

# Those Prices Were Insane!

## Which Home Price Index Is Best?

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‘Crazy Timmy’ Geithner [impersonates](#) adman [Jerry Carroll](#) in Treasury’s gilded Cash Room. Photo: © 2009 Joshua Roberts/Bloomberg – New York Times, 10 Feb 2009.

The Federal Reserve’s quarterly [Flow of Funds Z1 Release](#) underestimated the decline in US home values by roughly \$2 to \$4 trillion until after the November 2008 elections.

After I detailed the oversight in last week’s [Housing Indexes - When Will the Fed Get Smart?](#), I received a brief note from a reader in the mortgage risk management business. The note asked:

- Which Home Price Index (HPI) is best?

I e-mailed back an answer:

- Short answer is "there is none" in absolute. It depends upon context, types of assets that you care about or hold, and your risk exposure.

Below is a longer, but still simplified, answer.

### **METRIC**

I will begin by assuming that we care about [foreclosures](#). I believe that the US Government shares this concern, and this inspired the Treasury to unveil the [Homeowner Affordability and Stability Plan](#) on 18 Feb 2009.

Assuming that we care about, and are trying to “understand”, foreclosures, let’s attempt to answer the following simple question:

- Which Home Price Index (HPI) does the best job of “explaining” foreclosures?

Note: There are, of course, other metrics or benchmarks that could be used. I am simply picking *one* to get the ball rolling. You can use any metric that you’d like, as mentioned above in my “short answer.”

## DATA SOURCES AND CONVENTIONS

For *foreclosures*, I will use “foreclosures started” figures, as a percent of the total number of loans, from the [Mortgage Bankers Association National Delinquency Survey](#).

For alternative HPI’s, I will use three broad-based series that cover much of the country and which are available on the web:

- [FHFA/OFHEO](#)
- [S&P/Case Shiller National](#)
- [Radar Logic/RPX 25 MSA Composite](#)

Below is a quick summary of each of these home price data sources. Additional details are available from the websites linked above.

<b>Broad Market Home Price Index Alternatives</b>			
<b>Item</b>	<b>FHFA[OFHEO] National</b>	<b>S&amp;P Case Shiller National</b>	<b>RPX 25 MSA Composite</b>
<b>Publication Frequency</b>	Quarterly	Quarterly	Daily
<b>Publication Lag</b>	About Two Months (After Quarter End)	About Two Months (After Quarter End)	About Two Months
<b>Data Collection Interval</b>	Quarterly	Quarterly	28 Days (1Day & 7Day Available)
<b>Data Begins</b>	1975	1987	2000
<b>Home Types</b>	Existing Homes	Existing Homes	New & Existing Homes
<b>Condominiums</b>	Excluded	Excluded	Included
<b>Transaction Types</b>	Purchase & Refinance (Purchase Only Available)	Purchase	Purchase
<b>Data Source</b>	Fannie & Freddie	Local Governments	Local Governments
<b>Tradable Derivatives</b>	No	Yes	Yes
<b>Trading Began</b>	N/A	May 2006	September 2007
<b>Website</b>	<a href="#">ofheo.gov</a>	<a href="#">standardandpoors.com</a>	<a href="#">radarlogic.com</a>
Each of the above Home Price Indices is available at no charge on internet as an historical timeseries. Other indices may be available at a fee, in different formats, and/or from third-party vendors			
Source: Provider websites.			

**Figure 1: High Level Home Price Index Comparison**

To make the comparison as “fair” as I can, I will average the **RPX 25 MSA Composite**, which is available on a daily basis with a two-month lag (more about this later), into a quarterly time series, *consistent* with the offerings from FHFA/OFHEO and S&P Case Shiller.

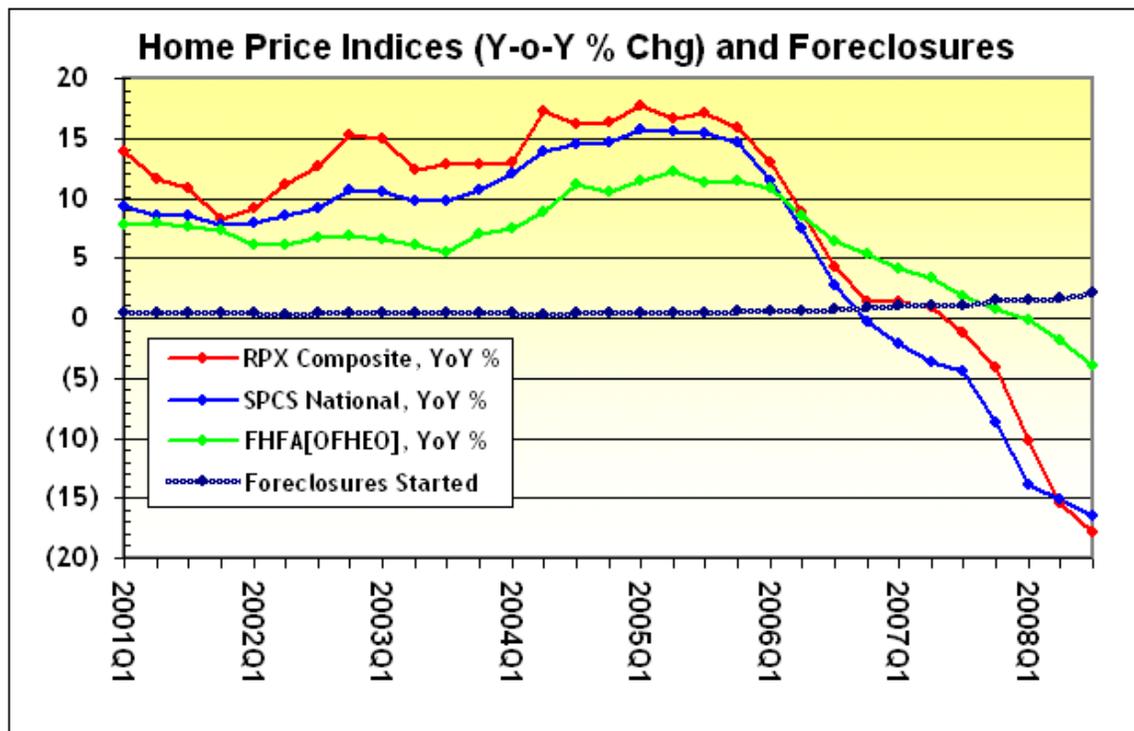
Finally, I will construct year-over-year percentage changes from all three series, using a common 2000Q1 – 2008Q3 data interval. This produces three series of annual changes for 2001Q1 – 2008Q3, to be used to judge “explanations” of *foreclosure starts*.

## LOOK AT YOUR DATA

When I studied statistical regression at MIT, the [professor](#) said:

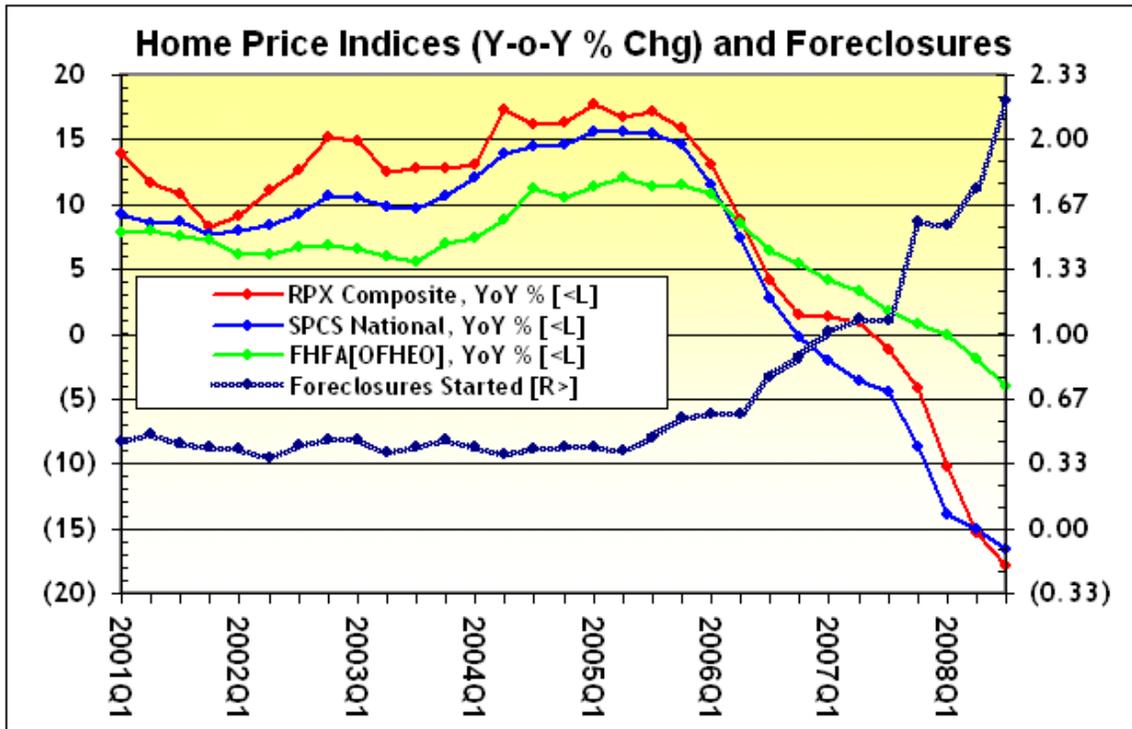
- If you only remember one thing from this class, here it is: LOOK AT YOUR DATA

That IS all that I remembered; so let’s give it a try.



**Figure 2: Foreclosures and Annual Change In Home Price Indices**

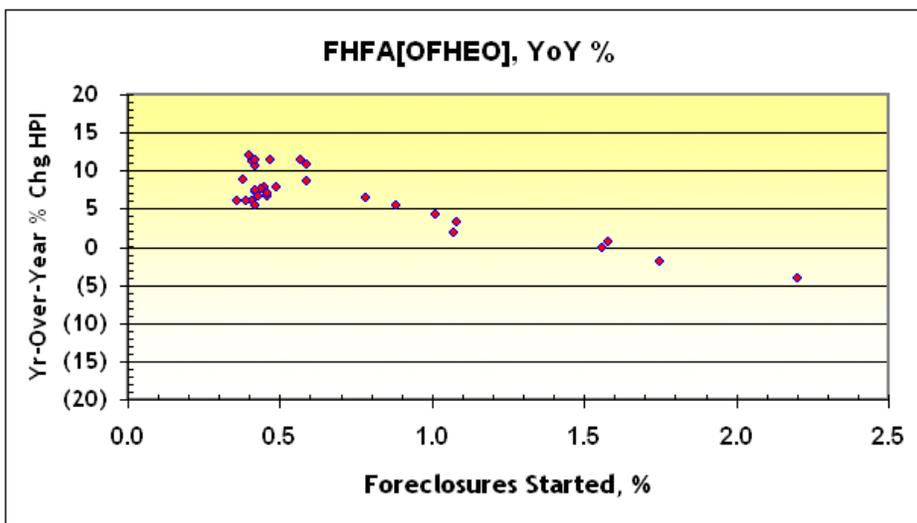
Gee .... *That* was useful. But **if** we chart foreclosures on a **separate axis**, then we get something that’s a little more compelling.

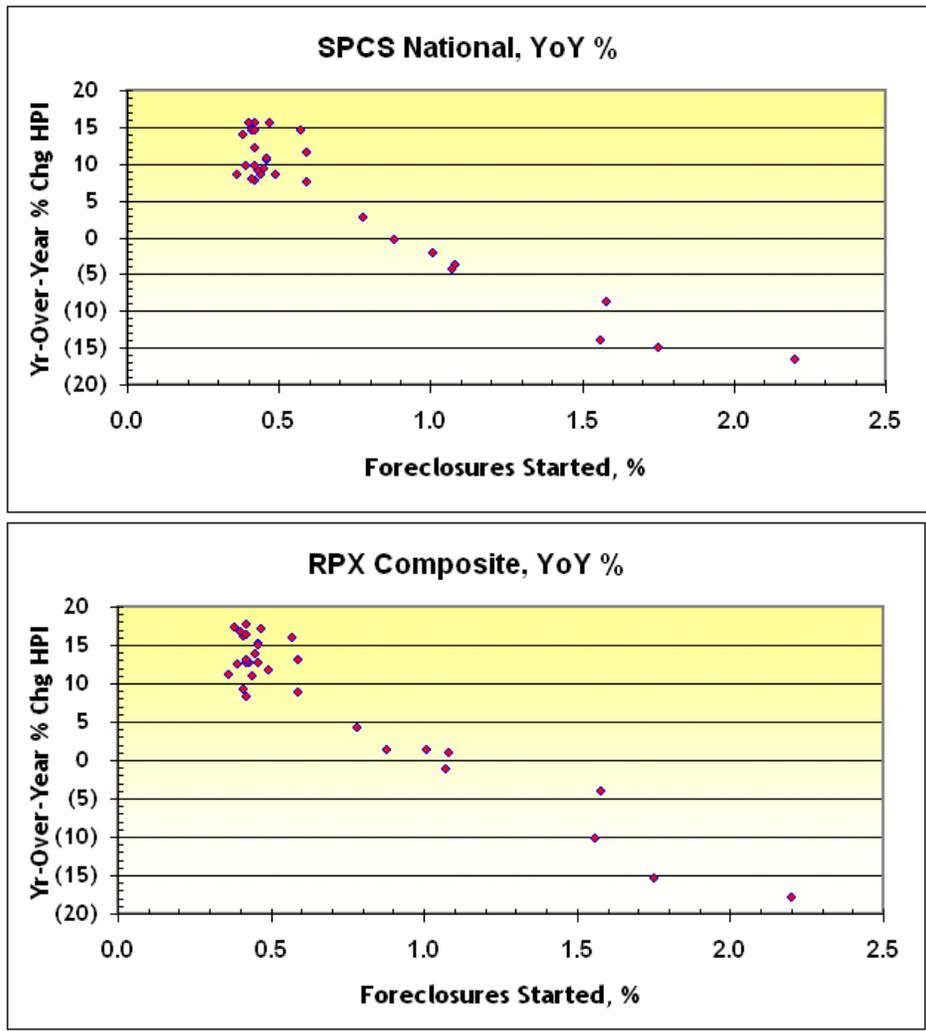


**Figure 3: Foreclosures and Annual Change In HPI, With Left & Right Axis**

The additional axis reveals the negative, or inverse, relationship between foreclosures and the year-over-year percentage changes in the HPI's ("YoY %").

Let's keep "looking at the data" and take a look at a few scatterplots. Year-over-year percentage change in HPI is on the vertical axis, and foreclosures are on the horizontal axis.



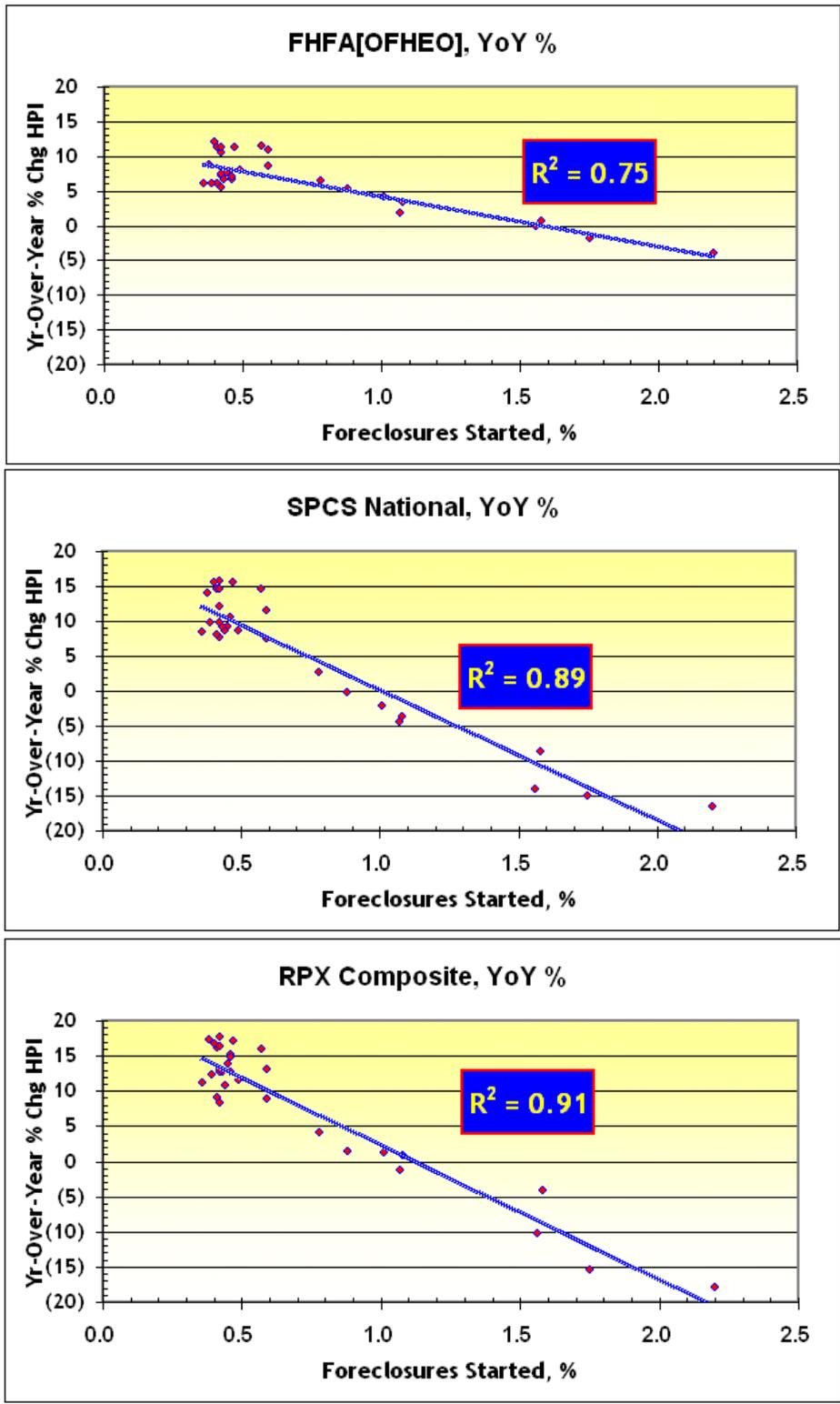


**Figure 4: Three Scatterplots – HPI versus Foreclosures**

The above graphs share common vertical and horizontal scales. Each data set slopes down from the top left to the bottom right – demonstrating again that there is a **rough negative (or inverse) relation** between foreclosures and HPI, as we saw in Figure 3.

**LINE DRAWING**

How **rough** is the relation? Let’s **draw some lines** on the scatterplots and see.



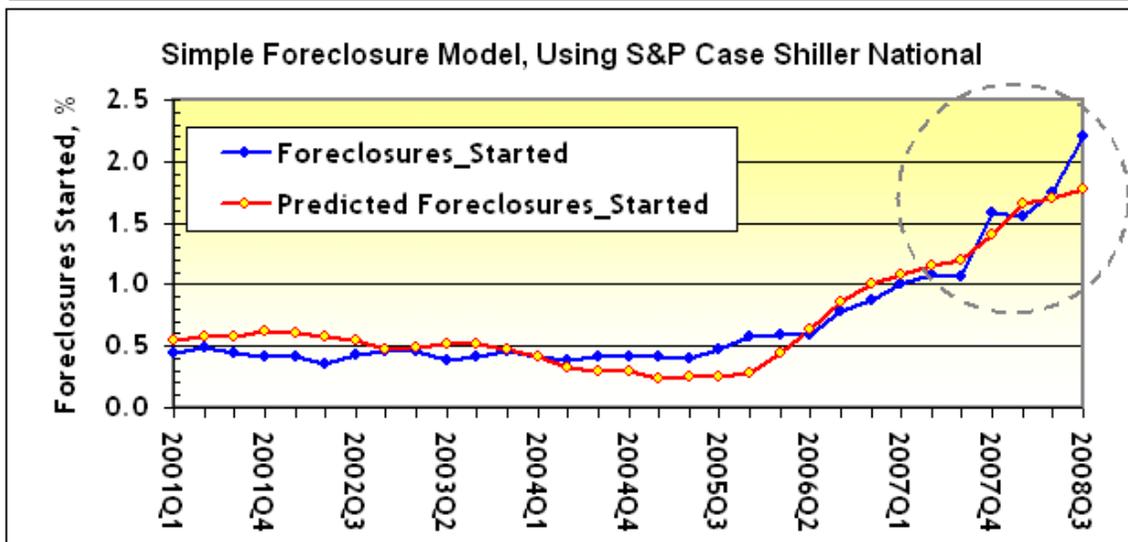
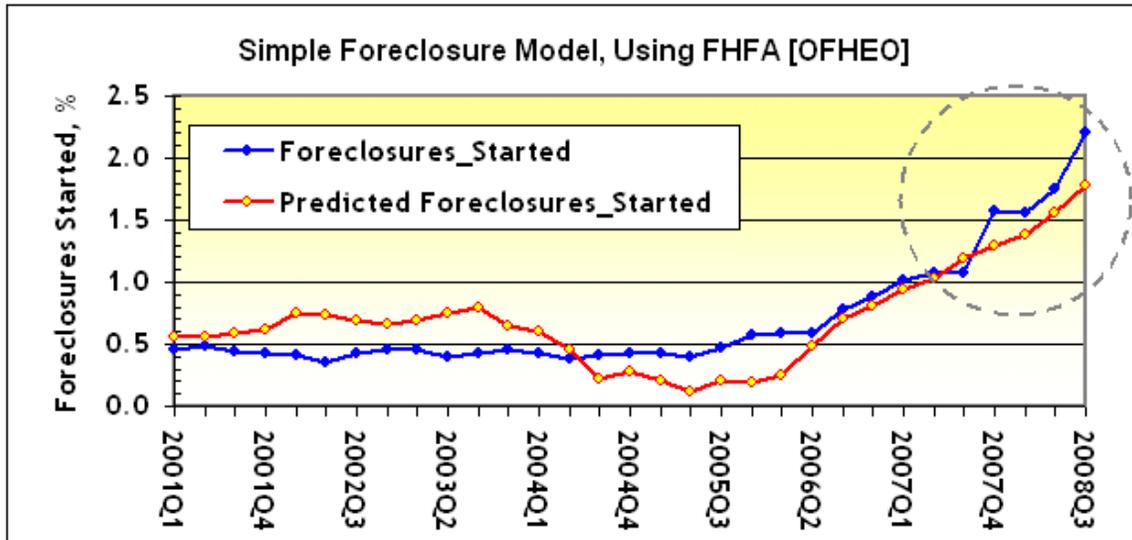
**Figure 5: Three Scatterplots With Regression Lines – HPI vs Foreclosures**

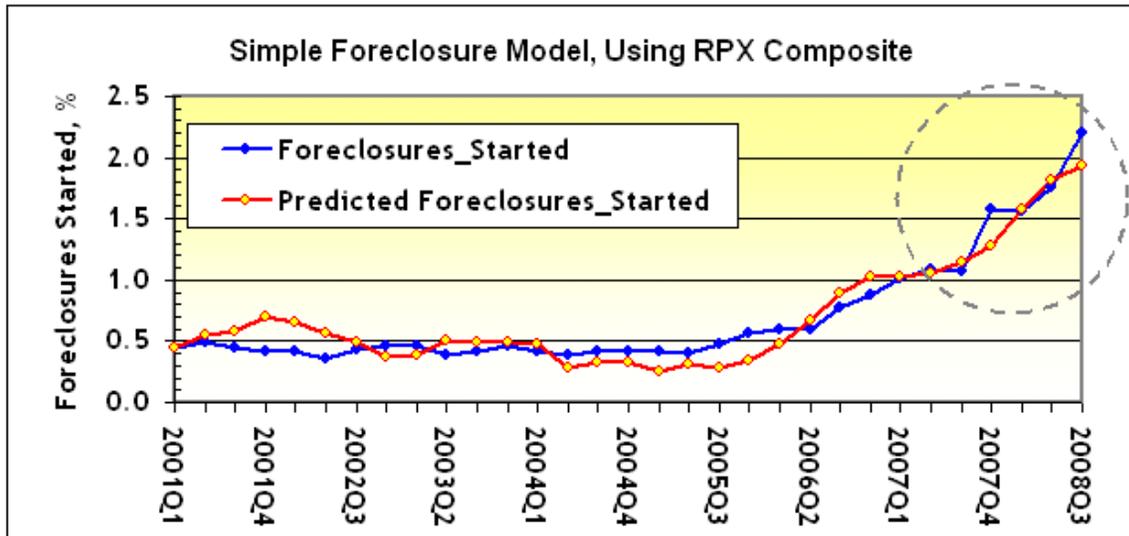
As noted in Figure 5, above, I've drawn regression lines on each scatterplot, and labeled each with the  $R^2$  ["R-squared"], which is a statistical measure of how well the regression line approximates the data points in each chart. An  $R^2$  of 1.0 indicates that the regression line *perfectly* fits the data. Lower  $R^2$ 's denote "poorer fits" than higher  $R^2$ 's.

This simple benchmark suggests that the HPI used by the Federal Reserve in the Z1 Release until 11 Dec 2008 does **not** do as good of a job in “explaining” foreclosures (in this simple model) than either the S&P Case Shiller National or RPX 25 MSA Composite series.

### MODELS, ACTUALS and FITTED

To get a sense for the **type of error** that one might make, IF one had relied upon, or disseminated, figures based on the FHFA/OFHEO HPI (as the Fed did until 11 Dec 2008), let’s look at *simple models for foreclosures based on each HPI*.





**Figure 6: Three Linear Foreclosure Models, Using HPI**

Figure 6, above, contains three simple models of foreclosures, where each is of the form:

- **Foreclosures % = a + b \* (Year-Over-Year Percentage Change in HPI)**

Note: One could, of course, construct more complicated models using other information or techniques. This is, as I noted earlier, just a simplified example.

In each chart, I've drawn actual foreclosures with a blue line, and the "modeled" foreclosures with a red line.

I've also annotated each chart (with a circle) to focus your attention upon the performance of these simple models during the last year for which we have data from all three sources – specifically, from 2007Q3 – 2008Q3.

I hope you can see that the model in the first chart, using **FHFA/OFHEO**, does the **poorest job** of "explaining" foreclosures than either of the other two alternatives. In particular, a simple FHFA/OFHEO model has consistently "underpredicted" foreclosures for the last year. This confirms our earlier observations (see Figure 5, above) that FHFA/OFHEO does not work as well as the other two HPI's.

The *S&P Case Shiller National* and the *RPX 25 MSA Composite* each do a much better job of "explaining" foreclosures, or other recent housing market-related problems, than the FHFA/OFHEO HPI used by the Fed in the Z1 until 11 Dec 2008. Finally, the **RPX Composite** does a **slightly better job** than **S&P Case Shiller**.

## **TIMING IS EVERYTHING**

I *think* we can all agree on two things with respect to monetary policy:

1. Timing is everything; and
2. Monetary policy works with [long and variable lags](#).

If that's the case, then it's pretty clear to me that the RPX Composite would be the "best HPI" - *if* one cares about foreclosures, or other housing-related problems requiring relatively rapid response.

That's because – due to the *daily availability* of the RPX Composite (see Figure 1) – one **does not have to wait until two months after the end of each calendar quarter** (as one does with **either** the FHFA/OFHEO or S&P Case Shiller National HPI's) to learn "what happened" in that quarter.

I believe the "early warning" provided by this index might have been useful in guiding policy, particularly if you didn't know how long it takes for your policies (remember: "long and variable lags") to impact the economy.

Perhaps we might have avoided some of the current carnage.

That's just **my guess** of course.

The only way to **know** is to ask the folks at the Fed who make these decisions and are employed (unlike yours truly). And after you ask them **that** question, you can then ask:

- Why did the Fed wait until 11 Dec 2008 to change from the FHFA/OFHEO HPI in the quarterly Z1 Release?

#### **DISCLOSURE: No Positions**

#### **BIOGRAPHY OF IRA ARTMAN**

[Ira Artman](#) has held quantitative analytical and whole loan trading positions in Mortgage and Structured Finance at JP Morgan Chase, Chase Manhattan, Security Pacific, and City Federal Savings. A graduate of Brown University and MIT's Sloan School, Mr. Artman resides in New Jersey.

He now writes the [Sterling Slivers](#) Mortgage Finance/Housing Blog at MortgageNewsClips.com. His writings focus on home prices, mortgage finance, and macro policy. Mr. Artman's views are his own.

Mr. Artman would gladly set aside his quill and re-embrace his financial models. If you'd like to discuss this post or contact him, his email address is [ibartman@inbox.com](mailto:ibartman@inbox.com).