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Tatom, John

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John A. Tatom

About the Author: John A. Tatom is the Director of Research at Networks Financial Institute and Associate Professor of Finance at Indiana State University. He has published widely on international and domestic monetary and fiscal policy issues, especially inflation, capital formation, productivity and growth.

Abstract: The state of Indiana has had a major foreclosure problem, especially since the 2001 recession. As the nation confronts an emerging surge in foreclosures associated with an explosion of subprime loans in 2004-06, the Indiana foreclosure rate is likely to surge to record territory. Two neighboring states, Michigan and Ohio, join Indiana in having the nation's highest foreclosure rates. In fact, Ohio has led the nation since 2003, knocking Indiana into second place since then. Meanwhile, Michigan climbed to third place since mid-2006. This report provides a perspective on the crisis in Indiana and its sources. The principal source of the high foreclosure rate in Indiana is the predominance of high risk loans, originally from FHA and later from subprime lenders. Slow house price appreciation and slow employment growth are statistically significant factors accounting for state foreclosure rates, but these factors have not been especially weak since 2001 and they are highly correlated with the share of risky loans. Other factors that are frequently mentioned do not fit the pattern of emerging foreclosure from 1995-2006, or they are not large enough to have had much substantive effect on the overall foreclosure picture. These include auto sector and manufacturing production and employment or predatory lending and mortgage fraud. Education of borrowers, especially first-time buyers, and the education of lenders in traditional prudent lending practices are more likely to foster lower foreclosure rates than other remedies and to do so without reducing homeownership rates.

Keywords: Foreclosure rate, mortgage finance, mortgage risk.

Why Is the Foreclosure Rate So High in Indiana?

The state of Indiana has had a major foreclosure problem since the recession in 2001 and, as the nation confronts an emerging surge in foreclosures associated with an explosion of subprime loans in 2004-06, the Indiana foreclosure rate is likely to surge to extremely high, record territory. This would have serious consequences for Indiana homeowners, lenders, their stockholders, the housing industry and neighborhood home prices, abandoned homes and the overall economy. Indiana is not alone. Two neighboring states, Michigan and Ohio, join Indiana in having the nation's highest foreclosure rates. In fact, Ohio has had the nation's highest foreclosure rate since 2003, knocking Indiana into second place since then. Meanwhile, Michigan climbed to third place since mid-2006 and Kentucky has been in fourth or fifth place since mid-2003.[1]

There is already widespread concern among policy makers and economic analysts for the emerging national spike in foreclosures. Since the beginning of 2007, a large number of mortgage lenders have gone out of business, sought bankruptcy protection or ceased risky lending activities. In July and August repricing of risky mortgage products and related derivatives led to a credit crunch and liquidity problem in global financial markets as hedge funds, large financial institutions and other investment funds revealed large losses and in some cases closures of funds. Federal Reserve Chairman Ben Bernanke (2007) has pointed out that about 24 percent of all first lien mortgages are subprime (14%) or alt-A (about 9%) The latter is a risk class above subprime loans in credit score, but that includes loans that have other higher risk characteristics, especially so-called "no-doc" loans which do not require documentation of income. Most of the large share of risky mortgages has emerged since 2004.[2]

Subprime loans are loans to individuals with low credit scores and relatively high expected default and foreclosure rates and higher mortgage interest rates. Many of these loans have other risky features, such as allowing interest only or other payment choices by borrowers in the early years of a mortgage. Some of these nontraditional loans were only available to high income/high net worth individuals until recent years when new technologies made it possible to price and offer such high risk loans. For a variety of reasons, but especially because so many of them have adjustable interest rates that will adjust upward in the near future, an already high national foreclosure rate among subprime loans is expected to lead to a spike in foreclosures over the next year or so. If the impact of this spike falls proportionately on Indiana, Ohio and Michigan, the region could see a depression in housing, with consequent adverse effects on housing, lenders and the overall economy.

This report provides a perspective on the crisis in Indiana and its sources up to 2007. The report also discusses the situations in Ohio and Michigan because they join Indiana in having the three highest state foreclosure rates in the country. The report draws heavily

[1] These states have not always led the nation. In 1995, regional foreclosure rates reached their last lows and were below the national rate. The national foreclosure rate was 0.88 percent, while Indiana registered 0.48%, Ohio 0.68%, Michigan 0.40%, Kentucky 0.38% and Illinois 0.72.

[2] Chiu (2006) provides an introduction to the development of nontraditional and alt-A mortgages.

on earlier statistical analyses conducted by the National Association of REALTORS (NAR), but it must be emphasized that they are in no way responsible for the results here. In 2003, the Metropolitan Indianapolis Board of REALTORS (MIBOR), the Builders Association of Greater Indianapolis, the Indiana Builders Association, the Indiana Association of REALTORS and the Indianapolis Neighborhood Partnership sponsored research by the NAR on Indiana's high foreclosure problem. The NAR study (2003) attempted to explain the factors influencing foreclosures and why Indiana already led the nation. NAR (2004) is a revised and final version.

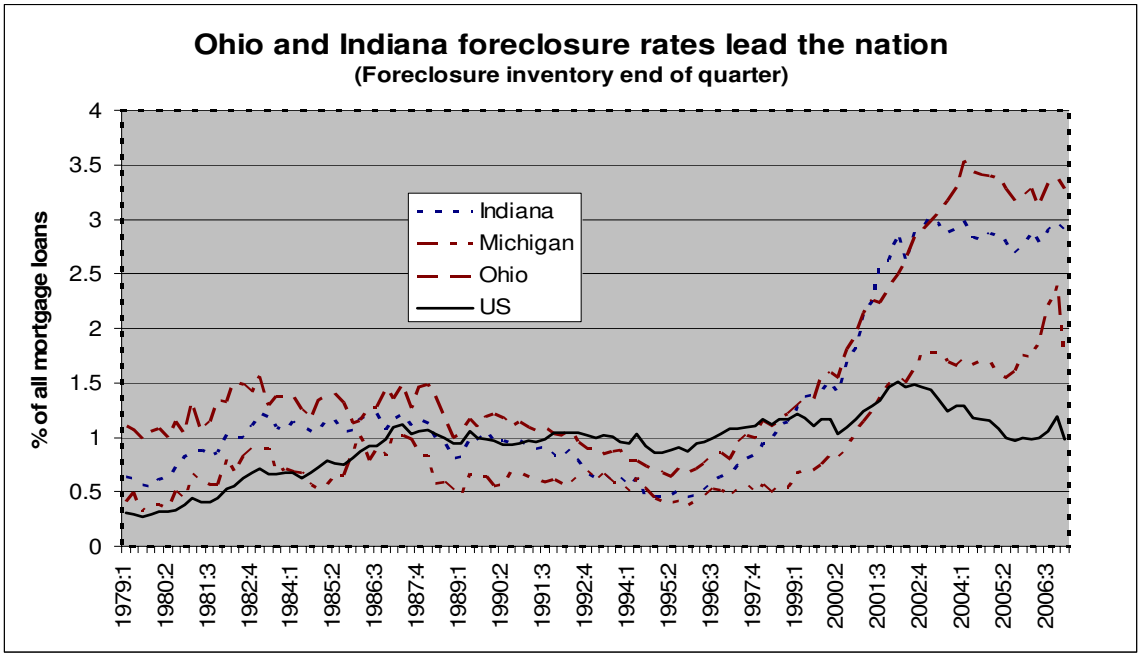
NAR (2003, 2004) conclude that the 2001 recession and its aftermath led to unusually high foreclosures in Indiana. Specifically, foreclosures "rose dramatically and nearly contemporaneously with the demise in the state's job market situation." [NAR (2004, p.13)]. The deterioration was worse in Indiana, in their view, because of the greater reliance on manufacturing. The reports conclude that the weak job market may have driven buyers to riskier loans with higher Loan-To-Value ratios (LTVs). In their view, rapid homebuilding continued despite the rising foreclosure rate, slowing home price appreciation and reducing the incentive to stay in homes/loans in times of financial distress. All of these factors then are in some way related to the job market deterioration. Given an expected improvement in the job market, the NAR expected a normal cyclical recovery in the foreclosure rate moving in tandem with a cyclical recovery in the job market. Obviously something went wrong. Foreclosures remained high in Indiana, Ohio and Michigan despite the cyclical improvement in the national economy, and, at least in Indiana, in the state economy. This report provides an update and suggests some of the problems that will face these states in the coming years.

I. The foreclosure rate in Indiana has been a serious problem since 2002

The foreclosure rate in Indiana has been a serious problem for several years. Indeed, the unusually high level in 2002 led to the reports noted above. The foreclosure rate has remained very high in Indiana since then. Chart 1 shows the foreclosure rate in the United States, Indiana, Michigan and Ohio. Ohio has led the nation since 2003, with Indiana a close second. Meanwhile the rate in Michigan moved into the top 10 in the country in 2004 and reached third place in 2006. Kentucky (not shown) has ranked in the top 5 states since 2003. Illinois has escaped the top 10 list for most of the period since the 2001 recession. Note that in Indiana and Ohio, the foreclosure rate began to rise in 1995, when it was well below the national level, and it climbed more before the 2001 recession than it has since. Michigan also recorded its previous low in 1995 and rose slightly more before the recession than it has since, but its sharp rise begins a little latter in 1998.

The worst aspect of Chart 1 is what is not shown. What is not shown is the explosion in subprime foreclosures that is about to send the national statistics, and perhaps those of the three states shown, into record territory.

Chart 1
Indiana and its neighbors have the highest foreclosure rates in the nation



Source: Mortgage Bankers Association

Table 1 shows the most recent foreclosure information for Indiana and the nation. Note that FHA and subprime loans in Indiana make up a higher percentage of all loans than for the nation (27.8% versus 21.2%). In Indiana, subprime loans are a little smaller share, but FHA loans are a much larger share.

Table 1
Indiana and U.S. foreclosures in the first quarter of 2006

	Foreclosure rate	Loans serviced	Loans in Foreclosure	Percent of loans serviced	Percent of foreclosed loans
Indiana					
Prime	1.40%	573,745	8,032	69.5%	32.7%
Subprime	9.57	122,033	11,679	14.8	47.5
FHA	3.95	107,198	4,234	13.0	17.2
All loans	2.98	825,008	24,585	100.0	100.0
United States					
Prime	0.54	33.924,965	183,195	78.6	32.6
Subprime	5.10	5,878,011	299,779	13.4	53.4
FHA	2.19	2,981,809	65,302	6.8	11.6
All loans	1.28	43,895,066	561,857	100.0	100.0

Source: Mortgage Bankers Association

The share of subprime and FHA loans in foreclosure in Indiana, 64.7%, is essentially the same as the 65% share for the United States as a whole, although the share of FHA loans (13.0%) in Indiana is almost double the U.S. share (6.8%) and this, unlike the recent national spike in the volume of subprime loans, has been a feature of Indiana mortgage

finance for several years. Nevertheless, the foreclosure rate in Indiana is not higher simply because of a greater share of riskier loans; all categories of risk in Indiana have higher foreclosure rates than for the United States. In particular, even prime loans have a foreclosure rate that is 2.6 times the national rate for prime loans and this plays a major role in Indiana's foreclosure rate being about 2.3 times the national average rate.

Table 2 shows that subprime loans have much higher foreclosure rates in both the United States and in Indiana. Adjustable rate loans have much higher foreclosure rates than fixed rate mortgages. So the highest foreclosure rates are adjustable rate subprime loans. Note that for prime loans, there are more than four times as many loans with fixed rates (FRM) as adjustable rates (ARM) in Indiana and almost as large a multiple for the United States as a whole. For subprime loans, the relative magnitudes are quite different.

Table 2
Subprime loans are more likely to be adjustable (ARM) than to have a fixed rate (FRM)

	Indiana		United States	
	Foreclosure rate	**Loans serviced**	**Foreclosure rate**	**Loans serviced**
Prime				
-FRM	1.15%	458,404	0.38%	23,694,889
-ARM	3.19	56,058	1.09	6,079,823
Subprime				
-FRM	6.37	53,793	3.29	2,130,443
-ARM	12.93	58,572	6.46	2,901,511
FHA				
-FRM	3.63	90,828	1.85	2,371,167
-ARM	5.23	8,111	2.73	192,924

Source: Mortgage Bankers Association

For the United States, there are over 36 percent more ARMs than FRMs among subprime borrowers; in Indiana, there are almost 9 percent more ARMs than FRMs among subprime borrowers. Even among FHA loans, which used to be the primary source of funds for subprime borrowers, better counseled, more informed, or simply more cautious borrowers (or lenders) have resulted in relatively fewer borrowers with adjustable rate loans than even among prime borrowers. The much higher foreclosure rates among subprime borrowers and relatively larger proportions of adjustable rate loans, which have disproportionately higher foreclosure rates, combine to make the subprime category the focal point for the emerging national foreclosure crisis. As the foreclosure rate on these loans continues to rise for loans that originated largely in 2004-06, the regional states' and the national foreclosure rate will rise sharply. This is especially the case because so many of the subprime loans are adjustable and will adjust upward in the near future, even if long-term mortgage rates do not.

II. Factors that Affect the Foreclosure Rate

In NAR (2003 and 2004), several factors are set out that influence foreclosure. They include relatively high homeownership rates, the share of Federal Housing Administration (FHA) loans, the proportion of loans that have a high loan-to-value ratio, job growth in the state, the rate of home price appreciation, or the state unemployment rate.

A higher home ownership rate might suggest more marginal and riskier buyers and borrowers and therefore be associated with a higher foreclosure rate. FHA loans are riskier loans intended for first-time and generally lower-income/less-wealthy homebuyers, so a higher share is expected to be associated with a higher foreclosure rate. FHA loans are also riskier because they generally have lower down payments than others, so that borrowers are more likely to default or walk away from their loans in times of financial stress, such as unemployment spells, or when the return for remaining in a loan and house are expected to have lower economic returns or benefits. But other borrowers also have the same characteristics and end up in foreclosure. Thus, a high-loan-to-value (price) ratio (LTV), in this case an LTV greater than 90 percent (LTV90), could be a separate factor leading to higher foreclosures. Such a loan means that the owner has made a down payment of less than 10 percent of the purchase price, or value, of the home and therefore has less to lose if they lose the house through foreclosure. In addition, a slower pace of house appreciation means that equity in the home is rising more slowly, again implying that there is a relatively smaller gain in homeowner equity in homes and perhaps less expected gain from remaining in a house and its associated mortgage loan. Finally a higher unemployment rate means typically means more economic distress due to lost income so that one might expect to observe more foreclosures.

The inclusion of foreclosures and the growth rate of payroll employment might seem redundant since both are highly correlated with each other. While both measure the same job market conditions to a degree, they are slightly different. The unemployment rate may be a closer indicator of distress and actual job and income losses, but slower growth in payroll employment might signal more difficulty in finding work. Normally the two measures move closely in an inverse relationship, but this does not have to be the case. In a state with little population growth like Indiana, slow job growth is likely even under the best of economic conditions because of relatively slow population and labor force growth. Business could be booming and the unemployment rate could be relatively low, but job growth would still be slow. In this case, income growth will be nearly as great as possible and the prospects for foreclosures should be relatively low, unless there are other factors, such as low productivity growth or poor housing or housing finance market performance.

There are other factors that affect foreclosure. One of the most important today is that innovations on housing markets have made loans to subprime borrowers much more readily available. Traditionally, borrowers with relatively low income relative to the cost of housing and low credit ratings, because of past problems of loan repayment or simply lack of evidence of ability and a willingness to pay, would access the FHA market. These borrowers had much higher loan default or delinquency rates and therefore a higher

percentage of such loans ended in foreclosure for any given economic and housing market conditions.

Today borrowers with even lower credit scores than FHA borrowers and whose economic circumstances make them less likely to be able to make their loan payments and meet other essential home ownership costs (insurance and property taxes) and/or whose past behavior may indicate a lower disposition to pay their monthly bills for their housing and other necessities can readily find credit in markets for high-risk creditors like themselves. These credits carry higher interest rates, which lenders hope will deter borrowing by individuals who are likely not to repay their debts and that will cover the higher costs of those who do not repay loans. As Federal Reserve Chairman Ben Bernanke has noted, there are nearly 7.5 million home owners because of the rise of subprime borrowing over the past 15 years or so, accounting for about 14 percent of all mortgages outstanding; another 10 percent of all mortgages are referred to as near prime, that is, they have higher expected foreclosure rates than other prime loans. In total, this represents about 24 percent of all mortgages outstanding and over 12 million loans and home owners. More importantly, most of the growth in this category has come in the past four years. If continued, these shares and loans would take on even larger shares of the market. With their associated higher foreclosure rates, foreclosures would be at a much higher level under the best of economic conditions. Thus the share of subprime loans, a relatively new phenomenon, is likely to replace the FHA share as a better indicator of foreclosure in housing markets. But there is limited experience with such loans, especially on such a large scale, so estimates at a high level of aggregation (such as a state) may lack precision for some years to come.

III. Cross-section regression results based on state foreclosure data

To assess the importance of the various influences, foreclosure rates for 2006 in the 50 states and District of Columbia were regressed on the measures that might account for foreclosure. The estimated equation is:

(1) Foreclosure rate = A0 + A1* homeownership rate + A2*LTV90
+ A3*FHA share + A4* employment growth
+ A5*house price appreciation rate
+ A6*unemployment rate

The data used here are standard. The foreclosure rate measure is the end-of-quarter foreclosure inventory as a percent of all residential mortgage loans and obtained from the Mortgage Bankers Association's *National Delinquency Survey*. The FHA share was also obtained from the Mortgage Bankers Association. Payroll employment growth and the unemployment rate are obtained from the U.S. Bureau of Labor Statistics. The Homeownership rate is from the U.S. Department of the Census. Home price growth is based on price data from the Office of Federal Housing Enterprise Oversight. Other house price series, especially their annual growth rates, are highly correlated. The loan–to-value greater than 90 percent share is provided by the Federal Housing Finance Board.

The estimates of the coefficients are shown in Table 3. The quality of the regression result reported in the table is quite high; the R-squared, which is an indicator of the explanatory power of the equation, is relatively high, 65.37 percent, and the standard error of the estimate is about 0.39, which is low relative to the mean level of the foreclosure rate in 2006, about 1.02 percent. However, in practical terms this measure means that there is a large range of error around the forecast level from the equation, so the equation cannot provide very precise forecasts of foreclosure, even if each of the measures accounting for foreclosure could be forecast with a high degree of precision. The equation is really most useful for assessing the importance or unimportance of each factor that could purport to account for the level of the foreclosure rate.

Table 3
Estimated regression estimates for state foreclosure rates (2006)

Equation coefficient	Coefficient	t-statistic
A0	0.482	0.46
A1	0.014	1.19
A2	-0.009	-1.12
A3	0.026	1.39
A4	-0.162	-3.46*
A5	-0.074	-3.39*
A6	0.103	1.75**

*significant at 5 % level; ** significant at 10 % level

All of the factors specified above affect foreclosure in the indicated direction, except for the share of loans with a loan-to-value ratio greater than 90 percent.[3] In particular, an increase in the homeownership rate, a rise in the FHA share of loans, and a rise in the unemployment rate all have a positive effect raising the foreclosure rate in a state. Similarly, a rise in employment growth or in the rate of house price appreciation reduces the foreclosure rate. Only the high loan-to-value percentage has the wrong sign. A rise in the percent of loans with a loan-to-value ratio greater than 90 percent reduces the foreclosure rate, which is counterintuitive because these are the riskiest loans from a delinquency/foreclosure perspective. However, this effect and several of the other estimated effects are not statistically significant at conventional levels. This means that there is a high probability that the observed effect of foreclosure could arise purely from chance. The t-statistics indicate this statistical significance. Generally a t-statistic below about two in absolute value indicates that the probability of observing the size of effect indicated by the coefficient, when the true effect is actually zero, is greater than five percent. For some observers, a t-statistic greater than one, which rules out a chance occurrence with a probability greater than about 32 percent, is used to determine whether the coefficient is more than a chance observation. This is a very low standard, however.

[3] In NAR (2004) all of the same variables were included except for the state unemployment rate. In NAR (2003) the unemployment rate had been included (and insignificant), but the most significant variables here, house price appreciation and employment growth, were not. The results in NAR (2004) were very similar, except that the LTV variable was statistically significant (t equals -2.2), but still had the wrong sign. The R-square for the estimate for 2002 in NAR (2004) was lower, 0.451.

By this very loose standard, all of the factors except the constant can be said to be significantly different from zero at a 32 percent significance level.

Using a five percent significance level, only employment growth and home price appreciation are statistically different from zero. The unemployment rate is significant at an 8.6 percent level and the FHA share is significantly different from zero at a 17.3 percent level. The homeownership rate and the percent of loans with a loan-to-value ratio greater than 90 percent are only significant at a 24 and 27 percent level, respectively, and as noted, the loan-to-value ratio has the wrong sign.

Simple correlations

A simpler test of the importance of each of the factors is to use the correlation coefficient for each factor and foreclosure. Table 4 shows the correlation coefficients for the state and District of Columbia foreclosure rates. All of the correlations are large and all have the "correct" sign. A correlation coefficient of zero indicates that two measures are independent of each other; a correlation coefficient of one or minus one is the largest possible in absolute value and indicates a perfect relationship between two measures. Note that the largest correlation in the group is between the FHA share of loans and foreclosure (0.87) although the FHA share is not significant in the regression analysis. All of these correlations are statistically significant at the 5 percent level for a simple linear relationship between foreclosure, and each measure and each correlation has the expected sign. The critical value for the correlation coefficient at the five percent level with 51 observations is 0.276.

Table 4
Correlation measures for state foreclosure rates and factors influencing them

Factors correlated with the foreclosure rate	**Correlation Coefficient**
FHA share	0.87
Share of loans with loan-to-value greater than 90 %	0.40
Homeownership rate	0.35
Payroll employment growth rate	-0.49
Unemployment rate	0.41
Home price appreciation rate	-0.68

One possible explanation for the weakness of some of the results in the regression equation is that the various factors on the right-hand-side of the equation, the factors accounting for foreclosure, are not really independent, as required by the statistical theory for estimating the regression and correctly interpreting the coefficient measures (see Table 5).

Table 5
Correlation of the state payroll employment rate and house price appreciation rate with other factors

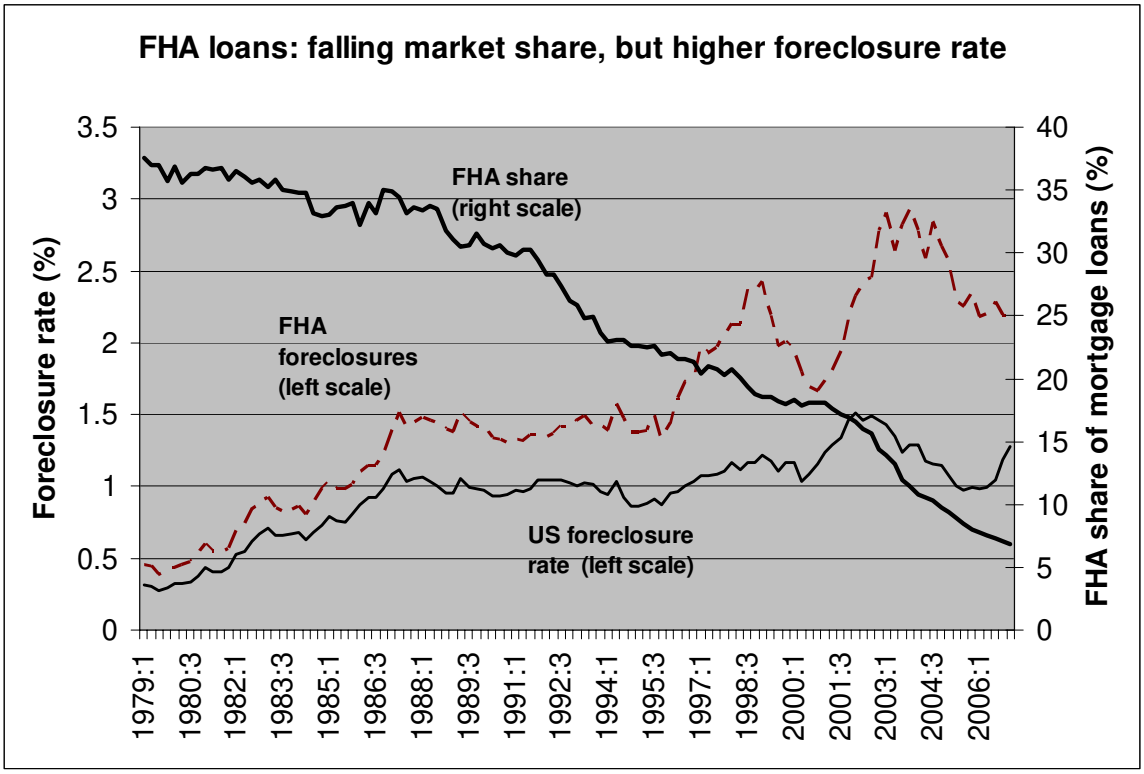
Factor	Correlation coefficient with employment growth	Correlation coefficient with home price appreciation
FHA share	-0.57	-0.54
High loan-to- value share	-0.39	-0.49
Homeownership rate	-0.03	-0.49
Unemployment rate	-0.38	-0.22
Employment growth	1.00	0.22
Home price appreciation	0.22	1.00

For example, the loan-to-value ratio, which has the wrong sign in the regression, but not in a simple correlation, is strongly related to home price appreciation rate (-0.49), so its effect could be arising primarily through the coefficient on the latter measure. In fact, the two main factors, payroll employment growth and home price appreciation, have large correlations with some of the other factors that do not appear to be statistically significant in the cross-section regression. This is especially true for the FHA share, which has the strongest negative correlations with the two factors that appear to be most influential in having a positive relationship with the foreclosure rate. Once one accounts for the latter two measures, there is no additional explanatory power from accounting for the FHA share itself, yet the latter has the largest single correlation coefficient with the foreclosure rate.

Riskier loans have higher foreclosures rates than in the past
Chart 2 shows that FHA loans have been a declining share of the national market for a long time. In this decade, at least, the decline has been fostered by the ease of obtaining subprime loans. This phenomenon is a little less true in Indiana, where the FHA share remains relatively high compared with the national average (Table 6).

The foreclosure rate on FHA loans has always been higher and more cyclical than for loans generally, but since 1995 the spread between the two foreclosure rates has widened. Recoveries from each of the housing cycle foreclosure spikes in 1998 and 2001 have been muted or incomplete, so that in each subsequent recovery the FHA foreclosure rate has failed to return to its pre-spike low. This is not the case for the national foreclosure rate overall, at least in the latest cycle which returned the rate to about one percent in 2005-06 and in early 2000. The earlier lows for the FHA foreclosure rate of 1.5 percent or somewhat less has not been seen in over 12 years. This presumably reflects an increased risk of FHA loans since then. As Tables 1 and 2 show, the growing share of subprime loans is even riskier.

Chart 2
FHA loans are riskier, but a declining share of the national market



Source: Mortgage Bankers Association

The Government Accountability Office (2007) cites the displacement of FHA loans mainly by subprime loans to low-income and minority groups as the as the main source of the decline and indicates that what in other contexts is called "cream skimming" or "cherry picking" is responsible for the rising risk of the FHA loan portfolio. Apparently the wide spread of risk for subprime loans over FHA loans suggests that the volume effects of newly available subprime loans overcame the cherry picking of subprime lenders.

Does Equation 1 explain Indiana's foreclosure rate?
Equation 1 provides some limited insight into the sources of high foreclosure in Indiana and its neighboring state. Table 6 shows the actual and forecast values of the average foreclosure rate in Indiana, Ohio and Michigan; equation 1 is used for the forecasts. The table also provides the average value of each of the factors in the equation for each state. The equation is also used to fit the average measures for the United States. While the equation is fitted so that the mean error for the 50 states and District of Columbia is zero, the same does not have to be true for the United States.

Table 6
Accounting for Foreclosure in 2006

	Indiana	Ohio	Michigan	United States
Foreclosure rate	2.88%	3.27%	2.05%	1.05%
Fitted value	1.79	1.87	2.11	0.96
Forecast error	1.09	1.41	-0.06	0.08
Homeownership rate	74.2	72.1	77.4	68.8
High loan-to-value share	31.0	20.0	32.0	19.0
FHA share	13.9	10.7	7.1	7.4
Employment growth	0.6	0.3	-1.1	1.8
Price appreciation rate	3.2	3.3	3.3	9.3
Unemployment rate	5.0	5.5	6.9	4.6

Nonetheless, the fit is quite good. For the three states shown, the fit for Michigan is nearly exact, but those for Indiana and Ohio are not. Recall that the standard error of the equation is 0.39 so the errors for Indiana and Ohio are 2.8 and over three times as large, respectively. Michigan has the highest forecast foreclosure rate, while Ohio and Indiana are second and third, respectively. While the fit of the general pattern of foreclosure rates is not bad, a large share of the actual foreclosure rate in Indiana and Ohio is not explained by the equation estimate. Ohio, which leads the nation, does not have any indicators that are worse than the respective indicator for Indiana or Michigan. Compared with Indiana, its higher forecast foreclosure rate is likely due to its slower employment growth and its higher level of the unemployment rate. Other indicators are more favorable in Ohio than in Indiana. Michigan has an even higher unemployment rate and slower, actually declining, employment growth. Additionally, Michigan has a higher homeownership rate and smaller FHA share, below the national average. The weaker economy in Michigan accounts for its forecast higher foreclosure rate. The high share of the high (over 90%) loan-to-value ratio works to lower the forecast loan-to-value rate, though only by a small amount (0.3%). All three states had about the same small rate of house price appreciation in 2006.

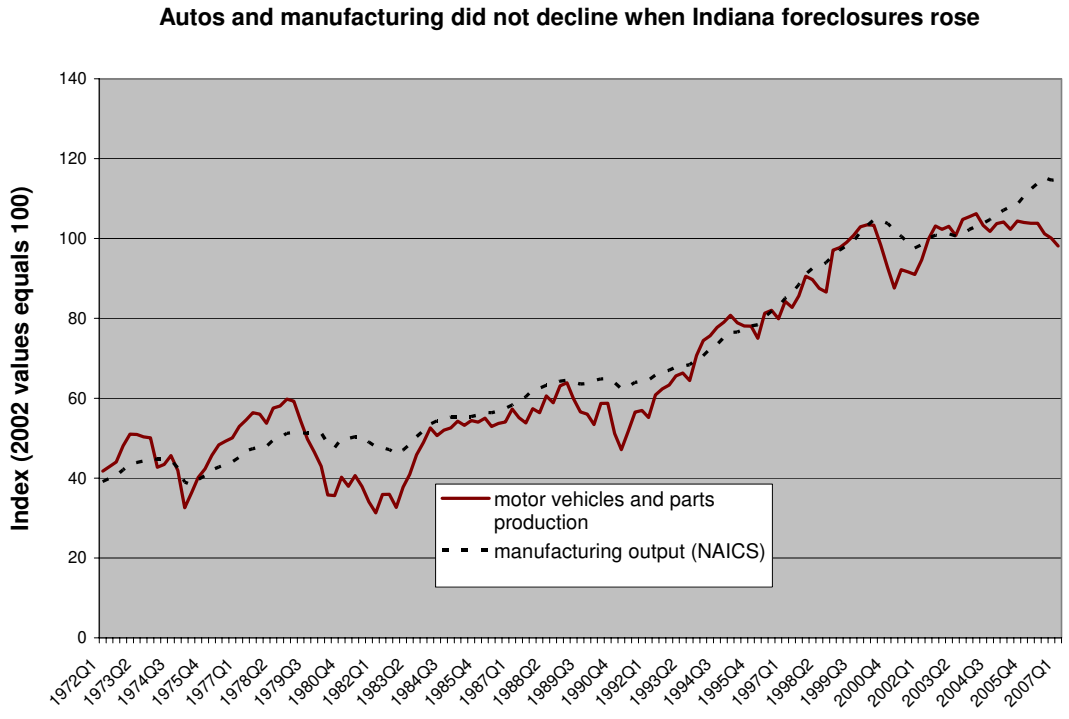
It is important to note that a cross-section study such as this one cannot address the potential for "reverse causality," which occurs when a high correlation in a regression could indicate that the direction of causality is the opposite of that indicated in the equation. In this case, one must consider that the high correlation of the FHA share and the foreclosure rate could reflect a causal link from the foreclosure rate to the FHA rate. It may be that states with relatively high foreclosure rates cause borrowers to fall back on FHA loans (or subprime loans) because of a lack of conventional funding sources. Similarly, a high foreclosure rate could slow the pace of house price appreciation, instead

of the causality direction presumed in equation 1. Because of the relatively small size of the housing sector in the economy, it is less likely that the foreclosure rate influences the pace of employment growth or unemployment. More detailed analyses involving time series data, observations over time could resolve the influence of reverse causation on the estimated effects. In future research, it will be important to examine the potential for reverse causality if for no other reason than that widespread expectation that the foreclosure spike will affect lenders, borrowers, house prices and production and sales for most market participants and not simply those involved in foreclosure events.

IV. Other factors affecting foreclosure rates

Some observers have argued that economic conditions have caused the deterioration in foreclosure rates. Concerns over the spike in subprime rates have almost nothing to do with expectations of general economic conditions, however. Another culprit is the supposed deterioration in the auto industry and manufacturing. At least in Ohio and Indiana, output and employment in manufacturing and auto manufacturing and parts have not deteriorated. The recent declines in motor vehicle and parts manufacturing are likely to be contributing to the rising foreclosure rate in Michigan, however, though the general decline in the economy is more widespread.

Chart 3
Manufacturing and auto output have not been declining in 1995-2006



Source: Board of Governors of the Federal Reserve System

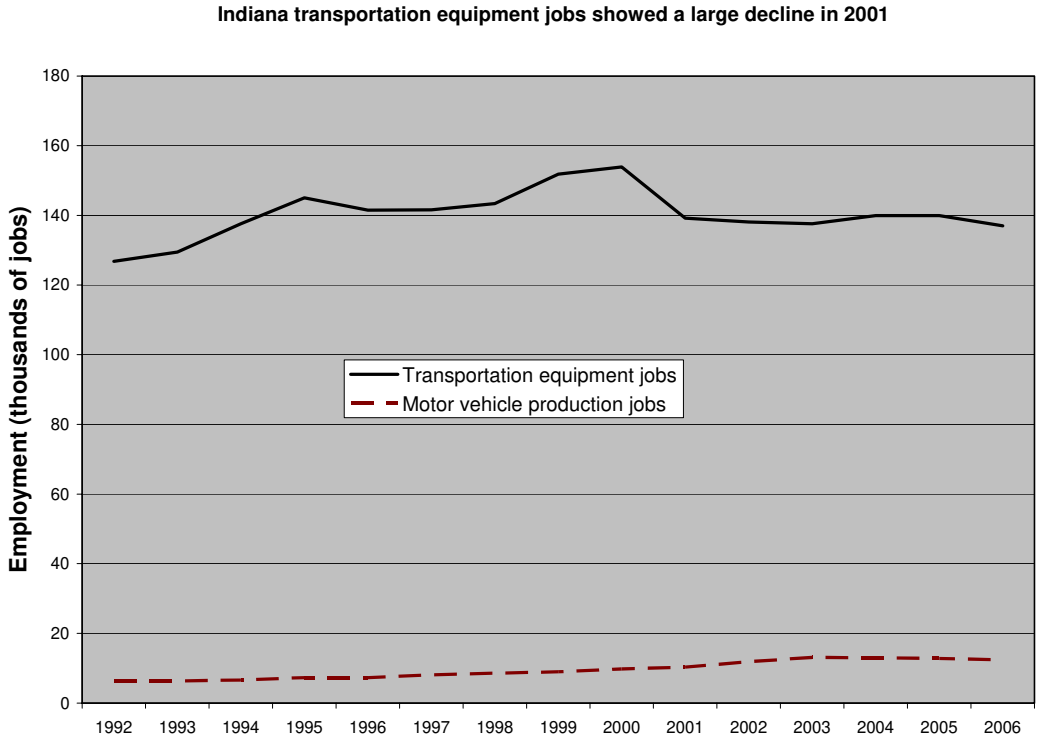
Chart 3 shows U.S. manufacturing output and the output of motor vehicles and parts. In 1996-2001 when foreclosure rates were booming upward in Indiana and Ohio, auto

output and overall manufacturing were booming. Similarly, auto output has risen at a 2.4 percent pace from 2001 to 2006, only slightly below the 2.7 percent pace for manufacturing. In fact the recovery in autos was more rapid, so that until early 2004 it grew faster than overall manufacturing. Since then there has been a slight decline in auto output, especially in 2006. Overall, auto production has been on a high plateau achieved in 1999, interrupted by the economic decline in 2000-01. While not matching the stellar growth of 1992-99, this plateau is far above the level in the earlier period of stagnant production in 1973-92.

The pattern of manufacturing and auto output does not match that of the foreclosure rate increase. Most of the foreclosure rise occurred in 1996-2001. No doubt the 2001 recession accounts for a little of the rise at the end, but the recovery in 2002-04 did not lead to a corresponding improvement in foreclosure rates. Only Michigan's rising foreclosure rate in 2006 appears to mirror performance in auto output.

We can also look at Indiana jobs in transportation equipment (which includes motor vehicles, parts, trailers and about 13,000 other workers producing non-auto related equipment) and in motor vehicle production (Chart 4).[4]

Chart 4
Indiana auto employment has declined little since 1995, except in 2001



Source: Bureau of Labor Statistics

[4] The employment data were graciously supplied by the office of Hope Clark, Director of Labor Force Information, Indiana Department of Workforce Development, and are prepared by the U.S. Department of Labor.

Except in 2001, there were no large declines in either series. In particular, in 1995-2000 jobs increased in both measures. Since 2001, there has been little change in the total or in motor vehicle production jobs in Indiana. Thus, except in 2001, there is little support for the notion that overall job loss played a major role in foreclosure experience. One possibility, however, is that job turnover may have risen over the period so that the mortgage holders who were getting jobs were not the same as those who lost jobs in the sector.

Mortgage fraud

Another factor that has been critically important in the region is mortgage fraud, although it is unlikely that it can account for much of the foreclosure problem. The Indiana Bankers Association (2003) examined one source of mortgage fraud, predatory lending, some years ago. As they point out, predatory lending is largely a problem for subprime loans and at the time, subprime lending was quite small. Subsequently subprime lending has risen sharply, but there is still little reason to think that predatory lending or other sources of fraud related to subprime lending can account for a significant share of the foreclosure rate.

It is difficult to measure the extent of fraud or the numbers of foreclosures that may be related to fraud. Sharick, Butts, Donahue, Larson and Croft (MARI 2007) have recently pointed to the rapid growth of fraud in mortgage finance. They point to a rise in "Suspicious Activity Reports" related to mortgage fraud submitted to federally-insured financial institutions since 2000 and reported to the Federal Bureau of Investigation and the Financial Crimes Enforcement Network. The number of these reports rose from 3,515 in fiscal year 2000 to over 28,000 in fiscal year 2006. The near eight-fold rise came largely in 2003-05 when submissions climbed from 5,387 to 25,989, or at a 69 percent annual rate. This corresponds to the period of surge in subprime lending. MARI suggests that the incidence of fraud is much larger because these reports are for federally insured institutions only. However, many of these reports, if not most, are not likely to involve fraud because they reflect "suspicious" activity. Nonetheless, MARI points to losses due to fraud of perhaps one billion dollars in 2006. Note that the total number of reports in 2006 is less than 5 percent of loans in foreclosure.

The top ten states for mortgage fraud for all loan originations, according to MARI, include Michigan and Illinois among Indiana's neighbors. Michigan has been among the top four states since 2004 and was third in 2006. Illinois ranked seventh in 2006, but was third in 2005. For a separate subprime mortgage fraud index, Indiana ranked seventh in the nation in 2006 and had ranked fourth in 2002 (in the intervening period it ranked 8th, 14th and 12th). Among the current top 10 list for subprime loans, Michigan ranked third in 2006, second in 2005 and third in both 2003 and 2004. Ohio also made this top 10, ranking 9th in 2006, seventh in 2005, fourth in 2004 and sixth in 2003. Thus, all three of the highest ranking states for foreclosure rank high on the MARI index of subprime mortgage fraud. While fraud may not account for much of the foreclosure problem, it is the least tolerable reason and it does seem to be worst where foreclosures are highest.

V. Conclusions and Outlook

The nation is bracing for an emerging spike in foreclosures which will impale Indiana and its neighbors, but this region already has seen an unusual rise in the foreclosure rate dating back to the mid-1990s and it has led the nation in foreclosures since 2001. While many factors have been cited, the principal ones have been the predominance of high risk loans, originally from FHA and later from subprime lenders.

A cross-section analysis of the state foreclosure rate in 2006 indicates that the main factors accounting for foreclosure are the FHA share, the lack of house price appreciation and the growth rate of payroll employment. The former share is the most highly correlated single factor and it is highly correlated with other factors accounting for foreclosure. With the recent surge in higher risk subprime loans, future work will require incorporating measures of these loans in explanations of foreclosure. But so far there is only limited information and these loans cannot simply be lumped together with risky FHA loans because they are even more risky. It is likely that the prevalence of high risk FHA loans have played a key role in the rise in foreclosure rates in Indiana and that the recent rising share of subprime loans has kept foreclosures from falling and soon will contribute to a further spike in foreclosures. In Michigan, the foreclosure rate has risen more recently and is likely more closely related to poor economic performance, especially in the past three years or so in the auto industry. Ohio has led the nation in foreclosure since 2003. There a weak economy, especially slow growth of employment and a higher unemployment rate have played important roles.

There are other factors that are frequently mentioned but they do not fit the pattern of emerging foreclosure from 1995-2006 or else they are not large enough to have had much substantive effect on the overall foreclosure picture. Auto sector and manufacturing production and employment do not fit the pattern of rising foreclosure in Ohio and Indiana except in one year, the recession in 2001. Predatory lending and other more prevalent means of mortgage fraud have had major damage on some borrowers, but most indicators do not support the presence of a major quantitative effect on the overall foreclosure rate.

There are ample remedies on offer for fixing the foreclosure problem. Most of them involve making credit to first-time and other riskier borrowers more difficult. But more difficult translates for lenders into more costly and that will mean that the achievement of the American dream of homeownership will become needlessly frustrated for many more potential homeowners than the number of foreclosures avoided. Proposals for lender forbearance are reminiscent of regulatory forbearance during the U.S. Savings and Loan crisis in the 1980s. A key lesson from that experience was that forbearance substantially raising the costs of failure when failure is inevitable or is fostered by the forbearance itself. Certainly the restoration of prudent lending standards is essential, but excessive and costly changes that will limit mortgage credit availability or reduce the use of new technologies to make housing affordability greater are likely to be self-defeating.

Indiana ranked ninth in the nation in homeownership in 2006, tied with New Hampshire and South Carolina, according to the U.S. Bureau of Census. Michigan was second in the nation and Ohio was 19th. Kentucky and Illinois, the remaining Indiana neighbors also had homeownership rates that were well above average. Indeed, the Midwest leads the nation in homeownership. Policy makers should insure that actions to address foreclosure do not jeopardize the achievement of this goal. Homeownership is boosted by relatively low home prices and by the availability of low cost credit to risky borrowers. Unfortunately these conditions are also favorable to a higher incidence of foreclosure. Education of borrowers, especially first-time home buyers, and the education of lenders in traditional prudent lending practices are more likely to foster lower foreclosure rates, while also promoting homeownership, than other proposed remedies.[5]

Outlook

Forecasting the size of the future spike in foreclosures is difficult. There is only limited experience with nontraditional loans and subprime loans. Subprime (and alt-A) loans are about 25 percent of all mortgages. At worst, in early 2002, foreclosures on subprime loans hit about 15 percent. A repeat of this experience with the now-larger share of subprime loans could mean that subprime foreclosures alone could raise the overall foreclosure rate by 4 percent. With the remainder running slightly above normal, say around one percent, the overall foreclosure rate would reach about 4.75 percent, almost four times the current rate and the highest since the Mortgage Bankers Association began collecting data. It is not implausible that the foreclosure rate on subprime loans could be far worse, say double the 2002 level, or 30 percent. In that case, the overall foreclosure rate would reach more than 8 percent. Such a level would mean about 1.6 to 3.2 million home loans in foreclosure at the peak and this would have serious consequences for the housing industry, housing prices and, at the top end, for the economy.

It remains to be seen whether the coming spike in the foreclosure rate could have a major impact on the housing market, financial institutions or the overall economy. The housing industry has already adjusted to the situation by drying up funds for riskier loans, depressing prices and sales of both new and existing housing. The emerging surge in the foreclosure rate is more likely to affect prices on neighboring properties and sales and will not appreciably add to the deterioration of production and employment in the housing sector. Over the past year, housing sector developments reduced annual growth at most by one percent and this may already be declining. This was not enough to induce recession or to significantly noticeably affect depository institutions and is not likely to be large enough in the future to do so either. Note that this does not suggest that housing markets are about to improve. It only requires that new construction flatten out at current depressed levels or at least slow the pace of descent. Record foreclosure rates will contribute to uncertainty in the housing market, however, depressing prices and further postponing recovery in housing, but Indiana and Ohio residents, and increasingly Michiganders, already knew that.

[5] Weicher (2007) focuses on the trade-off between maintaining the remarkable growth and level of homeownership and the *temporary* risk of higher foreclosure rates, especially in the riskier segments of the mortgage market.

The spreading of risk in mortgage markets has meant that the repricing of mortgage-related assets will occur very quickly and with less damage than earlier when these assets were concentrated on the books of banks and other financial institutions and were not able to be marketed easily. Moving ownership of homes from buyers who cannot afford the increasing or even unchanging terms of their mortgages will be much slower, dragging out the adjustment of housing market prices, sales and production of new units. As a result, the uncertainty and risk associated with housing finance will continue for several quarters, even though the worst of the effects on lenders and financial institutions is likely to occur much more quickly.

References

Bernanke, Ben, "The Subprime Mortgage Market," speech presented at the 43rd Annual Federal Reserve Bank of Chicago Bank Structure and Competition, May 17, 2007.

Chiu, Shirley, "Nontraditional Mortgages: Appealing but Misunderstood," *Profitwise News and Views*, December 2006.

Indiana Mortgage Bankers Association (IMBA), "Indiana Mortgage Foreclosure Rate," January 9, 2003, processed.

National Association of REALTORS, "Rising Foreclosure Rates in Indiana: An Explanatory Analysis of Contributing Factors," preliminary version, March 2003, and final version, March 2004.

Sharick, Merle, Jennifer Butts, Michelle Donahue, Nick Larson, and D. James Croft, "Ninth Periodic Mortgage Fraud Case Report to Mortgage Bankers Association," Mortgage Asset Research Institute, LLC, April 2007.

U.S. Government Accountability Office, *Federal Housing Administration, Decline in the Agency's Market Share Was Associated with Product and Process Developments of Other Mortgage Market Participants*, Washington D.C. GAO-07-645, June 2007. .

Weicher, John C., "The Long and Short of Housing: The Homeownership Boom and the Subprime Foreclosure Bust," Networks Financial Institute *Policy Brief,* 2007-PB-09*,* August 2007.