

Estimating the Effect of Mortgage Foreclosures on Nearby Property Values: A Critical Review of the Literature

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June 2010

The United States has seen a tremendous wave of residential mortgage foreclosures in recent years; and according to the Mortgage Bankers Association, some 2.0 million properties are currently in some stage of the foreclosure process.¹ Notably, foreclosed properties are not randomly distributed; but rather concentrated in states that have experienced falling home prices and among highly leveraged borrowers. States that have seen the greatest house price depreciation are those that had previously seen abnormal rates of house price appreciation (e.g., Arizona, California, Florida, and Nevada) or had been experiencing long-term economic decline (e.g., Michigan and Ohio). Highly leveraged borrowers refer to those that put little or no money down for the property purchase and/or drained much of their home equity.

The foreclosure process is costly to both borrowers and lenders. Borrowers incur search costs and moving expenses, face family disruptions, and have difficulty accessing credit markets in the future. Lender costs include the shortfall between the ultimate sales price and the mortgage balance and carrying costs (e.g., legal, property management and sales expenses, and foregone interest). Importantly, borrowers and lenders generally have an incentive to prevent the realization of foreclosure costs through debt renegotiation. During normal periods,

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¹ Foreclosure is the legal process by which the mortgage lender repossesses a property from the borrower because of nonpayment, or default. This process can vary significantly from state-to-state.

for example, the temporary use of forbearance, coupled with a repayment plan, tends to cure the loans. However, the circumstances of the current housing crisis have made foreclosure avoidance difficult. In particular, because of widespread house price declines there are a large number of borrowers who owe significantly more than their property is worth; with some nontrivial fraction of these having monthly debt obligations composing an unsustainably high fraction of their incomes.

In response to the rise in mortgage foreclosures, federal, state, and local governments have created or expanded programs aimed at keeping families in their homes. (Two prominent examples are the U.S. Treasury's Home Affordable Modification Program (HAMP) and Neighborhood Stabilization Program (NSP) grants distributed to states and some local governments through the U.S. Department of Housing and Urban Development.) Such policy interventions may be justified on economic efficiency grounds if there are either: (1) frictions preventing efficient workouts from taking place; or (2) social costs, or externalities, associated with foreclosures.

Social costs associated with foreclosure may arise from both direct municipal expenses as well as any reduction in the value of nearby properties. These costs would seem to be especially acute for vacant properties which are more likely to attract criminal activity (resulting in higher municipal costs) and be in worse physical condition (depressing property values). Determining potential municipal expenses associated with foreclosures and vacancies are largely a survey exercise to tabulate the prices for various public services. Apgar and Duda (2005), for example, do this using information from the City of Chicago. By contrast, estimates of the spill-over effects of foreclosures on nearby property values require the use of

multivariate regression techniques. Remarkably, prior to the foreclosure crisis, there had been little economic research connecting the incidence of foreclosure to nearby property values.

This short paper provides a critical review of the literature seeking to estimate the spillover effects of foreclosures. However, we start by summarizing the closely related literature on “foreclosure discounts,” which presumably must exist for foreclosures to have negative price effects on nearby properties. This literature suggests that foreclosure discounts exist and that they likely reflect below-average property quality; although quality measures are generally not observed in the data. The empirical evidence relating to foreclosure effects on nearby property sales prices also suggests a discount that likely dissipates quickly the further away the foreclosed property is from the sale in space and time. This evidence is consistent with the existence of social costs related to foreclosure activity. In the course of our review, we identify certain methodological issues, data limitations, and curious results.

Foreclosure Discounts: Do Foreclosed Properties Sell for Less?

If foreclosed residential properties are to have a negative effect on the value of nearby properties, they themselves should trade at a discount. Our review of the “foreclosure discount” literature suggests that this is the case, although estimates and interpretation vary.

There are three primary explanations for why a property foreclosure discount should exist: (1) systematic differences in characteristics; (2) lower average condition or quality; and (3) a liquidity discount. A thin empirical literature has generally sought to identify any such discount by estimating hedonic (log) sales price regressions that include a foreclosure indicator and a large number of control variables representing key property features (e.g., lot size, the

square footage and age of the home, and the number of bedrooms and bathrooms) and neighborhood characteristics. Notably, studies vary significantly in their coverage of property and neighborhood features – with the latter often simply proxied for using location indicators like zip code. Nevertheless, if one thought these property and neighborhood characteristics were well controlled for, any statistically and economically significant foreclosure discount could then presumably be ascribed to differences in property quality or liquidity. Note that, to date, there has been only limited investigation seeking to identify these two effects separately.

Two early studies of foreclosure discounts conditioned only on property characteristics. Shilling, Benjamin, and Sirmans (1990) estimate a 24% foreclosure discount for condominium sales in Baton Rouge, LA during 1985, while Forgery, Rutherford, and van Buskirk (1994) similarly report a 23% discount for residential sales in Arlington, TX between July 1991 and January 1993. (Note that the coefficient estimates in this latter study are clouded by the fact that they attempted to control for neighborhood characteristics using actual zip codes, rather than zip code dummies.) Carroll, Clauretje, and Neill (1997) study HUD home sales in Las Vegas between 1990 and 1993 and find no statistically significant foreclosure discount after controlling for various property characteristics and location using zip code indicators. This is an unusual result relative to the other studies in this literature.

Two more recent studies using hedonic methods examine larger samples and richer sets of neighborhood characteristics. Sumell (2009) estimates a 50% foreclosure discount for property sales in Cuyahoga County, OH between 2004 and 2006. Likewise, Campbell, Giglio, and Pathak (2009) report a 22% foreclosure discount for single-family properties in Massachusetts during 1987-2007. (Note that for this latter study, the hedonic characteristics

were only measured in 2007.) Unlike these previous studies, Pennington-Cross (2006) uses a repeat sales method that “differences-out” (and hence assumes constant) property and neighborhood characteristics. Comparing the change in prices from initial purchase to REO sale for a nationwide sample of foreclosed homes in relation to their metro area house price index, the author also finds a cumulative appreciation discount of 22%.²

One plausible explanation for the existence of these (conditional) foreclosure discounts is such homes are, on average, of lower quality. Distressed homeowners are less likely to maintain the property in both obvious and non-obvious ways and this will lead to a lemons discount. Two recent studies include indicators of observable subjective quality and find that foreclosed homes rated as “fair” or “poor” have larger than average foreclosure discounts (Clauret and Daneshvary 2009; Sumell 2009). While a step in the right direction, controlling for quality remains a significant challenge.

Related to the quality issue is occupancy status – i.e., owner, renter, or vacant. Non-owner occupied -- and especially vacant -- homes that are foreclosed upon are expected to be of lower quality. Knight (2002), Anglin, Rutherford, Springer (2003), and Clauret and Daneshvary (2009) all provide evidence supporting a vacancy discount. (The latter paper also finds evidence of a renter discount.) One suggestion here would be to also include interaction terms of occupancy status with foreclosure to distinguish an independent effect of occupancy status from the observable quality of the property.

² The author subsequently finds that this discount is positively related to loan size, time in REO, local house price movements, and being located in a judicial foreclosure state.

It has also been suggested that the foreclosure discount may be due, in part, to certain sellers being willing to accept a lower price in order to sell faster and avoid holding costs (e.g., property taxes, insurance, and maintenance). Notably, this explanation requires some “limit to arbitrage” opportunities since sales at below market prices imply positive economic rents to intermediaries of foreclosed properties. Under this “liquidity hypothesis”, one would expect to see foreclosed properties have a shorter “time on the market”. (That said, there is also evidence that “time on the market” also sends a negative signal about quality; so one would need to be careful in specifying an empirical model.)

There may also be a cash discount insofar as this reduces uncertainty about the sale and economizes on certain closing costs. Forgey, Rutherford, and VanBuskirk (1994) and Claretie and Daneshvary (2009) both provide some evidence for the existence of cash discounts for home sales. However, it’s not clear based on their specifications that this effect is any different for foreclosed properties. Again, the use of an interaction effect between cash and foreclosure indicators would be helpful.

Claretie and Daneshvary (2009) report a conditional foreclosure discount of less than 10% after controlling for various property and neighborhood characteristics, property condition (quality), occupancy status, time on the market, and cash sales. While this represents the most comprehensive analysis in terms of explaining residential sales prices using hedonic methods, the study is limited to data for Clark County, NV between 2004 and 2007.

Overall, it seems likely that foreclosure discounts exist, although the magnitude may vary significantly by location and time period. The estimated effects likely reflect a lemons discount with foreclosed properties having lower observable and unobservable quality. It is

also possible, that some of the measured discount is related to the sellers of foreclosed properties being less patient than a typical homeowner. Future research should strive to identify the extent to which foreclosure discounts reflect quality differences or impatient sellers separately.

Foreclosure Externalities: Do Foreclosure Discounts Affect the Value of Nearby Property?

Given that foreclosed properties generally sell at a discount, a natural question arises as to whether these distressed properties, in turn, put downward sales price pressure on nearby properties – resulting in a negative externality. According to Lee (2008), three potential channels by which such spillover effects might occur are through: poor property maintenance or negligence leading to blight, weak property appraisals based on “comparables”, and an increased supply of available properties for sale. Leonard and Murdoch (2009) further suggest that changes in nearby foreclosures foreshadow (negative) changes in neighborhood quality – leading to an expectations effect.

Five recent papers have documented a negative relationship between non-distressed residential sales prices and the number of nearby foreclosures using hedonic regressions that control for various property and neighborhood characteristics. (One other study uses the repeat sales method.) The studies also vary along other dimensions: the locations and time periods evaluated, the definitions of “nearby” and “foreclosure,” and whether they account for the effect of multiple foreclosures.

Immergluck and Smith (2006) relate sales price data for 9,600 single-family properties in the City of Chicago sold in 1999 to foreclosures in the two prior years and controls for a large

number of property and neighborhood characteristics. The authors identify the number of foreclosures at distances of 1/8 mile (one block) and 1/4 mile (two blocks). The authors find that each foreclosure associated with a conventional loan within 1/8 mile is associated with a 0.9% to 1.1% property price decline – depending on whether or not the median house price in the census tract is controlled for or not. Foreclosures associated with conventional loans located 1/8 to 1/4 mile away from a sale are estimated to have only modest spillover effects (0.1% to 0.2%). Interestingly, foreclosures associated with government-guaranteed loans appear to have no effect on nearby sales prices. It is not clear why foreclosures associated with different types of loans should have differential effects – this merits further investigation.

Schuetz, Been, and Ellen (2008) study residential (single- and multi-family) property sales and foreclosure notices in New York City between 2000 and 2005. The authors identify properties with foreclosure notices nearby non-distressed sales in both physical space (within 250 feet; 250-500 feet; and 500-1000 feet) and time (less than 18 months; greater than 18 months). The authors find evidence of foreclosure spillover effects; although strangely these measured effects appear to be larger for foreclosures located further away in both physical space and time. Such non-intuitive results suggest that there may be some issues with the empirical specification – for instance, the authors control for very few neighborhood characteristics (borough and zip code indicators and physical distance to subway) and ignore recent house price movements.³ The authors also provide some results suggesting that the

³ In one specification, the authors include post-sale foreclosure notices as an additional neighborhood control.

negative price pressure associated with foreclosure notices is larger when there are more of them.

Leonard and Murdoch (2009) study sales of single-family homes in Dallas County, TX during 2006. Their hedonic price analysis conditions on a large number of property and neighborhood characteristics, including recent house price trends. The authors delineate nearby foreclosures in physical space according to the number located within 250, 500, 1000, or 1500 feet of the sale. The authors find that properties in some stage of the foreclosure depress sales prices – and that each foreclosure within 250 feet appears to have an effect of about -0.5% on sales prices. The results suggest that spillover effects may exist at modest levels (-0.1%) even further out in physical space; although interpretation is difficult given the model specification.

Lin, Rosenblatt, and Yao (2009) explore property sales data for the Chicago MSA individually for 2003 and 2006 and delineate foreclosure spillover effects along physical and temporal dimensions. The authors find spillover effects for foreclosures located within 10 blocks (physical distance) and five years (temporal distance) -- with a nearby foreclosure in a bad year (like 2006) having a -8.7% effect on nearby property values. Foreclosure spillover estimates for a good year (like 2003) are found to be only half as large, thereby illustrating the importance of housing cycles. These effects are, by far, the largest estimated in this nascent literature -- likely owing to limited hedonic property characteristics, the use of only zip code indicators for neighborhood characteristics, and the lack of control for local property price trends. Indeed, a literal interpretation of these results would suggest that the externalities may exceed the value of the foreclosed property itself!

Campbell, Giglio, and Pathak (2009) study 20 years of single-family property sales from Massachusetts (although with hedonic property and neighborhood characteristics measured exclusively as of 2007). The authors first estimate the effect of foreclosures on sales prices without controlling for either common (unobserved) shocks driving foreclosures and house prices or the reverse causality from house prices to foreclosures. This preliminary exercise suggests a 7-9% foreclosure discount. (This incredible result is consistent with the estimates provided by Lin, Rosenblatt, and Yao, 2009). However, using two different “differences-in-differences” approaches that aim to net out such confounding effects, the authors estimate that foreclosures within 0.05 mile lower sales prices by about 1%.

As an alternative to a hedonic regression, Harding, Rosenblatt, and Yao (2009) use a repeat sales approach that ostensibly holds the house and neighborhood characteristics constant. The authors relate the difference between the sales price of each residential property and the “expected price” based on a house price index to nearby foreclosure activity differentiated in physical space (0-300 feet; 300-500 feet; 500-1000 feet; and 1000-2000 feet) and time (stage in the foreclosure process). For a set of seven MSAs, they find that property sales located within 300 feet of a foreclosed property experience about a 1% discount per foreclosure. (Furthermore, the average discount falls to 0.5% at a distance of 1/8 mile – i.e., that used by Immergluck and Smith, 2006). The authors also find that the peak discount occurs at the time of the foreclosure sale (before the REO, or real estate owned, sale) that they attribute to property neglect and uncertainty relating to the future owners.

Overall, the empirical evidence relating to foreclosure effects on nearby property sales prices suggests a discount. Moreover, such discounts likely dissipate quickly the further away

the foreclosed property is from the sale in space and time. Hedonic regressions – especially those with limited controls for property and neighborhood characteristics – likely suffer from omitted variables problems. Repeat sales approaches may represent an improvement insofar as they do not require a rich set of property and neighborhood covariates. The results also highlight the importance of controlling for local house price trends that influence the probability of default by all mortgage borrowers. (Note that this is especially important when studying the recent experience that included a large number of borrowers taking extremely levered positions just prior to a nationwide house price decline.)

The measured spillover effects of foreclosure are likely due to the condition of the foreclosed property. In future research, it would be helpful to control for property “quality” and/or “occupancy status” since it is widely conjectured that vacant foreclosed properties are of especially low quality and attract other social problems. The remaining two other explanations for foreclosure spillovers (lowered appraisals due to a foreclosure sale being treated as a “comparable” and an increased supply of homes on the local market) have also not been formally investigated. The repeat sales approach seemingly holds more promise than the hedonic approach because it does not require a large set of property and neighborhood covariates and can more easily be applied to many geographic areas and over longer time periods. However, the repeat sales approach does require a long time series.

Conclusions

The public sector has responded in various ways to the tremendous rise in mortgage foreclosures in recent years. The economic rationale for such interventions rests with the notion that there are social costs, or negative externalities, associated with such events.

Remarkably, prior to the recent foreclosure crisis, there had been little economic research documenting foreclosure spillover effects; although the literature has evolved rapidly since.

Our critical review of this literature suggests that foreclosed properties sell at a discount and that this is likely due to such properties being in worse condition. Moreover, very nearby foreclosures appear to depress the sales prices of non-distressed property sales; although this effect decays rapidly in physical distance and time. That said, there is a lot of variation in estimates – with some being implausibly large likely due to poorly specified empirical models. Repeat sales approaches also seem to hold greater promise than hedonic approaches because: (1) they are more likely to hold property and neighborhood characteristics constant; and (2) it is easier to examine multiple geographies and longer time periods.

A literature studying the effect of nearby foreclosures on property values has emerged over the past five years. While its results are compelling, it can certainly be improved and expanded. As a result, we expect the next five years of research into this topic to be even more fruitful.

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