Interest Rates and Real Estate Capitalization Rates on the Rise

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I. *Introduction*

Questions about near-term interest rates levels have become particularly difficult to answer with the importance of factoring in both future economic conditions and Federal Reserve Board policy modifications along with their interactions. Despite the difficulty of pinpointing the levels of interest rates during the next 12 and 24 months, some increase in interest rates appears inevitable given the continued and steady growth of an economy that should require less accommodation. Accordingly, heavier discounting of securitized and un-securitized cash flows from capital assets, such as commercial real estate, will impose downward pressure on values. Real estate capitalization rates also embody risk premiums through the discount rate and asset-specific income growth.[1] Changes in both of these components coincident with sustained economic growth will counter some or the entire upward drift in the riskless rate.

In the absence of the Federal Reserve changing its mind about accommodation and some unexpected inflation, this neutralization scenario could play out in the U.S. commercial real estate markets. Economic growth and impending changes in Federal Reserve policy acting together however may trigger enough of an increase in long-term interest rate to swamp expected NOI growth resulting in higher capitalization rates and lower values.[2] Some experts contend that at current levels a 100 bps. increase in long-

[1]The standard expression following Gordon (1959) is $R = (r_f + r_p) - g$, where R is the capitalization rate, r_f and r_p are the risk-free rate and risk premium, respectively; and g is the constant growth rate in net income.

[2] See (Yeatts 2013). Upward pressure on NOIs is largely the result of lease renewals at higher rents.

term Treasuries could manifest into a 50 bps. increase in CRE capitalization rates.[3] Others model in a gradual and 'not large' increase in capitalization rates (CBRE, 2013).

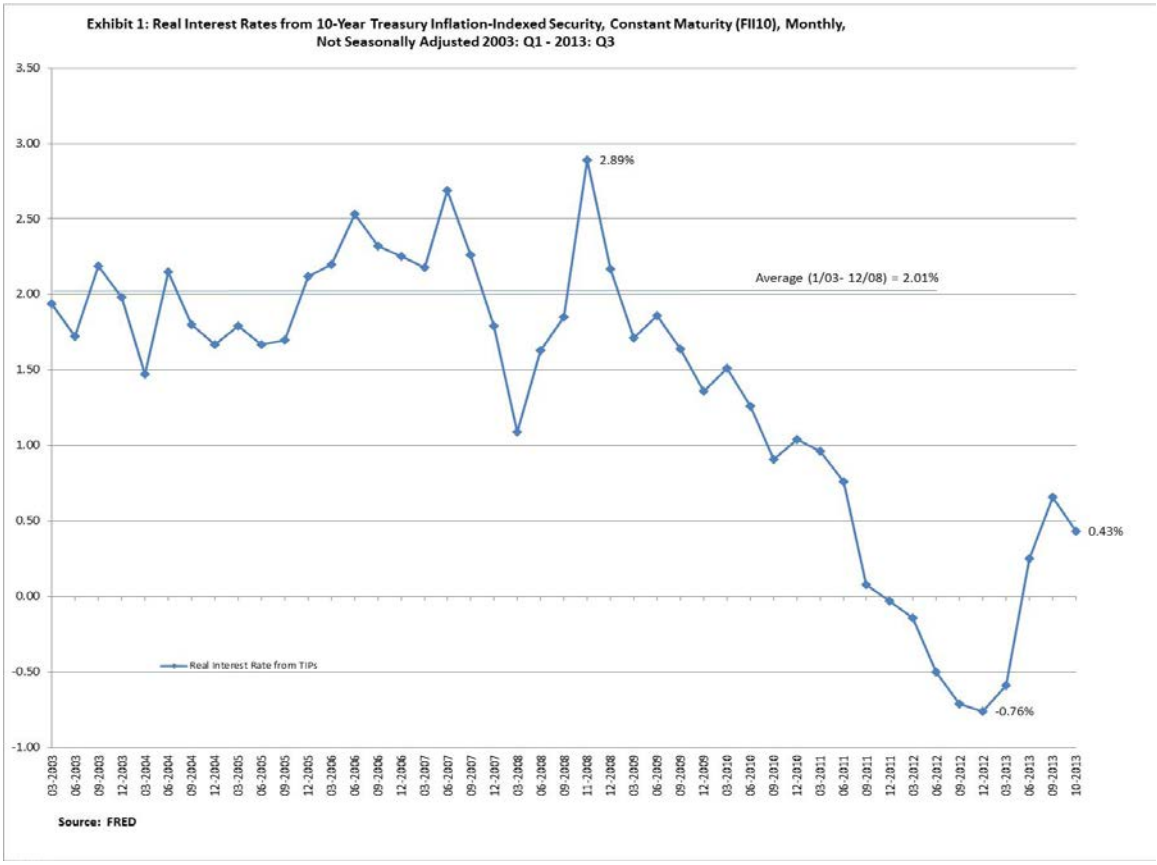
In this article, I present an estimate of how much near-term interest rate (*i.e.*, 10–Year Treasuries) could rise during the foreseeable future given steady economic growth, less accommodation from the Federal Reserve than during the past few years, and only expected inflation. Using this estimate and my findings on the relationship between interest and capitalization rates (*i.e.*, the elasticity of capitalization rates and interest rates), I offer views on what is likely to happen to capitalization rate levels in the near future.

II. *Interest Rates and Fed Policy Changes*

Assuming for the moment that inflation and inflationary expectations remain low defined as below the Federal Reserve's two percent target, the real rate appears as the likely component of the riskless rate to be immediately affected in a meaningful way by the some combination of continued economic growth and easing of Federal Reserve accommodation. This thesis is conditional on there being room for upward movement in the real rate using the historical long-run average as a benchmark. Exhibit 1 presents the pattern of real interest rates measured as constant maturity yields on 10-Year Treasury Inflation Protected Securities (TIPs) since these securities began trading in 2003. From 2003 to 2009 the average real rate was 2.01 percent using the TIPs trading result. The real rate currently stands at about .5 percent. If this series is mean reverting and stabilizes at the as pre-great recession mean as experience indicates, then in a world of low and

[3] *Ibid*. From a quote by Tad Phillips of Moody's.

constant expected inflation the ceiling on near-term interest rate increases is approximately 150 bps.



As a check for robustness I recreated the data and chart prepared for a recent *New York Times* article by Paul Krugman (2013) that shows the 54 year history of real rates computed as the 10-year Treasury rate minus the previous year core personal consumption expenditures inflation rate. The graphic of the recent history for this series closely resembles the one in Exhibit 1. The long-run average covering the period 1959 to present indicates a real rate of 3.08 percent. The average real rate using the Krugman series during the period 2003 through 2008 equals 2.28 percent which closely compares to the TIPs average rate for the same period of 2.01 percent (r=.7732). The current real rate in the Krugman series equals 1.53 percent which is about 100 bps. higher than the

current real rate using TIPs data. Again assuming mean reversion to the 2003 through 2008 average, the ceiling estimate becomes about 75 bps. Considering both methods the range for the ceiling is 75 to 150 bps.

What then would as much of a 150 bps. increase in real interest rates do to CRE capitalization rates? Before addressing this question the prospects for near-term inflation need to be considered.

III. *Current Inflation and Inflationary Expectations*

Despite the fears of many about accelerating inflation, the inflation rate has remained low and is expected to be in the range of one to two percent for the foreseeable future. Support for this conclusion comes from a number of sources including Federal Reserve economists. The Federal Reserve has the stated goal of maintaining the inflation rate, as measured by the personal consumption expenditures (PCE) price index, at the two percent level. Notwithstanding, the reported PCE has trended below two percent for the past four years.

Economists at the Federal Reserve Bank of Cleveland devised a sophisticated method for measuring inflationary expectations using inflation rate swaps (Haubrich, Pennacchi, and Richken, 2011).[4] In a recent analysis, their model indicates that investors expect a 1.7 percent inflation rate over the next decade. The TIPs and 10-Year constant maturity index rates place expected inflation at approximately 2.3 percent.[5] Regardless, a comparison of the current and expected inflation rates does not support the conclusion that the U.S. will

[4] See http://www.clevelandfed.org/.

[5]These data are available through FRED at the Federal Reserve Bang of Saint Louis. Expected inflation is estimated by subtracting the TIPs yield from the 10-year Treasury yield.

experience a meaningful interest rate increase over the next two or more years based on expectations of rising inflation.

IV. *Interest Rate CRE Capitalization Rate Relationship*

The CRE capitalization rate literature has progressively deepened over the past decade. Most studies, past and recent, seek a better understand the determinants of CRE capitalization levels and changes. The Gordon (1959) Growth Model presented in Equation (1) serves as the conceptual foundation for much of this empirical research.

$$R = (r_f + r_p) - g. \quad (1)$$

where R in this particular adaptation is the CRE capitalization rate level, r_f is the risk-free rate (*i.e.*, real rate and the rate representing inflation expectations) usually measured by the Treasury rate, r_p is the risk premium typically specified as the spread between a risky asset rate and the Treasury rate, and g is the growth rate in income from either rent growth or net operating income growth.

A recent round of CRE capitalization rate studies extends the variable set to include investor sentiment (Clayton, Ling, and Naranjo, 2009) and credit availability (Chervachidze, S, J. Costello, and W. Wheaton, 2009 and Chervachidze, S, and W. Wheaton, 2013). Both variables exhibit statistical significance for explaining variation in CRE capitalization rate levels.

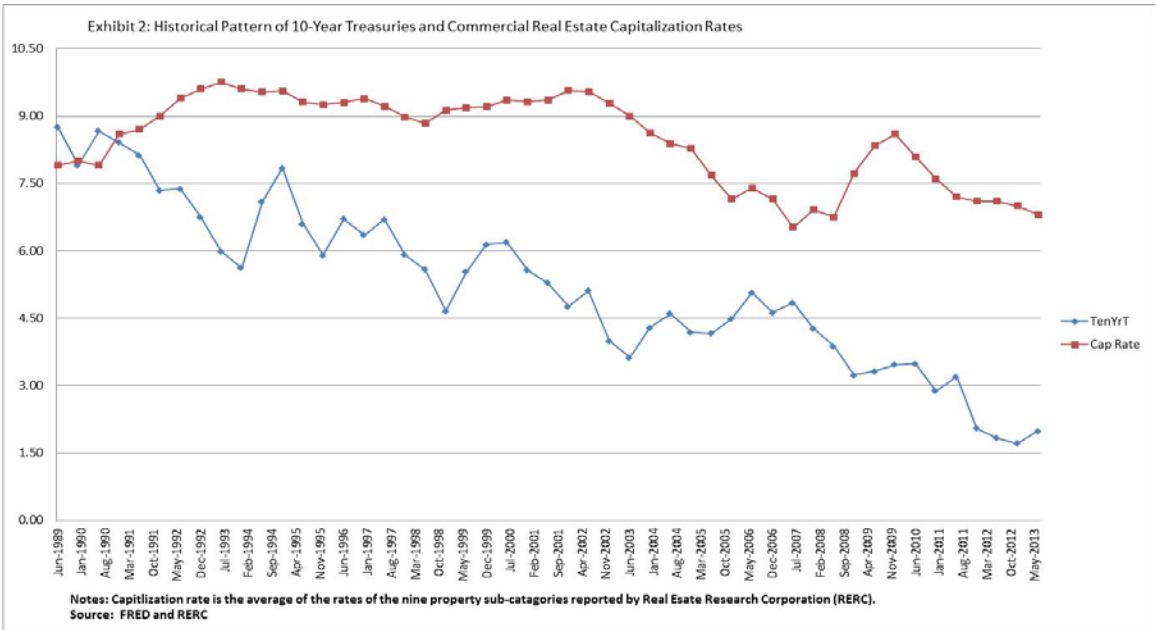
Among the forces that may influence capitalization rates going forward - Gordon Growth Model components, sentiment, and credit availability - the principle concern here is the general level of interest rates. Exhibit 2 offers an opportunity to make a side-by-side comparison of the historical capitalization and ten-year treasury rate series from 1989 to present. The exhibit indicates a common trend but the two series do not appear highly

correlated. I regressed the log of the ten-year Treasury on the log of the CRE capitalization rate and derived the elasticity as follows (t-statistics in parentheses)

$$LnR = \beta_0 + \beta_1 Lnr_f + \varepsilon \qquad (2)$$

$$\begin{array}{cc} 1.85 & .18 \\ (45.10) & (6.99) \end{array} \qquad \text{Adj. } R^2 = .33, \ \eta_{R,\, r_f} = .18$$

The Treasury rate explains one-third of the variation in CRE capitalization rates. The elasticity of .18 may be interpreted as for every 10 bp. change in the ten-year Treasury rate results on average in an 18 bp. change in the capitalization rate. So, for example, if the ten-year Treasury rate increases from 3.0 percent to 3.1 percent the assumed CRE capitalization rate of 8.0 would increase to 8.18 percent. Otherwise stated and for now not holding other things constant, it takes a 55 bp. increase in the ten-year Treasury to generate a 100 bps. uptick in the CRE capitalization rate.



The possibility exists that the elastic computed over the entire period and evaluated at the means does not represent the current environment for judging the relationships

between these rates. Accordingly, I computed the arc elasticity for the period Q1 2012 through Q3 2013. This period-specific elasticity is slightly greater equaling .205.

The more important extension for estimating the interest rate/capitalization rate elasticity is to recast this analysis in a multivariate context to allow and control for the offsetting effects of risk premium compression and income growth. As stated earlier, the conventional wisdom is for interest rates to move up, but coincidently, risk premiums to possibly shrink, and income from rents to expand. My multivariate regression with R as the dependent variable includes the following explanatory variables with their respective elasticity estimates:

- r_f - The constant maturity ten-year Treasury rate (Source: FRED), $\eta = .10$
- r_p – The spread between Moody's AAA corporate bond yield index and the ten –year Treasury rate (Source: FRED), $\eta = .07$
- g – The expected rent growth rate for the next five years specified by survey respondents (Source: RERC) $\eta = .02$

Controls

- Investment conditions rating specified by survey respondents based on a one-through-ten scale (Source RERC).
- Credit availability measured as the quarterly change in commercial bank real estate loans divided by GDP (Source: FRED).
- Dummy variables for nine property types and time as controls (Source: RERC).

The elasticity computed from the multivariate regression of .10 is considerable smaller that the univariate estimates which is not surprising given that risk spread and income

change are considered. This result suggests a one-to-one relationship between interest rates and capitalization rates.

Implications for Near-Term CRE Capitalization Rates

The CRE capitalization rate for all property types was 6.7 percent in the third quarter of 2013 according to RERC (2013) surveys. The real rate of interest is likely to mean revert over the next 24 months increasing between 75 and 150 bps. and if it does then CRE capitalization rates will increase to between 7.5 and 8.25 percent. This range estimate derives from the assumption of no unexpected inflation or deflation and incorporates the potential for offsetting effects of narrowing risk spreads in the economy and future CRE rent growth. The one-to-one relationship between interest rates and capitalization rates that I estimate is a bit higher than the estimates of others who use a different logic and empirical approach.

References

Chervachidze, S. What Will Happen to Cap Rates when Interest Rates Increase? *CBRE About Real Estate,* June 24, 2013.

Chervachidze, S, J. Costello, and W. Wheaton. The Secular Cyclic Determinants of Capitalization Rates: The Role of Property Fundamentals, Macroeconomic Factors, and "Structural Changes." *Journal of Portfolio Management*, 2009, Special Real Estate Issue, 50-69.

Chervachidze, S, and W. Wheaton. What Determined the Great Cap Rate Compression of 2000-2007, and the Dramatic Reversal During the 2008-2009 Financial Crisis? *Journal of Real Estate Finance and Economics*, 2013, 46, 208-231.

Clayton, J., D. C. Ling, and A Naranjo. Commercial Real Estate Valuation: Fundamentals Versus Investor Sentiment. *Journal of Real Estate Finance and Economics,* 2009, 38:1, 5-37.

Gordon, M. J. Dividends, Earnings, and Stock Prices, *Review of Economics and Statistics,* 1959, 41:2, 99-105.

Haubrich J.G, G. Pennacchi, and P. Richken. Inflation Expectations, Real Rates, and Evidance from Inflation Swaps, Federal Reserve Bank of Cleveland, working paper, March, 2011.

Krugman, P., 54 Years of Real Interest Rates, *New York Times*, August 22, 2013.

Real Estate Research Corporation, *Real Estate Report*, 2013, 42:3.

Yeatts, T., Interest Rate Growth Will 'Substantially Cancel Out' NOI Growth Over the Next 12 to 24 Months, Experts Say, *SNL*, October 15, 2013.