Institute
and Faculty
of Actuaries

A5: The Many Costs of Capital

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Fun Bits About Your Speaker

- CAS actuary for 27 years
- Current CAS Board Member
- Born in California
- Raised in Texas
- Live in New Jersey
- Work in New York City

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Me and Capital Allocation

- Many papers and presentations, here and at home
- Built on an unsound foundation
- Sufficient but not necessary
- Grand fictions with high operational costs
- There is a better way
- I could not pass up the opportunity to steer young minds in the right and proper direction

What to my surprise…

- Exam SA-3 General Insurance Specialist Applications exam embeds the approach I will describe

Symptoms of Problems with Current Capital Allocation

- Too much allocated to catastrophe-prone lines, not enough to attritional
- Too much to Property, not enough to Casualty
- Changes to model inputs produce non-intuitive changes in allocations
- Difficulty explaining method and building understanding with leadership team
- Manual intervention required to adjust or correct for allocation anomalies
- Completely different approaches for Life and General

Capital Cost Allocation Best Practices
The Case for Change

- More accurate assignment of true capital usage costs by product line
  - Pricing advantage in the marketplace
  - Attritional and catastrophe lines
- Single harmonized framework for both Life and General Insurance
- Clear linkage from Board risk preferences to pricing, planning and performance assessment
  - The Use Test put into action
- Greater transparency and buy-in means more value realized from capital modeling investment

Insurer capital is indivisible

- Allocation requires division
- Policies or classes or profit centers have simultaneous claim to up to all the available assets
- Merton and Perold (1993) saw this
- Compare: swimming club with 50 meter pool
  - Allocation: take the water and fill 1,000 inflatable kiddie pools
  - Simultaneous claims: rainy Tuesday morning you have the entire pool to yourself, sunny Saturday afternoon not so much

Insurer capital is not intended to be consumed

- Motorola RAZR division:
- Cap alloc @ BOY meant to last the entire year
- Opportunities arise that accelerate the usage (spending) of the capital for raw materials, plant, labor, etc.
- Call the CFO in March for more capital: GOOD THING

- Insurer:
- Cap alloc @ BOY meant to last the entire year
- Problems arise that accelerate the usage (spending) of the capital for reserve increases
- Call the CFO in March for more capital: BAD THING

Insurers may be more like lenders than venture capitalists

- VC Project:
  - Owner gives (invests in) the capital to a project
  - Project returns the capital over time plus profit
  - Huge upside potential
  - IRR

- Loan:
  - Owner lends principal to borrower
  - Borrower returns principal and interest
  - Only downside potential
  - Risk-adjusted Spread

There may be more than one dimension to capital costs

- VC capital project analog ➔ IRR
- RORAC = Return On Risk-Adjusted Capital
  - Fixed hurdle rate
- Reduces the risk picture to one dimension: how much capital

There may be more than one dimension to capital costs

- Taxi: time and distance
- Shipping: package weight and size (and distance and time)

Two Views of Capital

Proforma

- Pre-Event
- Rental
- Allocating underwriting capacity
- Allocate a total amount
- Leverage & diversification

  More than € for €
- Expected scenario
- RAROC framework
- Required capital

Contingent

- Post-Event
- Consumption
- Funding a deficit
- Transfer a needed amount
- No leverage

  Only € for €
- Actual scenario
- Loan (grant) framework
- Available capital

Proforma View of Capital

Proforma

- Pre-Event
- Rental
- Allocating underwriting capacity
- Allocate a total amount
- Leverage & diversification

  More than € for €
- Expected scenario
- RAROC framework
- Required capital

- *Planning*
- *Occupying capacity over time*
- *Prospective, not necessarily capital*
- *Proportional (snapshot)*
- *One capital pool exposed multiple times*
- *Plan to make money*
- *“Project” financial analogue*
- *Theoretical*

Contingent View of Capital

Contingent

- Post-Event
- Consumption
- Funding a deficit
- Transfer a needed amount
- No leverage (*Only € for €*)
- Actual scenario
- Loan (grant) framework
- Available capital

- *Crisis response*
- *Instantaneous destruction of future capacity*
- *Known amounts going to BU*
- *ACTUAL capital allocation*
- *Can only transfer it once*
- *"The reserve deficiency is ___"*
- *Replacement cost (contingent)*
- *ACTUAL balances*

Capital Allocation

- Capital allocation can inform planning decisions in a steady state
- Capital allocation has **concrete meaning** in firms like Siemens
- Unfortunately, it proved itself **meaningless** during the 2008 crisis
  - Anything less than $160B allocated to AIG Financial Products was incorrect and in fact meaningless
- Individual business units drained the corporate capital pool, regardless of their "capital allocations"

External vs Internal Capital Market
External

- Clearing cost of many players
- Competition, alternatives, opportunities
- Systemic and diversifiable
- Opinion and sentiment, confidence, herding
- Fluid, inconstant, volatile
- Opinions are generally offsetting, but during crisis can align leading to market seizure and liquidity crunch

External vs Internal Capital Market
Internal

- An unconstrained market of one capital supplier and numerous consumers (lines of business)
- Price access to this capital
- What to reward and punish, emphasize and ignore
- Cost is Contingent – conditional on state of the company

Comparables for Conditional Risk Preferences and Tolerances in Sport

- Tennis
  - Double-fault in first game or at match point
- (American) Football
  - Giving up five yards at opponent's ten yard line or your own
- (World) Football
  - Playing for a draw versus a win
  - Needing a goal versus needing to not give up a goal

Repair the foundation

Insurer capital is a Shared Asset

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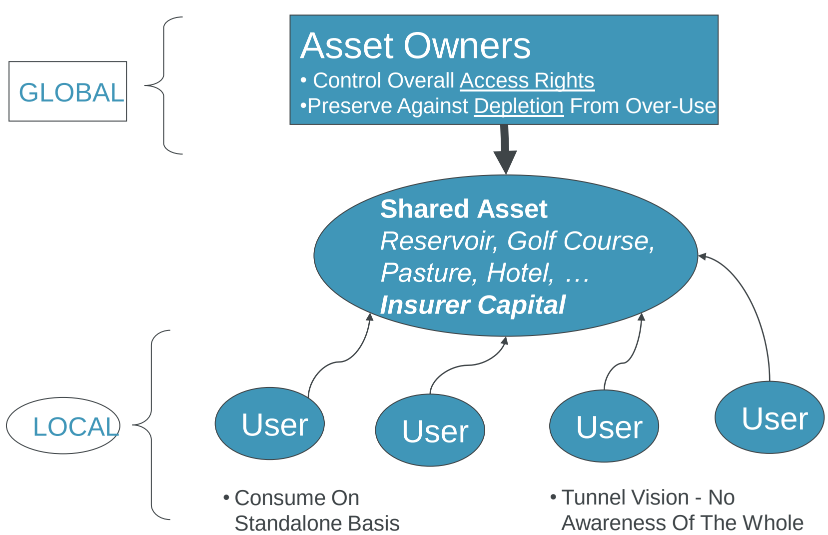
Foundational Theory
Valuing Parental Guarantees

- Merton & Perold (1993): "**risk capital**" for a financial services profit center is the cost of parental guarantee to make up any shortfalls
- Insurer provides these **shortfall guarantees** to every policy, product segment, profit center, operating company, etc.
- Guarantees are backed by the entire capital pool
- Everyone has simultaneous rights to (potentially) use up **all the capital**
- Company must manage the timing and size of guarantee exercises:
  - Concentrations
  - Correlation
  - Reserve deficiencies
- Too many calls for cash and the common pool of capital gets drained

Insurer Capital is a Shared Asset



Shared Assets Can Be Used Two Different Ways

- **Consumptive Use**
- Example: RESERVOIR
- ***Permanent*** Transfer To The User

- **Non-Consumptive Use**
- Example: GOLF COURSE
- ***Temporary*** Grant Of Partial Control To User For A Period Of Time

- **Both Consumptive and Non-Consumptive Use**
- Example: HOTEL
- ***Temporary*** Grant Of Room For A Period Of Time
- Guest could destroy room or entire wing of hotel, which is ***Permanent Capacity Consumption***

An Insurer Uses Its Capital Both Ways

- **1. "Rental" Or Non-Consumptive**
  - Returns Meet Or Exceed Expectation
  - Capacity Is Occupied, Then Returned Undamaged
  - A.k.a. ***Room Occupancy***

- **2. Consumptive**
  - Results Deteriorate
  - Reserve Strengthening Is Required
  - A.k.a. ***Destroy Your Room, Your Floor, Or Even The Entire Hotel***

Charge Each Segment for Its Capital Usage

Capital Usage Cost Calculation
Paying for the Parental Guarantee

Two Kinds Of Charges:

1. **Rental** = upfront fee for right to (possibly) use the Guarantee

   → ***Occupying underwriting capacity***

   BCAR, SPCAR, RBC, SCR, …

2. **Consumption** = contingent fee for using the Guarantee

   → Function of ***Potential for Deficit*** *(Consumption)*

   Risk appetite / preference / riskiness leverage function

Some Advantages of Shared Asset Approach

- Unifies Life and General Insurance/P&C/Non-Life
  - Life is mostly Rental (capital planning)
- Existing frameworks are special cases
  - Feldblum/Robbin IRR ~ Rental (one scenario where we make money)
- Can be used in RORAC or RAROC
  - Risk-adjust via capital factors to constant ROE

    OR
  - If constrained to use e.g., S&P or SCR capital factors, risk-adjust the ROE’s given the (non-risk-adjusted) capital factors
- Realism and Ease of explanation (Use Test)

Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.