Session II:
Impacts of Foreclosures/Distressed Sales

The Impact of Distress Sales on House Prices

Mark Zandi, *Chief Economist, Moody's Analytics*

Since World War II, house prices have tended to significantly affect foreclosures, but not the reverse; foreclosures have historically made little difference for house prices. This changed in the recent downturn because of the sheer volume of foreclosures. Indeed, foreclosures and short sales are among the most important near-term influences on the direction of house prices. The combination of rising distress sales, falling house prices and weak job growth has severely hampered the economic recovery. The large overhang of distressed properties thus clouds the outlook for housing and the broader economy.

Several factors govern the relationship between house prices and distress sales. A distressed home, particularly a foreclosure, is discounted when sold because it is often in poor condition and thus less valuable than a comparable non-distressed home (see Chart 1). Empty, foreclosed homes are subject to vandalism or may have been damaged or poorly maintained by the former homeowner. The average discount on foreclosure sales peaked in mid-2008 at more than 25 percent (see Chart 2). Typically, discounts on short sales are smaller than discounts on REO sales. There is usually a buyer ready to purchase the home in a short sale. Additionally, the seller often still lives in the home and thus the home is better maintained than an REO.

Chart 1: Home Price Index, Single-Family Homes, January 2008 = 100

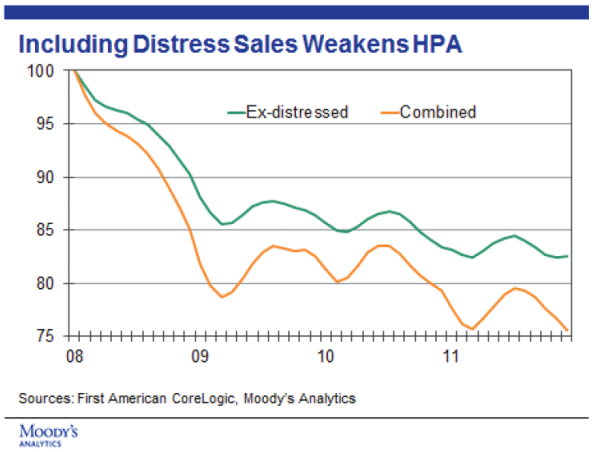
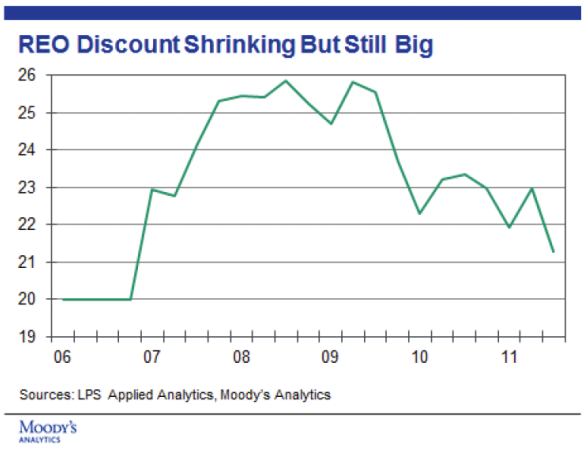


Chart 2: Discount for a REO Sale, %



When distress sales dominate the market, non-distressed house prices are also depressed. Buyers are wary of purchasing in areas with a large number of foreclosures. The blighted neighborhood thus becomes a characteristic of a non-distressed house that reduces its value. A large number of foreclosures also mean there is a large stock of vacant homes which weighs on prices of all types of houses.

Historically, distress sales have had little impact on measured house prices. Sale prices on individual distressed properties are discounted and might even have weighed on sale prices of a few nearby non-distressed homes, but aggregate measures of home prices were unaffected. The volume of distress sales was simply too small relative to normal home sales to have much impact on prices.

However, this changed dramatically in the past few years as the share of foreclosures and short sales surged to more than one-third of total home sales. As the share of distress sales increased, they came to dominate changes in house prices. A rising share of distress sales now results in a decline in house prices and a falling share results in price appreciation (see Chart 3).[i] This relationship is also evident when examining house price changes across metropolitan areas (see Chart 4).

Chart 3: Change in Foreclosure Share of Sales and House Price Growth

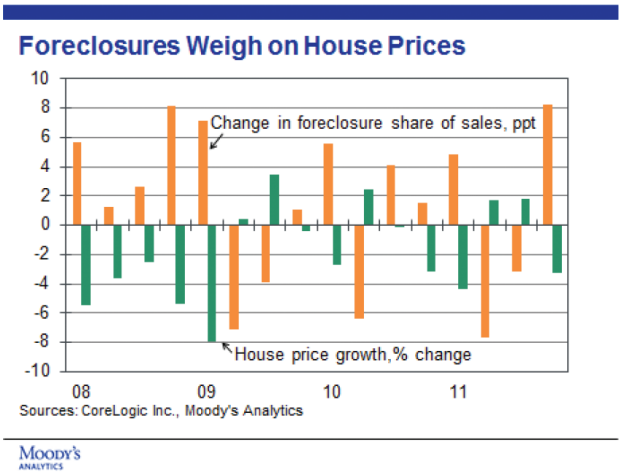
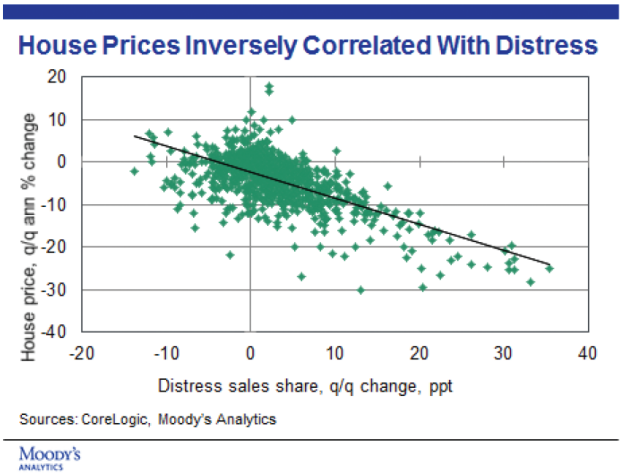


Chart 4: Quarterly Changes, 2007Q1 to 2012Q2, NSA



The importance of the distressed share of home sales is captured in Moody's Analytics model of house prices.[ii] Metropolitan area house prices are determined in two stages. In the first stage, the so-called equilibrium house price is estimated. The equilibrium price is closely tied to household incomes and effective rents, and abstracted from the business and credit cycles. The second stage determines the adjustment process by which actual house prices return to their long-run equilibrium given changing business and credit conditions.

[i] The strength of this relationship varies depending on the house price measure. It is particularly strong in repeat-purchase house price indexes such as those reported by Case-Shiller, LPS Analytics, and CoreLogic that include distress sales in their calculations.

[ii] Moody's Analytics has modeled and provides forecasts for metro area and national house prices based on the Fiserv Case-Shiller, FHFA and Realtors' gauges of median house prices. Of the three, the Fiserv Case-Shiller is the most accurate and comprehensive measure.

In the long term, house prices are most closely tied to household incomes and effective rents. Other factors that affect this relationship include non-housing household wealth, population growth, the age and ethnic composition of the population, regulatory conditions and permitting requirements, structural changes in lenders' underwriting standards, consumer preferences and the long-run, risk-adjusted return to housing and other household assets (see Table 1).

The most important explanatory variable in the equilibrium house price equation is real per capita income. On average, a 100-basis point increase in real (after-inflation) per capita income leads to an equivalent increase in real house prices. Income changes have a slightly larger impact on house prices in coastal markets than in non-coastal markets. Due to geographical constraints in the coastal markets, stronger income growth may drive up demand more quickly than supply, hence driving up house prices more rapidly.

Equilibrium house prices are also affected by shifting mortgage lending standards. The housing bubble saw rapid growth in subprime and alternative-A mortgages, interest-only and option ARMs, along with second liens and home-equity lines of credit. This lending significantly expanded the availability of mortgage credit to households that did not previously have access to any type of credit. As the bubble burst, the lending landscape shifted abruptly and a credit crunch took hold, undermining demand for housing. Lending standards are proxied in the equilibrium equation by an average of the loan-to-value ratio of mortgage originations and the adjustable mortgage share. The higher the share, the looser the lending standards. On average, a 100-basis point increase in this measure generates a 60-basis point increase in equilibrium house prices.

The collapse in stock prices and the plunge in short-term interest rates in the early 2000s made housing an attractive alternative investment. Households were rationally attracted by higher risk-adjusted returns to housing compared with the risk-adjusted returns on stocks and cash. Since the bust, falling house prices have created the reverse effect. The returns to housing are measured in the equilibrium house price equation by the difference between the risk-adjusted returns on stocks and cash, weighted according to their share of assets in the average household portfolio and the risk-adjusted return on housing. The risk-adjusted return is measured by a Sharpe ratio, proxied by the ratio of a five-year moving average of returns to the standard deviation of those returns.[iii] On average a 100-basis point increase in the risk-adjusted return to stocks and cash results in a 75-basis point decline in equilibrium house prices.

[iii] Alternative moving averages were tested. A five-year moving average provides the best statistical results.

Table 1: Equilibrium House Price Equation

Dependent variable: Log of real house price (Case-Shiller index) †				
Sample (adjusted): 1985Q4 to 2011Q4				
Included observations: 105 after adjustments				
Cross-sections included: 20				
Total pool (balanced) observations: 2,100				
R-squared	0.908			
Adjusted R-squared	0.906			
S.E. of regression	0.138			
F-statistic	701.7			
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	0.4105	0.1108	3.7	0.0002
Log real per capita income, Coastal	1.3796	0.0357	38.7	0.0000
Log real per capita income, Noncoastal	1.2093	0.0412	29.3	0.0000
Market portfolio versus housing returns, Coastal	-0.0089	0.0006	-15.2	0.0000
Market portfolio versus housing returns, Noncoastal	-0.0061	0.0006	-10.4	0.0000
Vacation home share of stock interacted with pop. share 50-64, Coastal	0.0028	0.0012	2.4	0.0145
Vacation home share of stock interacted with pop. share 50-64, Noncoastal	0.0092	0.0026	3.5	0.0005
Log 5-yr population growth, Coastal	0.4150	0.1448	2.9	0.0042
Log 5-yr population growth, Noncoastal	1.5309	0.1397	11.0	0.0000
Weighted average of ARM share and LTV of new loans, 4 qtr MA	0.0068	0.0004	19.4	0.0000
User cost of housing	-0.3787	0.5324	-0.7	0.4770
Metro Area Fixed Effects				
Atlanta, GA	-0.0399			
Boston, MA	0.0906			
Chicago, IL	-0.1323			
Dallas, TX	-0.0225			
Denver, CO	0.1442			
Detroit, MI	-0.3873			
Houston, TX	-0.4780			
Las Vegas, NV	-0.0481			
Los Angeles, CA	0.3665			
Miami, FL	-0.3111			
Minneapolis, MN	0.0492			
New York, NY	0.0796			
Philadelphia, PA	0.1654			
Phoenix, AZ	-0.2633			
Riverside, CA	0.1458			
San Diego, CA	0.4177			
San Francisco, CA	0.3539			
Seattle, WA	-0.0662			
Tampa, FL	-0.3794			
Washington, DC	0.3150			

† Case-Shiller index is benchmarked to the 2000Q1 median home price and then deflated by core PCE deflator.

The age composition of the population also affects equilibrium house prices, as people age 50 to 64 tend to have stronger demand for second and vacation homes. As the large baby-boom generation has moved into this age bracket, demand for second and vacation homes has risen significantly, lifting prices. This effect is captured in the equilibrium house price equation by the share of housing stock in second and vacation homes interacted with the share of the population age 50 to 64. A 100-basis point increase in the share of the population 50 to 64 lifts equilibrium house prices by an average of 60 basis points.

A population-growth variable is included in the equilibrium equation to capture the strength of migration flows, both domestic and international, into the various regions. Migration and population are likely to increase in coming years, with continued foreign immigration and more importantly, increased retiree migration among aging baby boomers.

Finally, the user cost of housing is included in the equilibrium equation. The user cost measures the after-tax cost of homeownership and is computed using the mortgage interest rate, the marginal income tax rate, property tax rate and house price expectations. The higher the user cost, the lower house price growth. House price expectations are proxied by consumer price inflation. The coefficient on this term has the correct sign, although its statistical significance is low. This weakness likely results from the fact that in recent years exceptionally low mortgage rates have driven down the user cost, yet house prices have fallen. Additionally, using consumer price inflation as the measure of house price expectation overstates expectations since the housing correction began.

The equilibrium equation is estimated using pooled cross-sectional estimation with metro-specific fixed effects in order to capture any systematic differences in the average quality of housing across areas. The fixed effects also capture the impact of those land supply constraints that do not vary over time.[iv] In order to capture broad regional differences in the response of house prices to the explanatory variables, the metro areas included in the estimation were grouped into metro areas situated along the coast and Great Lakes and non-coastal areas.[v] The coastal and non-coastal dummy variables were interacted with each of the explanatory variables to pull out the different responses of areas that face tighter building constraints as a result of geographical location, and are thus more susceptible to housing cycles.

The residuals from the equilibrium equation provide an estimate of the overvaluation or undervaluation of metro area house prices relative to their long-run equilibrium. Overvaluation and undervaluation can be due to temporary business cycle forces, speculation or both.

The house-price model also accounts for short-term business cycle dynamics that explain departures from the estimated long-run equilibrium house price. Business cycle drivers of housing demand include the unemployment rate and the distressed share of home sales.

[iv] F-tests of the metro area effects reject that these effects are zero at the 0.001 confidence level. Similar tests for time effects were not found to be significant.
[v] Glaeser, Edward L., Gyourko, Joseph, and Saiz, Albert, 2008 "Housing Supply and Housing Bubbles," NBER Working Papers 14193, National Bureau of Economic Research, show that metro areas in the U.S. located within 80 kilometers of the coast or the Great Lakes tend to feature supply-side constraints that produce larger and more frequent housing bubbles. The coastal dummy is an attempt to capture the inherent similarities of coastal and Great Lakes housing markets.

The adjustment process from the short to the long run is captured by time series terms that capture the tendency for house prices that have been rising or falling to continue rising or falling, as well as the tendency for prices to revert to their long-run equilibrium if they have departed from this trend for long. The larger the difference between the equilibrium house price and the actual price, the greater the reversion back to equilibrium.

The adjustment house price equation determines how house prices that deviate from their long-run equilibrium ultimately return to that equilibrium. The fitted values from the long-run equilibrium house price equation are thus an important explanatory variable in the adjustment house price equation (see Table 2). A 100-basis point increase in the contemporaneous change of the long-run equilibrium price will result in an 8-basis point increase in house prices. This response is measurably smaller than that found in other studies and may reflect the unique housing market conditions of recent years, when factors other than long-term drivers, such as mortgage foreclosures and government housing policy, have been at play.

House prices lagged one quarter are also included in the adjustment equation, reflecting the persistence of house price changes. House price persistence is marginally stronger in the coastal areas, reflecting the greater potential for speculative pressures to develop in these markets. A 100-basis point increase in the house price one quarter ago will result in a 40-basis point increase in the current house price.

The mean reversion term captures the tendency of house prices to revert to their long-run fundamental values and is calculated as the difference between the equilibrium house price and the actual house price. Thus, for example, if this term is positive—that is, actual house prices are below equilibrium—then price growth will be faster.

The principal business cycle variable included in the adjustment equation is the unemployment rate. The higher the unemployment rate, the slower real price growth. The direct impact of the joblessness rate on the adjustment to equilibrium, however, is small relative to that of serial correlation and mean reversion.

The inclusion of a measure of distress sales in the house price model also helps to explain and predict prices. An increase in the distress share will lead to a more pronounced decline in house prices, and the impact will persist for nearly one year. Over this period, a 100-basis point increase in the percent of distress sales will result in a 32-basis point decline in house prices, with the coastal metro areas feeling the impact slightly more. Thus, nearly 10 percentage points of the 34 percent decline in the Case-Shiller house price index from its peak in early 2006 can be attributed to the 30-percentage point increase in the distress share of home sales.

Table 2: Adjustment House Price Equation

Dependent variable: Change in the log of real house price, Case-Shiller index †
Method: Pooled EGLS (Cross-section weights)
Sample: 2007Q1 2011Q4
Included observations: 20
Cross-sections included: 20
Total pool (balanced) observations: 400
The mean reversion variable represents the difference between equilibrium and actual house prices.

R-squared	0.736
Adjusted R-squared	0.714
S.E. of regression	0.018
F-statistic	33.15
Durbin-Watson stat	1.95

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Constant	-0.0089	0.0012	-7.548	0.0000
DLOG equilibrium house price	0.0782	0.0515	1.519	0.1295
DLOG house price lagged 1 qtr, Coastal	0.3632	0.0598	6.077	0.0000
DLOG house price lagged 1 qtr, Noncoastal	0.3267	0.0772	4.230	0.0000
Mean reversion, Coastal	0.0337	0.0102	3.288	0.0011
Mean reversion, Noncoastal	0.0521	0.0160	3.255	0.0012
2-qtr change in jobless rate	-0.0111	0.0022	-5.016	0.0000
1-qtr change in distress sales share, Coastal	-0.0025	0.0004	-6.830	0.0000
1-qtr change in distress sales share, Noncoastal	-0.0019	0.0005	-4.207	0.0000
1-qtr change in distress sales share, lagged 1 qtr, Coastal	-0.0002	0.0004	-0.554	0.5803
1-qtr change in distress sales share, lagged 1 qtr, Noncoastal	-0.0004	0.0005	-0.717	0.4738
1-qtr change in distress sales share, lagged 2 qtrs, Coastal	-0.0007	0.0004	-1.640	0.1019
1-qtr change in distress sales share, lagged 2 qtrs, Noncoastal	-0.0007	0.0005	-1.285	0.1994
Metro Area Fixed Effects				
Atlanta, GA	0.0042			
Boston, MA	-0.0006			
Chicago, IL	0.0031			
Dallas, TX	0.0069			
Denver, CO	-0.0095			
Detroit, MI	0.0054			
Houston, TX	-0.0064			
Las Vegas, NV	-0.0062			
Los Angeles, CA	0.0051			
Miami, FL	-0.0052			
Minneapolis, MN	-0.0042			
New York, NY	0.0037			
Philadelphia, PA	0.0046			
Phoenix, AZ	-0.0068			
Riverside, CA	-0.0036			
San Diego, CA	0.0033			
San Francisco, CA	0.0007			
Seattle, WA	0.0029			
Tampa, FL	-0.0053			
Washington, DC	0.0077			

† Case-Shiller index is benchmarked to the 2000Q1 median home price and then deflated by core PCE deflator.

It is notable that house prices are currently about 10 percent undervalued relative to equilibrium. Thus, the surge in distressed-home sales has been instrumental in causing prices to overshoot their long-run equilibrium. Even this calculation likely understates the case, as it does not account for the feedback mechanism between falling house prices, the job market, underwriting standards, and distress sales.

The economic recovery is still struggling to take root. The U.S. economy is growing, but at a disappointing pace, particularly with the unemployment rate near 8 percent. A significant impediment to stronger growth is persistent weakness in the housing market. Home sales and construction are off bottom but still extraordinarily low, and house prices continue to founder. With millions of foreclosures and short sales about to hit the market over the next several years, prices could remain weak.

The economy will not be in full swing until house prices are rising consistently. For most Americans, the home is still the most important asset, and consumers will be reluctant to spend while their wealth erodes. Many small-business owners use their homes as collateral to grow, and local governments rely on property taxes.

There are some reasons to be optimistic that the housing slump is ending. Prices have fallen enough to make single-family housing affordable and attractive compared with renting. Investors are putting up cash to purchase distressed properties. Overbuilding remains a problem, but a decreasing one given a record low pace of construction and increased household formation.

But this optimism will be easily overwhelmed if house prices fall further, risking a vicious cycle that puts more homeowners underwater, accelerating foreclosures and distress sales and driving prices lower still. During the recession, only an unprecedented monetary and fiscal policy response short-circuited that cycle.

In light of the risks, policy makers should thus consider additional temporary help for housing. Reinvigorating mortgage refinancing would provide a substantial boost with no meaningful cost to taxpayers. More refinancing will mean fewer borrower defaults and more money in the pockets of homeowners, supporting the recovery through a quick and sizable cash infusion.

Facilitating well-targeted loan modifications, including those involving principal reduction, would be a much larger and costlier step but would bring the housing downturn to a quicker and more definite end. The number of modifications and the amount of principal reduction necessary to stabilize house prices can be reasonably financed with funds from the recent settlement between state attorneys general and mortgage servicers, and the president's proposals to expand Home Affordable Modification Program (HAMP).

Moving more properties out of the foreclosure pipeline before they go to distress sales would also be a big plus, lowering the negative pressure on home values. Given the sharp decline in prices and the recent increase in effective rents, the returns to private investors participating in such efforts are increasingly attractive.

Each of these policy steps has its problems, but they are each worth careful consideration, because the weak housing market remains a significant threat to the still fragile economic recovery.

Impact of Foreclosures on Children and Families

Ingrid Gould Ellen, *Professor, New York University, Furman Center for Real Estate and Urban Policy*

Collateral Costs of Foreclosures

- The Furman Center has studied the collateral costs of foreclosures on:
  - neighboring communities
  - renters living in foreclosed properties, and
  - children living in foreclosed properties.
- All potential victims of foreclosures who clearly cannot be blamed for having taken on more debt than they could handle—but they are still adversely affected by foreclosures

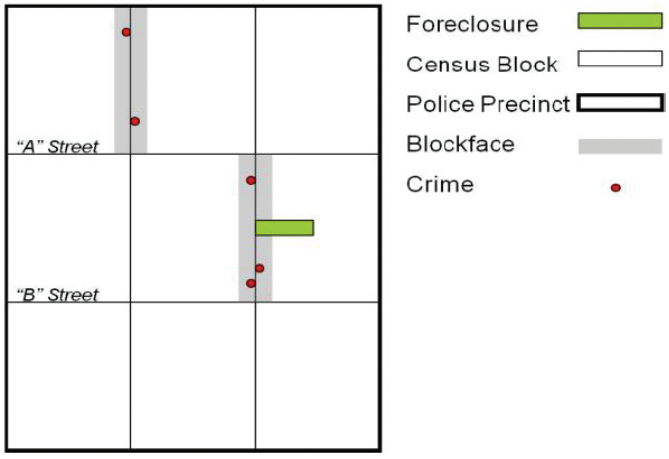
Impact on Communities

- We found that properties in foreclosure in New York reduce the value of surrounding properties (Schuetz, Been, and Ellen, 2008)
  - Consistent with other research (e.g., Harding, Rosenblatt, and Yao, 2009; Haughwout, Mayer, and Tracy, 2009; Lin, Rosenblatt, and Yao, 2009; Campbell, Giglio and Pathak; 2011; Gerardi, Rosenblatt, Willen, and Yao, 2012)
- Far less work exploring impacts on local crime (Ellen, Lacoe and Sharygin, 2012).

Does Foreclosure Cause Crime? Empirical Challenge: Identifying Causality

- Neighborhoods where foreclosures tend to occur are likely to be systematically different from other neighborhoods—and are likely to have more crime
- We need to "weed out" these baseline differences to test if additional foreclosures actually lead to additional crime using longitudinal and spatially disaggregated data

Geographic Unit of Analysis: Blockface



Impacts on Community Crime: Results

- An additional foreclosure leads to around a 1 percent increase in crime on average
- Strongest impacts on violent and public order crime
- Properties that are on their way to a foreclosure auction or in REO have largest effect on crime
  - Impacts start before auction
- The effects extend to crime on neighboring blockfaces, but these effects are attenuated

Impacts on Communities: Future Work

- So far, we have done work on crime in New York City
- We are now extending analysis to four additional cities: Atlanta, Chicago, Miami, and Philadelphia
  - These cities have seen different market conditions and are located in four different states with different laws governing their foreclosure process
  - Do differences in intensity of crisis or in requirements of foreclosure process shape effects on crime?
- Do more to explore mechanisms/timing of impacts

Impacts on Renters

- Many renters live in properties going through foreclosure
- Most of the properties that have received foreclosure notices in NYC are multifamily properties (mostly 2-4 family properties)
- This is not unique to NYC, though shares may be larger in New York

Estimated Share of Households in Foreclosed Buildings Who Are Renters

	2008	2009	2010	2011
Bronx	62.9%	69.3%	66.7%	65.1%
Brooklyn	57.4%	59.3%	61.0%	56.7%
Manhattan	87.4%	77.7%	96.0%	88.9%
Queens	40.0%	39.6%	41.6%	38.6%
Staten Island	27.1%	26.3%	25.9%	26.5%
NYC	52.6%	54.4%	66.5%	56.8%

Impacts on Renters

- While there are now protections in place for renters, we don't know how well these laws are understood or enforced, and renters may still be forced to move sooner than they would like
- Moreover, renters may experience deteriorating building conditions as owners disappear, so it is still possible that they are adversely affected

Impacts on Children

- The disruption and stress of a foreclosure may affect children profoundly
- Our focus has been on educational outcomes, as foreclosures and housing-related distress may force children to move schools and make it difficult for them to focus on school work

How Foreclosures Affect School Moves

- Owners pay back arrearages/receive modification
  - Homeowners may opt for public rather than private schools
  - Tenants may leave as owners reduce maintenance/utilities
- Owners sell property to pay off mortgage debt
  - Residents will move to new homes and perhaps schools
- Bank completes foreclosure/takes ownership
  - Residents will move to new homes and perhaps schools

Impacts on Children's School Mobility: Results

- Controlling for differences in schools and individual demographic, children living in foreclosed homes in New York City are more likely to change schools
- Students who moved to new schools after a foreclosure tended to move to lower-performing schools. (Been, Ellen, Schwartz, Stiefel, and Weinstein, 2011)

Impacts on Children: Future work

- Analysis of how negative equity has affected children's academic performance (NYC, FL, CA)
- Analysis of how foreclosures have affected children's academic performance (NYC, FL, CA)
- Study of how housing crash has affected household savings, bequests, retirement, and home maintenance