Comment On:

"Reducing Foreclosures" by Christopher Foote, Kristopher Gerardi, Lorenz Goette and Paul Willen

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The current global recession began with a sharp rise in mortgage defaults and falling house prices. The sheer volume of delinquencies raises the fear that impending foreclosures will further destabilize an already distressed housing market. For example, foreclosures can lead to significant deadweight losses due to poor maintenance of vacant homes. Similarly, fire sale of foreclosed homes can further drive down prices in the neighborhood, triggering more defaults and potential foreclosures.

Correspondingly a number of commentators have emphasized the importance of reducing foreclosures through policies that promote efficient debt restructuring. The paper, "Reducing Foreclosures" by Foote, Gerardi, Goette and Willen is therefore timely and opens up the debate on this important issue in a systematic manner.

The paper presents evidence on what precipitated the default crisis, and how losses from defaults may be contained. Regarding the causes of the default crisis, the paper argues that ex-ante leverage, in the form of the debt to income ratio at the time of loan issuance, is not an important driver of mortgage defaults. Instead the paper views the default crisis as largely being driven by falling house prices and unexpected income shocks in the form of higher unemployment.

On the question of reducing the cost of defaults, the paper takes issue with the view that securitization of mortgages is holding up successful restructuring of debt and hence generating excessive foreclosures. The paper presents evidence that delinquent loans held directly by banks are no more likely to be modified than loans held in securitized pools. Correspondingly the authors suggest that there is limited rationale for policies aimed at promoting restructuring. The best that policy makers can do is to try to limit job losses and other adverse income shocks.

I discuss each of the main points of the paper separately below.

I. Does ex-ante leverage (debt to income) predict default?

The paper's finding that leverage at the time of origination is not a strong predictor of default is surprising. One would think that individuals with a higher burden of debt at origination are more susceptible to economic fluctuations moving forward, and hence more likely to default. Yet the authors do not find a strong relationship between ex-ante leverage and future default. The authors' interpretation of this result is that individual income is quite volatile over time. As such, the debt to income ratio, when measured at a point in time, quickly loses its informativeness as a predictor of default.

However, there is an alternative explanation of the authors' finding based on biases in the measurement of debt to income ratio. In particular, debt to income is poorly recorded on loan applications, and in fact is missing for about half the applications. Consequently, investors and servicers place little weight on debt to income ratio in their decisions. The paper argues that the lack of emphasis on debt to income ratio by investors is due to its failure in predicting default. While it is true that *reported* debt to income ratio is not very useful in predicting default, this finding does not imply that the *true* debt to income ratio is also a weak predictor of default. For example, if the reported debt to income ratio has important biases and measurement issues, then investors will rationally choose to ignore the information.

Why might reported debt to income ratio suffer from measurement issues? First, as has already been noted, the information is missing for about half the applications. Second, even when the ratio is recorded, income can be self-reported. This not only introduces measurement error, but introduces it in a way that would make the author's estimate of the correlation between future default and initial DTI ratio biased downwards. For example, borrowers that are more likely to default, and hence do not deserve to receive as high a mortgage as they are applying for, will tend to over-state their true income on the application form. Such self-reporting bias will introduce a negative spurious correlation between DTI and future default.

Third, since default is an individual level (and not just loan specific) decision, the appropriate DTI ratio must aggregate different types of debt for a given individual. This is not the case for reported DTI on a mortgage application as it only includes debt for the given loan. This is especially an issue for borrowers with a high propensity to default. Such moral-hazard prone borrowers are more likely to take multiple loans on multiple credit cards, home equity lines etc. Thus when DTI ratio is computed at the loan level for such high risk individuals, it will appear much lower than what it should be. Since the same individuals are more likely to default ex-post, a spurious negative correlation between DTI and default will be created when looking at loan level data.

Given the above mentioned problems with using DTI ratio in the authors' data set, I propose an alternative methodology for testing whether ex-ante DTI ratio predicts future defaults or not. The idea is to compute debt to income ratio using, (i) aggregate borrowing for consumers, and (ii) audited income data such as payroll wages or income from tax returns.

We can use the above methodology to first compute debt to income ratio for the entire U.S. household sector. Figure I shows the evolution of this ratio over time using flow of funds data for household debt and wages. The figure shows that there is a sharp increase in household leverage from 2000 to 2006. Debt to income ratio for the U.S. rose from 1.2 in 2000 to 1.7 in 2006. Such an increase in leverage is unprecedented in recent U.S. history.

Figure I also shows the evolution of default rate for U.S. households over time. A loan is classified as default if its payments are more than 30 days overdue. The data comes from Equifax which is a nationwide consumer credit bureau. While default rate does not change much between 2000 and 2006, there is a sharp rise in defaults after 2006 when household leverage levels off.

The aggregate time series suggests a strong link between the increase in household leverage and subsequent defaults. While the limitations of time-series data are well-known, the historic rise in household leverage over 2000 to 2006 period followed by an equally historic rise in defaults from 2006 onwards is strongly suggestive of a link between the rising leverage ratio of new loans and subsequent defaults.

Does the time-series relationship between rising debt to income ratios and subsequent defaults also hold up in the cross-section? In other words, is it the case that households that levered up more during the credit boom years are also likely to default more in recent years? Such a test is closer in spirit to the tests conducted by Foote et al.

The cross-sectional test requires consumer level data on total debt and income. Mian and Sufi (2009a and 2009b) construct such a data set using individual level data on borrowing from the credit bureau agency Equifax, and zip code level data on income from the IRS. Since the location (zip code) of individuals in the credit bureau data set is known, consumers can be matched to the zip code level income data from IRS.

Using the consumer level borrowing data, Mian and Sufi (2009b) show that consumers that lever up more during the 2000 to 2006 credit boom period are significantly more likely to default. The effect of higher ex-ante leverage on defaults is particularly strong among subprime borrowers defined as borrowers with a credit score of below 660 in 1998.

The aforementioned result is not surprising in the light of credit flow patterns during credit boom years documented in Mian and Sufi (2009a). In particular, the growth of mortgage credit was much stronger in subprime neighborhoods relative to prime neighborhoods in the same city. This happened despite the fact that subprime neighborhoods were *declining* neighborhoods in terms of their relative income growth. There was thus a negative correlation between income growth and credit growth in the cross-section of U.S. neighborhoods during the heart of the credit boom years. In fact, 2002 to 2005 is the *only* period in the last eighteen years when income and mortgage credit growth are negatively correlated.

The negative correlation between income and credit growth during the boom years implies that the subprime neighborhoods were becoming increasingly more levered. As is well known, these same neighborhoods are defaulting at extremely high rates. In short, it is difficult to accept the view that ex-ante leverage of the household sector played an unimportant role in generating the default crisis.

II. Is negative home equity and adverse life events a "cause" of the housing crisis?

While the paper downplays the importance of ex-ante DTI ratio in predicting default, it argues that a more prominent explanation for the rise in delinquencies is the fall in house prices and increase in unemployment rate. There is no doubt that falling home prices and rising defaults are highly correlated. However, given a mortgage default crisis, the correlation between falling house prices and increase in defaults in almost tautological.

Theoretical literature on mortgage defaults treats the default decision as the exercise of a put option on the value of the house by the homeowner. A homeowner defaults on a mortgage when he is unable to sell the house at a price above the outstanding mortgage balance (Deng, Quigley and Van Order 2000 and Bajari, Chu and Park 2008). Thus fall in house prices is a necessary condition for large scale defaults in the mortgage market. Correspondingly falling house prices should not be referred to as an *explanation* of the housing crisis. It is more appropriate to think of falling prices as the *definition* of a housing crisis.

The second factor proposed by the paper as an explanation of the housing crisis is "adverse life events" such as the rise in unemployment. While there is no doubt that unemployment contributes to a worsening of the housing market, more care needs to be given to the direction of causality in the current U.S. recession. In particular, it may be the case that an over-levered household sector first led to a rise in defaults and a cut in aggregate demand as people re-evaluated their housing market expectations. If this were the case then the initial rise in unemployment would itself be caused by the preceding rise in mortgage defaults (instead of the other way round). So which came first, the rise in defaults or an increase in unemployment?

Figure II shows the quarterly change in the unemployment rate and the default rate for the U.S. The default rate is defined as the percentage of loans that are late in their payments by 30 days or more. While the change in the default rate turns positive in the second quarter of 2006, the unemployment rate does not increase until the second quarter of 2007. There are thus four straight quarters of consistent increase in mortgage default rates before unemployment rate picks up. This phenomenon is specific to the current recession; the same pattern of consistent rise in defaults preceding the rise in unemployment does not hold for the 2001 recession. In short the aggregate pattern in Figure II is not consistent with the view that unemployment shocks are the primary drivers of increasing default rates.

The combined evidence in Figure I and Figure II is more in line with the view that an over-levered (i.e. high DTI ratio) household sector could no longer sustain the frenzied housing market, leading to a slowdown (and ultimate reversal) in house price growth and defaults on mortgages. Thus a central question to understanding the housing crisis is why households increased their leverage to such unprecedented levels in the first place.

III.   Loan Renegotiation and Securitization

A widely held view suspects that securitization of mortgages is hindering the process of loan renegotiation. Foote et al present empirical evidence that disputes this contention. They compare explicit loan modifications for loans that were securitized and loans held directly in bank's portfolios and find no large differences in modification rates.

Since the paper's emphasis is on understanding foreclosures, modifications are useful to look at only to the extent they are successful in limiting the extent of foreclosures. From this perspective, there are two concerns with the way modifications are recorded in the data. First, some types of renegotiations such as temporary moratorium on payment and short sales will not be recorded in the authors' data set. Second, a vast majority of loan modifications in the authors' data involve *increases* in principal amounts.

Such modifications do not look like loan modifications that are done for the purpose of reducing foreclosures. Instead the increase in principal amount may reflect the *unwillingness* of mortgage servicers to restructure the debt as they impose further penalties on borrowers for delinquent loan by increasing the principal amount.

For these reasons, it would be more appropriate to look directly at the outcome of interest, i.e. foreclosure rates. A recent paper by Piskorski, Seru and Vig (cited by the authors) does so by comparing the foreclosure rates for securitized loans and loans held directly on bank's balance sheets. Contrary to the results in Foote et al, Piskorski et al find that conditional on delinquency securitized loans are significantly more likely to go into foreclosure.

The Piskorski et al paper also has an innovative identification strategy where they compare loans that become delinquent just before the three month "early pay default" triggers (and hence go back on the originating bank's books) versus loans that become delinquent just after the three month deadline (and hence remain in the securitized pool). They find that mortgages that become delinquent just a month earlier and hence go back to the bank's books are significantly less likely to be foreclosed on. These results cast doubt on the hypothesis that securitization does not reduce incentives to renegotiate the loan and prevent foreclosures.

IV.   Policy Implications

The paper concludes that the housing crisis was not driven by an excessive leverage of the household sector (i.e. ex-ante debt to income does not predict defaults), and that securitization is not adding any additional hurdles in the prevention of foreclosures. A natural policy implication of this is that not much needs to be done to facilitate restructuring and de-leveraging of the household sector. Instead the authors recommend that the government should focus on steps to reduce income volatility of individuals.

However, as I have argued above, there are reasons to be skeptical of the view that ex-ante leverage had no role to play in creating defaults, and that there are few inefficiencies (from a social perspective) in the debt renegotiation process. Consequently understanding the reasons for the remarkable rise in household leverage that led to the default crisis is important to prevent excessive leverage in future. Moreover better mechanisms of debt-restructuring and risk sharing in the current environment could help bring household leverage to more manageable levels and help reverse the current downturn.

References:

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Figure I: U.S. Households' Debt to Income Ratio and Default Rate

Figure II: Quarterly Change in Unemployment and Default Rate