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The Many Costs of Capital

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Agenda

- Two Ways to Use Capital (*and two kinds of cost*)
- Internal vs External Capital Market
- Allocation and the Shared Asset framework
- Risk Preferences / Appetite – *Riskiness Leverage functions*
- Q&A

Two Ways to Use Capital

Proforma	Contingent
▪ Pre-Event	▪ Post-Event
▪ Rental	▪ Consumption
▪ Allocating underwriting capacity	▪ Funding a deficit
▪ Allocate a total amount	▪ Transfer a needed amount
▪ Leverage & diversification *More than € for €*	▪ No leverage *Only € for €*
▪ Expected scenario	▪ Actual scenario
▪ RAROC framework	▪ Loan (grant) framework
▪ Required capital	▪ Available capital

Two Ways to Use Capital
Proforma

Proforma	
▪ Pre-Event	▪ *Planning*
▪ Rental	▪ *Occupying capacity over time*
▪ Allocating underwriting capacity	▪ *Prospective, not necessarily capital*
▪ Allocate a total amount	▪ *Proportional (snapshot)*
▪ Leverage & diversification *More than € for €*	▪ *One capital pool exposed multiple times*
▪ Expected scenario	▪ *Plan to make money*
▪ RAROC framework	▪ *"Project" financial analogue*
▪ Required capital	▪ *Theoretical*

Two Ways to Use 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*

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 *by any means necessary*
- What to reward and punish, emphasize and ignore
- Whether to reflect (and how much):
  – Time and history
  – Fact and intuition
  – Return periods
  – Risk factors
- **There is no right or wrong answer**

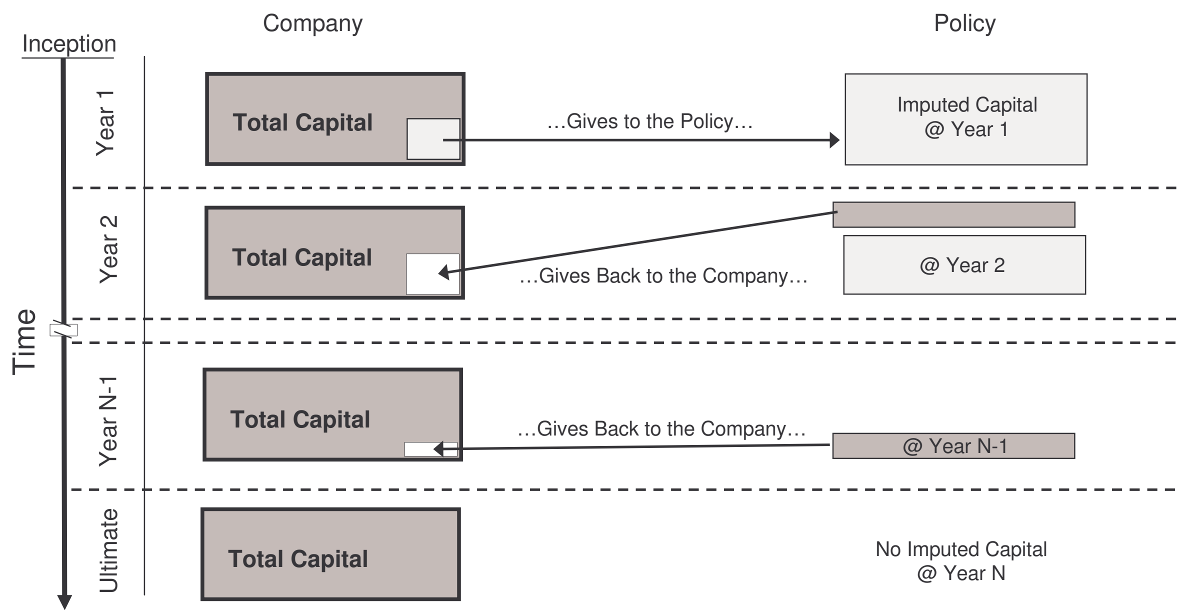
Capital Allocation

- 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
  – Examples: SCA, AIG Financial Products, numerous bancassurers
- Individual business units drained the corporate capital pool, regardless of their “capital allocations”
- **Is capital allocation necessary? Are there alternatives?**

Capital Impact Model: *Shared Asset*
Valuing Parental Guarantees

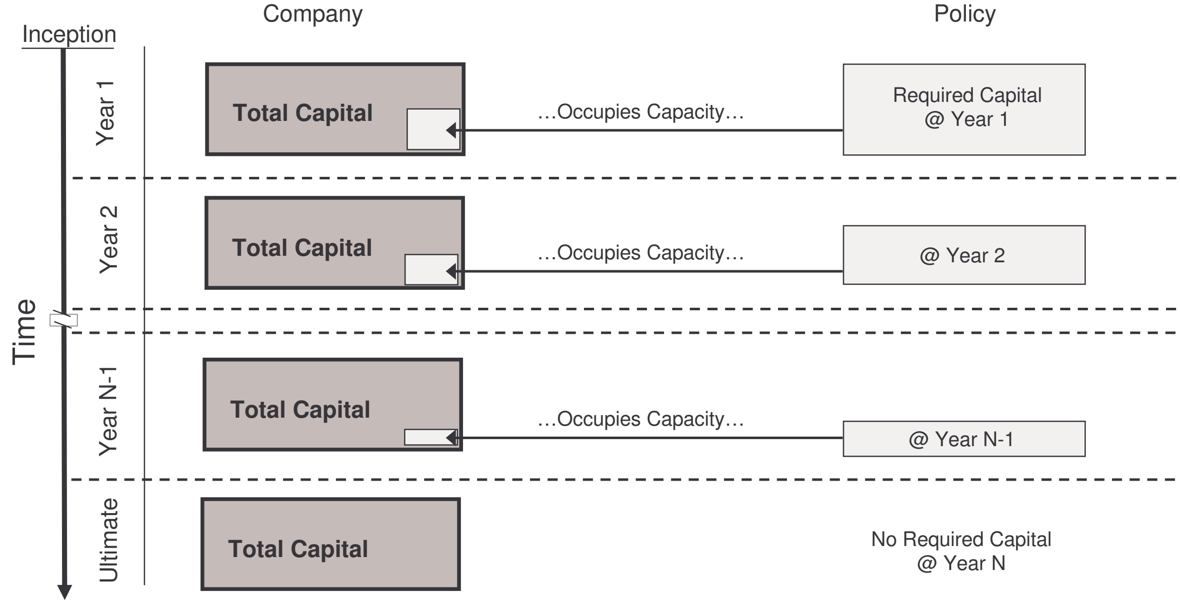
- Merton & Perold (1993): "**risk capital**" for a financial services profit center is the cost of parental guarantee to make up any shortfalls
- Insurer provides these **shortfall guarantees** to every policy, product segment, profit center, operating company, etc.
- Guarantees are backed by the entire 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

Do We Have The Direction Reversed?
IRR Model and Imputed Capital



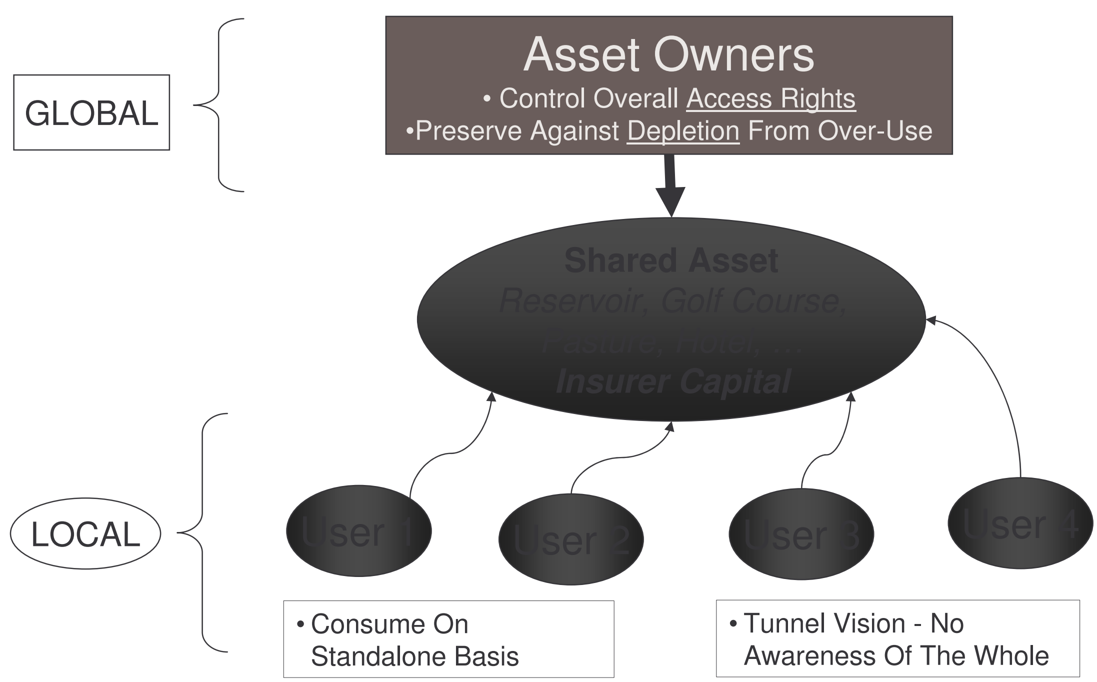
The Company Gives the Policy Capital

We Do Have The Direction Reversed!
Shared Asset Model and Impacted Capital



The Policy Impacts the Company

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***

Let's Charge Each Segment For Their 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

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

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

   Risk appetite / preference / riskiness leverage function

Comparables for Two Kinds of Charges
UPS

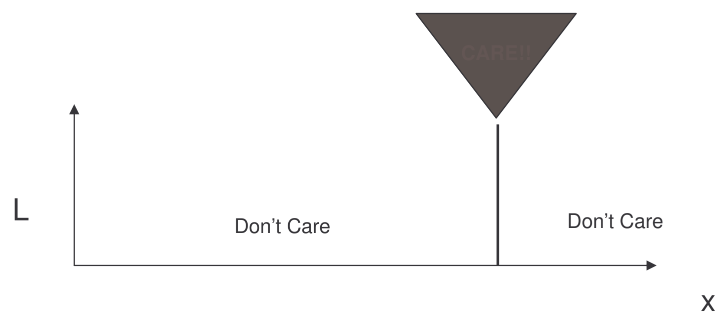
- Cost of shipping is function of
  - Size (volume) and Weight
  - Distance and time
- **CAPACITY:** How Much **can** UPS deliver…
  - Allocated on first-come, first-served basis
  - Constraints are physical
    - Only so much capacity on the airplanes
    - Capacity measured by weight **and** volume
- **DELIVERY:** …Where, by When?
  - Costs are variable and contingent
  - Fuel and labor

Comparables for Conditional Risk Preferences and Tolerances
Sport

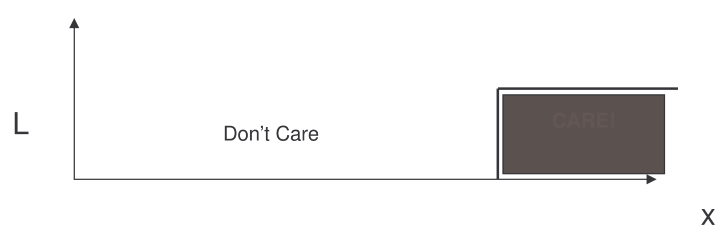
- Tennis
  - Double-fault in first game or at match point
  - The probability of double-faulting has not changed, your interpretation of it has
- (American) Football
  - Giving up five yards at opponent's ten yard line or your own
  - Giving up a touchdown in the last two minutes…
    - …when leading by four points
    - …when trailing by one point
    - …when trailing by twenty points
- (World) Football
  - Playing for a draw versus a win
  - Needing a goal versus needing to not give up a goal

Every approach has an **IMPLICIT** riskiness leverage function
(Possibly many)

VaR:



TVaR:



Every approach has an **IMPLICIT** riskiness leverage function
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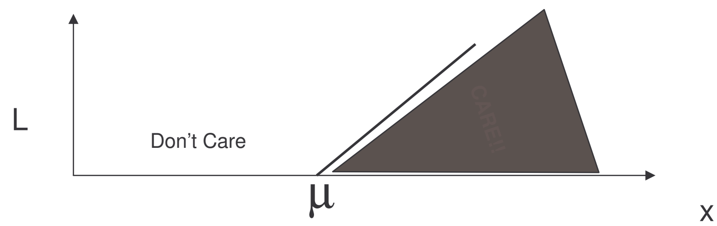
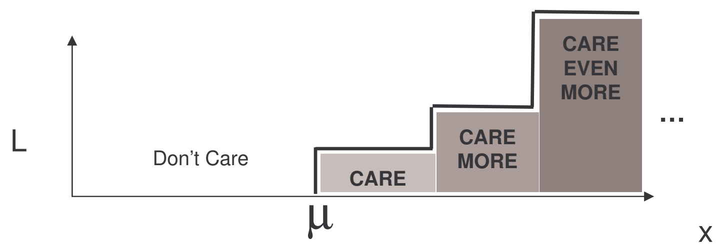
Semi-variance:



Consumption



Shared Asset in Practice
ICA Model Output

- Rental
  - BCAR, SCR, ECR
    - Assessed annually based on expected reserve balances
    - Opportunity cost
- Consumption
  - Riskiness Leverage function
    - Calculated on total return column
    - Distributed back over LOB
    - Varying with either/or loss amount or return period
- Result
  - EVA = profit minus cost of capital
    - Calibrate to target cost in total

Summary

- Two Ways to Use Capital – **Be Clear on Which Kind You Are Using**
- Internal vs External Capital Market – **It's <u>Your</u> Cost of Risk**
- Allocation and the Shared Asset framework – **Choose a Unifying Framework and Focus on …**
- Risk Preferences / Appetite – *Riskiness Leverage functions* – **Be Explicit**

Thank You

Questions?

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