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## The Risk of Forecasting Interest Rates

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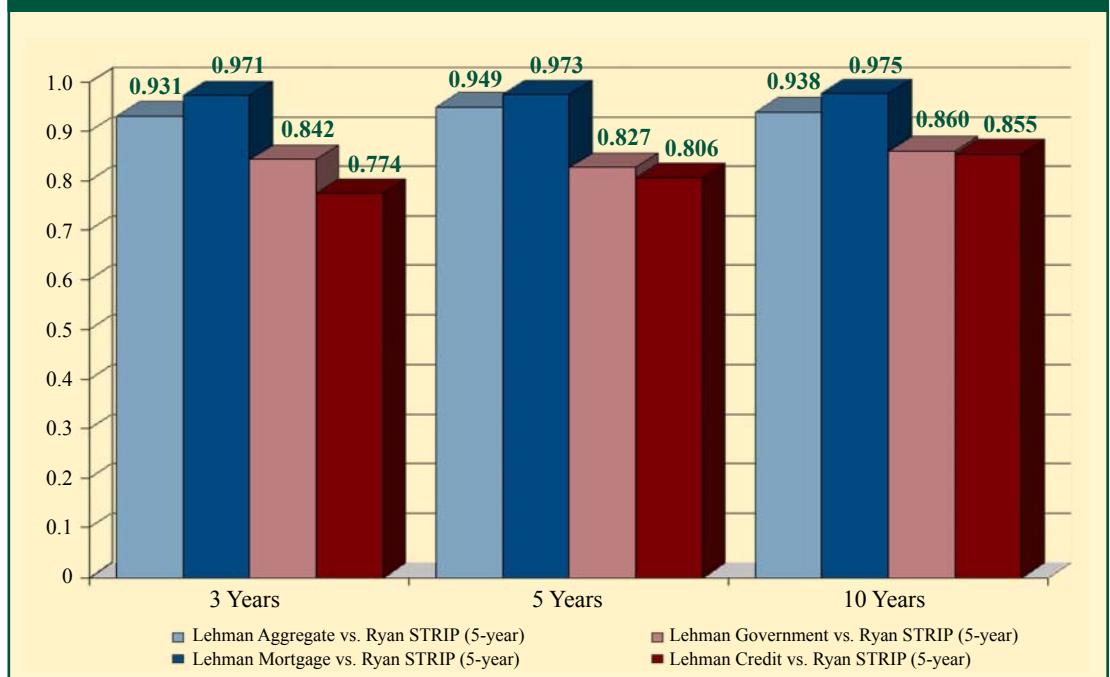
Interest rate risk dominates in the fixed income markets. This *market risk (systematic risk)* is so strong that it explains about 90% of the risk/reward behavior of the investment grade bond market. Ryan Labs measures this behavior as part of our Risk/Reward Monitor product where we compare popular bond indexes to the Treasury yield curve. Based on the correlation of monthly returns over numerous time horizons, it is obvious how much of the return behavior can be explained by a single spot on the Treasury yield curve. The best correlations are where the average duration of the index best matches a constant duration spot on the Treasury STRIP yield curve (i.e., Ryan indexes) against which it is compared.

As Figure 1 indicates, the Lehman Aggregate has a 0.93 to 0.94 correlation versus the 5-year STRIP over the last three, five and ten years. This is quite amazing to think that one Treasury issue, one constant duration, could explain such a high percentage of the return from a very broad based index with every coupon, maturity, rating and issuer in the investment grade universe.

Governments tend to be quite volatile due to their lower yields and lack of features. As a result, they correlate even higher to longer STRIPS (i.e., 0.989 vs. STRIP 7-year over ten years). Mortgages have had an ever-changing risk/reward behavior due to prepayment accelerations as interest rates have come down consistently for several years. Mortgages have a higher correlation vs. STRIP 2-year in the last three years of 0.872. Corporate or credit are more volatile and tend to correlate better vs. longer STRIPS (0.899 vs. STRIP 10-year over ten years).

With such a large component of total return decided by market risk, getting the right duration or interest rate sensitivity would seem critical in investment grade bonds. Without any return consideration from non-market risk (i.e., issue selection), getting the right duration seems to be the highest alpha or value added for asset management. As shown in Figure 2, the best spot on the Treasury STRIP yield curve would do much better than the broad bond index (Lehman Aggregate) against which asset managers are measured.

**Figure 1.**  
Risk/Reward Monitor:  
Correlation of Monthly Returns over Time Horizons Example  
(Period Ending 12/31/2003)





Switching durations from year to year to the more favorable spot on the yield curve would have value added of 6.67 % annualized or 38.62 % cumulative. Given that the difference between 1st Quartile and Median is less than 50 basis points per year, one think there is great value in targeting durations vs. the benchmark index. So why doesn't the industry forecast interest rates and manage to duration compatible with their forecast? Because ... forecasting interest rates are too risky!

### Wall Street Journal Survey of Economists

Proof of the risk in forecasting interest rates can be found with the Wall Street Journal (WSJ) Survey of Economists. Every six months the WSJ surveys most of the top economists (53 of them) as to their forecast of interest rates. Ryan Labs converts this into a performance measurement study showing how difficult it is to predict interest rates consistently. As shown below, these top economists have great difficulty in just getting the direction of interest rates correct (30%) much less the level of interest rates. Moreover, the magnitude of error between what was forecasted (as a

**Figure 2.  
Risk/Reward Monitor:  
Treasury STRIP Yield Curve Better Than Broad Bond Index  
(Period Ending 12/31/2003)**

	1999	2000	2001	2002	2003	3 Years	5 Years
Lehman Aggregate	-0.82	11.63	8.44	10.25	4.10	7.57	6.62
Ryan STRIP (2-year)	2.43	8.87	9.21	6.89	2.30	6.10	5.90
Ryan STRIP (20-year)	-16.63	32.31	0.77	21.85	1.41	7.59	6.56
Difference vs. Aggregate	3.25	21.32	0.77	11.60	-1.80	0.02	-0.06

group) versus reality was huge when calculated as a total return difference for just six month intervals (average return difference = 9.26%). Again, remember that performance measurement studies prove that the margin between 1st quartile and median is less than 50 basis points per year.

The lesson learned here is that it is safer and wiser to be "Interest Rate Risk Neutral". Match the interest rate risk of your index objective rather than try to outwit the market behavior. Large bond portfolios would be especially wise to use this discipline since it is usually more difficult for them to alter their term structure dramatically based on short-term interest rate predictions. ■

### About the Author

Ronald J. Ryan is president of Ryan Labs, Inc., a financial lab dedicated to solving problems through quantitative solutions. Prior to founding Ryan Labs, Ron was the former director of research (1977-1982) at Lehman Bros., where he designed the Lehman Government/Corporate index as well as supervised over 60 other custom indices. When Ron left Lehman in 1982, he started his initial firm, The Ryan Financial Strategy Group, which was dedicated to helping money managers with beating bond indices and understanding complicated bond math. Today, Ryan Labs continues the index innovations tradition and is currently one of the largest bond index fund managers in America.

**Table 3.  
Wall Street Journal Survey of Economics  
(Forecast: 30-Year/10-Year Treasury)**

Yield Level					Yield Level					Forecast: 10-Year				
Date	Forecast	Actual	Yield	Return	Date	Forecast	Actual	Yield	Return	Date	Forecast	Actual	Yield	Return
6/82	13.05	13.92	0.87	-6.38	6/91	7.65	8.41	0.76	-8.34	12/01	5.30	5.02	-0.28	2.13
12/82	13.27	10.41	-2.86	26.24	12/91	8.22	7.39	0.83	10.03	6/02	5.06	4.83	-0.23	1.73
6/83	10.07	10.98	0.91	-8.16	6/92	7.30	7.78	0.48	-5.44	12/02	5.20	3.82	-1.38	10.73
12/83	10.54	11.87	1.33	-11.22	12/92	7.61	7.39	-0.22	2.62	6/03	4.42	3.51	0.91	7.10
6/84	11.39	13.64	2.25	-16.77	6/93	7.44	6.67	-0.77	9.67	12/03	3.85	4.25	-0.40	-3.05
12/84	13.78	11.53	-2.25	18.63	12/93	6.83	6.34	-0.49	5.78	<b>Observation:</b>				
6/85	11.56	10.44	-1.12	10.17	6/94	6.26	7.61	1.35	-16.06	• Only 13 out of 44 forecasts (30%) = direction was correct.				
12/85	10.50	9.27	-1.23	12.99	12/94	7.30	7.87	0.57	-6.63	• Return Difference Methodology: Calculate forecast/actual into absolute returns Forecast return - Actual return = difference				
6/86	9.42	7.28	-2.14	25.51	6/95	7.92	6.62	-1.30	16.51	<b>Formula:</b>				
12/86	7.41	7.49	0.08	-0.93	12/95	6.61	5.94	-0.67	8.79	Yield = Actual - Forecast Return Difference = Actual - Forecast				
6/87	7.05	8.50	1.45	-16.30	6/96	6.00	6.89	0.89	-10.53	<b>Note:</b>				
12/87	8.45	8.98	0.43	-5.49	12/96	6.86	6.64	-0.22	2.83	• 30-year Treasury discontinued on 10/31/2001.				
6/88	8.65	8.85	0.20	-2.15	6/97	6.52	6.78	0.26	-3.32	• 10-year Treasury substituted on 12/1/2001.				
12/88	9.36	8.99	-0.37	3.64	12/98	5.72	5.09	-0.63	9.18					
6/89	9.25	8.04	-1.21	13.28	6/99	5.01	5.98	0.97	-13.30					
12/89	8.12	7.97	-0.15	1.68	12/99	5.83	6.48	0.65	-8.63					
6/90	7.62	8.40	0.78	-8.73	6/00	6.39	5.90	-0.49	-6.76					
12/90	8.16	8.24	0.08	-0.90	12/00	6.01	5.50	-0.51	7.17					
					6/01	5.35	5.70	0.35	-2.19					