The Impact of Distressed Sales on Repeat-Transactions House Price Indexes

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Preface

This Federal Housing Finance Agency (FHFA) research paper analyzes the impact of distressed home sales on house price measures, including the FHFA House Price Index. It is part of FHFA's ongoing effort to enhance public understanding of the nation's housing finance system. The paper was prepared by Andrew Leventis of the Office of Policy Analysis and Research. Patrick J. Lawler and Robert S. Seiler, Jr., at FHFA, provided helpful comments. Useful background information was provided by Sean O'Toole of ForeclosureRadar.com and Patti Koscinski and Steve Holden at Fannie Mae.

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Background

With the large and growing number of properties with seriously delinquent mortgages and foreclosures, the impact of sales of such properties on the Federal Housing Finance Agency's (FHFA's) House Price Index (HPI) and other price indexes is increasingly relevant. FHFA has conducted a brief review of this topic. The analysis studies the frequency of "distressed sales" and their impact on house prices. Such sales are defined so as to include sales of foreclosed properties, short sales, and, more generally, sales that occur once borrowers evidence significant difficulty in making their payments. The influence of such sales is measured on FHFA's index and an index constructed using data from county recorder offices. Owing to data constraints, the analysis only reviews the impact of distressed sales on price measures for California.

Whether these sales are having a significant impact on house price indexes may affect how the indexes should be interpreted. Sales prices for these homes may be unusually low because homes with financially troubled borrowers and those that have gone into foreclosure frequently go into disrepair. Also, for homes that become part of a lender's inventory of real estate owned (REO), the holding costs to the lender can be very high. In general terms, both distressed borrowers and lenders in possession of REO may be more urgent to sell and have lower price demands than would be expected of other sellers.[1]

While this greater motivation ultimately can lead to lower prices for distressed sales, despite the increasing prevalence of such transactions, little has been written on the recent influence of these data on house price indexes, particularly repeat-transactions indexes. Radar Logic, which releases data showing trends in price-per-square-foot for 25 U.S. cities, has published indications of the influence of these transactions on its measure, which is not a repeat-transactions index of home prices, since May of 2008. Graphs presented in its monthly releases compare per-square-foot price trends for "motivated" and "unmotivated" sales, where the former are foreclosure-related sales. The Radar Logic analyses generally reveal that prices for homes with "unmotivated" sellers have been declining at a slower pace than prices for other homes sold. For example, between January and October 2008, its weighted average "composite" index of the 25 cities estimated a 12.6 percent decline for "motivated" sales versus an 11.1 percent decline for other sale prices. For Los Angeles, prices for motivated sales had declined 21.1 percent versus 17.5 percent for others.[2]

For repeat-transactions indexes, the only available indication of the recent influence of foreclosure sales is embedded in a short paper released in September 2008. The paper, written by Karl Case, gave only minimal attention to the subject but did reveal that the impact of foreclosures on select indexes produced by Fiserv-CSW was large. Case reported that, for Miami, the standard Fiserv-CSW index had reported a 22 percent decline since the peak (through the first quarter of 2008), but that, excluding foreclosure sales, the decline had been 15 percent.

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[1] A good summary of the causes and interpretation of price discounts for distressed sales can be found in Campbell, John Y.; Stefano Giglio; and Parag Pathak, "Forced Sales and House prices," available at http://www.richmondfed.org/conferences_and_events/research/2008/pdf/forced_sales_and_house_prices.pdf.
[2] See "RPX Year in Review 2008" available at http://www.radarlogic.com/research/RPXYearInReview2008.pdf.

In Cleveland, the impact was reported to be much larger, with the full index showing a 28.5 percent decline and the foreclosure-excluding metric estimating a 6 percent decline.[3]

Using sales prices and foreclosure data through the end of 2007, Harding, Rosenblatt, and Yao (2008)[4] employed the repeat-transactions indexing model to study the contagion effects of foreclosed properties on nearby home values. Their research, which used similar methods to those that will be used in this analysis, did not focus on quantifying the impact of distressed sales on aggregate index measures, however.[5] Also, their underlying data source seemed to allow for the identification of foreclosures transactions, but not short sales.

Relative Frequency of Distressed Sales

To identify distressed sales, address-level Notice of Default (NOD) filing information, supplied by DataQuick Information Systems ("DataQuick"), is used. In California, the first stage in the most common foreclosure process, which is depicted in Appendix 1, occurs when a servicer files an NOD with the county recorder office indicating that the borrower is delinquent on his payment. The NOD filing is a necessary first step in the foreclosure timeline, which often culminates in an auction sale occurring about four months after the filing. In most recent cases, no buyers bid for the property at the auction and the property becomes REO at that point.

In this analysis, transactions that occur within one year of the NOD filing are assumed to be distressed sales. This approach is convenient because it does not require a review of seller names in county recorder documents, as is required if one exclusively looks to REO sales to identify distressed sales. As indicated earlier, the approach also is advantageous in that it flags short sales, which occur prior to a property going into REO, as "distressed." Because the approach can be overly inclusive (e.g., if a distressed sale occurs after an NOD filing and a subsequent nondistressed sale occurs within the remainder of the one-year window), only the first sale occurring after an NOD filing is flagged as "distressed."

Using the NOD-based definition, Figure 1 plots the proportion of California sales in recent quarters that were distressed. The proportion is shown for two different samples of home sales, one comprised of the sales transactions that are observed in the Fannie Mae and Freddie Mac ("Enterprise") data used in the construction of the HPI and the other consisting of sales data from county recorder offices. The latter dataset, which has been provided by DataQuick, should represent roughly a full census of sales activity in the state during the relevant time frame. The dataset, which could be described as a "full sample" series, should be similar to the transactions data that are used by other producers of house price measures, who use county recorder data exclusively. It is reasonable to assume that the relative distress frequencies in the underlying data used by S&P/Case-Shiller, First American Core Logic, and other index producers would resemble those reported in the "recorder" classification.

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[3] See page 25 of Case, Karl, "The Central Role of House Prices in the Financial Crisis: How will the Market Clear?" Brookings Papers on Economic Activity, Fall 2008 Conference Draft, available at http://www.brookings.edu/economics/bpea/~/media/Files/Programs/ES/BPEA/2008_fall_bpea_papers/2008_fall_bpea_case.pdf.

[4] See Harding, John P.; Eric Rosenblatt; and Vincent W. Yao "The Contagion Effect of Foreclosed Property," available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1160354&download=yes.

[5] The authors in fact remove foreclosure sales from the data they use for estimation.

Figure 1 shows dramatic growth in the distress shares for both data samples over the last two years. In the fourth quarter of 2006, distressed sales amounted to less than five percent of all sales in both samples. By the first quarter of 2009, however, distressed sales comprised about 45 percent of both samples.

Because FHFA's HPI and alternative price indexes employ the "repeat-transactions" estimation approach, which measures price trends by observing price changes for homes that have multiple sales transactions, the share of distressed sales has also been calculated using the data that are actually fed into the statistical model. The resulting estimates do not differ materially from those reported in Figure 1; roughly half of the modeled data in the first quarter of 2009 is comprised of distressed sales.

Measuring the Impact of Distress

To measure the impact of distress, the standard price index (estimated using distressed and nondistressed transactions) is compared with an index calculated using only non-distressed sales. The difference between the two indexes represents the direct impact distressed sales have had on measured price trends.

As discussed in recent economic literature,[6] there are significant spillover effects of distressed sales on values for other properties. Accordingly, the simplistic approach taken here only measures the *direct* effect of distressed sales on price trends. The approach's failure to capture the indirect effects can be viewed as a benefit. While sales prices for distressed properties can be viewed as defective measures of true home values (because of quality degradation issues or unusual seller motivation), the indirect effects on other home values can be real and thus ought to be captured by a price index.[7]

By comparing the standard index against one calculated after excluding distressed sales, Figure 2 shows the effect of removing distressed sales from the FHFA HPI. The graph shows four-quarter price changes for recent quarters, as well as the cumulative price decline that has occurred in California since prices peaked in 2006. Over the most recent four quarters (through the first quarter of 2009), the difference in measured price declines is approximately 2.3 percentage points; the four-quarter price drop was 22.1 percent with the complete HPI data sample and 19.9 percent after distressed sales are omitted.[8] The influence of distressed sales on the HPI seems to have been material in prior periods as well. The measured price decline since California prices peaked in 2006 is magnified by about 5.4 percentage points with the inclusion of the distressed sales; the standard HPI shows a 41.3 percent decline, while the index formed without distressed sales evidences a 36.0 percent drop.

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[6] See, for example, Rogers, W.; and William Winter, "The Impact of Foreclosures on Neighboring House Sales," *Journal of Real Estate, Finance, and Economics*, volume unassigned.

[7] Some economists might contend that a home's "quality" includes not just house attributes (e.g., square footage, number of bathrooms), but also neighborhood characteristics including the presence of occupied, well-maintained nearby homes. To the extent that distressed properties reduce the attractiveness of neighborhoods, some might argue that a rigorous constant-quality index would attempt to remove some of the indirect effect of distressed sales as well.

[8] Note that reported figures are all rounded, but the differences are calculated using unrounded data. Accordingly, the reported differences may not equal the difference between the rounded values.

Figure 3 shows the influence of distressed sales on a full-market index for the state, which is based on data from county recorder offices. As with Figure 2, four-quarter changes are reported as well as the decline since prices peaked. The graph shows a more modest effect of distressed sales than was shown for the HPI. Over the latest four quarters (between the first quarters of 2008 and 2009) the impact of distressed sales on measured price declines was only 0.9 percent, less than half of the impact in the HPI sample. The effect of removing distressed sales on the since-peak decline is also more modest than it was for the HPI. After removing distressed sales from the sample, the full-market index shows a 44.8 percent price decline, about two percentage points shallower than the all-inclusive measure's decline and a much smaller impact than the 5.4 percentage point effect shown for the Enterprise HPI.

For both the full-market index and the FHFA metric, the measured impact of distressed sales does not change significantly if the California indexes are constructed as weighted averages of zip-code-based indexes (instead of pooling all data together, as is done here). Such an approach would remove the effects of shifts in the geographic composition of the sample that occur as a result of removing distressed sales; with the weighted-average index, each zip code's contribution to the statewide sample remains fixed over time.[9] The similar results obtained for the weighted index indicate that the measured effect of distress is not a phantasm arising from overweighting of sales trends in the weakest markets.[10]

Measuring the Magnitude of Distress Discounts

The modest-but-detectable impact of distressed sales on house price indexes suggests that the average price discount for individual distress-related sales is likely to be relatively small. The average price discount can be conveniently measured in the repeat-transactions framework. The basic repeat-transactions model, which attempts to explain a home's price change over a given interval using a series of variables reflecting when the property was sold, can be augmented with indicator variables that flag distressed sales. The inclusion of such variables allows the model to detect the extent to which appreciation or depreciation rates are systematically different where homes are sold in distress. A time series of distress-related discounts is then generated by the model.[11]

Figure 4 reports the distress discounts for the Enterprise transactions data as well as for the recorder-based sample since 2003. The discounts reported in the graph show the percentage price difference between properties sold in distress as opposed to properties sold in other

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[9] The weighted state index is constructed by first estimating indexes for roughly 50 three-digit zip codes in the state. A statewide index is then formed as a weighted average of those measures, where the number of one-unit properties in each zip code as reported by the Census Bureau in the 2000 Census is used as a weight.

[10] If the impact of distressed sales is larger in locations where recent (since-2000) building activity has been the greatest, then the 2000 Census-based weighting scheme may not adequately capture the full effect of distressed sales. Constructing updated, zip code-level estimates of housing stock would be an involved (and imperfect) exercise and, due to time constraints, is left for later analysis.

[11] Details of the approach are beyond the scope of this paper, but the fundamental methodology is broadly described in Leventis, Andrew. "Removing Appraisal Bias from a Repeat Transactions House Price Index: A Basic Approach" (available upon request: http://www.fhfa.gov/AboutUs/Contact/Pages/Data-and-Research-Form.aspx). That paper measures the effect of appraisal bias on measured price changes using a series of indicator variables. The same approach is used here, except that distressed sales are flagged rather than refinance appraisals.

circumstances (all else equal). Negative values indicate lower prices for properties sold in distress.

The graph reveals that distress discounts for both samples have diverged in the most recent periods. All else equal, properties sold in distressed situations sold at roughly the same (and, briefly, slightly higher) prices during height of the housing boom, but discounts became evident and relatively large by the end of 2007. At that point, the series deviate. Discounts for the Enterprise-based series deepened from about 16 percent to approximately 19.5 percent, while the full-sample discounts have become more modest. The average discount for the full-sample was 13.6 percent in the first quarter of 2008, but only 9.1 percent by the first quarter of 2009.

Explanations and Remaining Puzzles

The magnitudes of the distress discounts reflected in Figure 4 would seem to account for the greater direct effects of distressed sales on the HPI than on a full-market, recorder-based index. Although the cause of the greater discounts is not clear, in searching for explanations, it may ultimately prove useful to reframe the analysis to think about the discount in terms of spillover. That is, the results in Figure 4 may indicate that the spillover effects of distressed sales (on other home prices) have been greater for the full sample than for the Enterprise series. Indeed, the fact that absolute price declines for the recorder-based sample are significantly greater than for the Enterprise series suggests that the spillover perspective may be appropriate.

A growing literature has addressed the complex and significant micro-level effects of distressed sales (particularly foreclosure sales) on neighborhood prices.[12] Although that literature suggests that small variations in the location or relative densities of distressed sales could lead to significant differences in spillover, it should be noted that an initial evaluation does not reveal obvious geographic coverage differences across the two samples. In light of this finding and the similarity in the overall share of distressed sales across the two samples, however, it seems likely that the cause of differential spillover will remain elusive.

Whatever the source of the spillover, for reasons discussed earlier, spillover will never be complete; that is, distressed properties will tend to sell at a discount to others. A good deal of work remains to quantify the extent to which this discount reflects home quality degradation as opposed to differences in seller motivation. FHFA is currently analyzing a number of data sources, including results of a survey conducted by the National Association of Realtors, in an attempt to estimate the various effects. The analysis here has effectively put an upper bound on the influence of any one of those.

Constructors of house price series generally attempt to minimize the effects of changes in the quality of homes to focus on a purer measure of price change. The desirability of controlling for differences in seller motivation is more questionable. Housing prices are famously "sticky" downward because, unlike institutional property owners, individual homeowners derive a stream

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[12] See, for example, Lin, Z., E. Rosenblatt and V.W. Yao, "Spillover Effects of Foreclosures on Neighborhood Property Values," *Journal of Real Estate, Finance, and Economics*, 2009, 38, 4 and Schuetz, Jenny; Vicki Been; and Ingrid Gould Ellen, "Neighborhood Effects of Concentrated Mortgage Foreclosures," *Law & Economics Research Paper Series Working Paper No. 08-41, NYU Center for Law and Economics,* available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1270121&download=yes.

of benefits while owning a home. The presence of motivated sellers can be viewed as diluting this stickiness and helping the market reveal true price levels in downturns, or as simply polluting the data sample with transactions that do not reflect bargaining of equally motivated buyers and sellers.
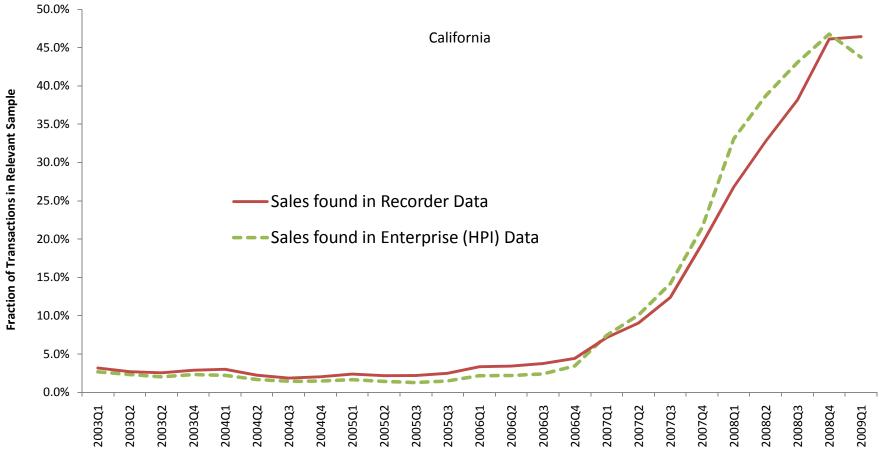
Figure 1: Estimated Share of Distressed Sales

California

"Distressed Sales" are defined as sales for which:
(a) a Notice of Default (NOD) was filed less than a year before the transaction and
(b) no other sale occured between the NOD date and the sale date.

Sources: DataQuick Information Systems (Sales and Notice of Default filings from recorder offices) and Enterprise HPI data submissions.
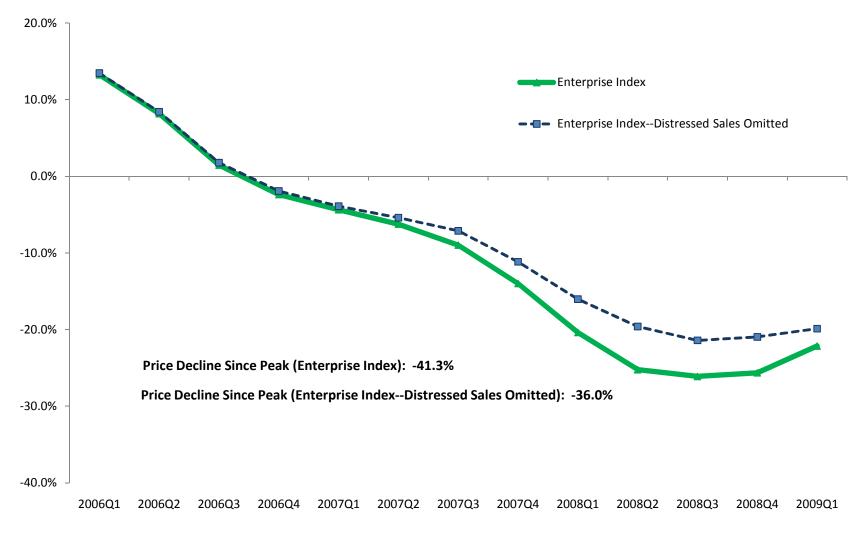
Figure 2: Effect of Removing Distressed Sales from Enterprise Index for California
Four-Quarter Price Changes

Enterprise Index

Enterprise Index--Distressed Sales Omitted

Price Decline Since Peak (Enterprise Index): -41.3%

Price Decline Since Peak (Enterprise Index--Distressed Sales Omitted): -36.0%

Sources: DataQuick Information Systems (Notice of Default filings from recorder offices) and Enterprise HPI data submissions.

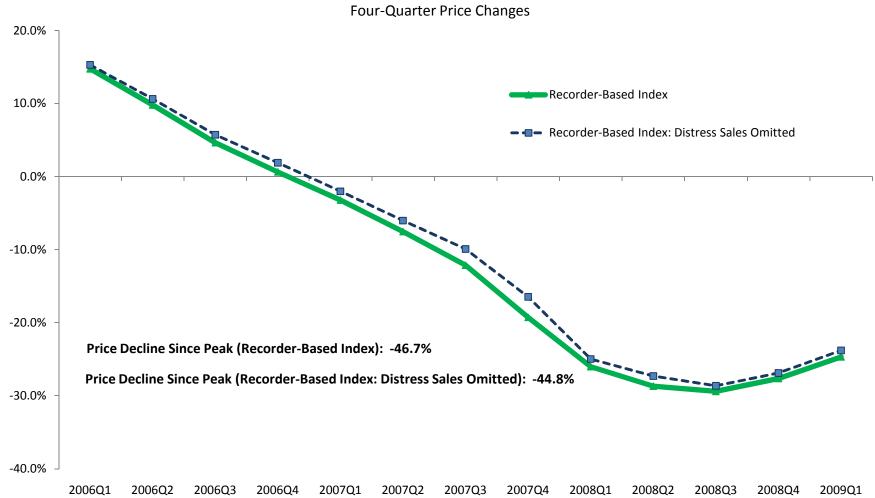# Figure 3: Effect of Removing Distressed Sales from Recorder-Based Index for California

Four-Quarter Price Changes

Price Decline Since Peak (Recorder-Based Index): -46.7%

Price Decline Since Peak (Recorder-Based Index: Distress Sales Omitted): -44.8%

Sources: DataQuick Information Systems (Sales and Notice of Default filings from recorder offices).
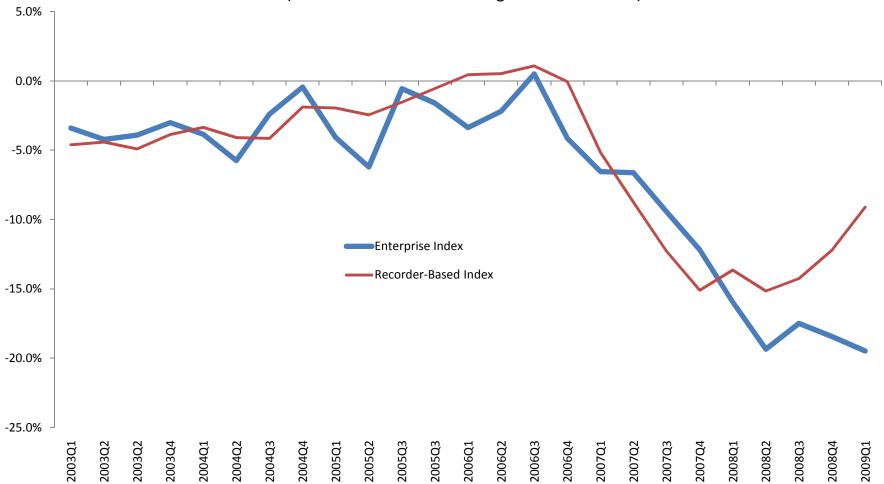
Figure 4: Price Difference between Distressed Sales and Others
(Assessed in HPI Model's Regression Estimates)

Note: Negative values indicate the percentage discount for distressed sales as estimated by the model. A value of -10 percent, for example, suggests that properties sold after NOD filings tend to sell for 10 percent lower prices than would be expected.

Sources: DataQuick Information Systems (Sales and Notice of Default filings from recorder offices) and Enterprise HPI data submissions.

APPENDIX 1: CALIFORNIA NON-JUDICIAL FORECLOSURE PROCESS
(NOD = NOTICE OF DEFAULT, NOTS = NOTICE OF TRUSTEE SALE)

Grant Deed Filed

NOD Filed

NOTS Filed

Trustee Deed Upon Sale Filed

Lender Considers Short Sale Offers

House Purchase

Missed Payment → NOD Filed and Published → NOTS Published in Newspaper → *NOTS Recorded* → Auction

Typically two months or more

"REDEMPTION PERIOD"

At Least Three Months

"PUBLICATION PERIOD"

At Least 21 Days