



The Intersection of Pensions and Enterprise Risk Management

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Frontiers in Pension Finance and Reform

DNB – Netspar – IOPS

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Headlines

- Risk management:
 - it's not about risk and reward
 - it's about value
- Corporations can add value by shorting the market
 - the defined benefit plan is often the best place to short the market

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Outline

- Corporate finance view
- Why not to manage risk
- Why to manage risk
- Project portfolio includes risk portfolio
- Ex-ante discounting for risk
 - Level one discount – market calibrated cash flow valuation
 - Level two cost – firm-specific secondary impact of risk
- Creating value by shorting the market
- Role of DB plan

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Corporate Finance View

- Financial risk management
 - Hedging/insurance
- Ex-ante decision model (simultaneously treats)
 - project selection
 - project finance (capital structure)
 - and risk management

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Why Not to Manage Risk and DB Asset Allocation

- Adds no value:
 - all risk is held by individuals not institutions
 - systematic risk – irreducible minimum market-clearing price
 - idiosyncratic risk – diversified investors end up on both sides of any hedging or insuring transactions
- DB plans traded in the same markets, same implications

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Why to Manage Risk and DB Asset Allocation

- Market imperfections
 - Tepper-Black tax arguments in applicable regimes
 - DB plan assets – no distinction between tax on equities, debt
 - Taxable investor assets – lower tax on equities than on debt
 - DB plans should hold debt, short equity
 - Smith-Stulz identify convex costs associated with
 - Corporate taxes
 - Contracting costs
 - Financial distress

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Project Portfolio

- Select project portfolio
 - not returns for risk, but
 - positive NPV
 - risk comes along
- The **E** in Enterprise Risk Management implies:
 - look at aggregate risk portfolio
 - calculate cost of risk across the enterprise
 - net risks are retained or disposed of

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Ex-Ante Discounting for Risk

- $NPV = PV \text{ project revenues} - \text{investment}$
- Uncertain revenues require two discounts
 - Level one discount – market calibrated, reflecting:
 - Minimum discount for systematic risk
 - No discount for idiosyncratic risk
 - Level two cost (collateral damage)
 - Internal – firm-specific
 - Reflects variance of project portfolio
 - Can impact cash and/or franchise value

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Ex-Ante Discounting for Risk

- Level one discount: why not to manage risk
 - diversification already gives us minimum cost for risk
- Level two cost: why to manage risk
 - uncertain outcomes destroy value
 - because of convex
 - tax schedules
 - contracting
 - financial distress

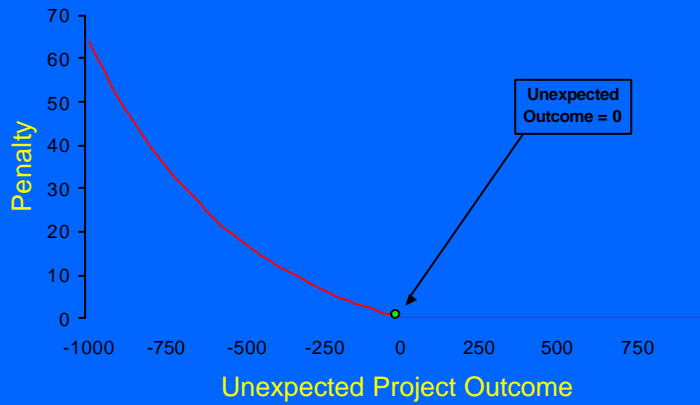
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Ex-Ante Discounting for Risk

- Financial distress – conceptual term with several uses in the literature
- Most narrowly – the deadweight cost of bankruptcy
- More broadly – diminished franchise value
 - Higher capital cost
 - Project abandonment

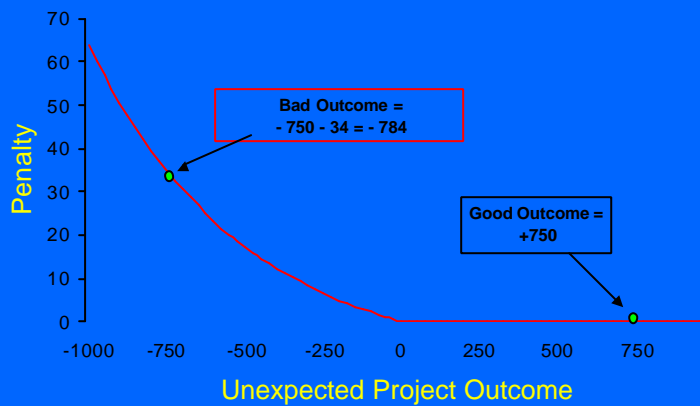
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Figure 1
Convex Risk Penalty
(\$ Millions)



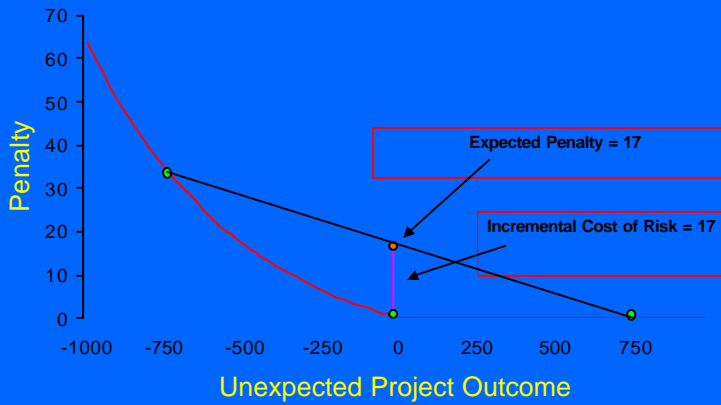
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Figure 2
Binary Outcomes
+750 / -750



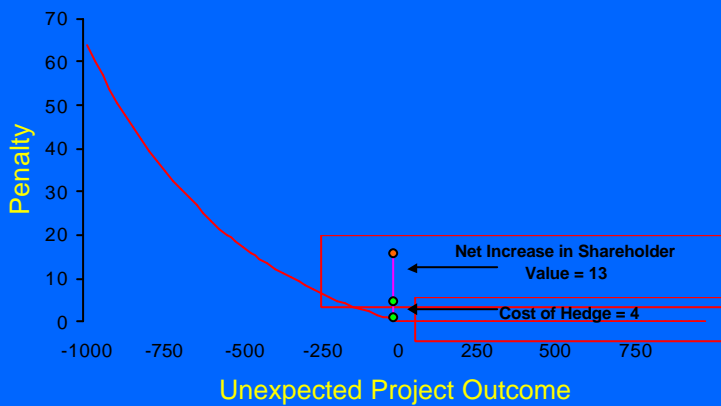
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Figure 3
Cost of Risk



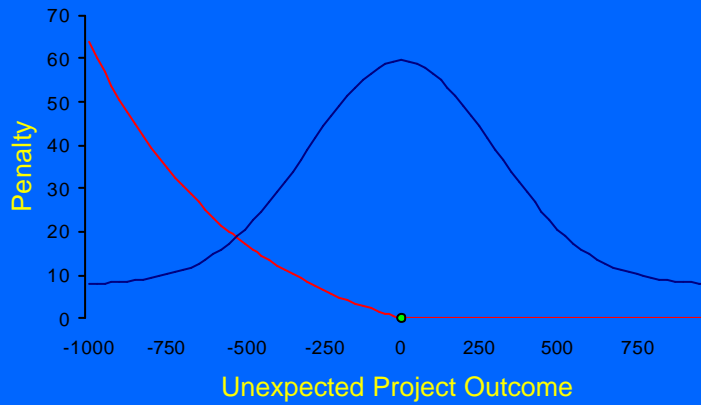
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Figure 4
Cost of Risk
(Hedged)



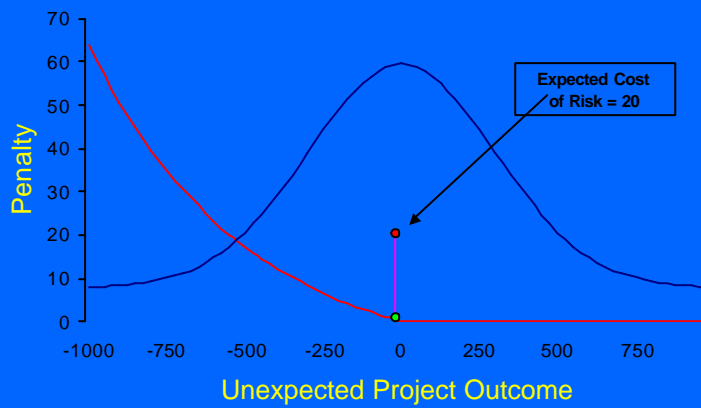
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Figure 5
Symmetric Distribution
(Normal)



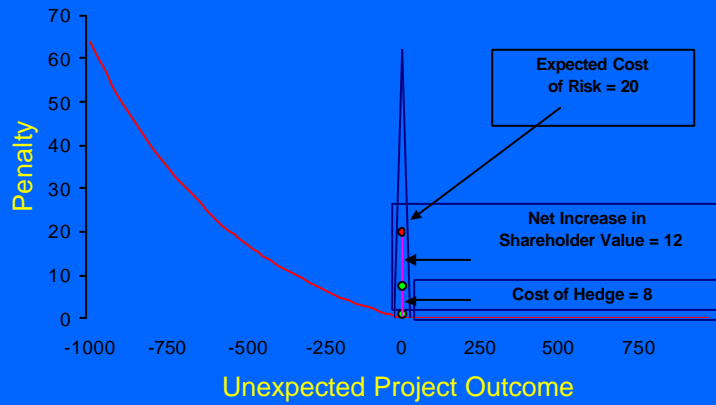
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Figure 6
Expected Cost of Risk



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Figure 7
Expected Cost of Risk
(Hedged)



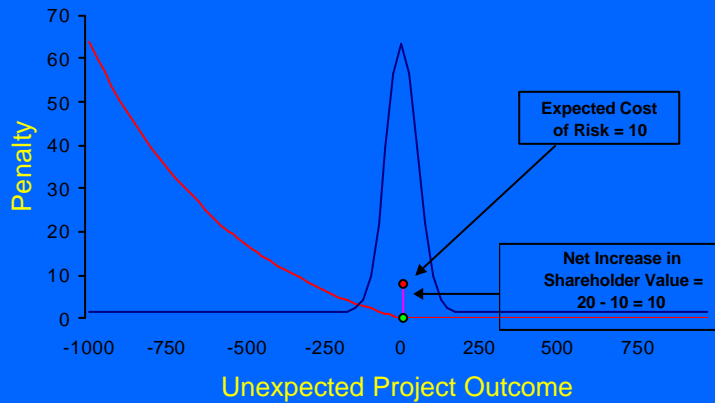
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Creating Value by Shorting the Market

- Some risk disposal is nearly free
 - Energy costs
 - Interest rate exposures
 - Equity exposures – β

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Figure 8
Expected Cost of Risk
(Reduced by Costless Hedging)



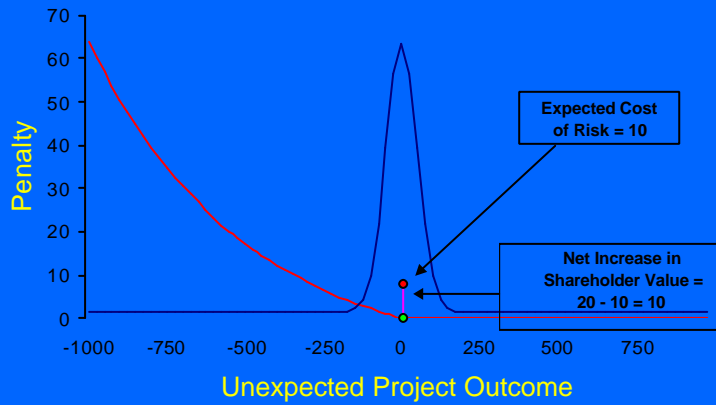
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Creating Value by Shorting the Market

- Most projects have positive correlation with the overall market, i.e., beta
- Beta \Rightarrow variance \Rightarrow wider distribution of outcomes
- So shorting the market reduces the variance implying a narrowing distribution of outcomes and increased shareholder value

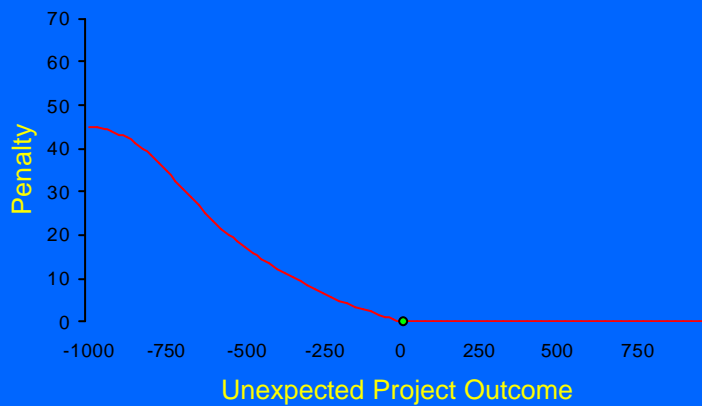
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Figure 8
Expected Cost of Risk
(Reduced by Hedging Beta)



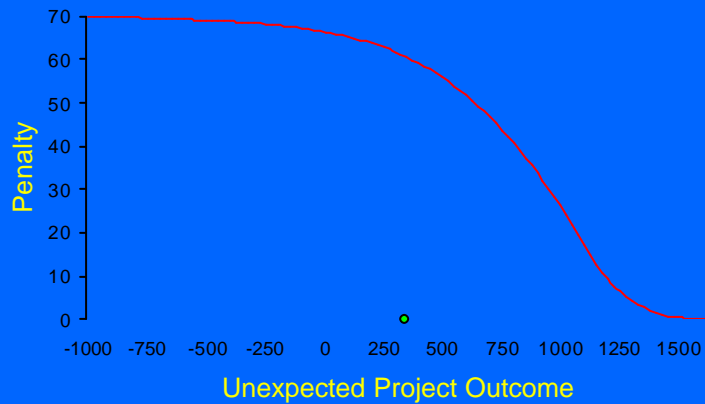
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Figure 9
Concave Zone
(\$ Millions)



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Figure 10
Concave Zone
(\$ Millions)



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Creating Value by Shorting the Market

- The Tepper-Black arbitrage implies:
 - Positive beta companies should adjust pension asset allocations to produce negative beta in the plan (i.e., short equity positions)
 - Rare negative beta companies should add beta on their balance sheets – not in their pension plans

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Creating Value by Shorting the Market

- Many DB plans should be net negative equity exposure.
- 25 years since Tepper and Black
 - Just gaining traction
 - Driven more by risk considerations than by taxes
- My approach, a radical outlier, today
 - but a theoretical argument for negative equity exposure may accelerate the trend toward equity reduction.

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