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> A Rise in Interest Rates Will Not Necessarily Increase Cap Rates, Roduct

"It is difficult to get a man to understand salary depends upon his not something when his understanding it." –Upton Sinclair

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This article explores two sources of cap rate risk. One is interest rate risk volatility. Does an increase in interest rates *necessarily* increase cap rates? The other source is cap rate uncertainty at the time an investor sells a property. • Brokers and many investors believe that rising interest rates will *necessarily* increase cap rates and that the percentage increase in the cap rate will be one for one. The received wisdom

in this case is wrong.

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Interest Rate Risk

Simple scatters of Treasury bond yields versus office and retail cap rates reveal that if there is a relationship between US Treasury bond yields and cap rates, the relationship is not simple, and other factors obscure the true relationship (Exhibits 1 and 2). A rise in yields will not *necessarily* increase cap rates.

What Is a Cap Rate?

A cap rate is the ratio of net operating income (NOI) over the property price; it is also the sum of the riskfree rate and the credit spread minus the expected rate of growth of NOI, including other variables: CAP RATE = RISK-FREE RATE + CREDIT SPREAD – EXPECTED GROWTH OF NOI + other variables.

The cap rate is not an interest rate. Even if the riskfree rate (e.g., Treasury yields) increases, as it likely would in a booming economy with low unemployment, credit spreads might shrink and expected NOI growth rates strengthen, thus offsetting or even swamping any increase in interest rates. Hence, cap rates could fall even in a rising interest rate environment.

If other factors are held constant, the partial impact of an increase in bond yields on cap rates is statistically significant and positive. However, even if yields rise by, say, 1%, cap rates would rise by less than 1%.

If there were a strong and consistent bivariate relationship between bond yields and cap rates, the correlation between yields and cap rates should be uniformly positive, but it is not, as shown in Exhibit 3.

Results of Econometric Analysis

Just because a strong bivariate correlation is absent does not mean that interest rates have no partial effect on cap rates. They do.

Exhibit 1: Comparison of Treasury Bonds and Office Cap Rates Bond yields by themselves explain only18% of the variation in office cap rates.

9.5% 9.0% 8.5% 8.0% Office Cap Rates 7.5% 7.0% 6.5% 6.0% 5.5% 1.0% 2.0% 3.0% 4.0% 5.0% 6.0% **Ten-Year Constant Maturity Treasury Bonds**

Exhibit 2: Comparison of Treasury Bonds and Retail Cap Rates

Bond yields by themselves explain only12% of the variation in retail cap rates.



Source: Real Capital Analytics

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I estimated an econometric model of cap rates (I invite technically motivated readers to request econometric results) and confirmed the following:¹

• The real ten-year Treasury bond yield has a significant effect on cap rates, but its effect is often swamped by other factors. Bond yields alone explain only 12% to 27% of the variation in cap rates.

Holding other factors constant, a 1% rise in the real bond yield increases the office cap rate by 38 basis points. I found similar results for retail, industrial, apartment, and even single-tenant properties.

• Even though the bond yield has a statistically significant effect on cap rates, the impact is not one for one.

Increasing the flow of economy-wide debt in relation to GDP decreases cap rates. This debt flow is correlated with transaction volume. When capital is scarce and borrowers are rationed, transaction volume declines and cap rates increase.

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• Cap rates exhibit considerable momentum (serial correlation), or smoothing, and unlike REITs, they are backward looking.

• An increase in real rents lowers cap rates. As noted earlier, an increase in expected NOI reduces the cap rate.

• An increase in the economy-wide risk premium, which is the spread of Moody's AAA Corporate Bond Index over the ten-year Treasury, increases the cap rate. Prices fall when investor anxiety rises.

Exit Cap Rate Risk

Regardless of the impact of bond yields on cap rates, exit cap rate volatility can pose substantial risk to

Exhibit 3: Correlation of Bond Yields and Office Cap Rates

The correlation between bond yields and office cap rates is volatile.



Sources: Morningstar, Real Capital Analytics

^{1.} This model reflects some of the insights of an important scholarly article prepared by Serguei Chervachidze and William Wheaton, "What Determined the Great Cap Rate Compression of 2000–2007, and the Dramatic Reversal During the 2008–2009 Financial Crisis?" *The Journal of Real Estate Financial Economics*, February 2013, Vol. 46, No. 2, pp. 208–231.

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value-added and opportunistic deals (as well as to core investments even with low default risk), especially when the timing of the exit is critical. Investors focused on internal rates of return are especially vulnerable. Today, as the market peaks, neglecting exit cap rate risk can be irresponsible, even hazardous to investors' wealth.

The longer the investment horizon and the narrower the exit window, the greater the risk. The less flexible the holding period, the greater the danger that investors may be forced to accept a higher cap rate. By contrast, core investors may be more flexible if selling conditions appear too volatile and less conducive. However, they too must contend with cap rate risk at the time of sale, whenever it occurs. Exit cap rate risk alone can have a dramatic impact on downside risk. Investors typically do not use the correct tool—Monte Carlo analysis—to estimate risk and potential loss. Limited partner (LP) and general partner (GP) investors do not share exit cap rate risk equally; the GP position is replete with more optionality than the LP position, and the value of the GP position increases more rapidly with market volatility. The LP position is less risky.

Consider industrial transaction cap rates. Exhibit 4 shows the minimum and maximum cap rates, two confidence intervals, and the average cap rate. The left tail of the cap rate distribution—lower cap rates-is the riskiest. High-net-worth investors, offshore investors, and institutional trophy investors dominate this portion of the distribution. To the extent that the market is segmented and cross elasticities are low, volatile capital flows can have a disproportionately volatile effect on the lower cap rate tiers. When average cap rates are low and the market is hot, investors "stretch" and pay higher prices. Thus, the distribution spread widens but from the left, as the red line is the most variable. In other words, this behavior is asymmetric because the volatility of the right (high cap rate) side of the distribution (pink, 95% confidence interval) is about 20% of the volatility of the low cap rate side (yellow, 15% confidence interval). The average is the blue line.

Many investors have strong expectations regarding the future path of interest rates, including those contemplating an exit within three to five years. Although I avoid forecasting interest rates beyond the next few months, those who do should keep the following in



Exhibit 4: Industrial Cap Rates

The left tail is the riskiest portion of the industrial cap rate distribution.

Many investors have strong expectations regarding the future path of interest rates, including those contemplating an exit within three to five years.

mind: If interest rates rise at the time of exit, the impact on cap rates may not necessarily be discernible, much less significant, because of offsetting factors. Of course, the opposite could be true as well if other factors reinforce the increase in interest rates.

Conclusion

Cap rates are a function of many variables. In theory and in practice, rising interest rates should increase cap rates, holding other factors constant. These factors include credit spreads, the change in economywide debt in relation to GDP, the expected rate of growth of NOI or rents, and market liquidity. Their impact on cap rates can offset or completely swamp the impact of rising Treasury yields. That is why a bivariate scatter of bond yields and cap rates appears almost random.

Hence, the casual observer might conclude that the relationship between cap rates and interest rates is ten-

uous at best. That conclusion is wrong, but there are important qualifications. The truth is that although bond yields alone have a positive and statistically significant impact on cap rates, the impact is often swamped by other factors. Additionally, the interest rate effect is not one for one; a 1% increase in real bond yields will increase cap rates by only 36 bps, not 100 bps, holding other (variable) factors constant.

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Therefore, a rise in interest rates will not *necessarily* increase observed cap rates.

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