ENTERPRISE RISK MANAGEMENT

ERM

Symposium

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Interest Rate Earnings Risk Analysis for Insurers – Repricing Gap Approach

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Agenda

- Introduction
- Re-pricing Gap Analysis and Earnings Risk
- Modeling Implementation
- Sample Reports
- Governance and Market Risk Exposure

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INTRODUCTION

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The Current Situation

- 5 and 10 Year treasury rates as of March 27 were 1.04% and 2.20%, respectively
- Numerous analyst calls have cited lower profitability due to squeezed interest margins.
- Typical insurance company balance sheets are a short straddle
  - Short call options on assets
  - Short put options on liabilities
  - Business will perform poorly in either very high or very low interest rate environments
- Thus, for many, the ideal situation from an interest rate perspective would be for rates to increase gradually back to more "normal" levels.

The current economic environment and associated uncertainties about the future pose a number of challenges for life insurers

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Industry Response

- Life insurance companies benefit from having a robust risk management framework
  - Defining risk appetite is key
- Very low interest rates is the current issue
  - However, there are other threats on the horizon
  - Risk metrics can be used to help identify and evaluate impacts of interest rate risk that are not necessarily intuitive — things such as the relative steepening of the curve and timing of movements, both of which can adversely affect insurers through the interplay of assets and liabilities

Doing nothing and hoping for things to return to "normal" is not a defensible strategy

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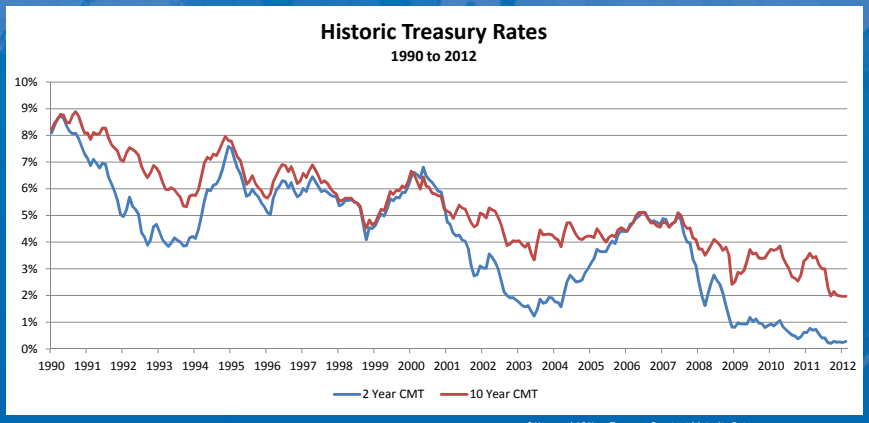
Trends in level



2 Year and 10 Year Treasury Constant Maturity Rate
Source: Board of Governors of the Federal Reserve System

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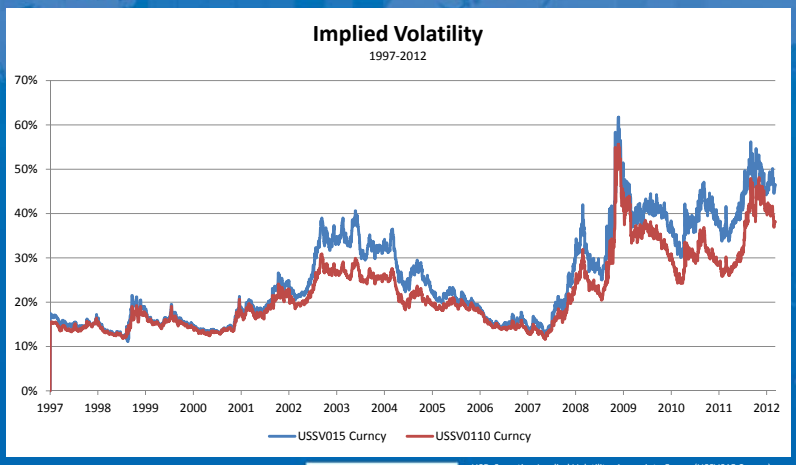
Trends in volatility



USD Swaption Implied Volatility: 1 year into 5 year (USSV015 Curncy) and 1 year into 10 year (USSV0110 Curncy)

Source: Bloomberg

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Assertions

- Many believe the future interest rate environment is unlikely to follow a clear trend
  - Fat tail risk seems to have gone up - extreme scenarios now appear to be more likely
  - Even in the short term, the direction of rates is completely uncertain
  - Volatility rather than trend is the order of the day.
- The most frequently mentioned plausible adverse scenarios for U.S. rates are:
  - A Japan-type very low rate environment persisting for a long period of time amid a disinflation or possibly even deflation economic prognosis.
  - An inflationary environment with a rapid resurgence in the economy (similar to what occurred in the late 1970s), forcing the Fed to reverse course in a hurry as it tries to undo the stimulus now being pumped in.

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Euro sovereign problems

Concerns about the solvency of several European countries

Renewed concerns about sovereign risks

Concerns about the solvency of European sovereigns started in late 2009 when the Greek government reported a much higher fiscal deficit and larger debt than market participants expected. Since then, renewed concerns about the solvency of various European countries have continued to drive sovereign debt markets in Europe.

The most recent wave of concerns about fiscal sustainability and of heightened risk aversion has put pressures on all but the most creditworthy sovereigns. Even among the high-quality issuers, market pricing of sovereign bonds differs significantly. In January 2012, Standard & Poor's downgraded a number of Euro sovereigns, making a specific reference to the ongoing systemic stress.

Figure 01. Spreads over 10-yr German Bonds

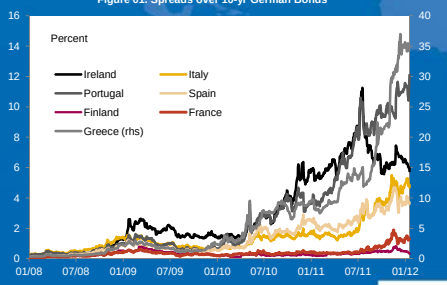
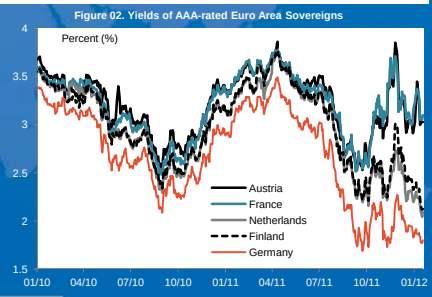


Figure 02. Yields of AAA-rated Euro Area Sovereigns



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Risk Management Framework

- Companies with an established enterprise risk management framework are better positioned to assess the impact of interest rate movements and respond to those movements.
- There are some important considerations in developing such a framework:
  - The company needs an enterprise-wide view on risk.
  - Include both value at risk (driving the economic value perspective) and earnings at risk (driving the accounting, book value or earnings perspective).
  - Determine acceptable levels of credit risk.
  - Examine the role that interest rate risk plays in setting capital levels.
  - Insurers need the ability to measure and report on actual and potential risk exposures in a manner consistent with how risk is viewed and risk appetite expressed within the organization.
  - Insurers should establish, equip and empower a robust risk management organization that stands independently of pricing actuaries and portfolio managers to test the compatibility of the risks they assume.

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Need for Improved Analysis

- It has become increasingly necessary for insurers to look at these types of extreme scenarios and to plan their portfolios for optimization under either case.
  - Interest rates stay at their relatively low level and remain low for a long period of time (with potentially significant non-parallel movements).
  - Interest rates spike up suddenly across the board in line with rampant inflationary expectations (with potentially significant non-parallel movements).
- Virtually all life insurers perform some basic scenario analysis on interest rates through their asset-liability management (ALM) analyses and cash-flow testing.
  - A wider range of possible interest rate scenarios and to examine the resultant potential impact on earnings as well as value may be useful
- For many life insurers, earnings volatility is a significant concern
  - Risk analytics tend to be focused more on balance sheet measures

There is a need to expand current analysis

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REPRICING GAP ANALYSIS AND EARNINGS RISK

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Evolution of Gap Analysis

Gap Analysis	Method	Note
Classical Cashflow Gap Analysis	•Aggregating cash flows into maturity buckets •Checking to see if cash flows in each bucket net to 0	•There is an inherent assumption that all cash flows occur with certainty. (i.e. no embedded options) •Not practical to do perfect cash flow matching •Matching cashflow implies that there are no liquidity/repricing gaps
Liquidity Gap Analysis	•Focus on cash flows at maturities	•5-year floater has cash flow maturities in 5 years
Repricing Gap Analysis	•Focus on the timing when the rate resets (i.e. rate maturity) instead of cashflow maturities	•More details to follow

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Repricing Gap

Rate Maturity Profiles show the outstanding balances of assets/liabilities that are outstanding at the current rate on multiple future dates.

Repricing Gap measures the relative difference between the rate maturity profiles of interest bearing liabilities and interest earning assets.

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Repricing Gap - Example

- 5-year floating rate asset ($100 notional) backing 5-year fixed rate debt ($100 notional)

Principal Cashflow Maturity Profile

Year	0	1	2	3	4	5
Liability	0	0	0	0	0	100
Asset	0	0	0	0	0	100
Principal Mismatch	0	0	0	0	0	0

Rate Maturity Profile

Year	0	1	2	3	4	5
Liability	100	100	100	100	100	100
Asset	100	100	0	0	0	0
Gap (Liability-Asset)	0	0	100	100	100	100

Not a cashflow analysis, but repricing risk analysis

- Principal Cashflow Matched
- Rate Maturity Mismatch (i.e. Repricing Gap) since the rate on the asset resets at the next reset date
- Positive earnings impact if rate increases, and vice versa

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Repricing Gap and Earnings Sensitivity

- If Liabilities reprice faster than Assets, there is negative Gap which indicates liability refinancing risk with adverse exposure to increasing interest rates.
- If Assets reprice faster than Liabilities, there is positive Gap which indicates asset reinvestment risk with adverse exposure to decreasing interest rates

Gap = Liability Rate Maturity Balance – Asset Rate Maturity Balance

ΔEarnings = Gap X (ΔInterest Rate)

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Repricing Gap Analysis as Management Tool

Example: Crediting Rate Product (i.e. Fixed Annuities)

- Liability rate maturity profile based on crediting rate strategy
- Asset maturity profile based on the actual portfolio maturity mix
- Any tactical / strategic deviation of the asset maturities from the liability maturities will show up as a gap

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Repricing Gap Analysis Strengths

- Provides an objective measure of interest rate earnings risk against current positions, as a static instantaneous view
- Clearly identifies the source of the earnings risk and indicates how to mitigate this risk
- Does not require any assumption about reinvestment or disinvestment strategy
- Simple and transparent, and relatively easy to implement

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Re-pricing Gap Analysis Shortcomings

Shortcomings	Solutions
Only considers parallel shifts in the yield curve	•The earnings impact under the non-parallel shift can be obtained by the incremental cost of eliminating the re-pricing gap by swaps and FRA's after the interest rate shock occurs, and looking at the emergence of earnings. (More details in Appendix)
Does not capture the asset/liability convexities	•Similar to above. The earnings impact due to changing rate maturities can be obtained by assuming that the additional gap due to convexity is eliminated by swaps and FRA's after the shock occurs
Does not capture the impact from Guaranteed Minimum Rate (GMR)	•The additional impact can be measured by projecting future crediting rates and comparing them to the guaranteed minimum rates to determine the extent of margin compression
Does not capture basis (spread) risk	•This risk can be quantified by keeping track of different benchmark rate index for floating assets/liabilities
Does not include New Business	•The analysis can be augmented to include new business by inputting volume and rate characteristics associated with the new business.

MODELING AND IMPLEMENTATION

Repricing Gap Analysis Implementation Overview

- This is used as a framework to quantify interest rate earnings risk primarily for ERM purposes
- This implementation involves characterizing rate maturity profile for all interest rate earning assets and all interest rate bearing liabilities (mostly accrual based general account products) on the Company's Balance Sheet
- However, the FAS 133 benefit riders (i.e. VA living benefit guarantees) are excluded since they are not spread-based products and the interest rate earnings risk emerges differently. This particular risk is addressed in a separate analysis
- Initially focused on one Business Unit as a proof of concept, and currently rolling out to the remaining Business Units within the Company
- In-house system infrastructure is currently being built to streamline processes involved this analysis

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Rate Maturity Profile Modeling Insurance Liabilities

Type	Example	FASB	Methodology
Future Policy Benefit	•Immediate Annuity •Term Life Reserve •Structural Settlement	FAS60 FAS97 LP	Use expected reserve runoff based on expected mortality/lapse
Fixed Term & Rate Products	•Retail Notes •Funding Agreements	FAS97 Investment	Rate maturity profile based on contractual terms & rates
Crediting Rate Products	•Fixed Annuity •Stable Value Product •Universal Life	FAS97 Investment FAS97 UL	Rate Maturity profile modeled based on crediting rate strategy
Participating Products	Any product where the asset yields are passed to policyholders	FAS97 Investment	Rate Maturity profile to be the same as that of the supporting assets

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Rate Maturity Profile Modeling Swaps

- Viewed as a portfolio of a pay leg and a receive leg
  - Receive Fix / Pay Float is treated as a combination of a fixed rate bond and a floating rate debt
- Example: 5-year fixed receiver swap

Rate Maturity Profile

	0	1	2	3	4	5	6	
Liability	100	0	0	0	0	0	0	Pay-float Leg
Asset	100	100	100	100	100	100	0	Receive-Fix Leg
Gap	0	-100	-100	-100	-100	-100	0	

  - Contribute to negative gap → negative earnings impact if rate increases

Rate Maturity Modeling Crediting Rate Products

Example: 80%/20% Old Money /New Money Strategy with Annual Rate Reset

- ***Blue Boxes*** represent the portion of the balances that are still at the current rate (i.e. old money rate), and is ***Rate Maturity profile***
  - It follows an Exponential Decay at the Rollover Rate
  - Rate Maturity Modeling ignores any presence of liability guaranteed minimums
- **Earnings Impact Due to Guaranteed Minimum Rate** (GMR) is quantified by projecting future crediting rate (i.e. **Blended Rate**) and comparing to GMR to determine the degree of spread compression

Lessons Learned

- Clear communication to all levels of management is a key, as this analysis is not familiar to an insurance organization.
- Modeling liability rate maturity profile requires collaboration with Business Unit actuaries, while modeling assets is relatively straightforward.
- Effective management of massive data (particularly liabilities) is crucial for timely periodic production of this analysis

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SAMPLE REPORT

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Line of Business #1: Structured Settlement

Gap Report

Year		-	1	2	3	5	10	15	20	25	30
Underlying	Asset	1,000	967	933	900	833	667	500	333	167	-
	Liability	1,000	980	960	940	900	800	700	600	500	400
Swap	Receive Fix	300	300	300	300	300	300	300	300	-	-
	Pay Float	300	-	-	-	-	-	-	-	-	-
GAP[*]		-	(287)	(273)	(260)	(233)	(167)	(100)	(33)	333	400

[*] GAP = (Asset + Receive Fix Leg) - (Liability + Pay Float Leg)

Business Overview

- Very long tailed liability – Rate Maturity Profile based on the reserve run-off projection from the actuarial system
- Long maturity assets are not readily available
- Swaps are used to lengthen duration of assets

Observations

- Gap in the initial years are negative, indicating that earnings will adversely affected if rates increase.
- However, gaps in the later years turn positive due to long tails of the liability

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Line of Business #2: Fixed Annuity

Gap Report

Year		-	1	2	3	4	5	10	15	20	25	30
Underlying	Asset	2,000	1,800	1,600	1,400	1,200	1,000	-	-	-	-	-
	Liability	2,000	2,000	1,600	1,280	1,024	819	268	88	29	9	3
GAP[*]		-	200	-	(120)	(176)	(181)	268	88	29	9	3

[*] GAP = Liability - Asset

Business Overview

- Liability Rate Maturity Profile is modeled based on 80%/20% OM/NM crediting rate strategy with an annual rate reset on January 1st. (Benchmark rate for the New Money Rate is 7-year Treasury Rate)
- Assets are invested in the 10-year laddered portfolio.

Observations

- Gap is positive in Year 1, since the liability rate will not rate reset until January 1st of Year 2, while some portions of asset mature during Year 1.
- Gaps are negative during Year 3 though 5, and then turn positive in later years when all the current assets have matured.

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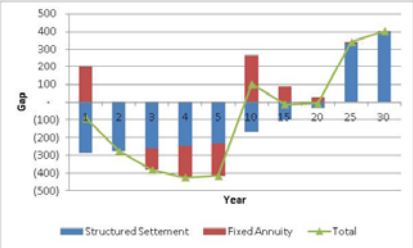
Combined Gap Report

Gap Report



- Negative gaps in the earlier years are driven by both lines of business (LOB), where as the positive gap in the later years is primarily driven by Structured Settlement LOB.

Earnings Sensitivity Report

	Down 100 bps					Down 200 bps				
	Rate Maturity Mismatch Gap	Guaranteed Min. Rates	Asset Convexity	Bond AUM Net Fees	TOTAL	Rate Maturity Mismatch Gap	Guaranteed Min. Rates	Asset Convexity	Bond AUM Net Fees	TOTAL
Year 1	$ 0.9	$ -	$ (0.2)	$ 0.2	$ 0.9	$ 1.7	$ -	$ (0.3)	$ 0.4	$ 1.8
Year 2	$ 2.7	$ (1.3)	$ (0.3)	$ 0.2	$ 1.3	$ 5.5	$ (3.0)	$ (0.4)	$ 0.4	$ 2.5
Year 3	$ 3.8	$ (2.0)	$ (0.4)	$ 0.2	$ 1.6	$ 7.6	$ (4.0)	$ (0.5)	$ 0.4	$ 3.5
Year 4	$ 4.2	$ (3.0)	$ (0.4)	$ 0.2	$ 1.0	$ 8.5	$ (5.0)	$ (0.6)	$ 0.4	$ 3.3
Year 5	$ 4.1	$ (3.5)	$ (0.5)	$ 0.2	$ 0.3	$ 8.3	$ (7.0)	$ (0.7)	$ 0.4	$ 1.0

	Up 100 bps					Up 200 bps				
	Rate Maturity Mismatch Gap	Guaranteed Min. Rates	Asset Convexity	Bond AUM Net Fees	TOTAL	Rate Maturity Mismatch Gap	Guaranteed Min. Rates	Asset Convexity	Bond AUM Net Fees	TOTAL
Year 1	$ (0.9)	$ -	$ 0.1	$ (0.2)	$ (1.0)	$ (1.7)	$ -	$ 0.2	$ (0.4)	$ (1.9)
Year 2	$ (2.7)	$ 0.7	$ 0.1	$ (0.2)	$ (2.1)	$ (5.5)	$ 1.3	$ 0.3	$ (0.4)	$ (4.3)
Year 3	$ (3.8)	$ 1.4	$ 0.2	$ (0.2)	$ (2.4)	$ (7.6)	$ 2.2	$ 0.3	$ (0.4)	$ (5.5)
Year 4	$ (4.2)	$ 1.8	$ 0.2	$ (0.2)	$ (2.4)	$ (8.5)	$ 2.3	$ 0.4	$ (0.4)	$ (6.2)
Year 5	$ (4.1)	$ 2.2	$ 0.3	$ (0.2)	$ (1.8)	$ (8.3)	$ 2.4	$ 0.4	$ (0.4)	$ (5.9)

- In addition to rate maturity mismatch gap, additional earnings impact (guaranteed minimum rates, asset convexity, and Bond AUM Net fees) are captured to address limitations of repricing gap analysis.
- For alternative interest rate scenarios, this earnings sensitivity report presents the total earnings sensitivity to the base case, and identifies sources of earnings sensitivity
- Rate maturity gap is a typically a primary driver, but the impact of GMR becomes more significant later years.
- These sensitivities need to be interpreted in the context of the size of the business.

GOVERNANCE AND MARKET RISK DISCLOSURE

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Sample EaR Limits / Triggers

Define Interest Rate Scenario: +200/+100/+50/-50/-100/-200 bps Shift

Types of Possible Limits / Triggers

Types of Limit or Trigger	Description
12-month EaR	$ … Earnings Loss for specified scenario
5-year EaR	$ … Earnings Loss for specified scenario
Size of Cumulative Gap	$ … in any single year from 1 to 5 years

Determination of Limits

- % Total Assets
- % of Interest Earnings Assets
- % of Equity
- % of Forecasted Earning under Base Case Scenario

Limits Should be Defined at the Level of

- The Company
- Business Unit
- Line of Business
- Investment Portfolio

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Market Risk Disclosure

- Some banks discloses Economic Value Sensitivity and 12-Month Earnings Sensitivity for its banking (accrual) book.
- Insurance Companies can disclose similar information:
  - Earnings Sensitivity from the rate maturity gap analysis
  - Economic Value Sensitivity from Economic Capital Analysis
- These can be shared with Senior Management, Regulators, or Rating Agencies (if not disclosed publicly)

Sample Disclosure[1] – Bank of Montreal

Structural interest rate sensitivity to an immediate parallel increase or decrease of 100 and 200 basis points in the yield curve is disclosed in the table below. This sensitivity analysis is performed and disclosed by many financial institutions and facilitates comparison with our peer group. The change in economic value sensitivity from the prior year reflects capital growth and higher interest rates. The asset-liability profile at the end of the year results in a structural earnings benefit from interest rate increases and structural earnings exposure to interest rate decreases.

Structural Interest Rate Sensitivity (Canadian $ millions)*

Canadian equivalent	As at October 31, 2010		As at October 31, 2009	
	Economic value sensitivity pre-tax	12-month earnings sensitivity after-tax	Economic value sensitivity pre-tax	12-month earnings sensitivity after-tax
100 basis point increase	(388.5)	20.9	(353.2)	11.0
100 basis point decrease	322.3	(70.3)	254.2	(75.6)
200 basis point increase	(815.1)	33.4	(779.2)	(10.6)
200 basis point decrease	738.2	(12.8)	892.8	(82.9)

*Exposures are in brackets and benefits are represented by positive amounts.

Models used to measure structural market risk project how interest rates and foreign exchange rates may change and predict how customers would likely react to the changes. For customer loans and deposits with scheduled maturity and repricing dates (such as mortgages and term deposits), our models measure how customers are likely to use embedded options to alter those terms. For customer loans and deposits without scheduled maturity and repricing dates (such as credit card loans and chequing accounts), our models assume a maturity profile that considers historical and forecasted trends in balances. These models have been developed using statistical analysis and are validated through regular model vetting and backtesting processes and ongoing dialogue with the lines of business. Models used to predict customer behaviour are also used in support of product pricing and performance measurement.

MD&A

Enterprise Risk Management ERM Symposium

Sample Repricing Gap Report

Interest Rate Gap Position
(Canadian $ in millions, except as noted)

As at October 31	0 to 3 months	4 to 6 months	7 to 12 months	Total within 1 year	Effective interest rate (%)	1 to 5 years	Effective interest rate (%)	Over 5 years	Effective interest rate (%)	Non-interest sensitive	Total
Canadian Dollar											
Assets											
Cash and cash equivalents	(4,107)	74	(1,221)	(5,254)	0.10	319	0.10	–	–	(1,594)	(6,529)
Interest bearing deposits with banks	586	–	–	586	0.71	–	–	–	–	–	586
Securities	50,788	1,134	1,926	53,848	2.47	16,232	3.52	4,709	4.63	750	75,533
Securities borrowed or purchased under resale agreements	7,490	349	20	7,279	1.01	–	–	–	–	–	7,279
Loans	79,361	3,624	6,160	89,145	3.95	29,491	5.60	2,246	5.54	8,975	128,957
Other assets	80,538	611	5,570	94,727	na	19,020	na	650	na	2,903	109,100
Total assets	222,656	5,812	12,457	240,925		56,070		7,605		10,214	315,614
Liabilities and Shareholders' Equity											
Deposits	76,365	5,324	11,179	92,868	1.34	54,048	1.23	4,915	4.89	–	151,831
Securities sold but not yet purchased	11,013	–	–	11,013	2.24	–	–	–	–	–	11,013
Securities lent or sold under repurchase agreements	21,826	103	–	21,929	1.00	–					
Other liabilities	80,819	163	295	89,277	na	3,242					
Subordinated debt and Capital trust securities	626	–	–	626	–	2,200					
Shareholders' equity	659	–	–	659	–	1,925	–	250	–	18,740	21,574
Total liabilities and shareholders' equity	199,308	5,590	11,474	216,372		61,415		10,169		27,458	315,614
Asset/liability gap position	23,348	222	983	24,553		(4,545)		(2,564)		(17,444)	–
Notional amounts of derivatives	(10,416)	(63)	(1,302)	(19,861)		15,575		4,286		–	–
Total Canadian dollar interest rate gap position											
2010	4,932	159	(399)	4,692		11,030		1,722		(17,444)	–
2009	(1,681)	967	3,960	3,254		11,510		1,067		(15,831)	–
U.S. Dollar and Other Currencies											
Assets											
Cash and cash equivalents	21,992	221	1,521	23,734	2.20	260	–	237	–	(342)	23,897
Interest bearing deposits with banks	2,600	–	–	2,600	0.44	–	–	–	–	–	2,600
Securities	40,014	864	647	41,525	1.19	2,196	8.01	4,099	3.61	46	47,866
Securities borrowed or purchased under resale agreements	17,414	1,706	720	20,120	0.36	103	0.36	–	–	–	20,223
Loans	33,910	2,394	2,722	38,626	3.43	6,720	6.03	1,099	6.08	523	47,606
Other assets	(40,750)	(402)	(3,991)	(45,143)	na	(2,472)	na	(509)	na	1,884	(46,246)
Total assets	74,480	5,363	1,619	81,462		6,017		5,636		2,111	96,026
Liabilities and Shareholders' Equity											
Deposits	72,248	2,073	3,461	77,782	0.44	17,437	1.08	2,201	0.19	–	97,420
Securities sold but not yet purchased	5,425	–	–	5,425	0.81	–	–	–	–	–	5,425
Securities lent or sold under repurchase agreements	24,720	359	102	25,181	0.21	–	–	–	–	–	25,181
Other liabilities	(34,714)	87	174	(34,453)	na	1,372	na	252	na	523	(32,306)
Shareholders' equity	–	–	–	–	–	306	–	–	–	–	306
Total liabilities and shareholders' equity	67,679	2,519	3,737	73,935		19,115		2,453		523	96,026
Asset/liability gap position	6,801	2,844	(2,118)	7,527		(12,298)		3,183		1,588	–
Notional amounts of derivatives	(5,306)	(918)	2,310	(3,914)		6,611		(2,697)		–	–
Total U.S. dollar and other currencies interest rate gap position											
2010	1,495	1,926	192	3,613		(5,687)		486		1,588	–
2009	5,184	(1,374)	(128)	3,682		(4,638)		(1,162)		2,118	–

na – not applicable
Certain comparative figures have been reclassified to conform with the current year's presentation.

Sample Disclosure[1] – Bank of Montreal

[1] Excerpt from 2010 Bank of Montreal Annual Report

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Appendix

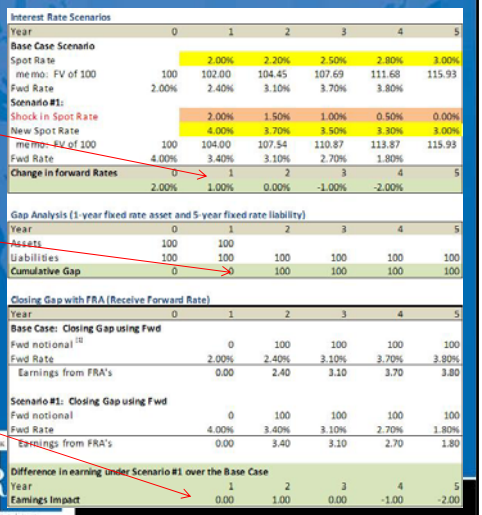
Earnings Impact Under Non-Parallel Shock

Step 1: For a non-parallel shift, derive a corresponding shift in terms of forward rate

Step 2: Obtain cumulative gaps of assets and liabilities

Step 3: Earnings impact derived by

Earnings Impact [Year-N]
= Gap [Year-N]
X Δ (Year-N Forward Rate)



Interest Rate Scenarios

Year	0	1	2	3	4	5
Base Case Scenario						
Spot Rate		2.00%	2.20%	2.50%	2.80%	3.00%
memo: FV of 100	100	102.00	104.45	107.69	111.68	115.93
Fwd Rate	2.00%	2.40%	3.10%	3.70%	3.80%	
Scenario #1:						
Shock in Spot Rate		2.00%	1.50%	1.00%	0.50%	0.00%
New Spot Rate		4.00%	3.70%	3.50%	3.30%	3.00%
memo: FV of 100	100	104.00	107.54	110.87	113.87	115.93
Fwd Rate	4.00%	3.40%	3.10%	2.70%	1.80%	
Change in forward Rates	0	1	2	3	4	5
	2.00%	1.00%	0.00%	-1.00%	-2.00%	

Gap Analysis (1-year fixed rate asset and 5-year fixed rate liability)

Year	0	1	2	3	4	5
Assets	100	100				
Liabilities	100	100	100	100	100	100
Cumulative Gap	0	0	100	100	100	100

Closing Gap with FRA (Receive Forward Rate)

Year	0	1	2	3	4	5
Base Case: Closing Gap using Fwd						
Fwd notional [2]		0	100	100	100	100
Fwd Rate		2.00%	2.40%	3.10%	3.70%	3.80%
Earnings from FRA's		0.00	2.40	3.10	3.70	3.80
Scenario #1: Closing Gap using Fwd						
Fwd notional		0	100	100	100	100
Fwd Rate		4.00%	3.40%	3.10%	2.70%	1.80%
Earnings from FRA's		0.00	3.40	3.10	2.70	1.80
Difference in earning under Scenario #1 over the Base Case						
Year		1	2	3	4	5
Earnings Impact		0.00	1.00	0.00	-1.00	-2.00

References

- Fenton J. et al. "Interesting Challenges for Insurers", Towers Watson Report, March 2011
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