

A Tale of Two States: Forecasting Housing Price Growth in Florida and Missouri

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Slides available at
<http://pages.slu.edu/faculty/rapachde/Simon.htm>

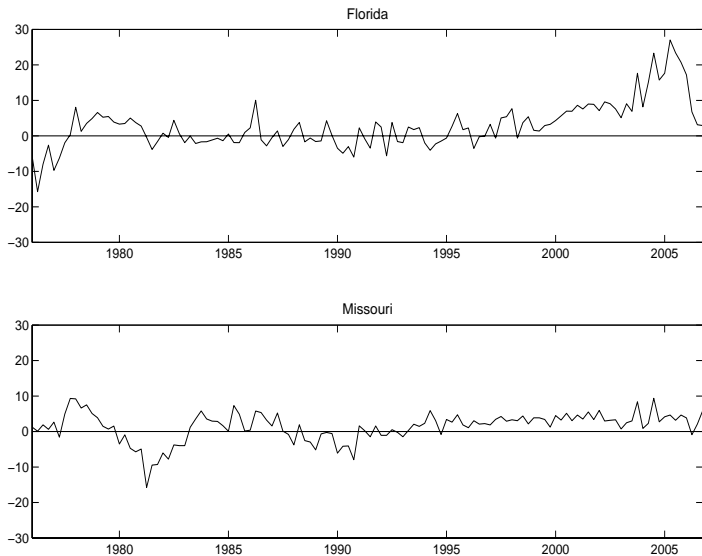
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Differences in Real Housing Price Growth

- There are significant differences in annualized real housing price growth in Florida and Missouri for 1995:1–2006:4
 - Florida
 - Mean = 7.45%
 - Maximum = 27.01%
 - Missouri
 - Mean = 3.43%
 - Maximum = 9.37%
 - Data based on Freddie Mac's Conventional Mortgage Home Price Index that accounts for quality changes
- We see similar differences across a number of “coastal” and “interior” U.S. states

Figure 1: Real Housing Price Growth, 1976:1–2006:4



- Do these differences translate into differences in real housing price growth **forecastability** between Florida and Missouri?
 - Differences could be due to differences in the underlying “economic fundamentals” in the two states, so that economic variables would provide relatively accurate forecasts of real housing price growth in both states
 - Alternatively, the behavior of real housing price growth (in terms of the underlying fundamentals) could be anomalous in one of the states, with a deterioration in forecastability

Forecasting Models

- Autoregressive (AR) model
 - Popular benchmark time-series forecasting model
 - Forecast real housing price growth using lagged real housing price growth
- Autoregressive distributed lag (ARDL) models
 - Incorporate information from economic variables
 - We consider a large number of individual ARDL models, each based on a particular economic variable
- Combination forecasts
 - To incorporate information from a large number of economic variables, we use a “cluster” method that combines the forecasts generated by the individual ARDL models
 - Cluster method attaches more weight to individual forecasts that have performed relatively well recently in terms of forecast accuracy

- State-level predictors
 - Housing price-income ratio
 - Per capita personal income
 - Population
 - Employment
 - Labor force
 - Unemployment rate
- Census region predictors
 - Housing starts
 - Building permits
 - Homes for sale
 - Homes sold
 - Housing vacancy rate

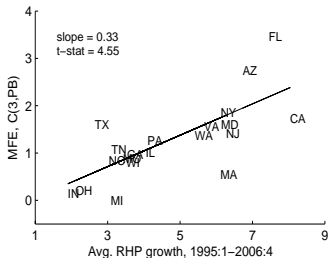
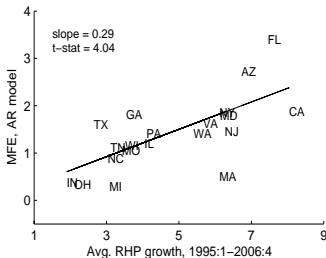
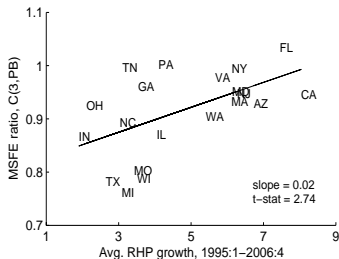
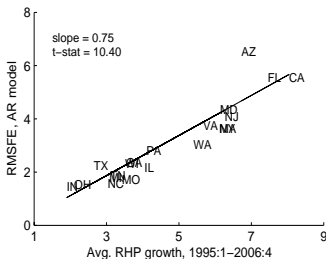
- National predictors
 - 9 of the Conference Board's leading indicators
 - Inflation
 - Industrial production
 - Commercial and industrial loans outstanding
 - Consumer installment credit outstanding
 - Real effective mortgage rate
 - U.S. real housing price growth, Freddie Mac
 - U.S. real housing price growth, NAR
- Neighboring states' real housing price growth

Out-of-Sample Forecast Results, 1995:1–2006:4

- Results from Rapach and Strauss (work in progress)
- 1-year (4-quarter) forecast horizon
- Florida
 - AR model: RMSFE = 5.55, MFE = 3.39
 - Individual ARDL models rarely outperform the AR model; when they do, only by 1%–2% in terms of MSFE reduction
 - Cluster combining method: RMSFE = 5.64, MFE = 3.47
- Missouri
 - AR model: RMSFE = 1.71, MFE = 1.05
 - A number of the individual ARDL models outperform the AR model, with reductions in MSFE of up to 47%
 - Cluster combining method: RMSFE = 1.53, MFE = 0.88

- Out-of-sample forecast results suggest that real housing prices in Florida were “disconnected” from economic fundamentals during 1995:1–2006:4
 - This could be interpreted as a “bubble” in Florida housing prices
 - This makes it difficult to develop a forecasting model for real housing price growth in Florida that works reasonably well consistently over time
- Out-of-sample forecast results indicate that real housing prices in Missouri were more closely linked to economic variables during 1995:1–2006:4
 - This makes it more likely that a reasonably reliable forecasting model can be developed for Missouri
- Rapach and Strauss (work in progress) find a similar pattern among the 20 most populous U.S. states

Figure 2: Results for 20 Most Populous States



Missouri real housing price growth forecast

- We use the cluster combining method to generate the initial Simon Center forecast for Missouri real housing price growth
 - 2008 forecast = -1.8%
 - 68% confidence interval = $[-4.2\%, 0.6\%]$
 - 1991–2007 average = 2.2%