

The Predictability of Appraisal-Based Real Estate Returns

Mark J. Eppli, James D. Shilling, and Kerry D. Vandell

This paper undertakes an analysis of metropolitan-level retail real estate returns to determine what moves appraisal-based real estate returns. We begin our analysis by relating metropolitan-level appraisal-based retail real estate returns to unexpected changes in both retail sales and retail construction starts.

We also relate our return series to unexpected changes in inflation, mortgage interest rates, equity rates of return, and stock market volatility. Theory suggests that the value of retail real estate is determined by discounting the expected future benefits by the required rate. Changes in value can occur through changes in either benefits or required rates. Theory also suggests that, in an ideal market, prices of retail real estate should fully reflect all available and relevant information regarding retail sales, retail construction starts, and our macroeconomic variables, and any new information about retail sales, retail construction starts, and our macroeconomic variables should produce a return movement.

We have generally applied a variety of statistical techniques to predict retail sales and retail construction starts on a quarterly basis for eleven metropolitan areas in the U.S., beginning with the earliest period allowed by the data and ending in 1994:2. Our retail sales equation is specified in a format consistent with recent work. The equation assumes that the logarithm of retail sales moves toward its equilibrium value, but only gradually. The equation also assumes that retail sales are directly tied to household income in the metropolitan area. Demographic variables are included in the model to reflect the shift in the distribution of the population toward those age categories that tend to have below-average propensities to spend.

The method used to predict retail construction starts assumes demand factors, like the expected change in retail sales, influence retail starts through stock-level forces. The equation also includes a proxy for the part of production that is expected to replace depreciated, removed, or converted retail space. The model is estimated separately for each metropolitan area.

To identify the determinants of changes in inflation, mortgage interest rates, equity rates of return, and stock market volatility, we resort to a less structured model. The model estimated relates each macroeconomic variable to its own history and that of the other variables. This formulation avoids having to classify the underlying variables into endogenous and exogenous variables.

Our findings generally suggest that only 4% of the variance in (unsmoothed) appraisal-based retail real estate returns can be explained by contemporaneous macroeconomic news and real estate market innovations. The results also show that augmenting the model with lagged values significantly improved its fit. With lags of up to 3 years, the explained variation in (unsmoothed) appraisal-based retail real estate returns increased to 36%. These latter results are a mixture of the anticipated and unexpected.

Certainly, it has by now been well documented that unadjusted appraisal-based real estate returns lag behind actual market conditions because of the way appraisals are carried out. Yet as we take stock of matters, it seems to us that the unsmoothed appraisal-based retail real estate returns reported in the paper should have responded more fully to contemporaneous macroeconomic news and market innovations. Considering the significant lag between macroeconomic news and market innovations, and movements in unsmoothed appraisal-based retail real estate returns, our findings would suggest that appraisal-based real estate returns let investors continue perceiving past conditions as prevalent, even when major changes in conditions have already occurred. This raises very serious questions about the reliability of appraisal-based real estate returns.

On the basis of the data presented here, we can also identify which retail markets appear to be more predictable than others. This byproduct makes our model of great interest to practitioners and academics alike.