

When rates rise, do stocks fall?

The performance of equities and other return-seeking assets in rising and falling interest rate scenarios, January 1970 through September 2013

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ISSUE:

With rates at all-time lows, investors often ask about the behavior of fixed income assets as rates rise. This question has been addressed in many papers and analyses; an equally important question, and not as frequently addressed, is “What has been the performance of equities and other return-seeking assets when interest rates rise [fall]?” In other words, what have been the return outcomes for broadly diversified portfolios in rising [falling] interest rate scenarios?

RESPONSE:

Interest rates have been very volatile for the past 40 years. The performance of equity markets during periods of rising rates has been somewhat less than in periods of falling rates. Closer analysis shows that the equity markets have performed better when interest rates are either rising slowly or falling rapidly (rather than rising rapidly or falling slowly). This may be due to the impact of economic conditions: economic distress can lead to both fast-rising interest rates and weak equity markets; strong economic growth can lead to fast-falling rates and strong equity markets; and periods of slower-changing interest rates are more likely to see negative correlations between stock and bond markets.

There is also a strong relationship between the direction of interest rates and the relative performance of U.S. and international markets.

Diversified portfolios’ overall patterns of behavior were similar to those of equity portfolios for the time period we analyzed, January 1970 through September 2013, although individual components (real estate, commodities and so on) did display different characteristics for various sub-periods.

Background

Interest rate environment

The 43.75-year period from January 1, 1970, to September 30, 2013 was an extremely volatile rate environment, with the 10-Year Treasury starting at a yield of 7.0%, reaching a high of 16.5% on September 30, 1981, and ending at 2.6%. In this time frame, rates rose for a total of 18.2 years, with a cumulative yield increase of 27.8%. Similarly, rates fell for a total of 25.4 years, with a cumulative drop in yields of 33.0%. The 11 rising and 11 falling periods are shown in detail in tables 1 and 3. The time periods, corresponding to peaks and troughs, were chosen by inspection.

Equity markets have performed better when interest rates are either rising slowly or falling rapidly.

Observations

1. On average, U.S. equities perform somewhat worse in rising interest rate periods [9.7%] than in falling rate environments [10.7%]. (Please see Appendix for more information.)
2. However, in the 1990 to 2013 time period, in rising interest rate scenarios, U.S. equities significantly outdistanced the results for falling rate periods: 15.6% vs. 6.4%, respectively. See Table 7. This is because the rising rate periods capture the height of the 1990s equity bubble and the falling rate periods coincide with the recessions in the early 2000s and 2008.
3. In addition, in rising rate periods, U.S. equities perform best in times when rates rise more slowly; in falling rate scenarios, U.S. equities do best when rates fall more rapidly. See tables 2 and 4.

One explanation for the dependence of equity returns on the velocity of interest rate changes is that, on the upside, larger rate increases are often associated with times of economic distress and weaker equity markets – whereas smaller rate increases are more typical and don't impact equity returns as much. On the downside, the periods of faster-falling rates may be associated with improving economies and therefore better equity performance.

4. A similar relationship between interest rates and equity performance is observed in returns simulated over 20-year scenarios and shown in Figure 1.

The highest equity returns [vertical axis] are for the lowest interest rate changes [horizontal axis]; conversely, the lowest equity returns are from time periods with the highest interest rate changes. Returns were simulated using Russell's capital market assumptions, December 31, 2012.

5. U.S. equities underperform non-U.S. equities in 9 of 11 rising rate periods; in contrast, U.S. equities outperform non-U.S. equities in 9 of 11 falling rate periods.
6. Commodities, private equity, hedge funds, REITs and high-yield bonds all showed superior returns in rising vs. falling rate periods. Private real estate underperformed when rates rise. See Table 7.
7. Intermediate bonds [aggregate] and long Treasury bonds underperformed when rates rose, as expected.
8. Diversified 60/40 policies were also analyzed over rising/falling scenarios. The 60/40 policy formed in 1970 was simple, including only U.S. and non-U.S. equities, commodities and T-bills. New asset classes were added to the mix as returns became available – such that in 1990, the policy included global equities, commodities, private equity, private real estate, public real estate, hedge funds, and high-yield and aggregate bonds. See “Policy Definitions” in Table 5.

This building-blocks approach to the back-tested investment policy is analogous to the investment process followed by institutional fund owners over the last 40 years: as new asset classes have become available and understood, they are added to the investment portfolio. The long-term performance of a particular plan's or fund's benchmark is the linked performance of all the versions of the investment policy since inception.

Commodities, private equity, hedge funds, REITs and high-yield bonds all showed superior returns in rising vs. falling rate periods.

The diversified 60/40 policy

Returned 9.4% in rising interest rate markets with a standard deviation of 7.3%;

Returned 9.9% in falling interest rate scenarios with a standard deviation of 8.6%.

In real terms, the diversified 60/40 policy returned 3.4% in rising rate scenarios and 6.6% in falling rate scenarios.

In analogy with equities, the diversified 60/40 policy has higher returns when rates rise more slowly or fall faster, as shown in tables 6 and 7.

Analysis

Returns for 12 asset classes were computed for rising [falling] interest rate scenarios for the 43.75-year period ending September 30, 2013. Note that there are no periods of constant rates. The asset classes and their proxies are shown in the appendix. Table 7 lists the returns for the 12 asset classes; depending on data availability, asset classes have returns for differing segments of the total time period.

Period A, January 1970 through September 2013

Inflation was higher in rising rate periods [5.8%] than in periods of falling rates [3.2%]. In higher inflation periods, commodities performed better [19.2% per year] than in lower inflation periods [2.7% per year]. This is because it was the commodity prices themselves which drove inflation.

In times of rising rates, U.S. equities have lagged non-U.S. equities by a significant margin [9.7% vs. 17.1%]; U.S. equities outdistanced non-U.S. equities [10.7% vs. 5.9%] in falling rate environments.

For example, in rising rate scenarios, U.S. equities fell behind non-U.S. equities in periods such as December 1971 to September 1975 [0.7% per annum vs. 5.1% per annum, respectively] and January 1977 to February 1980 [8.8% vs. 19.9%, respectively] during U.S. recessions and dramatic rate increases.

In falling rate scenarios, U.S. equities outperformed non-U.S. equities in periods such as September 1996 to September 1998 [22.6% vs. 4.8%, respectively] during the tech bubble, when non-U.S. equities suffered from the Asian crisis. More recently, as rates have fallen domestically and the volatility surrounding the euro has destabilized European markets, U.S. equities have significantly outperformed.

Period B, January 1976 to September 2013

Aggregate bonds and long Treasuries are added in this time period. These fixed income asset classes behaved as expected, with the Agg losing 0.7% per year as rates rose and returning 13.6% per year in falling rate environments; long bonds, with a longer duration, lost 7.3% per year in rising markets and gained 19.9% per year when rates fell.

Period C, January 1981 to September 2013

Private equity returns were significantly higher in rising rate environments, while private real estate had similar returns in both rising and falling cycles.

Period D, January 1990 to September 2013

High-yield bonds, REITs and hedge funds all performed better in rising than in falling rate environments.

Diversified policies

As shown in Table 6, policies P1 and P4 performed better when rates rose than when they fell; P2 and P3 did just the opposite, performing better in the falling rate periods.

The reasons are as follows:

- Policy P1 [January 1970 to December 1975] outperformed when rates rose because of holdings in non-U.S. stocks and commodities;
- Policy P2 [January 1976 to December 1980] did better when rates fell because of its 40% position in the AGG;
- Policy P3 [January 1981 to December 1989] – similarly to Policy P2 – 40% AGG accounts for the better outcome when rates fell;
- Policy P4 [January 1990 to September 2013] significantly outperformed in rising rate periods [12.4% vs. 5.5%], largely because of the return difference between ACWII in rising and falling rate scenarios [19.7% vs. 0.9%].

RISK PARITY IN RISING RATE ENVIRONMENTS

The performance of a leading provider's risk parity product in rising rate environments [18.2 of the 43.75 years] was 10.8% per annum [results prior to 1996 are simulated]. In comparison, the annualized return of the diversified policies described in the text over the same period was lower, at 9.4%.

A diversified portfolio consisting of equities, alternatives and fixed income is more representative of current institutional thinking than a naïve 60% public equity / 40% aggregate bond policy often used as a bogey by the risk parity providers. The diversified policy is meant to represent a plan or fund sponsor's asset allocation; when sponsors evaluate new strategies for inclusion, the reference point is the existing asset policy, not a hypothetical 60/40 mix of listed stocks and bonds.

The outperformance of the risk parity product during rising rate environments is attributable to the December 1971 to September 1975 time period in which commodities returned 18% per year and index-linked bonds [simulated] returned 14.3% per year.

During the following 14.4 years of rising markets, January 1977 to December 2009, risk parity lagged the diversified policy, 7.4% vs. 9.9%.

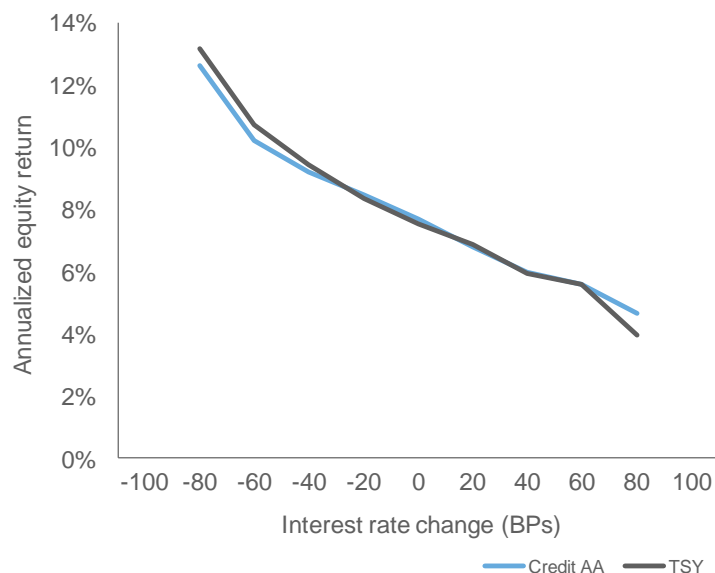
During this 43.75-year time period, there was no compelling reason to alter one's portfolio in the face of rate increases or decreases.

Investment considerations

1. The returns of broadly diversified 60/40 institutional portfolios are nearly the same for periods of rising interest rates [9.4%] as for falling rate scenarios [9.9%]. Therefore, during this 43.75-year time period, there was no compelling reason to alter one's portfolio in the face of rate increases or decreases.
2. The real returns for a diversified 60/40 portfolio are 3.4% in a rising environment and 6.6% in a falling rate environment. Typical real return expectations for most institutional portfolios is 3.4%, so even in a rising rate environment, a diversified portfolio has delivered a competitive real rate of return.
3. There are return differences within the short-term rising [falling] scenarios, which might suggest opportunities to capitalize on the timing of rate moves. However, the average rising [falling] period is only two years, implying that asset allocation changes would have to be very accurate for one to move in and out of investments in an expeditious manner.

Figure 1: Simulated U.S. equity returns vs. interest rate changes

20 Years ending 12/31/2032



Source: Simulated Returns using Russell's Capital Market Assumptions, December 31, 2012
Data is historical and not indicative of future results.

Table 1: Rising rate period

BEGIN DATE	END DATE	LENGTH (YEARS)	YIELD START	YIELD END	YIELD CHANGE
Dec-71	Sep-75	3.8	6.0	8.7	2.7
Jan-77	Feb-80	3.2	7.5	13.1	5.6
Jul-80	Sep-81	1.2	11.0	16.5	5.5
May-83	May-84	1.1	11.1	14.4	3.3
Sep-86	Sep-87	1.1	7.6	9.9	2.3
Oct-93	Nov-94	1.2	5.5	8.1	2.6
Jan-96	Aug-96	0.7	5.7	7.1	1.4
Oct-98	Jan-00	1.3	4.7	6.8	2.1
Jun-03	Jun-06	3.1	3.6	5.2	1.6
Jan-09	Dec-09	1.0	2.9	3.9	1.0
Apr-13	Sep-13	0.5	1.8	2.6	0.8
All Rising Periods (Duration)					18.2

Table 2: Rising rate periods

	TOTAL YEARS	YIELD CHANGE PER YEAR	AVERAGE ANNUALIZED RETURN		
			US EQUITY	NON-US EQUITY	DIV. POLICIES
Period I	9.8	1.0	11.7%	19.3%	12.1%
Period II	8.4	2.5	7.4%	14.5%	6.3%
Total	18.2	0.0%	9.7%	17.1%	9.4%

Period I: 9.8 years in which yield changes range from 0.5% to 1.6% per year, averaging 1.0%
Period II: 8.4 years in which yield changes range from 1.8% to 4.2% per year, averaging 2.5%

Table 3: Falling rate periods

BEGIN DATE	END DATE	LENGTH (YEARS)	YIELD START	YIELD END	YIELD CHANGE
Jan-70	Nov-71	1.9	7.0	6.0	-1.0
Oct-75	Dec-76	1.2	8.7	7.5	-1.2
Mar-80	Jun-80	0.3	13.1	11.0	-2.1
Oct-81	Apr-83	1.6	16.5	11.1	-5.4
Jun-84	Aug-86	2.2	14.4	7.6	-6.8
Oct-87	Sep-93	6.0	9.9	5.5	-4.4
Dec-94	Dec-95	1.1	8.1	5.7	-2.4
Sep-96	Sep-98	2.1	7.1	4.7	-2.4
Feb-00	May-03	3.3	6.8	3.6	-3.2
Jul-06	Dec-08	2.5	5.2	2.9	-2.3
Jan-10	Mar-13	3.2	3.9	1.8	-2.2
All Rising Periods (Duration)					25.6

Table 4: Falling rate periods

	TOTAL YEAR	YIELD CHANGE PER YEAR	AVERAGE ANNUALIZED RETURN		
			US EQUITY	NON-US EQUITY	DIV. POLICIES
Period III	13.7	-0.7%	5.9%	1.4%	6.3%
Period IV	11.9	--2.0%	16.5%	11.3%	14.3%
Total	25.6	0.0%	10.7%	5.9%	9.9%

Period III: 13.7 years in which yield changes range from -0.5% to -0.9% per year, averaging -0.7%

Period IV: 11.9 years in which yield changes range from -1.0% to -3.4% per year, averaging --2.0%

Table 5: Diversified policy definitions over time

ASSET CLASSES	P1	P2	P3	P4
	1/1/1970-12/31/1975	1/1/1976-12/31/1980	1/1/1981-12/31/1989	1/1/1990-9/30/2013
US Equity	30%	30%	30%	0%
Non-US Equity (Developed)	20%	20%	15%	0%
Global Equity	0%	0%	0%	40%
Cash	40%	0%	0%	0%
Broad Market Fixed Income	0%	40%	40%	30%
Long Treasury Fixed Income	0%	0%	0%	0%
High Yield Fixed Income	0%	0%	0%	10%
Commodities	10%	10%	5%	5%
Listed Real Estate	0%	0%	0%	2%
Private Real Estate	0%	0%	5%	3%
Private Equity	0%	0%	5%	5%
Hedge Fund-of-Funds	0%	0%	0%	5%
TOTAL	100%	100%	100%	100%

Table 6: Average annualized returns through September 2013

STARTING PERIOD	ALL RATE ENVIRONMENTS			RISING RATE ENVIRONMENTS			FALLING RATE ENVIRONMENTS		
	NOMINAL RETURN	INFLATION	REAL RETURN	NOMINAL RETURN	INFLATION	REAL RETURN	NOMINAL RETURN	INFLATION	REAL RETURN
Policy P1: Jan-70 to Dec-75	7.9	6.6	1.2	7.9	7.8	0.1	7.8	4.6	3.1
Policy p2: Jan-76 to Dec-80	11.6	9.2	2.2	9.5	9.9	-0.4	17.5	7.1	9.7
Policy P3: Jan-81 to Dec-89	15.4	4.3	10.7	3.6	6.0	-2.3	21.6	3.4	17.5
Policy p4: Jan-90 to Sept-13	7.7	2.6	4.9	12.4	2.8	9.3	5.5	2.6	2.9
Total	9.7	4.2	5.2	9.4	5.8	3.4	9.9	3.2	6.6
Standard Deviation	8.1	1.3	--	7.3	1.3	--	8.6	1.1	--

Table 7: Average annualized returns through September 2013

STARTING PERIOD	ALL RATE ENVIRONMENTS				RISING RATE ENVIRONMENTS				FALLING RATE ENVIRONMENTS			
	A	B	C	D	A	B	C	D	A	B	C	D
	1970	1976	1981	1990	1970	1976	1981	1990	1970	1976	1981	1990
US Equity	10.3	11.4	10.9	9.3	9.7	12.2	11.7	15.6	10.7	10.9	10.5	6.4
Non-US Equity (Developed)	10.4	11.0	10.1	5.7	17.1	20.5	20.7	23.6	5.9	5.5	5.3	-2.0
Global Equity	--	--	--	6.7	--	--	--	19.7	--	--	--	0.9
Cash	5.3	5.2	4.8	3.3	5.6	5.6	4.6	2.8	5.1	5.0	5.0	3.6
Broad Market Fixed Income	--	8.0	8.5	6.6	--	-0.7	-0.1	0.6	--	13.6	12.9	9.6
Long Treasury Fixed Income	--	8.8	9.8	8.0	--	-7.3	-7.4	-5.8	--	19.9	19.3	15.5
High Yield Fixed Income	--	--	--	9.0	--	--	--	11.6	--	--	--	7.7
Commodities	9.3	6.8	5.8	4.0	19.2	14.8	11.9	13.3	2.7	2.2	3.0	-0.1
Listed Real Estate	--	--	--	9.6	--	--	--	12.1	--	--	--	8.4
Private Real Estate	--	--	8.4	7.4	--	--	8.0	6.5	--	--	8.6	7.8
Private Equity	--	--	13.4	14.4	--	--	24.2	30.2	--	--	8.5	7.5
Hedge Fund-of-Funds	--	--	--	7.3	--	--	--	10.2	--	--	--	5.9
Inflation	4.2	3.9	3.1	2.6	5.8	5.3	3.7	2.8	3.2	3.0	2.8	2.6

Appendix

ASSET CLASS	BENCHMARK
US Equity	S&P 500® to Dec-78; Russell 3000® Index thereafter
Non-US Equity (Developed)	MSCI EAFE Index to Jun-76; Russell Global ex-U.S. Large Cap Index thereafter
Global Equity	MSCI All Country World Index
Cash	Citigroup 3-Month U.S. Treasury Bill Index
Broad Market Fixed Income	Barclays Capital U.S. Aggregate Bond Index
Long Treasury Fixed Income	Barclays Capital Long U.S. Treasury Index
High Yield Fixed Income	Barclays Capital High Yield Very Liquid Index
Commodities	S&P GSCI™ Commodity Index
Listed Real Estate	Dow Jones U.S. Select REIT Index
Private Real Estate	NCREIF Property Index One Quarter Arrears
Private Equity	Russell 3000® Index + 3% One Quarter Arrears to Jun-81; Thomson Pooled time weighted average thereafter
Hedge Fund-of-Funds	HFRI Fund of Funds Composite Index
Inflation	Consumer Price Index, All Urban Consumers

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