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# Commercial Real Estate Valuation: Fundamentals Versus Investor Sentiment

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## Abstract

This paper investigates the role of fundamentals and investor sentiment in commercial real estate valuation. In real estate markets, heterogeneous properties trade in illiquid, highly segmented and informationally inefficient local markets. Moreover, the inability to short sell private real estate restricts the ability of sophisticated traders to enter the market and eliminate mispricing. These characteristics would seem to render private real estate markets highly susceptible to sentiment-induced mispricing. Using error correction models to carefully model potential lags in the adjustment process, this paper extends previous work on cap rate dynamics by examining the extent to which fundamentals and investor sentiment help to explain the time-series variation in national-level cap rates. We find evidence that investor sentiment impacts pricing,

even after controlling for changes in expected rental growth, equity risk premiums, T-bond yields, and lagged adjustments from long run equilibrium.

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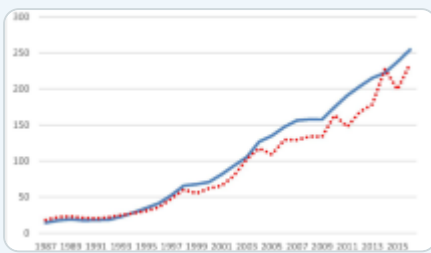
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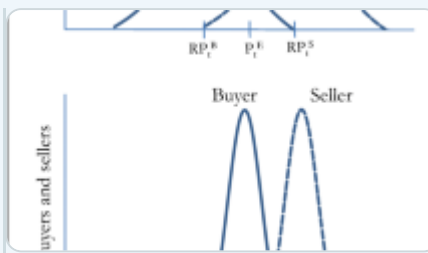
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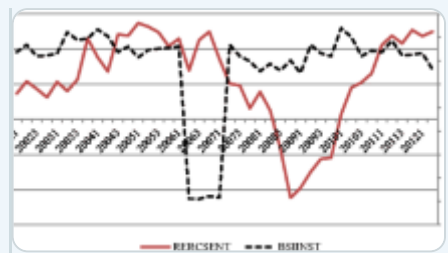
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## Notes

1. Hendershott and MacGregor ([2005a](#), [b](#)) test whether cap rates, and hence

property values, reflect rational projections of future rental growth and expected returns, thereby providing an indirect test of the role of sentiment.

2. Hirshleifer ([2001](#)) and Barberis and Thaler ([2003](#)) provide reviews of the extensive behavioral finance literature.
3. As part of the growing behavioral finance literature, researchers have also begun to carefully explore the impact of “flows” and trading activity on asset prices in public markets. See, for example, Warther ([1995](#)), Edelen and Warner ([2001](#)), Froot et al. ([2001](#)), Brown et al. ([2002](#)), Griffin et al. ([2007](#)), and Fama and French (2007). Clayton ([2003](#)) reviews much of this literature with a focus on the implications for private real estate.
4. Gompers and Lerner ([2000](#)) study the relationship between flow of funds (commitments) into venture capital funds and the valuation of new investments (firms) financed by the venture capital funds. Their findings are consistent with an uninformed demand /sentiment explanation of the link between fund flows and valuations.
5. NOI is assumed to include a reserve for expected capital expenditures and other nonrecurring expenses, such as leasing commissions.
6. State and federal income tax effects also affect property values and, therefore, price/NOI multiples, as may the amount and cost of mortgage financing.
7. Geltner and Mei ([1995](#)) and Plazzi et al. ([2004](#)) both adapt variants of Campbell and Shiller’s ([1998](#)) log-linearized present value model with time-varying discount and “dividend” growth rates to study the relative contributions of time-variation in expected future returns versus property income in property valuation. Both studies conclude that in the short run, property price fluctuations are driven primarily by changes in expected returns and not expected rents.

8. The specification in Eq. 4 uses the results of Eq. 3 to specify the equilibrium cap rate as a function of the discount rate,  $r_t$ , and expected NOI growth,  $g_t$ , but does not impose the exact relationship,  $R_t = r_t - g_t$ , that holds under the constant growth assumption.
9. Several stock market studies find institutions to be informed investors; i.e., “smart money.” See, for example, Chakravarty ([2001](#)), Jones and Lipson ([2004](#)), and Sias et al. ([2006](#)). However, this evidence is tempered by studies that suggest institutions do not outperform individual investors (e.g. Nofsinger and Sias [1999](#), and Kaniel et al. [2005](#)).
10. *Real Estate Report*, Summer 2002.
11. Note that, in theory, cap rate movements are driven by variations in expected net rental income (NOI). We assume that such expectations are highly correlated with expected changes in market rental rates.
12. The Weighted Symmetric test is often recommended over the Dickey-Fuller test because it is more likely to reject the unit root null hypothesis when it is in fact false. That is, the weighted symmetric test has higher power. We also obtain similar results using the Phillips-Perron test. The Phillips-Perron test is a variant of the Dickey-Fuller test that addresses the problem of additional serial correlation in the residuals.
13. The NCREIF property index is comprised of the same class of properties and investors as the RERC survey. The quarterly “constant liquidity” version of the NPI is developed in Fisher, Geltner and Pollakowski (2007). The authors recognize that private, relatively illiquid asset markets adjust through both changes in prices and liquidity; observed transaction prices are conditional on overall market liquidity at the time of sale (i.e., price and liquidity are jointly determined). A “constant liquidity value” of a property is the value

assuming no change in the level of market transaction activity; all adjustment takes place through price. The difference between the constant liquidity and hedonic value index, based on observed transaction prices that implicitly reflect time variation in liquidity, provides a calibration of commercial property liquidity. The TBI, including its constant liquidity version, are available at the MIT Center for Real Estate website.

14. Dokko et al. ([1999](#)) provide an overview of alternative explanations for real estate cycles that includes the potential role of mortgage flows. Pavlov and Wachter ([2006](#)) suggest that the underpricing of the borrowers' put option in non-recourse commercial mortgage loans is at the root of the link between mortgage flows and property values. Riddiough ([2008](#)) argues that the securitization boom of the past 5 years has been accompanied by mispricing mortgage default risk that once again resulted in excessive mortgage flows and a bubble in commercial property prices.
15. Baker and Stein ([2004](#)) develop a theoretical model in which aggregate liquidity acts as an indicator of the relative presence of sentiment-based traders in the market place and therefore the divergence of asset price from fundamental value. Abnormally high aggregate liquidity (high turnover and/or low bid-ask spreads) is evidence of overvaluation and in fact forecasts a downturn in stock prices.
16. The lagged cap rate change was initially included to expand the dynamic adjustment process. However, it was dropped from the analysis because in no specification was its estimated coefficient statistically significant.
17. An alternative approach would be to estimate a structural equation system. However, this would require identifying restriction assumptions and would also be problematic given the non-stationary and cointegrated nature of our data.

18. See, for example, Baker and Stein ([2004](#)). Yu and Yuan ([2007](#)) also find that irrationality is more prevalent in rising markets.
19. The version of the CLN sentiment index used here is the principal component of the sentiment proxies after first orthogonalizing each proxy by regressing it on the three economic fundamental variables.

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