SimErgy
THE ERM SPECIALISTS

Applying Enterprise Risk Management at the Country Level

ASNY
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BACKGROUND

- Based on soon-to-be-released research
  - National Risk Management: A Practical ERM Approach for Federal Governments
  - White paper: opinion
- Research sponsors
  - Canadian Institute of Actuaries (CIA) ERM Research Subcommittee (ERMRS)
  - Joint Risk Management Section Research Committee (JRMSRC), a collaboration of SOA, CIA, and CAS

COUNTRY RISK MANAGEMENT IS HERE

- OECD Recommendation of the Council on the Governance of Critical Risks (May 2014)
  - Establish/promote comprehensive all-risks approach to country risk governance
  - Assign leadership at national level
    - Drive policy implementation
    - Connect policy agendas
    - Align competing priorities
- Only 3rd time signed by all members
- Three-year deadline

WHY ERM FOR FEDERAL GOVERNMENT?

- Success
  - Increase likelihood of achieving critical national objectives
- Prioritization
  - Identify and quantify key national threats – individual and combination
- Forecasts
  - Improve accuracy/credibility of forecasts, in part via SMEs
- Decision making
  - Provide robust/integrated picture of decision impacts
- Simulations
  - Provide robust/integrated picture of potential changes in national/global situation

WHAT ERM APPROACH?

Value-based ERM approach

- Risk = deviation from baseline expectations ("Plan")
  → Connects ERM to strategic plan goals
- Risk = both upside and downside volatility
  → Provides both risk and reward info to support decisions

HOW?

If you were given the entire federal budget…how would you spend it?

or

If you were country CRO and asked to suggest changes to the national strategic plan, how would you form your recommendation?

- How would you reallocate budget and resources?
- What changes would you make to strategic decisions?

THIS LEADS TO FIVE QUESTIONS

First, answer questions 1 and 2:

1) What are critical national objectives?
2) What are key metrics for success?

Then, ERM helps think through questions 3-5:

3) What are key risks?
4) What are key risk scenario impacts/likelihoods?
5) What decisions increase likelihood of success?

QUESTION 1: CRITICAL NATIONAL OBJECTIVES?

- Challenging question
- Varies by country…and within country
- Must be manageable number for practicality/focus
- (Focus is federal government, not state, provincial)
- Suggestions?

CRITICAL NATIONAL OBJECTIVES

- **Life:** Protect life of citizens
- **Health:** Protect/enhance health of citizens
- **Wealth:** Provide opportunity for citizens to financially support needs/wants
- **Sovereignty:** Maintain/enhance level of independent from foreign influence

These answers, and subsequent answers, are merely examples provided to illustrate the steps in applying value-based ERM to a federal government; many other answers are possible

QUESTION 2: KEY METRICS FOR SUCCESS?

- Another challenging question
- Suggestions for **Life** objective?

LIFE OBJECTIVE – KEY METRICS/SUB-METRICS

- Deaths caused by war/terrorism
- Deaths caused by large-scale crime/negligence
  - Such as illegal polluting, civil unrest, organized crime
- Deaths caused by transportation
  - On roads, rail, water, and air
- Deaths caused by natural disaster
- Perception of life safety
  - Not fully correlated with actual life safety (e.g., foreign propaganda)
  - Different events with same actual impact perceived differently (e.g., terrorizing event)

QUESTION 2: KEY METRICS FOR SUCCESS?

- Another challenging question
- Suggestions for **Health** objective?

HEALTH OBJECTIVE – KEY METRICS

- Life expectancy (period life expectancy at birth)
- Perception of health safety
  - Not fully correlated with actual health safety (e.g., false research findings)
  - Different events with same actual impact perceived differently (e.g., social factors may focus public on less-critical risks)

QUESTION 2: KEY METRICS FOR SUCCESS?

- Another challenging question
- Suggestions for **Wealth** objective?

WEALTH OBJECTIVE – KEY METRICS

- Ability to cover expenses
  - Possibly use average ratio: $\frac{\text{family net worth (assets less liabilities)}}{\text{monthly living expenses}}$
  - GDP, unemployment not best measures of financial status
- Perception of wealth security
  - Not fully correlated with actual wealth security (e.g., political campaign rhetoric)
  - Different events with same actual impact perceived differently (e.g., more sensitivity to direct tax increase vs. indirect tax of same impact, such as expanding money supply)
  - Can have real impact → less (or more) investment/spending due to under- (or over-) confidence in economy

QUESTION 2: KEY METRICS FOR SUCCESS?

- Another challenging question
- Suggestions for **Sovereignty** objective?

SOVEREIGNTY OBJECTIVE – KEY METRICS

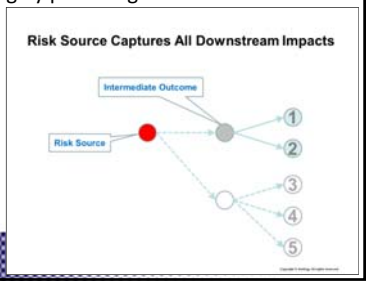
- Self-generated critical resources
- National wealth
- Military strength
- Perception of national sovereignty
  - Not fully correlated with actual wealth security (e.g., foreign intrigue, corporate or military lobbyists)

QUESTION 3: WHAT ARE KEY RISKS?

- Create RCD
  - Consider each key metric/sub-metric
    - Must consider impact on **multi-year** projected baseline values to fully/accurately assess risks and properly inform decision making
  - Identify key risk sources that can materially impact
    - Define risks consistently by source

DEFINE RISKS CONSISTENTLY BY SOURCE

- Captures all impacts
- Clarifies QRA voting by providing context



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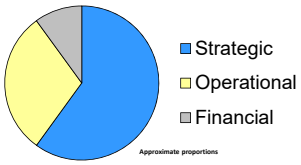
    - Include all risk sources

INCLUDE ALL RISK SOURCES



Approximate proportions

RESEARCH STUDIES:
1) 1-Year Globe & Mail study: Strategic: 65% / Operational 22% / Financial 13% (Source: "Front-Page Risks", Joint Risk Management Section)
2) 1-year WSJ study: Strategic: 64% / Operational 35% / Financial 1% (Source: "IMPACT Study," Watson Wyatt)
3) 18-year 50% market cap decline study: Strategic: 65% / Operational 20% / Financial 15% (<15% / most "financial" were miscategorized operational) (Source: CFO Executive Board, Audit Director Roundtable research)
4) 6-year largest 1-month value decline study: Strategic: 61% / Operational 33% / Financial 6% (Source: Mercer Management Consulting)
5) Director survey of biggest threats: Strategic outnumbered financial by margin of >3-to-1 overall, and >2-to-1 in financial services sector (Source: The Conference Board, The Role of U.S. Corporate Boards in ERM)

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    - Define risks consistently by source
    - Include all risk sources
    - (Many will impact more than one key metric/sub-metric)
- Conduct QRA (Interview #1)
  → Key risks advance to risk quantification
- Emerging risk ID
  - Monitoring known risks (non-key risks from QRA)
  - Environmental scanning for unknown risks

EXCERPTS FROM SAMPLE RCD – STRATEGIC RISKS

Risk Sub-Category	Description
Budgeting – Strategy	Federal budget strategy not as viable as expected (e.g., flawed budget assumptions)
Intelligence – Quality	Quality of intelligence info not as expected (e.g., failure to gather and analyze as expected)
Lifestyle Habits	Unexpected change in lifestyle habits (e.g., higher-calorie diets or increase in drug usage)
Economic Policies – Strategy	Economic strategy not as viable as expected (e.g., flawed approach to stimulating economy)
Trade Policies – Strategy	Trade policy strategy not as viable as expected (e.g., suboptimal choice of trading partners)
Trade Competition	Unexpected change in foreign competition for exported goods/services or trade routes
Cyber Attack	Unexpected cyber-attack (e.g., cyber-criminal org or hacktivist attack)

EXCERPTS FROM SAMPLE RCD – OPERATIONAL RISKS

Risk Sub-Category	Description
Civil Unrest	Unexpected change in level of civil protests (e.g., masses of citizens gather in sustained violent protests)
Corruption	Corruption in executive, legislative, or judicial branch officials or staff (e.g., elected official takes bribe to subvert legislation)
Transportation Innovation	Innovation in transportation (vehicles or infrastructure) results in unexpected change in safety level (e.g., self-driving vehicles; upside)
Human Resources – Execution	Unexpected change in ability to maintain human resources required (e.g., inability to attract key talent)
Pandemic	Unexpected change in frequency/severity of pandemics
Solar Flares	Unexpected change in frequency/severity of solar flares

EXCERPTS FROM SAMPLE RCD – FINANCIAL RISKS

Risk Sub-Category	Description
Economic	Unexpected change in the economy (e.g., severe economic downturn)
Exchange Rates	Unexpected changes in exchange rate (e.g., a shift in exchange rates that decreases national exports)
Equity Markets	Unexpected changes in equity markets (e.g., stock market crash)
Credit Markets	Unexpected changes in credit markets (e.g., drying up of credit availability)

RISK QUANTIFICATION

- Baseline
- IRSQ
- ERE

BASELINE ERM MODEL – 5 KEYS TO SUCCESS

1. Practical modeling
   - Practical construction, manageable inputs (high complexity unwarranted and counter-productive)
2. Project key metrics/sub-metrics
   - Federal governments do not focus on all of these
3. Project over appropriately-long time horizon
   - Federal government projections are often too short-term
4. Dynamic to value/risk drivers
   - Ability to shock risk/value-drivers (not simply stress tests)
   - Federal government projection models are too simplistic
5. Project values with appropriate granularity
   - Capture impacts on key sub-groups of citizenry
   - Federal governments do not project these metrics with granularity

MODELING EXPERTISE

- Need input from many fields of expertise, such as:
  - Economists
  - Demographers
  - Finance
  - Actuaries
  - Etc.

IRSQ

- FMEA with SMEs
- Deterministic risk scenarios
  - **By source:** Guides SMEs to identify risks by source, and then follow downstream for consequences
  - **More accurate:** Leverages intelligence, knowledge, judgement, intuition of those closest to the operations/risk
  - **More robust:** Each scenario is thought all the way through
  - **More dynamic:** Quickly/easily contact SME for updates
  - **Leads to decisions:** One-pagers → buy-in → actions
  - **Fewer errors/bias:** Shared vertically/horizontally → input
  - **Enhances risk culture:** Engages more people in the process

ERE

- Define simulation set (combinations)
- Quantify impact and likelihood of each simulation
- ERE (aggregate volatility) expressed as pain points
  - Confidence level of meeting/exceeding Plan goals
  - Likelihood of falling below critical levels

EXAMPLES OF PLAUSABLE ERE PAIN POINTS

Likelihood of:

- 10%+ decrease in average of life sub-metrics
- Perception of life safety below critical level *x*
- Life expectancy health sub-metric below critical level *x*
- Perception of health safety below critical level *x*
- Ability of a constituent group to cover its expenses below critical level *x*
- Perception of wealth security below critical level *x*
- 10%+ decrease in average of sovereignty sub-metrics
- Perception of national sovereignty below critical level *x*

DEFINING RISK APPETITE/LIMITS

- Method 1
  - Define risk appetite as max likelihood of pain points
    - Example: "likelihood of crossing pain point '*life expectancy decreasing 10%*' must never be higher than 10%", where current likelihood may be, say, 8%
  - Risk limits set as allocation down from risk appetite
  - Challenge: optics leads to inference this is acceptable
- Method 2
  - Define risk appetite = ERE, as direct result of funding

INTEGRATION OF ERM INTO DECISION

- Decision is adopted if results in better risk-reward tradeoff than current state
  - Risk:
    - IRSQ (absolute and in relation to risk limits)
    - ERE (absolute and in relation to risk appetite)
  - Reward:
    - Baseline projection of key metrics
- Process identical for all types of decisions
  - Strategic planning, strategic and tactical
  - Mitigation-related

Q&A

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