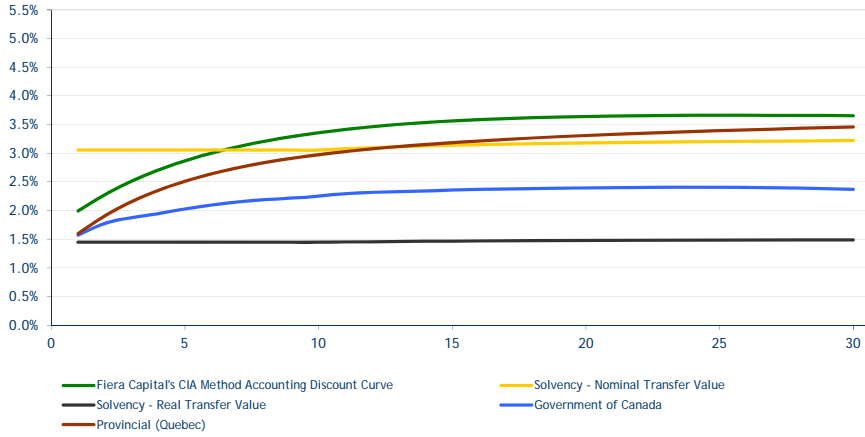
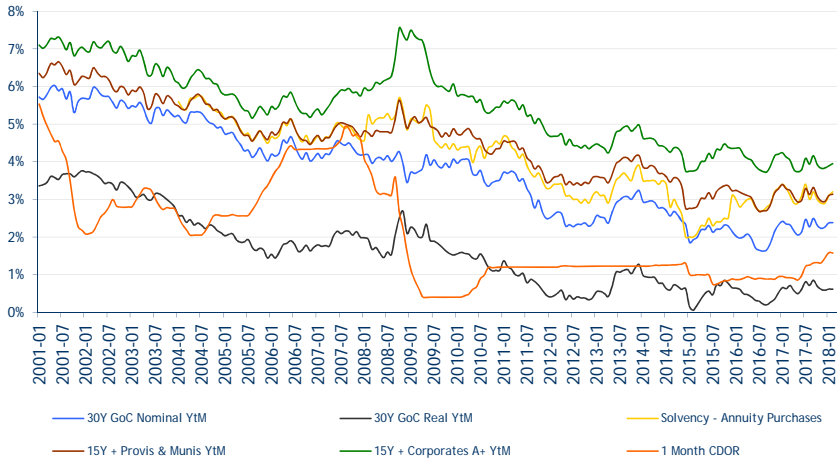


LDI Monitor - February 2018

Canadian Discount Curves as of 2018-02-28 *



Historical Interest Rates in Canada



Monthly LDI Highlights

During the month of February, the accounting discount rates increased driving liabilities down. Spreads on provincial bonds and corporate bonds (15 yr+) widened by 3.4 bps and 5.3 bps respectively since the end of January. Sample Canadian pension plan asset portfolios had returns ranging from -0.5% to -0.3% for the month. The sample accounting liability returns (-1.6% to -0.6%) and the sample solvency liability returns (-2.7% to -1.2%) were both negative during the month of February.

Long-Term Market Interest Rates

	As of 2018-02-28	Change from 2018-01-31	Change from 2017-12-29
GoC 7 Year Nominal YtM	2.13%	-7	18
GoC 30 Year Nominal YtM	2.38%	1	12
GoC 30 Year Real YtM	0.61%	0	3
30 Year Break-Even Inflation	1.77%	1	9
GoC 15 Year + YtM	2.38%	1	14
Provis 15 Year + YtM	3.14%	4	19
Corporate Rated A and over 15 Year + YtM	3.95%	6	11
Interest Rate Swap 20 Year	2.75%	-4	13
Interest Rate Swap 30 Year	2.70%	-3	16

Short Term Financing Rates

Overnight REPO	1.23%	-1	23
1 Month CDOR	1.58%	-1	13
3 Month CDOR	1.67%	0	13

Pension Solvency Rates **

Transfer Value - Nominal 1-10 Year Fwd Rate	3.1%	30	50
Transfer Value - Nominal 10 Year + Fwd Rate	3.4%	10	0
Transfer Value - Real 1-10 Year Fwd Rate	1.5%	20	10
Transfer Value - Real 10 Year + Fwd Rate	1.5%	0	-10
Annuity Purchase Rate	3.2%	10	30
CIA's Prescribed Annuity Purchase Spread	0.8%	10	10

Accounting Discount Rate (Based on the Fiera Capital's CIA Method Accounting Discount Rate Curve) ***

Young Pension Plan	3.64%	11	20
Steady Pension Plan	3.59%	10	19
Mature Pension Plan	3.50%	8	19

Canadian Pension Plan Performance Matrix ***

Assets	Young		Steady		Mature			
	(February 2018 YTD)		60% Stocks, 40% Bonds		50% Stocks, 50% Bonds		40% Stocks, 60% Bonds	
Accounting Liability @ Fiera Capital's CIA Curve	-1.6%	-2.8%	-1.2%	-2.2%	-0.6%	-1.4%	-0.27%	-0.17%
Solvency Liability @ CIA Curve	-2.7%	-3.0%	-1.9%	-2.4%	-1.2%	-1.9%		
Economic Liability @ GoC Curve	0.1%	-1.7%	0.2%	-1.4%	0.3%	-1.1%		
Accounting Surplus	1.1%	2.9%	0.8%	2.1%	0.3%	1.2%		
Solvency Surplus	2.3%	3.1%	1.5%	2.4%	0.9%	1.7%		
Economic Surplus	-0.6%	1.8%	-0.6%	1.4%	-0.6%	1.0%		

Accounting Liability Performance Attribution ***

	Young		Steady		Mature			
	(February 2018 YTD)		60% Stocks, 40% Bonds		50% Stocks, 50% Bonds		40% Stocks, 60% Bonds	
Change in Risk-Free Rates	0.0%	-2.0%	0.1%	-1.7%	0.2%	-1.4%		
Change in Credit Spreads	-1.9%	-1.3%	-1.5%	-1.0%	-1.0%	-0.5%		
Time Carry	0.3%	0.6%	0.3%	0.6%	0.3%	0.6%		
Accounting Liability Total Return	-1.6%	-2.8%	-1.2%	-2.2%	-0.6%	-1.4%		

Assumptions & Sources

(*) All discount curves shown are expressed as continuously compounded annual spot interest rates.

(**) Rates are based on the CIA methodology. The annuity purchase rate and the CIA prescribed spread are based on medium duration (11.3 years) liabilities as defined in the most recent CIA solvency valuation guidelines.

(***) The target duration of the accrued liabilities for the young, steady and mature pension plans are fixed to 16, 13 and 10 respectively at beginning of year. Solvency, accounting and economic liabilities are assumed to discount expected nominal liability cash flows. All surplus return calculations assume a fully funded status at the beginning of the year. Asset allocation in equities is assumed to be evenly allocated amongst the S&P/TSX, S&P500 unhedged in CAD and MSCI-EAFE unhedged in CAD. Bank of America Merrill Lynch Canadian Broad Bond Market Index (CANO) is used as the benchmark for fixed income. Sources: Fiera Capital, Bank of America, Bank of America Merrill Lynch, Bloomberg, MSCI-Barra, S&P and the Canadian Institute of Actuaries.