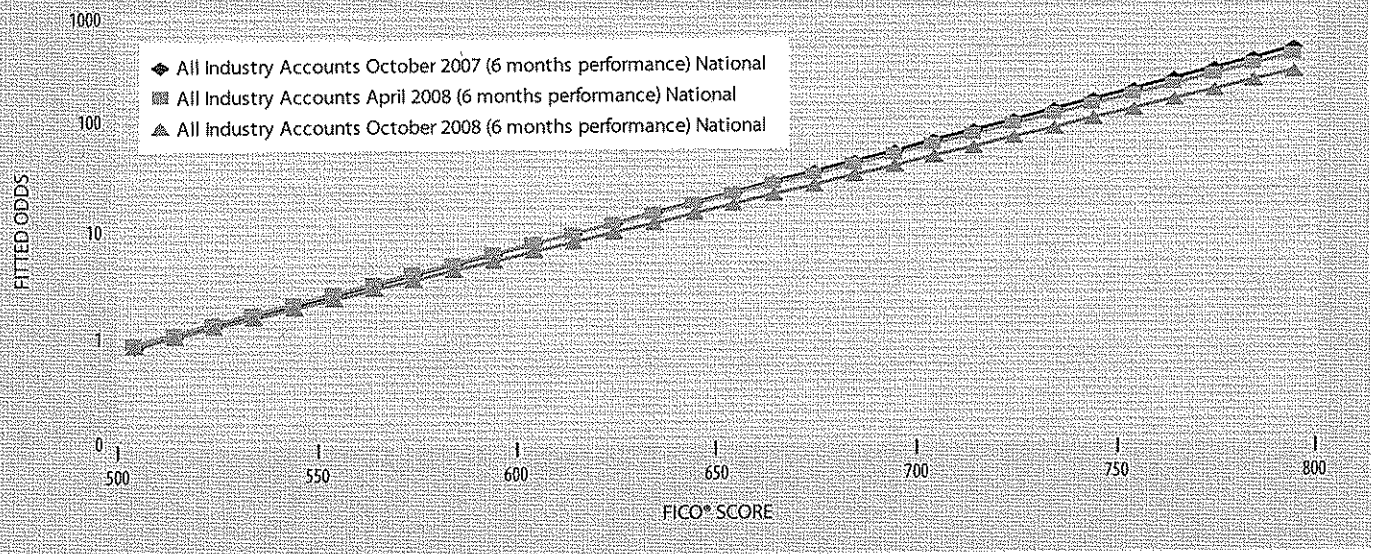
To understand overall risk trends by FICO® score, we analyzed FICO score performance by comparing 6-month performance based on October 2007–April 2008, April 2008–October 2008, October 2008–April 2009 credit bureau data samples.

We used odds-to-score rankings to explore how relationships differed over the time periods. In other words, at a given score, are the odds (90+ days past due) continuing to shift higher, and if so, by how much?

The results support what the industry has been reporting—that US credit risk has indeed continued to rise industry-wide, as well as within bankcards, auto and mortgage lending segments. The change in odds at a given score range is most pronounced within mortgage. This is not surprising given the particular stress within that industry segment.

Figure 5 shows the odds-to-score relationship for the general population for all three time periods analyzed.

**Figure 5: Industry-wide risk trends**  
General Population  
Alignment Plot



As the chart illustrates, the odds-to-score relationship has remained relatively stable over time. However, risk has increased slightly in the most recent vintage. While the two earlier periods remained relatively steady, there was a slight shift of approximately 12 points in odds at a given score in the most recent sample. For example, a 700 in the most recent sample is performing more like a 688 in previous vintage.

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Figures 6 and 7 show this same graph, but for existing bankcard and auto loan industry segments.

Figure 6: Bankcard risk trends

Bankcard Segment  
Alignment Plot

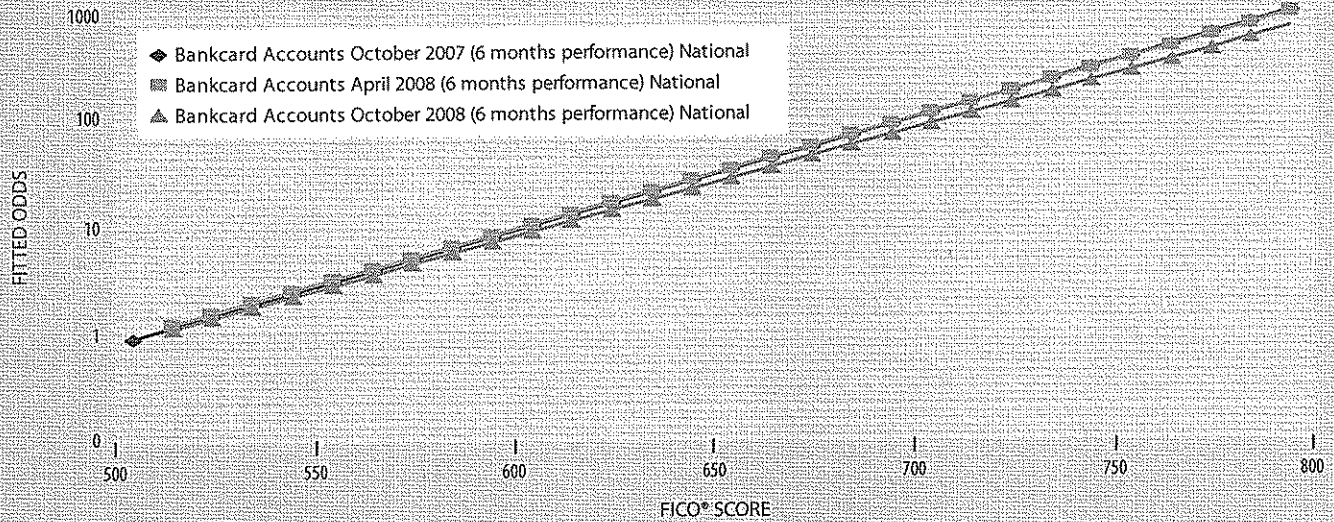
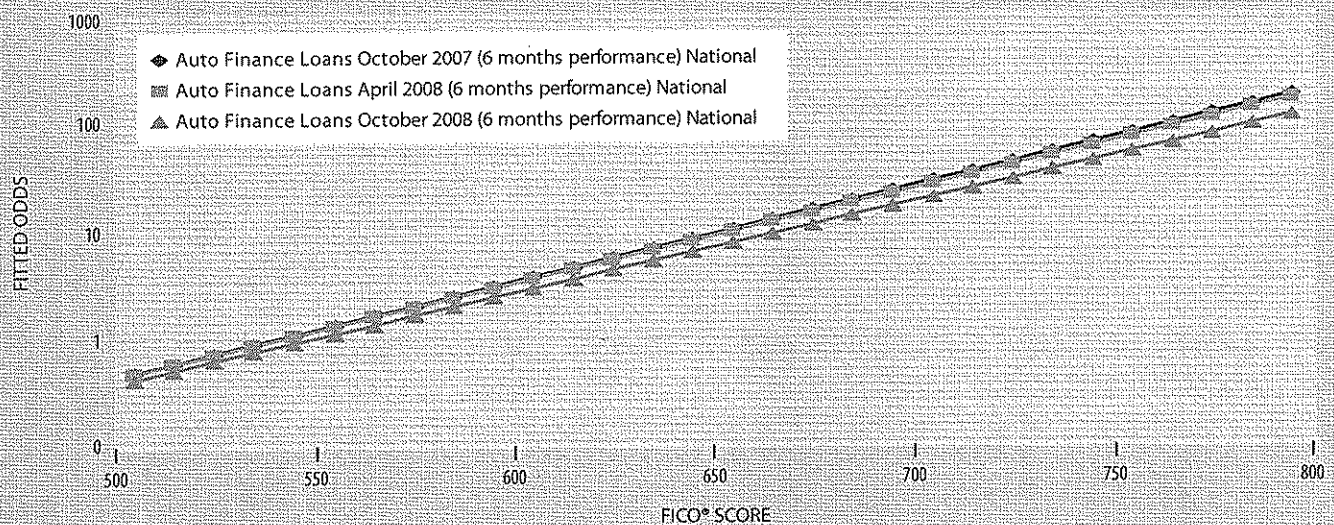


Figure 7: Auto risk trends

Auto Loan Segment  
Alignment Plot

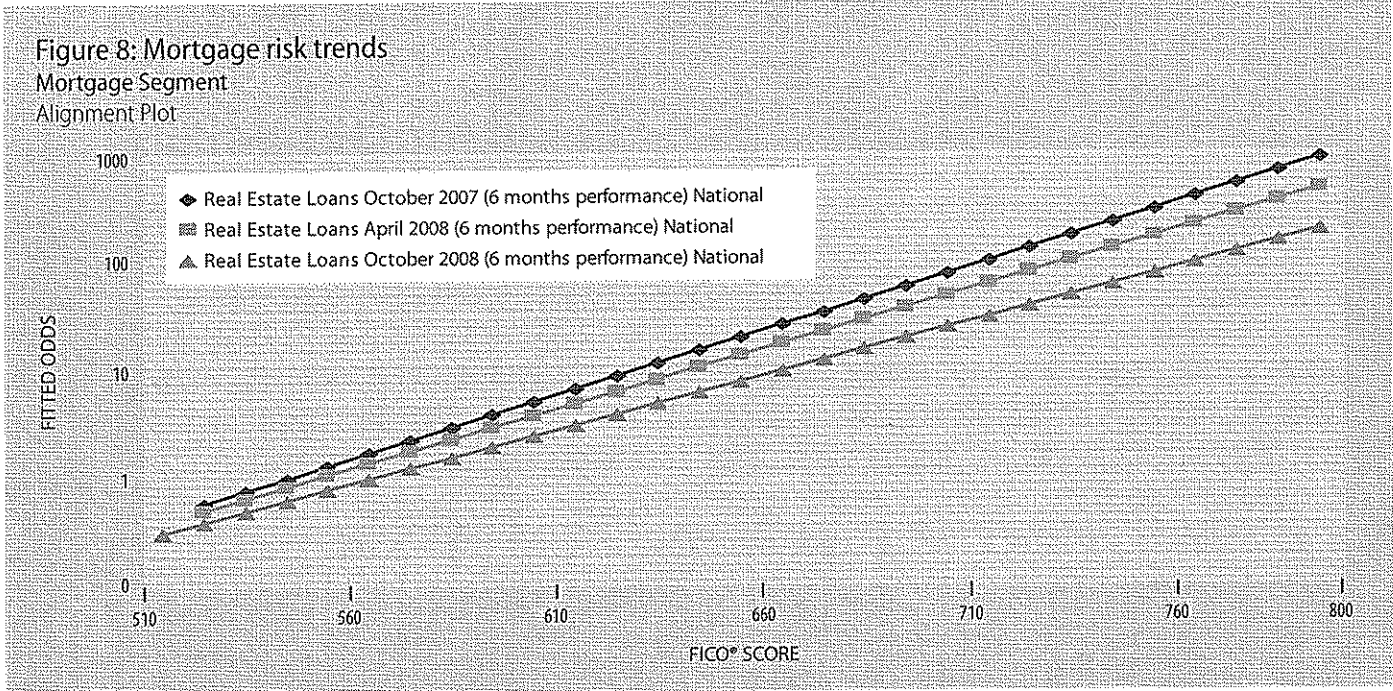


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As with the general population, the odds-to-score relationship has remained relatively stable over time for both bankcard and auto loan segments. However, risk has increased slightly in the most recent vintage in the bankcard segment and more noticeably in the auto lending segments:

- In bankcard, there was a slight shift of approximately 11 points in odds at a given score in the most recent sample. Thus, a 700 in the most recent sample is performing more like a 689 in previous vintages.
- In auto loan, there was a slight shift of approximately 15 points in odds at a given score in the most recent sample. Thus, a 700 in the most recent sample is performing more like a 685 in previous vintages.

Figures 8 show this same graph, but for the existing mortgage segment.



The chart shows that the more recent samples are noticeably more risky compared to prior vintages across the score range. The increased risk trend is more pronounced compared in the general population and other industry segments. There is a shift of approximately 17 points in odds at a given score between the two earlier samples and more than 30 point shift in odds at a given score between the two most recent samples.

These results could be a reflection that general mortgage lending practices (guidelines related to doc/verification/down payment, DTI ratios, etc.), home price values and access to refinancing options have changed drastically in the most recent time periods.

While the overall risk has increased in more recent vintages and the odds/bad rate by score have changed, these results also illustrate that the FICO® score continues to rank-order risk in each of the three time periods and for each industry segment.

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» **What are scoring best practices during uncertainty?**

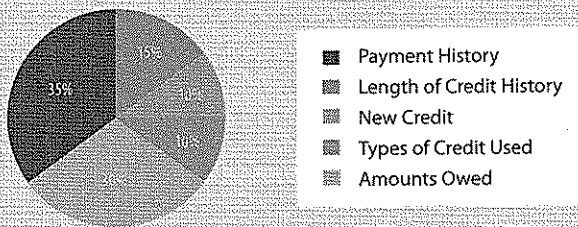
Whether in a period of economic growth or uncertainty, smart risk management practices remain essential. Lenders should continue evaluating and testing existing credit policy risk controls.

- Lenders should closely track and **monitor portfolio performance by score**, and make adjustments accordingly.

**What's in a FICO® score?**

FICO® scores summarize the real-time information in consumers' credit files and rank-order consumers according to risk of default on a 300–850 scale, where higher scores equate to lower future risk.

FICO® scores assess the person's credit history as represented on their credit report. Their history can be split into five data categories. The chart reflects how important each category is when calculating scores for the general population. This credit information is typically the same items a lender would use to make a credit decision.



FICO® scores consider trade line, inquiry, collections and public record information. Information from other parts of the credit bureau report, including occupation, income and length of time at present address, is not used as predictive variables in the score. In addition, FICO scores do not consider data prohibited by Regulation B of the Equal Credit Opportunity Act, including race, color, religion, national origin, sex, marital status or age.

Additional information on what's considered by the FICO® score can be found at the *Credit Education Center* on myFICO.com.

- Given today's market, it's especially important to **evaluate portfolios by vintage and local economic factors**. If something looks unusual or a vintage isn't performing as expected, it is a red flag for lenders to tighten customer management in those risky areas—and to reevaluate targeting approaches and underwriting criteria.
- More **frequent score refreshes**, even among collateralized products, could identify losses earlier and signal a need to re-evaluate portfolio performance. We recommend at least quarterly account management updates.
- **Stronger risk tools** can also help. Validation results show that the latest release of the FICO® score, FICO® 08, increased predictive power in higher-risk segments, including credit shoppers and nonprime borrowers.

While credit bureau data and scores are highly predictive, good underwriting and customer management consider a broader view of risk. Risk factors not captured by bureau data, such as fraud or even product terms, can also impact portfolio performance.

While lenders need to remain risk vigilant, the reality is that they also must be able to grow and pursue new opportunities—often even more difficult in times of uncertainty.

That's why we recommend using risk management tools and techniques that permit lenders to better calculate risk vs. reward—like champion/challenger testing to evaluate and refine strategies before rolling them out to a broad customer base. Lenders can evaluate which products and terms to offer, and which underwriting criteria, scores and external data are most useful in strategies, under varied market conditions for different consumer segments.

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Stronger measures of consumer credit capacity can also help lenders identify new opportunities with less risk. FICO® Credit Capacity Index™ is a forward-looking analytic measure that, when combined with FICO® scores, determines, "For consumers who look equally risky, who can more safely manage additional credit?"

Balancing business growth and risk management, while tricky, certainly continues to be business-critical. Those who do it best are most likely to ride out the market fluctuations and challenges like those we face today.

**FICO will continue to validate FICO® scores and underlying risk trends, and dig deeper on key scoring topics in future Insights papers. For more information, contact us at 800-777-2066 or [cbhelpline@fico.com](mailto:cbhelpline@fico.com), or subscribe to our Insights white papers at [www.fico.com/insights](http://www.fico.com/insights).**

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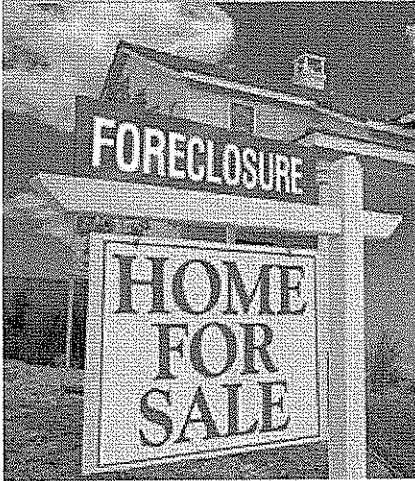
**International**  
+44 (0) 207 940 8718

**email**  
[info@fico.com](mailto:info@fico.com)

**web**  
[www.fico.com](http://www.fico.com)



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## Are today's market pressures reshaping credit risk?

New study explores FICO® score trends in dynamic times—and how lenders can respond

Number 3 — May 2008

In turbulent economic times, financial services firms often tighten the credit reins and refocus on risk. But with growing consumer debt and continued fallout from the credit crisis, many are questioning the effectiveness of today's lending strategies.

As rising debt leads to defaults, financial services clients are turning to FICO with concerns such as: Why are my delinquencies increasing, even for lower-risk segments? Why is a 680 FICO® score performing like a 650?

This begs the broader question: Are today's economic pressures changing the credit risk patterns underlying FICO® scores—and if so, how should lenders respond?

FICO set out to understand and quantify potential changes in risk dynamics. We conducted a FICO® score performance analysis, comparing data samples across several time periods reflecting different economic conditions. This paper highlights our most significant research findings and provides guidance for best practices, given what we saw.

*FICO conducted a performance analysis to understand potential changes in FICO® score risk patterns. This paper highlights the most significant findings and provides guidance for best practices.*

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» **Research results:  
key takeaways**

Lenders experiencing increased delinquencies should know that they are not alone. Our performance analysis showed:

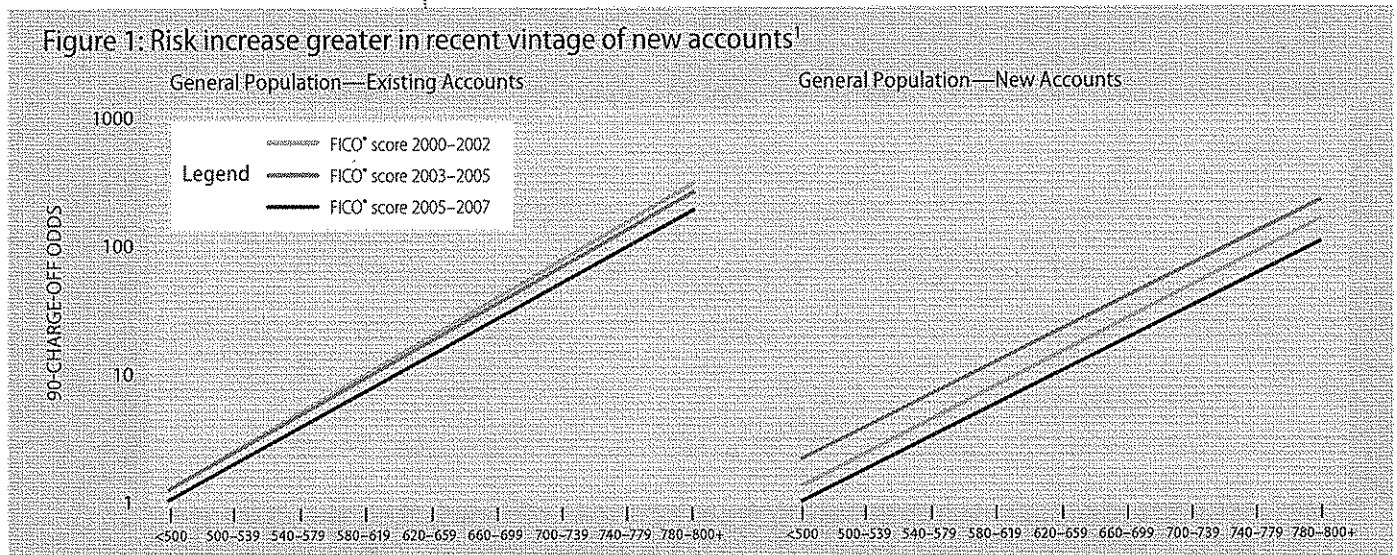
- **Consumer risk is rising industry-wide**, across lending products and score ranges.
- **Segments with the greatest risk increases largely reflect market pressures.** We see greater risk, for instance, for new mortgage accounts, and select states hit harder by unemployment, falling home prices and speculative investing. These groups are likely impacting overall portfolio charge-off rates.
- **Despite increasing risk, many risk predictors remain stable—with notable exceptions.** Consumers with multiple mortgages, for example, are still less risky than those with none or fewer mortgages—but are comparatively riskier than before. Later in the paper, we'll discuss the more pronounced changes to risk indicators that lenders should keep an eye on.
- **FICO® scores continue to rank-order risk**—in other words, the higher the score, the lower the risk. This holds true on a general population, as well as specifically for bankcards, auto and mortgage risk prediction.

Let's explore these findings in more detail, including a focused look at risk trends for consumers with mortgage loans.

» **Credit risk on the rise**

To assess overall risk trends, FICO researchers analyzed FICO® score performance by comparing 2000–2002, 2003–2005 and 2005–2007 credit bureau data samples. The earliest period incorporates performance impacts from 9-11 and the dot-com collapse; the middle period reflects the economic boom driven by the mortgage industry; and the most recent vintage reflects the early indication of increasing defaults and other fallout of the prior mortgage and refinance boom.

We used odds-to-score rankings to explore how relationships differed over the time periods. In other words, at a given score, were charge-off odds shifting higher, lower or staying the same?



Industry-wide, the 2005–2007 new accounts show greater risk compared to the previous vintages. The lower the line, the worse the odds, which translates into greater risk.

<sup>1</sup> New accounts include consumers that opened new credit accounts in the six months following the 2000, 2003 and 2005 score dates. Existing accounts include those that opened accounts prior to the score dates.

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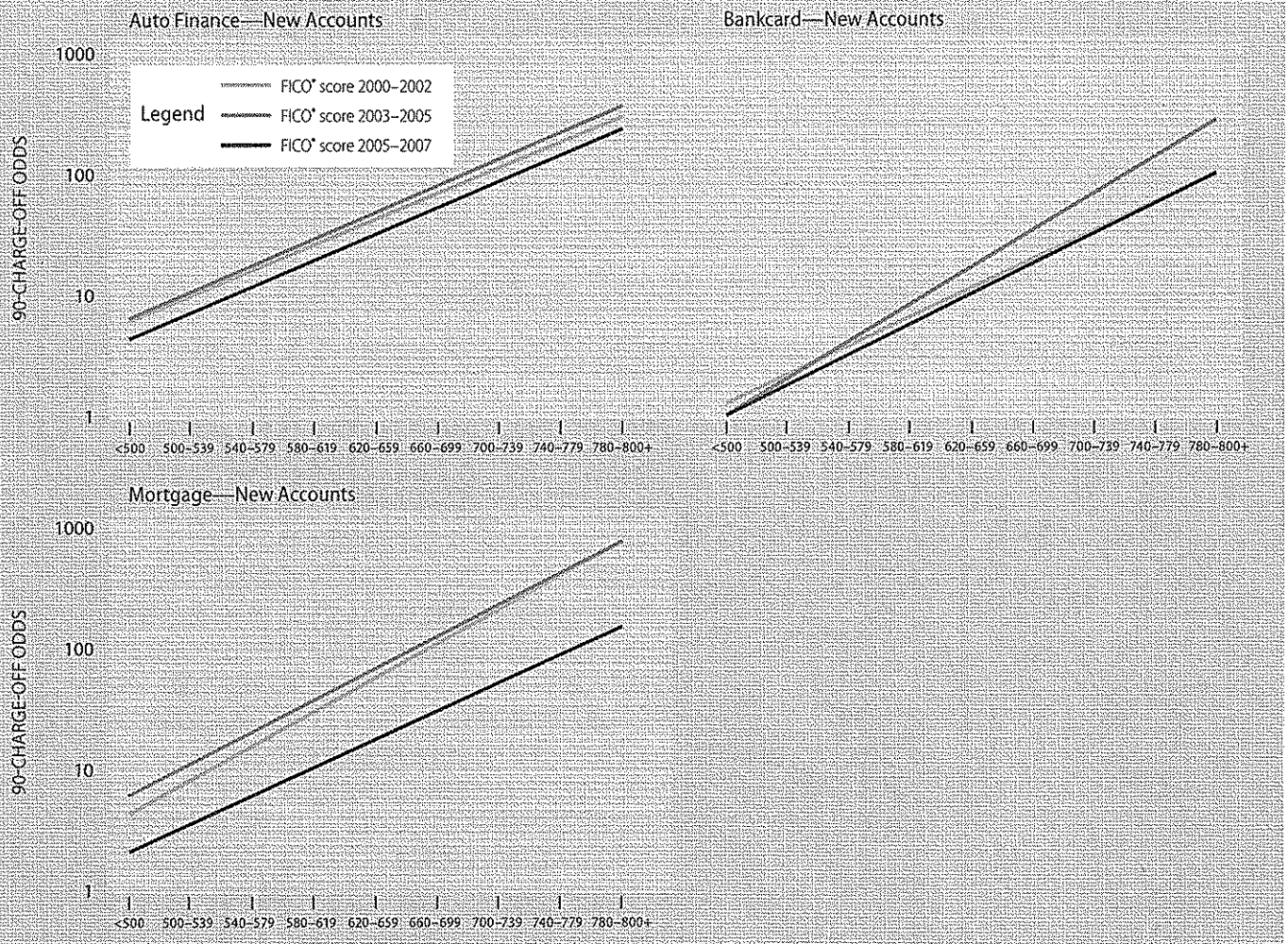
US credit risk has indeed risen industry-wide, as well as within bankcards, auto and mortgage.

Risk has increased in the most recent vintage for both existing and new account segments of the general population (see Figure 1 previous page). On average, the odds have shifted about 10 points lower for existing accounts in 2005–2007 compared to the previous samples. The movement is more noticeable on the new account segment, where odds have shifted about 30 points lower when compared to 2003–2005, and 15 points lower when compared to 2000–2002.

This trend holds true across industry verticals for the new account segment (Figure 2). Lender strategies and decisions enacted during the time of each vintage within each industry vertical would have had a large impact on the performance observed. The risk increase is greatest for new mortgage accounts, but is also observed for new bankcards and auto loans. Looking at the 2005–2007 data:

- **For new auto accounts**, the odds-to-score relationship has shifted about 30 points lower when compared to 2003–2005, and 15 points lower when compared to 2000–2002.

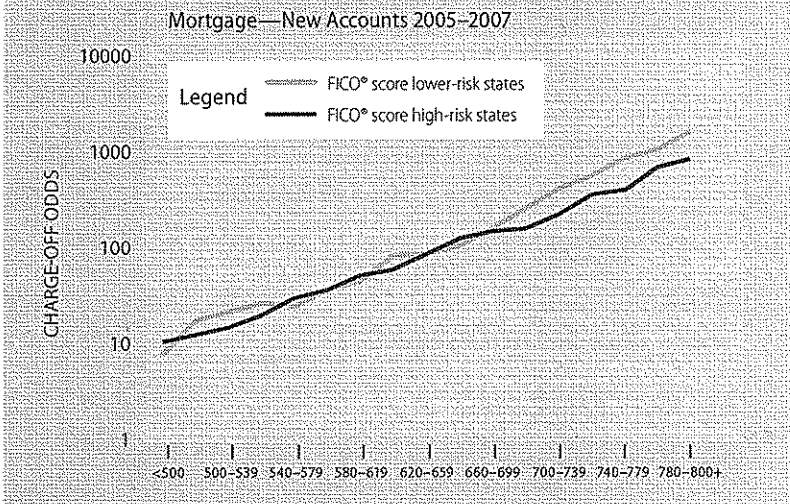
Figure 2: Comparing risk shifts for auto, bankcard and mortgage



New auto, bankcard and mortgage accounts in 2005–2007 show greater risk of charge-off compared to the previous vintages, with the greatest increases observed in new mortgages.

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**Figure 3: Evaluating "high-risk" states**  
CA, NV, AZ, FL, OH, MI



In the 2005–2007 sample, consumers opening new mortgages that reside in higher-risk states show greater risk in the higher FICO® ranges compared to consumers opening mortgages in lower-risk states.

- **For new bankcard accounts**, the odds-to-score relationship has shifted about 20 points lower when compared to 2003–2005, and 5 points lower when compared to 2000–2002.
- **For new mortgage accounts**, the odds-to-score relationship has shifted about 80 points lower when compared to 2003–2005, and 70 points lower when compared to 2000–2002.

FICO evaluated performance of states that many in the industry would consider higher risk—Ohio and Michigan due to high unemployment, and California, Florida, Arizona and Nevada for mortgage fallout. Figure 3 shows the increases in risk for these higher-risk states compared to the rest of the nation.

Despite the overall risk increases, the analysis demonstrates that the FICO® score continues to effectively rank-order risk in the different time periods. The results also show that the odds at a given score range can shift over time, as lender practices evolve and economic conditions change. Lenders should frequently monitor and track this dynamic on their portfolios and adjust scoring strategies accordingly.

» **Impact of mortgage risk across lending**

Given the growing risk of new mortgage accounts, FICO decided to further evaluate FICO® score performance for consumers with mortgages. Has recent industry volatility changed general credit risk patterns?

Historically, consumers with multiple mortgages have been less risky than those with none or fewer mortgages. These consumers often have the assets and financial savvy necessary for property investment. And prior to the mortgage boom, lenders used more stringent underwriting criteria, especially for those purchasing non-owner-occupied properties.

But after an era of piggyback home loans and with property values falling below consumers' equity, some are walking away from their properties. Once a consumer's credit is tarnished by foreclosure, there is less incentive to maintain good credit ratings with other creditors.

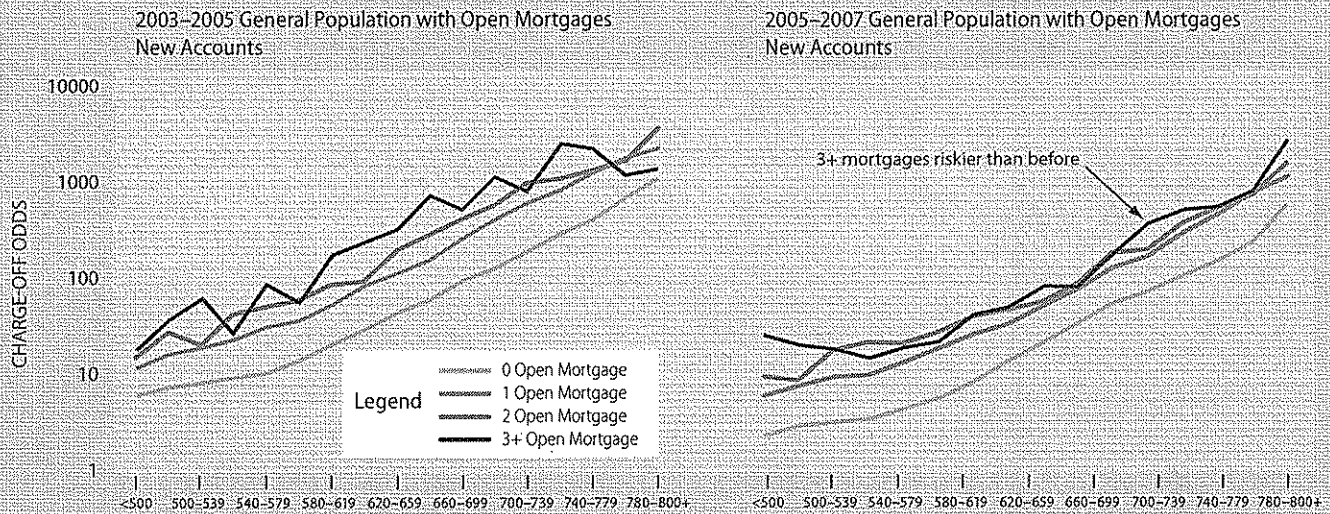
To better understand the impact of these trends, we evaluated whether risk patterns were changing for consumers with multiple mortgages across the 2003–2005 and 2005–2007 time periods.

Multiple mortgage holders are still less risky than those with none or fewer mortgages—but risk is increasing in the 2005–2007 data. This is particularly noticeable for new accounts (Figure 4 next page).

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In other words, while risk is increasing across all segments, we see greater increases for those with multiple mortgages. The 3+ mortgage consumers in 2005–2007 are performing at the same risk level as 3+ mortgage consumers in 2003–2005 that score 35–55 points lower. Similarly, odds-to-score relationships for consumers with two mortgages dropped by 45–50 points. By contrast, consumers with only one mortgage showed a 25–30 point difference.

Figure 4: Multiple mortgages still less risky—but risk increasing



In 2003–2005, consumers with 3+ mortgages are lower risk at a given score compared to those with fewer mortgages. In 2005–2007, the 3+ mortgage line drops and converges with those with fewer mortgages; thus, risk is increasing at a given score for this segment.

FICO conducted further analysis to better understand risk score predictors for new mortgage loans in the more recent timeframe. We found that the following segments pose greater risk than before:

- **Shorter time in file**—that is, consumers with newly established credit histories or with a recent build-up of newly opened credit.
- **Little to no prior installment experience**—suggesting a first-time big-ticket purchase, given the lack of auto and home loans on the credit file.
- **Multiple inquiries prior to mortgage opening**—suggesting aggressive credit-seeking behavior.<sup>2</sup>

Knowing these higher-risk credit bureau attributes can help lenders revise underwriting and customer management strategies, as we'll discuss in the "best practices" section of this paper.

» Best practices during uncertainty

Our research on risk trends, combined with today's economic climate, reinforce the need to evaluate and test existing credit policy risk controls.

- Lenders should closely track and **monitor portfolio performance by score**, and make adjustments accordingly.

<sup>2</sup> Inquiries were processed through a de-duplication process, whereby mortgage-related inquiries within 45 days are considered as a single inquiry.

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- Given today's market, it's especially important to **evaluate portfolios by vintage and local economic factors**. If something looks unusual or a vintage isn't performing as expected, it is a red flag for lenders to tighten customer management in those risky areas—and to reevaluate targeting approaches and underwriting criteria.
- More **frequent score refreshes**, even among collateralized products, could identify losses earlier and signal a need to re-evaluate portfolio performance. We recommend at least quarterly account management updates.
- As mentioned earlier, our mortgage validation research identified **specific segments posing greater risk**—those with shorter time in file, multiple prior inquiries and less installment experience. As a result, lenders should review strategies to consider these changing risk patterns and tighten risk controls when appropriate.
- **Stronger risk tools** can also help. Validation results show that the latest release of the FICO® score, FICO® 08, increased predictive power in higher-risk segments, including credit shoppers and nonprime borrowers.

While credit bureau data and scores are highly predictive, good underwriting and customer management consider a broader view of risk. Risk factors not captured by bureau data, such as fraud or even product terms, can also impact portfolio performance.

To fill in this broader risk picture, lenders can benefit from the growing availability of non-traditional credit data (e.g., debit and phone utility data), as well as from geographic, economic and demographic data sources. Third-party data—and scores based on that data—can help identify changes to consumer risk that lenders might not otherwise be aware of. The FICO® Expansion® score leverages non-traditional credit data, and when used with the FICO® score, has been shown to boost risk assessment.

While lenders need to remain risk vigilant, the reality is that they also must be able to grow and pursue new opportunities—often even more difficult in times of uncertainty.

That's why we recommend using risk management tools and techniques that permit lenders to better calculate risk vs. reward—like champion/challenger testing to evaluate and refine strategies before rolling them out to a broad customer base. Lenders can evaluate which products and terms to offer, and which underwriting criteria, scores and external data are most useful in strategies, under varied market conditions for different consumer segments.

Stronger measures of consumer credit capacity can also help lenders identify new opportunities with less risk. FICO® Credit Capacity Index™ is a forward-looking analytic measure that, when combined with FICO® scores, determines, "For consumers who look equally risky, who can more safely manage additional credit?"

Balancing business growth and risk management, while tricky, certainly continues to be business-critical. Those that do it best are most likely to ride out the market fluctuations and challenges like those we face today.

**We will continue to validate FICO® scores and underlying risk trends, and dig deeper on key scoring topics in future Insights papers. For more information, contact us at 1-888-342-6336 or [cbhelpline@fico.com](mailto:cbhelpline@fico.com), or subscribe to our Insights white papers at [www.fico.com/insights](http://www.fico.com/insights).**

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International  
+44 (0) 207 940 8718

email  
[info@fico.com](mailto:info@fico.com)

web  
[www.fico.com](http://www.fico.com)