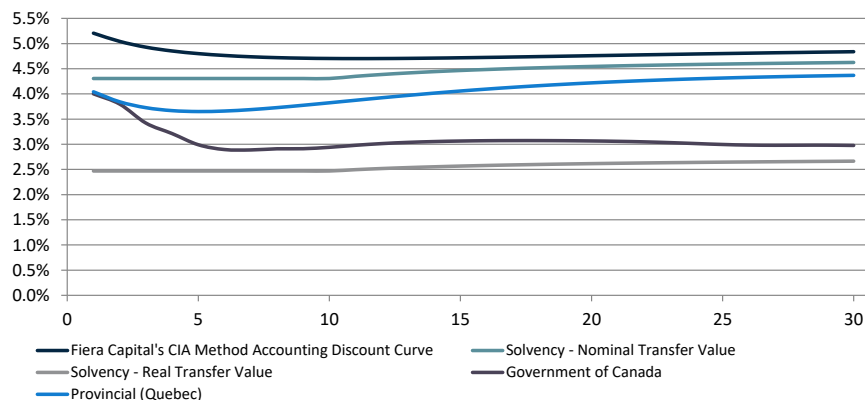
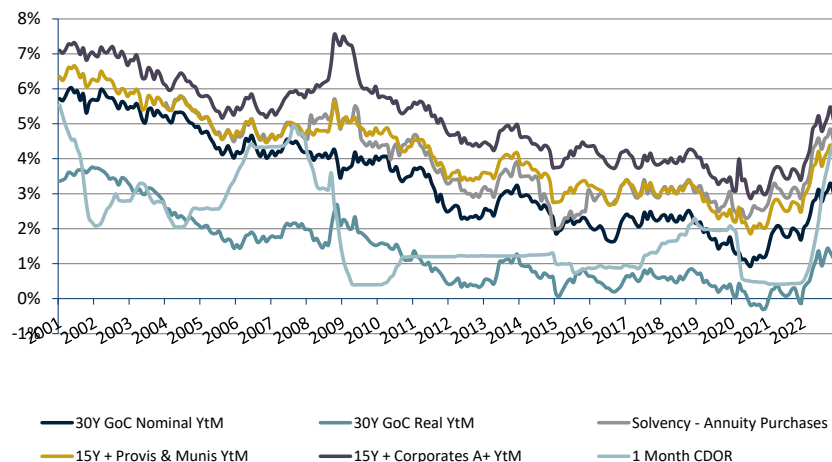


LDI Monitor - November 2022

Canadian Discount Curves as of 2022-11-30 *



Historical Interest Rates in Canada



Monthly LDI Highlights

During the month of November, long-term interest rates went down, driving liabilities up. Spreads decreased by 1.1 bps on long-term provincial bonds (15 yr+) and decreased by 8.6 bps on long-term corporate bonds (15 yr+) over the month. Sample Canadian pension plan asset portfolios had positive returns (4.16% to 5.08%) for the month. The sample accounting liability returns over the month ranged from 3.8% to 6.3%, while the solvency liability returns were between -2.8% and 1.1% depending on the plan's maturity.

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	As of 2022-11-30	Change from 2022-10-31	Change from 2021-12-31
Long-Term Market Interest Rates			
		(bps)	(bps)
GoC 7 Year Nominal YtM	3.04%	-26	176
GoC 30 Year Nominal YtM	3.04%	-27	136
GoC 30 Year Real YtM	1.15%	-16	128
30 Year Break-Even Inflation	1.88%	-11	6
GoC 15 Year + YtM	3.06%	-28	138
Provis 15 Year + YtM	4.10%	-29	163
Corporate Rated A and over 15 Year + YtM	5.12%	-36	173
Interest Rate Swap 20 Year	3.57%	-32	141
Interest Rate Swap 30 Year	3.33%	-29	125
Short Term Financing Rates			
1 Month CDOR	4.47%	30	402
3 Month CDOR	4.75%	19	423
Pension Solvency Rates **			
Transfer Value - Nominal 1-10 Year Fwd Rate	4.4%	10	200
Transfer Value - Nominal 10 Year + Fwd Rate	4.9%	50	150
Transfer Value - Real 1-10 Year Fwd Rate	2.5%	0	160
Transfer Value - Real 10 Year + Fwd Rate	2.8%	10	160
Annuity Purchase Rate	4.5%	-33	166
CIA's Prescribed Annuity Purchase Spread	1.5%	0	30
Accounting Discount Rate (Based on the Fiera Capital's CIA Method Accounting Discount Rate Curve) ***			
Young Pension Plan	4.89%	-40	188
Steady Pension Plan	4.90%	-39	193
Mature Pension Plan	4.88%	-39	204

Canadian Pension Plan Performance Matrix ***

	Young		Steady		Mature	
Assets	60% Stocks, 40% Bonds		50% Stocks, 50% Bonds		40% Stocks, 60% Bonds	
	(November 2022 YTD)					
Accounting Liability @ Fiera Capital's CIA Curve	6.3%	-23.4%	4.9%	-19.7%	3.8%	-15.2%
Solvency Liability @ CIA Curve	-2.8%	-21.6%	-0.6%	-17.4%	1.1%	-12.9%
Economic Liability @ GoC Curve	5.9%	-19.9%	4.8%	-17.0%	3.6%	-12.9%
Accounting Surplus	-1.2%	16.1%	-0.3%	11.9%	0.4%	6.9%
Solvency Surplus	7.9%	14.2%	5.2%	9.6%	3.0%	4.6%
Economic Surplus	-0.8%	12.6%	-0.2%	9.1%	0.6%	4.6%

Accounting Liability Performance Attribution ***

	Young		Steady		Mature	
	(November 2022 YTD)					
Change in Risk-Free Rates	5.5%	-20.4%	4.3%	-17.2%	3.2%	-13.6%
Change in Credit Spreads	0.2%	-5.9%	0.2%	-5.2%	0.2%	-4.3%
Time Carry	0.3%	2.9%	0.2%	2.7%	0.2%	2.6%
Accounting Liability Total Return	6.3%	-23.4%	4.9%	-19.7%	3.8%	-15.2%

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, 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 17, 14 and 11 years respectively. 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 (CAN0) is used as the benchmark for fixed income. Sources: Fiera Capital, Bank of Canada, Bank of America Merrill Lynch, Bloomberg, MSCI-Barra, S&P and the Canadian Institute of Actuaries.