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## **Investment Newsletter – June 2009**

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### **Unexpected Inflation's Effects on Real Estate Returns**

With inflation expectations rising, we'll analyze the potential impact of a sudden increase in inflation on real estate investments. To do so we'll build a model of how interest rates and asset values interact with inflation. Given the complexity of the topic, I will simplify the details of my spreadsheet as much as possible and focus on the high level factors driving the analysis. We cannot match the real world exactly with a model but we won't need such precision to see the big picture results. An understanding of how this model works will provide insight into the risks and returns of real estate in the current environment.

First we'll look at apartments where leases typically run for just 12 months. The analysis will show that unexpected inflation increases returns on equity substantially. Then we'll examine the more complicated situation for triple net leased properties that have rental rates locked in for many years in advance. Although unexpected inflation also helps owners of these properties in the long run, there will be losses in the early years as rising inflation expectations feed into required returns.

#### **A Simple Model of Inflation Expectations**

In our model of how interest rates and required returns are determined, investors add their forecast for inflation to the required real rate of return. Given the linkages between monetary policy and the lags inherent in economic interactions that lead to inflation, we assume that the market as a whole can foresee what inflation will be over the next 12 months. Beyond that, we will assume that investors forecast long term inflation by averaging the inflation rates over the last 3 years along with the current 1 year forward expectation. Over the last 12 months the consumer price index (CPI) fell 1.3%. In the year prior to that it rose 4.2% and the year before that it rose 2.7%. If we add in a one year forward forecast of 2%, our model yields a long run expected inflation rate of 1.9%.<sup>1</sup> Using this model, observed inflation in excess of expectations will increase long run expectations but will do so slowly over time.

#### **Inflation Linkages to Interest Rates and Investors' Required Returns**

In a properly functioning economy there must be positive real returns on investment to encourage savings and investment activity. Because inflation represents the decline in the real value of money, interest rates and required returns include inflation compensation on top of the real rate of return. In our model world

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<sup>1</sup> As of 6/30/09 the inflation rate implied in the 10 year Treasury Note vs. Inflation Protected Note is 1.77%.

we assume that 10 year treasury rates are equal to a constant 2% plus the long run inflation expectation.

Treasury bond rates are risk free interest rates. We will use these as a starting point and add on required spreads for risk taking lenders and investors in the economy. Specifically, we assume that commercial mortgage rates are set by adding 3.5% to the 10 year treasury yield. We further assume that real estate investors require a return on their equity equal to the 10 year treasury yield plus 6%. Note that the current crisis has elevated spreads but these assumptions are realistic spreads for normal markets. In any case, the overall result should not be sensitive to the levels of these risk premiums (though they would be sensitive to large changes in risk premiums).

### **A Surge in Inflation**

For our illustration we will assume a surge in inflation and then reversion back towards the Federal Reserve's comfort zone. The path of inflation is as follows:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
2%	2%	5%	8%	11%	9%	7%	5%	3%	2%

In this scenario CPI would increase by 68% over 10 years – a 5.4% compounded rate.

### **Debt vs. Equity the Effects of Commercial Mortgage Underwriting Criteria**

When banks underwrite commercial real estate mortgages they require that current net operating income of the property must cover the mortgage payments 1.2 times. I.e. they want current cash flows to provide a cushion of at least 20% over the mortgage payments. In addition they will typically constrain the loan-to-value ratio regardless of the property's cash flows. In a normal market, apartment loans can go as high as 80% of value and commercial (triple-net) real estate loans will be no more than 70% of value. Level payments are set so that apartment loans are amortized over 30 years and commercial property loans are amortized over 25 years.

As inflation drives up mortgage rates, the payment rises as a percentage of the initial principal. But, since current cash flow constrains the maximum allowed payment, the lender must reduce the size of the loan offered. Buyers must use more equity and less debt when purchasing a property in an inflationary environment. Either buyers accept lower returns on their equity or they require a higher capitalization rate (a lower price) to compensate for the overall increase in their real cost of capital.

### **A Detailed Look at Apartments**

Recall that a capitalization rate is the net operating income divided by price:  $Cap\ Rate = NOI/Price$ . Equivalently:  $Price = NOI/Cap\ Rate$ . Given our assumptions, apartments should be selling at a capitalization rate of 6.4% and the mortgage rate is 7.4%. A buyer would need to make a down payment of 36% to qualify for the loan. We assume that net operating income increases in line with CPI.

Rapid increases in net operating income (due to inflation) drive up both the cash flows to the owner and the numerator in the pricing equation above. The capitalization rate is also affected by inflation but by a much lower magnitude. In simple terms the capitalization rate for apartments reflects the weighted average cost of capital less the long term appreciation forecast. Since appreciation closely follows inflation for short term leases (in our model) the capitalization rate moves much less than inflation itself. The changes in the capitalization rate here are caused by the increasing portion of financing that must come from equity rather than the mortgage

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as underwriting constraints reduce allowable loan to value ratios. Our projected path of capitalization rates for apartments looks like this:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
6.4%	6.5%	6.7%	6.9%	7.0%	7.0%	6.9%	6.8%	6.6%	6.5%

These capitalization rates and rapidly increasing net operating income lead to fast appreciation in the value of apartments – and no down years. The combination of higher than expected returns and a (locked in) mortgage rate based on the earlier lower inflation forecasts produces returns on equity far above investor’s initial requirements. In 10 years the apartment building will increase in value by 66%. Return on equity will exceed inflation by 11% annually rather than the 8% required under our assumptions. See Appendix A for a table with detailed results.

**A Detailed Look at Triple Net Leased Commercial Property**

For a primer on triple net lease property see the March 2003 newsletter. These properties typically have leases with initial terms of 20 years and rents are increased at the end of every 5 years. The low inflation environment has pushed escalations down to the level where 10% every 5 years is quite common. Thus we will use this for our analysis. In cases where market rents rise far above the lease rate, capitalization rates will be heavily influenced by the length of time until the lease expires and the rents go up to market. Essentially values for such properties act very much like long term bonds when market rents are far in the future. Therefore a rise in inflation and required returns can push property values down when remaining lease terms are long. This is because the offsetting rent increases are too far in the future to compensate for the sudden rise in the cost of capital faced by potential buyers.

For our analysis we first look at a property with 20 years remaining on the lease. The going in capitalization rate is 6.6% and the investor must put down 39%. At the end of each year we discount remaining rents and the ending property value back at the cost of capital for that year end. The resulting value divided by current lease rents is our capitalization rate. Since rents adjust only in the distant future we see that capitalization rates rise much more on these properties. I.e. the property value must drop to provide new investors with returns high enough to compensate for the increased inflation expectations. Assuming an initial property value of \$100, the path of capitalization rates and property value is as follows:

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
6.5%	6.4%	7.0%	7.3%	7.8%	7.3%	6.7%	6.0%	5.5%	5.6%
\$102	\$103	\$94	\$91	\$93	\$99	\$109	\$121	\$133	\$143

Weighted average cost of capital peaks in year 6 and since rents become smaller relative to the terminal value, a large part of investor returns must come from accretion of the discount. I.e. the property value increases towards the terminal value with the passage of time as the discount period shortens. At the same time, decreasing inflation and cost of capital also drive up the value after having driven it down in years 3 and 4.

Although an investor in such a triple net leased property is likely to suffer a significant short term unrealized loss as the surprise inflation materializes, the long run is more favorable. Over a 10 year period, the property increases in value by less than inflation but the value of the mortgage debt is also depreciated by the same

inflation. Over 10 years, return on equity will exceed inflation by 7.3% annually rather than the 8% required under our assumptions. See Appendix A for a table with detailed results.

In order to show how remaining lease term impacts returns we can analyze a triple net lease property with a remaining lease term of just 10 years. In this scenario the property value never drops below the initial value and it goes to \$168 by the end of year 10. This provides a compounded return of 14.4% over the 10 years – 9% over the inflation rate - which is better than the required return going into the investment.

### **Conclusion**

While inflation boosts property income and ultimately value, it also increases required returns on capital by eroding the real value of the dollar. As investors we need to know how these variables interact when inflation increases rapidly and unexpectedly. The analysis in this newsletter shows that apartment investors can unambiguously benefit and earn higher than normal returns when there are inflation surprises. For triple net lease investors it is more of a mixed result. They will earn reasonable returns over a long enough holding period but would be better off waiting to buy in cases where the property has a very long time until lease maturity combined with small fixed rent escalations.

### **Government Manipulations = Risks - Stock Market Comments**

Much of the news media seems to believe that we are on the verge of a miraculous economic recovery and that somehow the massive wave of foreclosures and de-leveraging that we are experiencing will not have any further economic impact. Judging by the stock market's performance, there are a lot of investors who also believe this story. My take is that there is very significant risk of further declines for a large part of the market, financials in particular.

Let me give you an alternative interpretation for what has transpired this year. The government realized that congress was not going to provide any more bailout money because people were mad about the taxpayer money given to the banks. They also know that the banks need a LOT more money to absorb the losses they must own up to over the next 2 years. So, they figured out a way to help the banks raise money from investors.

First they announced a moratorium on foreclosures to stall the adjustment process under way in the economy and postpone recognition of banks' losses. Since borrowers aren't making loan payments or paying rent, they were able to spend more money on other stuff – supporting the economy. Next they had the Federal Reserve drive down mortgage rates temporarily so the banks could take a one-time boost in earnings from refinancing a huge amount of mortgages into government subsidized loans. They combined this with the "stress test" publicity stunt to convince investors that all was great with the banks. Bingo, bank stocks rallied right on schedule and they were able to raise large amounts of capital from some investors willing to bet that the government will always be there to rescue them when needed. Other investors reasoned that if the banks are OK then recovery is at hand. So they bid up the whole market.

Unfortunately, foreclosures must now resume since the banks cannot afford to let people live in their houses for free indefinitely. Also the Federal Reserve cannot

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keep mortgage rates artificially low for long – especially if there were a real recovery. So banks will not enjoy such robust refinancing fees this quarter. Banks are going to lose a lot of money as the next wave of mortgage rates reset higher – triggering more defaults. House prices will continue dropping - causing consumers to spend even less; they will default on their mortgages more frequently as more and more find themselves under-water. It's hard to see how this scenario supports a robust economic recovery in the U.S.

Despite my negative views for a large part of the market, some countries and sectors may do much better. A dropping dollar will be good for a lot of investments we hold. We continue our hedging strategy while waiting for the market to offer us more return and/or less risk. **Year to date my average client has a return of 5.80% compared to 3.16% for the S&P 500 but with considerably less volatility.**

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**Appendix A**

**Effect of Unexpected Inflation on Real Estate Values and Returns**

End of Year:	0	1	2	3	4	5	6	7	8	9	10
<b>Apartment Analysis</b>											
Apartment NOI		6.40	6.52	6.85	7.40	8.21	8.95	9.58	10.06	10.36	10.56
Apartment Value	100.0	102.0	104.8	108.6	116.9	128.0	138.3	147.0	154.5	160.5	166.0
Implied Cap Rate	6.4%	6.4%	6.5%	6.8%	7.0%	7.0%	6.9%	6.8%	6.7%	6.6%	6.5%
Loan	64	63.6	62.9	62.2	61.5	60.7	59.8	58.8	57.8	56.7	55.6
Equity	36	39	44	49	59	68	77	86	94	102	110
Cash Flow to Equity		1.07	1.19	1.52	2.07	2.88	3.62	4.25	4.73	5.03	5.24
Pre-tax Nominal Return on Equity		11%	17%	15%	24%	21%	19%	17%	15%	13%	13%
Pre-tax Real Return on Equity		9%	15%	10%	16%	10%	10%	10%	10%	10%	11%
Annualized to Date		11%	13.7%	14.1%	16.5%	17.4%	17.6%	17.5%	17.2%	16.8%	16.4%
<b>NNN Analysis:</b>											
NNN NOI		6.62	6.62	6.62	6.62	6.62	7.28	7.28	7.28	7.28	7.28
NNN Value	100.0	102.1	102.7	94.4	91.0	93.2	99.2	108.5	121.2	133.1	142.8
Implied Cap Rate	6.6%	6.5%	6.4%	7.0%	7.3%	7.8%	7.3%	6.7%	6.0%	5.5%	5.6%
Loan	61	60.4	59.5	58.5	57.4	56.2	54.9	53.5	52.1	50.5	48.8
Equity	39	42	43	36	34	37	44	55	69	83	94
Cash Flow to Equity		1.23	1.23	1.23	1.23	1.23	1.89	1.89	1.89	1.89	1.89
Pre-tax Nominal Return on Equity		11%	7%	-14%	-3%	14%	25%	28%	29%	22%	16%
Pre-tax Real Return on Equity		9%	5%	-19%	-11%	3%	16%	21%	24%	19%	14%
Annualized to Date		11%	8.8%	0.6%	-0.4%	2.4%	5.8%	8.7%	11.1%	12.3%	12.7%