Using the DCAT to Address Risk

Wayne Simpson, PhD
Professor of Economics
University of Manitoba

Why Use the DCAT to Set the RSR?

1) Percentage of Premium (POP or Kopstein) approach
   - Target 15% of premiums written with range of 10% to 20%
   - simple and transparent but no connection to risk unless risk is directly related to premiums
2) Dynamic Capital Adequacy Test (DCAT)
   - less transparent and replicable but specifically addresses risks from adverse events
   - Requires specific risk scenarios
   - Requires empirical justification (insofar as that is possible)
   - Involves specification of a reasonable risk tolerance, i.e. what probability of occurrence of an event is tolerable, e.g. 1-in-40 years (2.5% probability of occurrence)

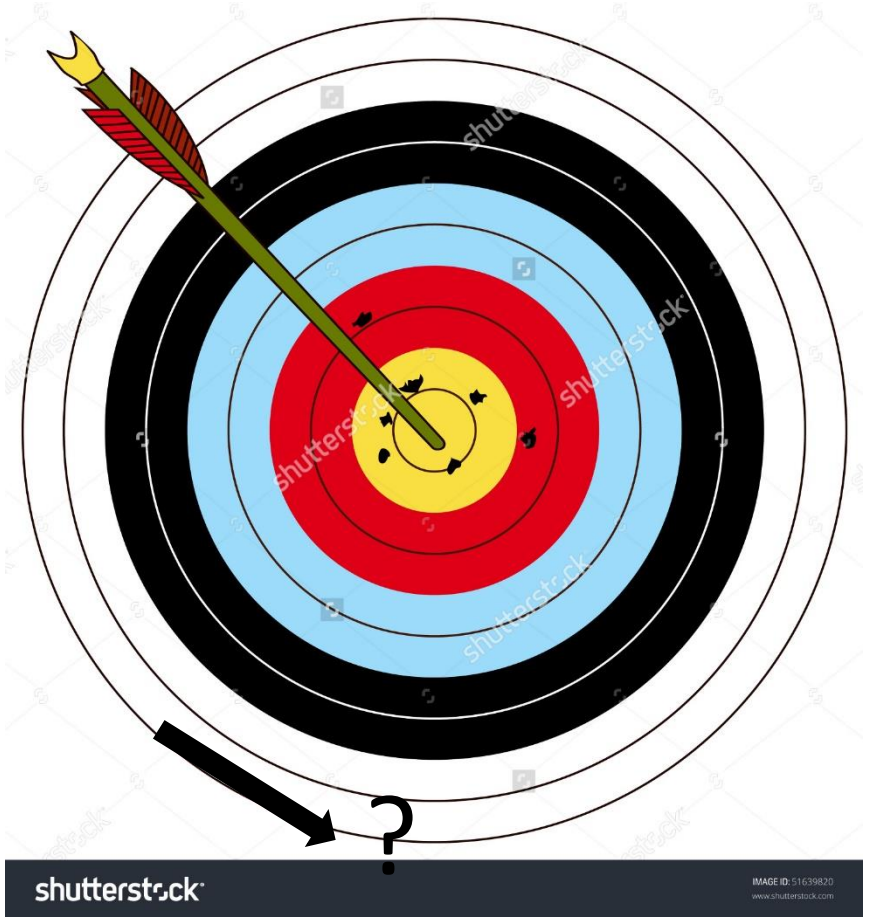
DCAT methodology has been developed in consultation with PUB and interveners; now let's use it consistently and as intended to:

1) Establish a range for the Risk Stabilization Reserve (RSR) to avoid "rate shock"
2) Address all risks, including interest rate forecasting risk

1) Establish a range for the RSR: What has MPI Done with the DCAT?

- Used the DCAT to establish a “target minimum” of $181M from the combined scenario with a 1-in-40 (2.5%) risk tolerance
- Used the criterion of a 100% Minimum Capital Test (MCT) to set a “maximum” for the RSR of $404M
  - Unlike the “target minimum,” the “maximum” has no direct link to any specified risk scenario at any specified tolerance range in the DCAT report
  - Unsubstantiated by evidence of a specified risk

Why Would the “Target” be a “Target Minimum” Rather than a “Target Range Midpoint”?



Archers (and forecasters of uncertain or risky outcomes) aim for the mid-point of the “target,” not the bottom or top to allow for error

The DCAT Can be Used Consistently to Set an RSR Range Around a Target Midpoint such as a 1-in-40 Probability: Illustration

- CAC(MPI) 2-45 provides DCAT results **before management action** for the two-year combined scenario for a range of risk tolerances around 1-in-40 from 1-in-10 to 1-in-200
- **Combined Scenario Total Equity (in millions)**

Probability	**2017/18**	**2018/19**	**2019/20**	**2020/21**
1-in-200	$99	($51)	($80)	($111)
1-in-100	$112	($32)	($56)	($79)
1-in-40	$86	($3)	($44)	($68)
1-in-20	$117	$32	$4	($13)
1-in-10	$141	$65	$31	$19

The DCAT Can be Used Consistently to Set an RSR Range Around a Target Midpoint such as a 1-in-40 Probability: Illustration

- Implied RSR values would be the differences in 2018/19 from the 2016/17 base forecast of $217M:

Probability	Value
1-in-200	$268M
1-in-100	$249M
1-in-40	$220M
1-in-20	$185M
1-in-10	$152M

RSR Based on Specified Range of Risk Tolerances for Combined Scenario Around a 1-in-40 Target: Illustration

Probability Range	**Values Range**
Wide Range: [1-in-10, 1-in-200]	**[$152M, $268M]**
Narrow Range: [1-in-20, 1-in-100]	**[$185M, $249M]**

Range Midpoint (Target) in Each Case is $220M

Range Maximum far Below 100% MCT ($404M)

Range Closer to POP Range of [$93.2M, $186.4M]

2) Address all risks, including interest rate forecasting risk: Where does the IRFRF come in?

- MPI application
  - **2% overall** rate increase in Basic Autopac
  - Plus an **Interest Rate Forecast Risk Factor (IRFRF)** whose form and magnitude would be determined by a collaborative process between the PUB, interveners and MPI (MPI Rate Application, Volume 1) but could be **2.3%** or higher (PUB(MPI) 2-25)
  - Total rate increase of 4.3% or higher
  - RSR range of [$181M, $404M] based (?) on the DCAT Report

MPI's Argument for an IRFRF

- critical to "mitigate **the risk** of a deficiency in premiums resulting from the impact of an interest rate forecast with too steep a trajectory over the forecast period" (Vol. I, p.7)
- "necessary to **prevent potential rate shock**. The amount of the IRFRF would ultimately reflect the PUB's assessment, informed by input from the Corporation and other parties, of **the extent of the risk and risk tolerance** in the context of financial integrity and smooth and stable Basic insurance rates" (PUB(MPI)2-25)
- doesn't this sound like the justification for the RSR?

Where Does the IRFRF Come From?

- no other insurance company or jurisdiction in Canada or North America that uses a concept such as the suggested IRFRF
- IRFRF is a concept invented by MPI (see CAC (MPI) 1-94 and PUB (MPI) 2-25) for special circumstances arising from “an interest rate forecast with too steep a trajectory over the forecast period”
  - Isn’t this just the interest rate decline scenario from the DCAT?

Doesn’t DCAT Already Deal with Interest Rate Risk?

- DCAT report results from extensive collaborative effort to use the DCAT methodology generally practiced in property and casualty insurance to deal with risk as the basis for determination of an RSR to mitigate rate shock
- DCAT Report identifies the three most important risk factors, including the interest rate decline scenario
  - risk associated with “**interest rates [that] decline or remain at sustained low levels over the forecast period**” (Vol. II, RSR-2, P.37)
  - scenario considers sustained low interest rates relative to a base consensus bank forecast (p.22) as in the IRFRF
  - important component of the 2-year combined scenario ultimately used to justify an RSR minimum target level of $181 million

Isn’t the IRFRF Just the Interest Rate Decline Scenario from the DCAT?

1) Both start with the consensus bank forecast or Standard Interest Rate Forecast (SIRF) as the base scenario
   - In the **DCAT interest rate decline scenario**, the SIRF provides the basis for the Base Scenario and the test is whether total equity in the RSR is sufficient if interest rates remain below the SIRF at an interest rate floor calculated from the 10-year Government of Canada bond rate
   - In the **IRFRF**, the SIRF is compared to either a naïve forecast in which interest rates remain at their current levels throughout the forecast period or a “50-50” scenario that is the average of the naïve and SIRF forecasts

Isn’t the IRFRF Just the Interest Rate Decline Scenario from the DCAT?

2) Both calculations establish an interest rate floor that is the effective basis for the risk scenario

- In the **DCAT interest rate decline scenario** the floor is the monthly minimum 10-year GoC bond rate from 1989 to the present, now 1.19% (Vol.II, RSR2, p.37), and interest rates remain there throughout (DCAT report, p.42)
- The preferred **IRFRF** is calculated from a “50-50 weighting between the SIRF and the naïve forecast” (PUB(MPI) 2-25) such that interest rates rise from a current level of 1% to about 2¼% by 2020/21 (PUB (MPI) 2-25, Figure 1

Isn’t the IRFRF Just the Interest Rate Decline Scenario from the DCAT?

3) The interest rate floors that are crucial to the DCAT interest rate decline scenario and the IRFRF are both arbitrary

- The floors have no empirical foundation in the past history of interest rate movements since the current low-interest rate experience is unique in the modern era
- We can assign a proper risk tolerance to the equity decline and high-loss ratio scenarios in the DCAT but not to the interest rate decline scenario or the IRFRF “50-50” scenario, which has comparably shaky foundations, i.e. how do we assess the risk?

Why Have the IRFRF When We Have the DCAT?

- If the elements of the IRFRF and interest rate decline scenarios are identical, why should the single risk of interest rates falling short of the consensus bank forecast be counted twice, i.e. once for the IRFRF component of the rate increase and once for the RSR target?
- If we are trying to be consistent, why does the IRFRF argue that interest rate stagnation below the SIRF is a foregone conclusion when the DCAT base scenario accepts the SIRF as "a realistic set of assumptions used to forecast the insurer's financial position . . . consistent with the insurer's business plan" (RSR-2,p.21)?
- Uncertainty about future interest rates (and other future events) creates risk that is
  i. best evaluated using the established DCAT methodology that has been developed cooperatively and can be scrutinized and criticized based on the evidence
  ii. best provided for by an appropriate Risk Stabilization Reserve