December 6th 2018

Trustees of the Burlington Employees' Retirement System
149 Church Street
City Hall, 2nd Floor
Burlington, Vermont 05401

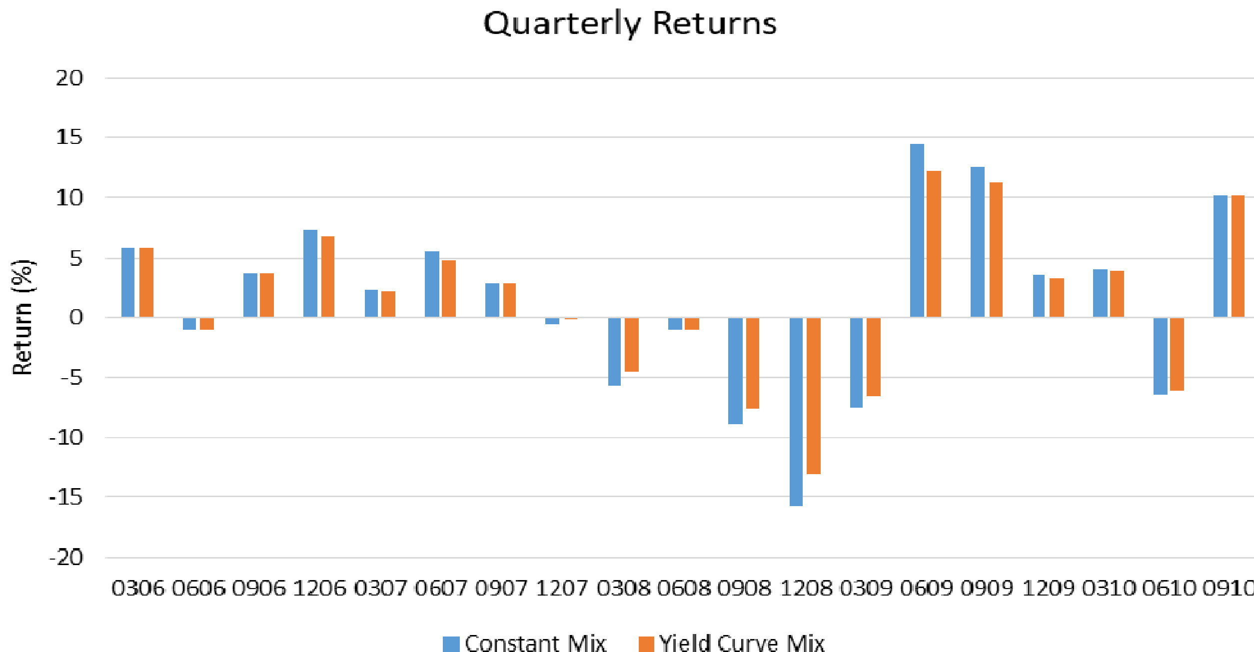
Ladies and Gentlemen:

In response to a board member's question regarding yield curve inversions and preparing for a recession we have completed an analysis on how proposed portfolio changes would affect your portfolio's performance. We focus on yield curve inversions because they have historically been a good leading indicator of recessions. The analysis showed that tactical movement from equity to fixed income after yield curve inversion helps lower volatility and marginally enhances performance.

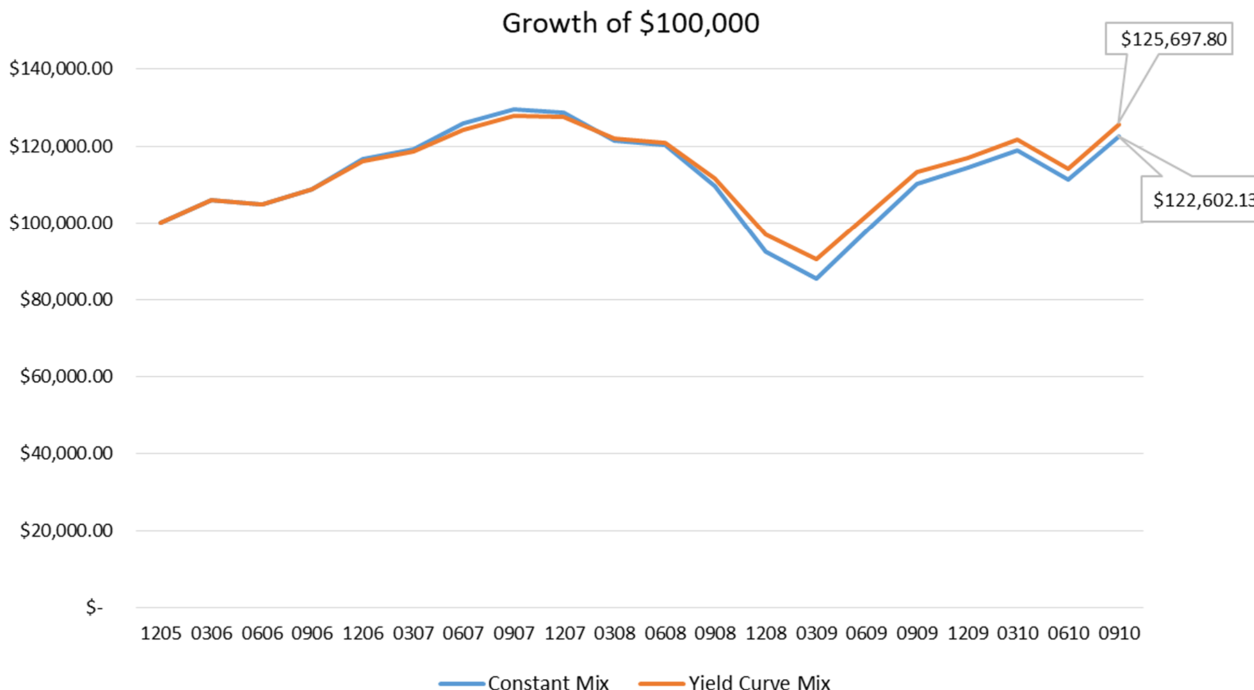
To complete this analysis we used the U.S. yield curve inversion that occurred in the first quarter of 2006. At the end of each quarter we moved money from equity to fixed income. We did this in 2% increments. In the first quarter we took the money from domestic large (1%) and domestic small (1%), and then in the second quarter international (1%) and emerging markets (1%), then 1% from domestic large and 1% from domestic small for the third quarter, continuing in a like manner for five quarters until the overall allocation has shifted from 70% equity, 10% RE, 20% FI to 60% equity, 10% real estate, 30% fixed income. We then left this allocation in place for 8 quarters, then moved the money back in a reverse manner until the overall portfolio was back to its original allocation. For purposes of graphing we will call this shifting allocation the "Yield Curve Mix." While we'll call the mix that stays pat the "Constant Mix." Below is a table showing the allocation of the "Yield Curve Mix" in each quarter.

	Quarter #	Date	LCAP	SMID	INTL	EM	PE	RE	TIMB	FI
Move to Fixed Income	0 (Inversion)	0306	30	18	10	10	2	8	2	20
	1	0606	29	17	10	10	2	8	2	22
	2	0906	29	17	9	9	2	8	2	24
	3	1206	28	16	9	9	2	8	2	26
	4	0307	28	16	8	8	2	8	2	28
	5	0607	27	15	8	8	2	8	2	30
Stay at new allocation	1	0907	27	15	8	8	2	8	2	30
	2	1207	27	15	8	8	2	8	2	30
	3	0308	27	15	8	8	2	8	2	30
	4	0608	27	15	8	8	2	8	2	30
	5	0908	27	15	8	8	2	8	2	30
	6	1208	27	15	8	8	2	8	2	30
	7	0309	27	15	8	8	2	8	2	30
	8	0609	27	15	8	8	2	8	2	30
Move back to Equity	1	0909	28	16	8	8	2	8	2	28
	2	1209	28	16	9	9	2	8	2	26
	3	0310	29	17	9	9	2	8	2	24
	4	0610	29	17	10	10	2	8	2	22
	5	0910	30	18	10	10	2	8	2	20

The graph below shows that the movement from equity to fixed income and back again dampens some of the good performance going into the Great Financial Crisis for the Yield Curve Mix. However, it allows the mix to avoid some of the poor performance throughout 2008 and the beginning of 2009.



This dampening of both bad and good returns (lowered volatility) helped the portfolio overall. To better visually this we use the graph below. We started with both portfolios having a value of $100,000. At the end of the period, the Constant Mix outperformed the Yield Curve Mix by 3.1%, or 0.6% annualized.



Based on this analysis we have found that this allocation schedule marginally enhanced performance of the portfolio during the period (4.9% vs. 4.3%), while modestly decreasing volatility (6.8% vs. 7.7%). We should note that moving allocations in a fixed-schedule-like manner is not optimal. While yield curve inversions are a good predictor of recessions, historically recessions have happened anywhere from 3 months to 3 years after an inversion. We believe that flexibility to allocate between fixed income to equity during stock market downturns is ideal.

Should you have any additional questions, please do not hesitate to call us at our Bay Shore office at (631) 665-6181.

Sincerely,

Steven Roth, CFA

Chief Investment Officer