Eureka!

A Next Generation Retirement Plan Design

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June 20, 2017

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Retirement Plan Basics

Defined Benefit

- Assets are pooled to pay benefits for plan participants at retirement. There are not individual accounts for each participant. A trust is required.
- The benefit is defined as an annuity, and the contribution that is needed to fund the benefit is determined by the actuary.

Defined Contribution

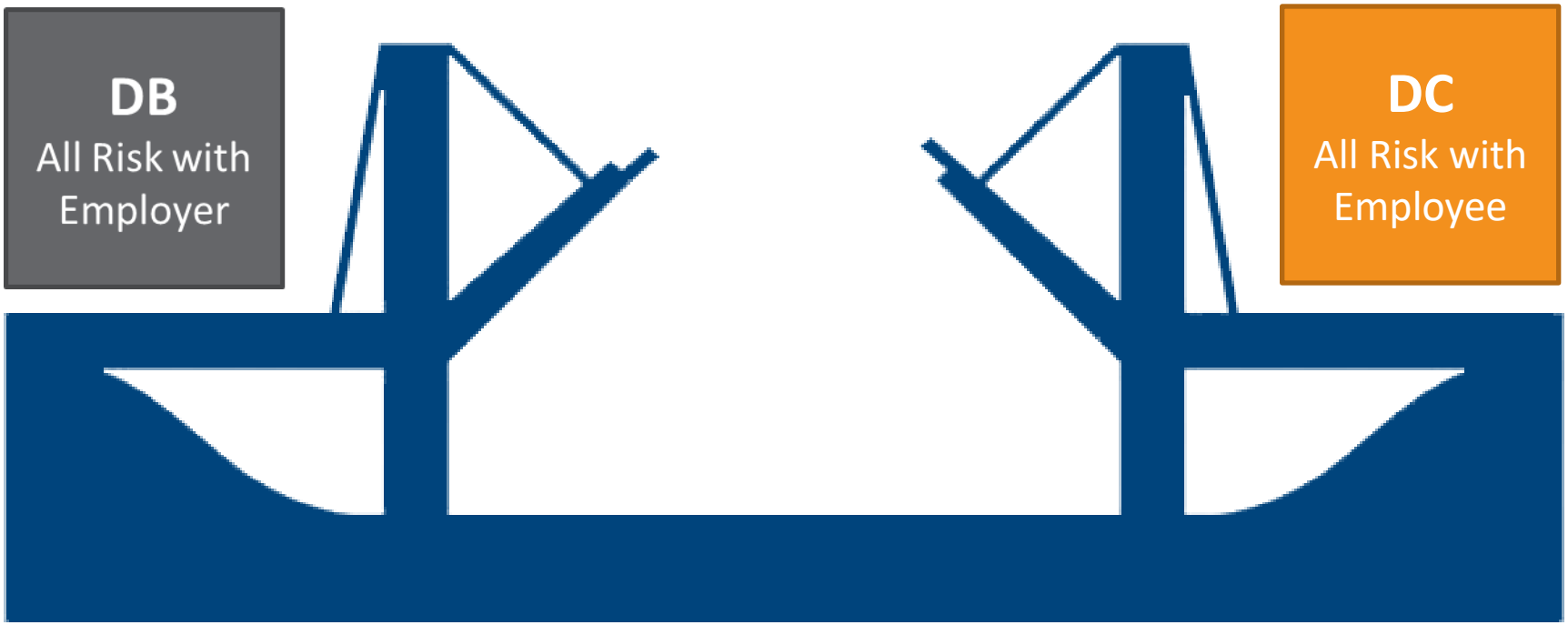
- The contribution is defined. Monies are deposited into separate individual accounts and the benefit grows to an underdetermined figure based on the account's results.
- Lump sum of account balance distributed at termination or retirement.

Plan Sponsor Pension Risk Management

Dynamic and Multi-faceted

Regulatory Risk	Funding rules changes, FASB, IFRS convergence, IRS, DOL, PBGC regulation changes
Operational Risk	Plan administration, plan compliance, fiduciary governance, strategic plan changes such as freeze or closing of plans, conversion to cash balance
Demographic Risk	Life expectancy increases, turnover, disability, popularity of plan design features such as lump sums
Interest Rate Risk	Inflation rate changes, changes in treasury yield curve shape, Risks posed by changes in spreads, yield curve shapes and resulting asset/liability mismatches
Market Risk	Equity volatility, credit risk, currency risk

Historically All-or-Nothing



Cash Balance Plan

DB
Market, Interest Risk

DC
Demographic Risk

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Does this Allocation Make Sense?

What is the Plan Sponsor's biggest fear?

A significant market correction that forces the employer to contribute significantly more unexpectedly

What is the Participant's biggest fear?

Outliving their money

So why would you implement a plan where both parties retain their biggest fears?

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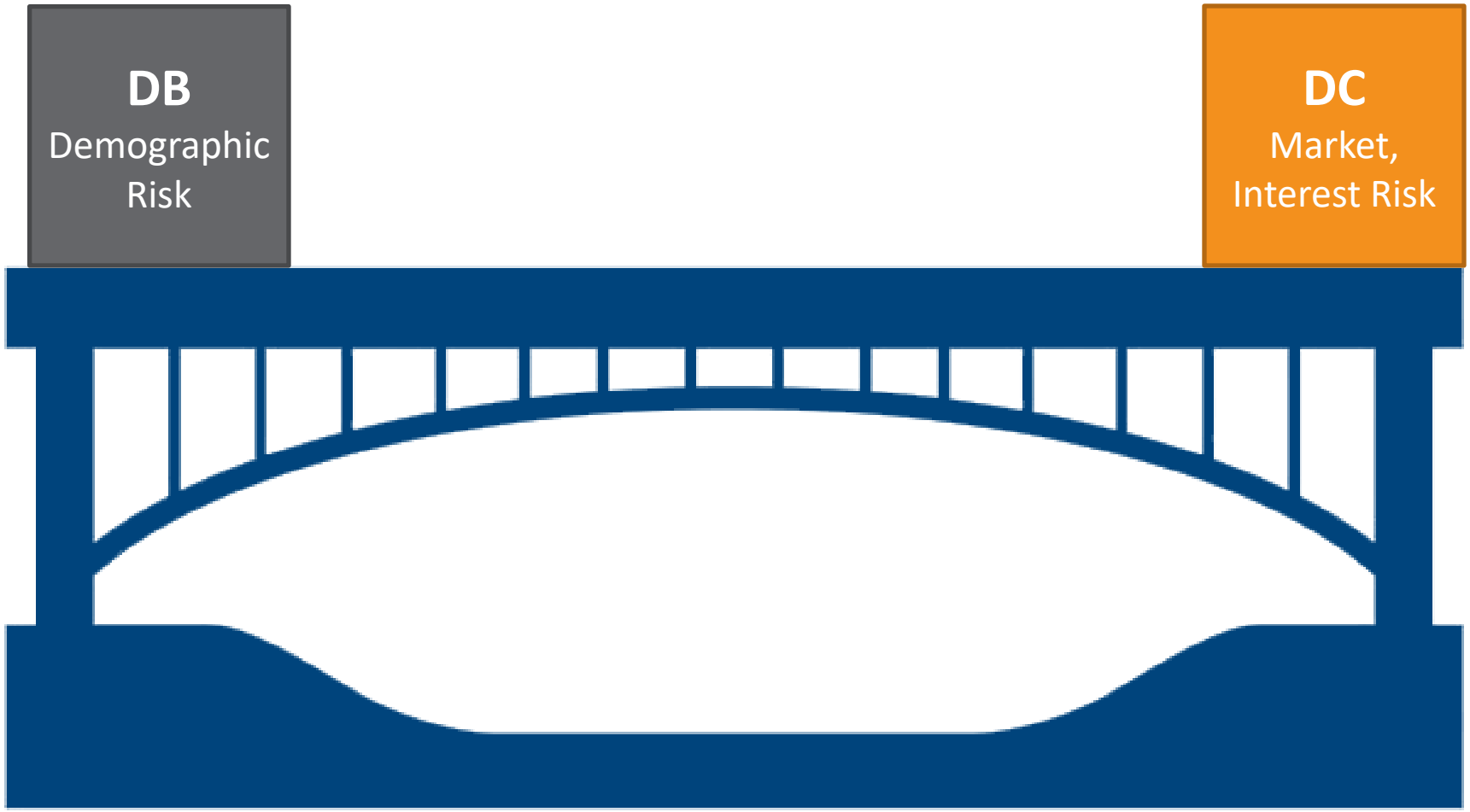
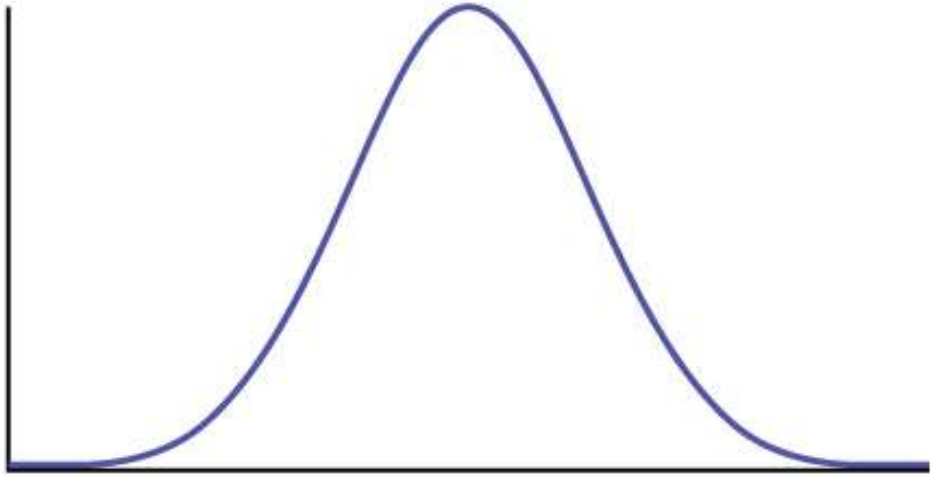
Variable Benefit Plan



Why is this Appropriate?

- Average life expectancy for a male age 65 is 22 years, but there is a high degree of variability at the individual level
- A pooled group (i.e. the plan sponsor), spreading risk over many lives, is far better equipped to handle this than a lone individual



Age at Death

- Market risk is accepted by participants in today's age
- Providing an annuity in a retirement plan produces an orderly turnover pattern
- A little cutback to every participant is more manageable than an employer coming up with millions in contributions in the middle of a recession

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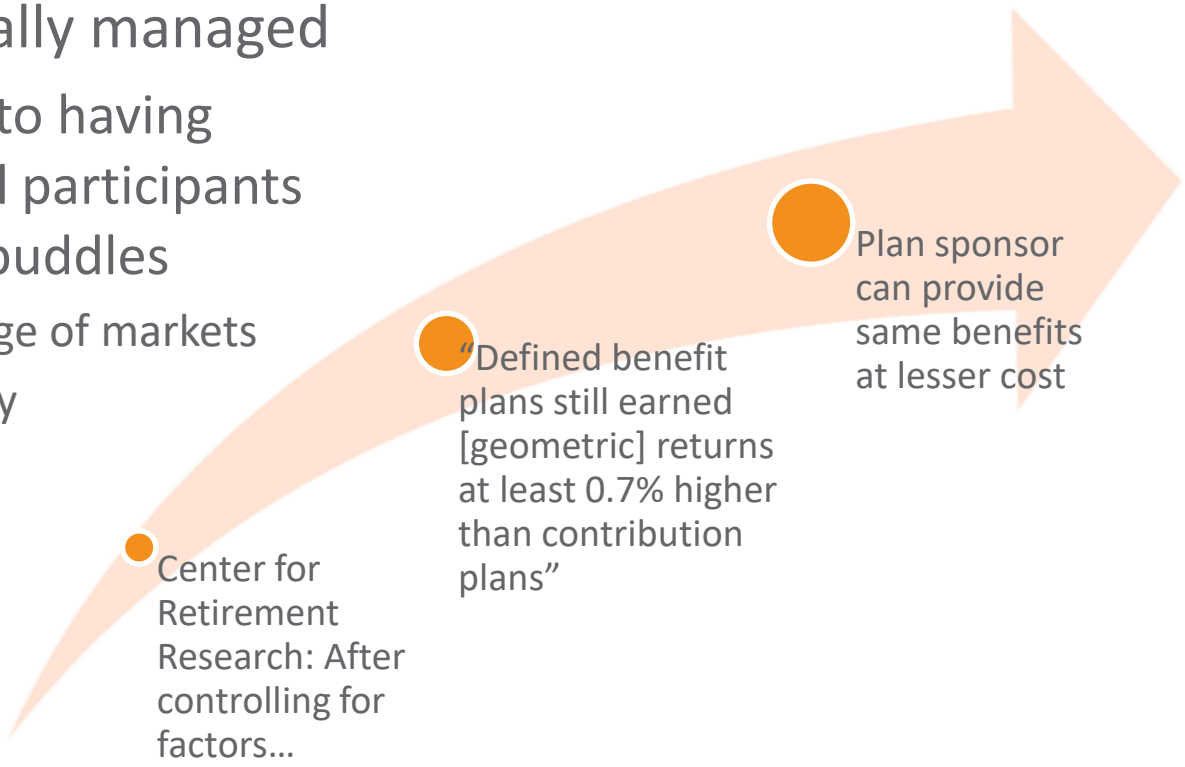
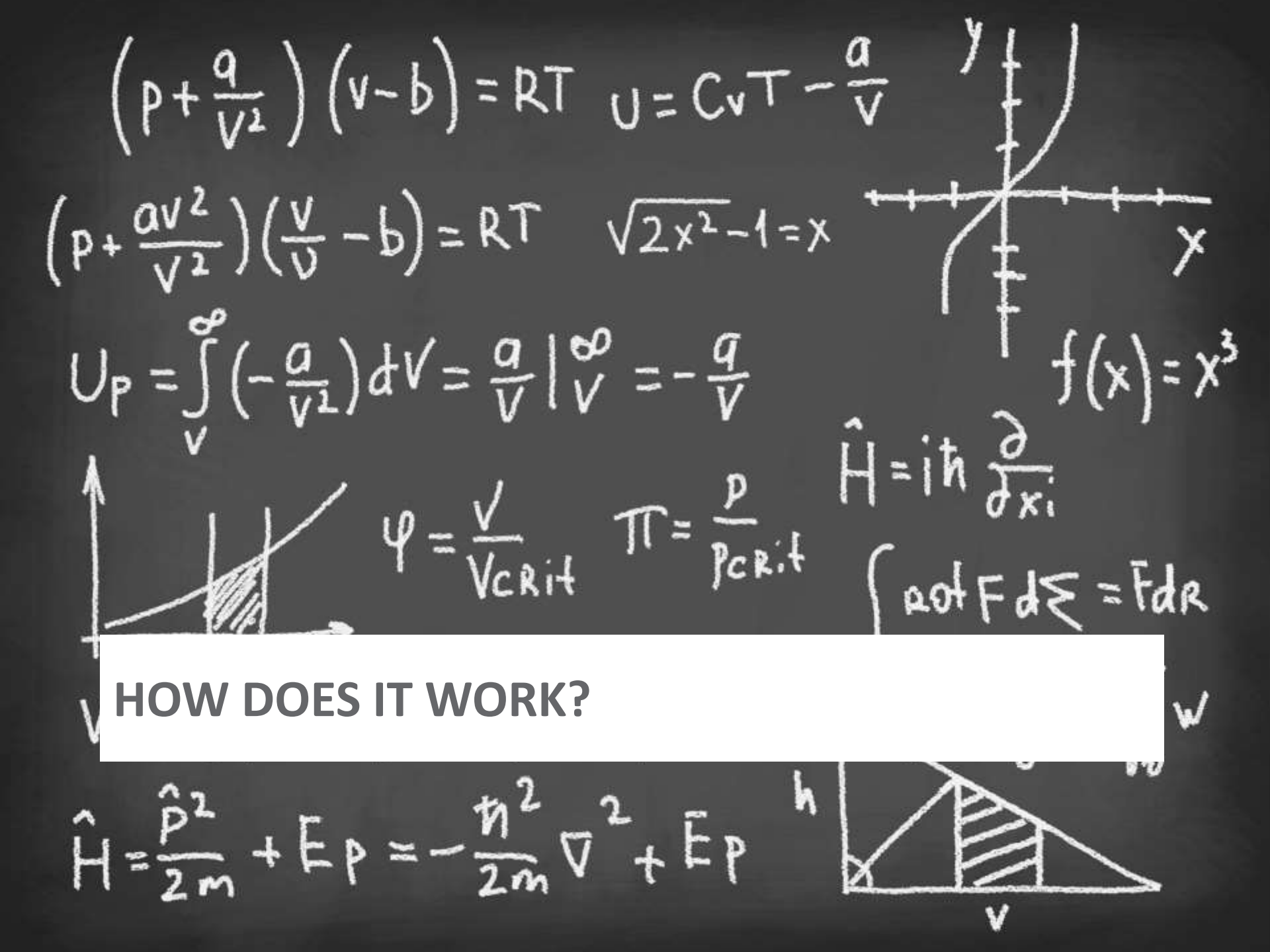
Efficiency in Design

- DB plans have one pool of assets that are professionally managed
  - Superior to having individual participants manage puddles
    - Knowledge of markets
    - Scalability



Munnell, Alicia H.; Aubry, Jean-Pierre; Crawford, Caroline V. Investment Returns: Defined Benefit Vs. Defined Contribution Plans, December 2015

HOW DOES IT WORK?



The Hurdle Rate

- A key driver in determining
  - Cost of plan
  - Richness of benefit

- The hurdle rate sets the bar to determine whether benefits get increased or decreased each year

The Accrued Benefit

The accrued benefit each year consists of two pieces

1. The adjusted prior year benefit

Adjusted to the current year, up or down based on the return earned in the trust versus the hurdle rate

2. The current year accrual

Usually a percent of current year pay, so plan benefits accumulate like a career-average pension plan or 401(k) plan

$AB_1 = [AB_0 \times (1 + \text{Return}) / (1 + \text{Hurdle Rate})] + \text{Accrual Rate}$

- If Return= Hurdle, no adjustment to accrued benefit
- If Return < Hurdle, benefit decreases
- If Return > Hurdle, benefit increases

Simple Example (Ignores the Accrual Rate)

$$AB_1 = [AB_0 \times (1 + \text{Return}) / (1 + \text{Hurdle Rate})]$$

Age	Benefit	Return	Hurdle Rate
45	$1,000.00	7%	5%
46	$1,019.05	3%	5%
47	$999.64	2%	5%
48	$971.08	11%	5%
49	$1,026.57	4%	5%
50	$1,016.79	18%	5%
51	$1,142.68	4%	5%
52	$1,131.79	8%	5%
53	$1,164.13	-2%	5%
54	$1,086.52	7%	5%
55	$1,107.22		

Example taken from "Variable Annuity Plans", James McHale, Session 502, 2015 Enrolled Actuaries Meeting

Assets = Present Value (PV)

Hurdle Rate = 5% and Discount Rate = 5%

Age	Benefit	PV	Assets	Funded Status	Return
45	$1,000.00	$6,017.12	$6,017.12	100%	7%
46	$1,019.05	$6,438.32	$6,438.32	100%	3%
47	$999.64	$6,631.47	$6,631.47	100%	2%
48	$971.08	$6,764.10	$6,764.10	100%	11%
49	$1,026.57	$7,508.15	$7,508.15	100%	4%
50	$1,016.79	$7,808.47	$7,808.47	100%	18%
51	$1,142.68	$9,214.00	$9,214.00	100%	4%
52	$1,131.79	$9,582.56	$9,582.56	100%	8%
53	$1,164.13	$10,349.16	$10,349.16	100%	-2%
54	$1,086.52	$10,142.18	$10,142.18	100%	7%
55	$1,107.22	$10,852.13	$10,852.13	100%	

Example with the Accrual Rate

Hurdle Rate = 6%
Accrual Rate is 1% of pay
$AB_1 = [AB_0 \times (1 + \text{Return}) / (1 + \text{Hurdle Rate})] + \text{Annual Accrual Rate}$

Age	Monthly Benefit	Asset Return	Annual Pay	Monthly Accrual Rate
50	$500.00	6%	$40,000	$33.33
51	$533.33	0%	$41,000	$34.17
52	$537.31	15%	$42,000	$35.00
53	$617.93	10%	$43,000	$35.83
54	$677.08			

Note the plan sponsor is only paying for the Accrual Rate, which is very predictable at 1% of pay. Other increases or decreases to the accrued benefit are impacted by the performance of the plan's assets.

Comparison to Other Plans

- Hypothetical participant hired at age 30 making $40,000 and retires at 65 with 3% pay raise each year
- Benefit accruals such that expected benefit at age 65 equals a 33% replacement ratio at retirement
  - 1% of Final Average Pay Traditional DB
  - 7% of compensation contributed to a DC plan
  - 1.15% of Current Year Pay as an annuity in Variable Benefit plan

Present Value at 6.5% of Employer Contributions over 35 year working career

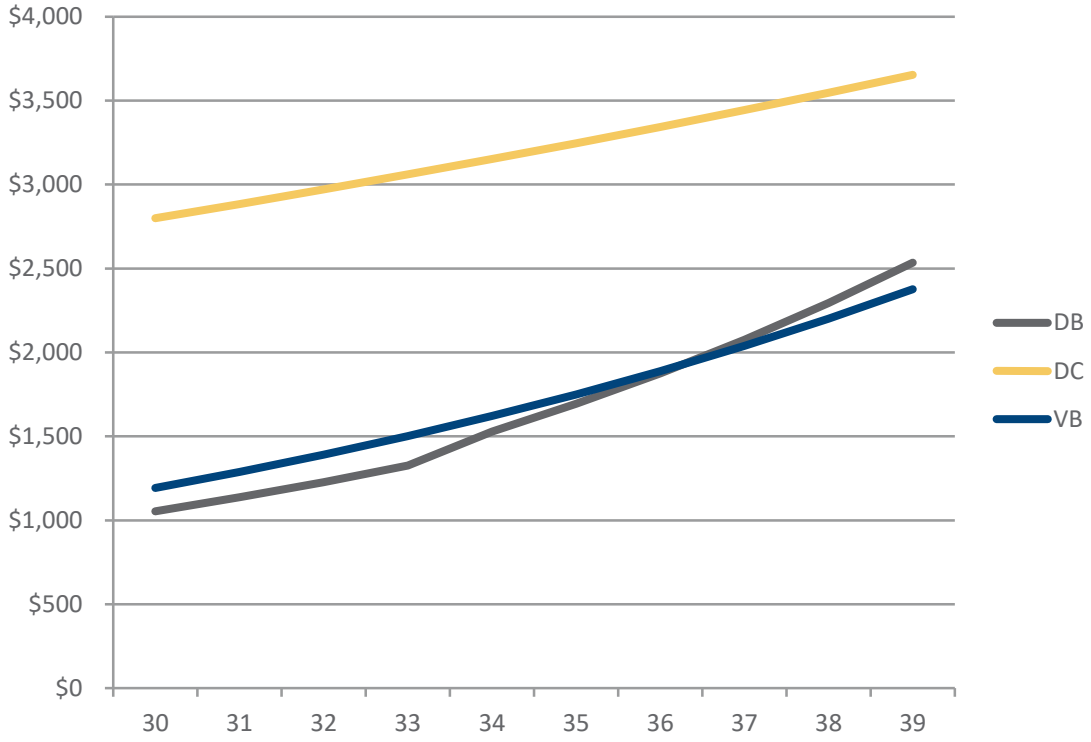
Plan Type:	DB	DC	VB
	$65,322	$55,160	$50,267

See Appendix on last page for assumptions used in analysis

Employer Contribution by Year

First Ten Years

- Variable Benefit similar to DB that both are much cheaper than DC plan in early years of employment
- Variable Benefit plan's accrual pattern much less steep than DB because not based on Final Average Pay, just current year pay (like DC plan)
- DC and VB designs not subject to investment risk so when assumptions are not met, still don't have wild fluctuations



	DB	DC	VB
10-Yr Total	$16,743	$32,099	$17,249

Stable Cost DB Plan Has Been Achieved!

- Two biggest sources of volatility in DB plans
  - Investment risk: Passed to participants
  - Interest rate: Eliminated
    - If discount rate equals expected rate of return, the effective “discount rate” is the hurdle rate as previously shown
    - the plan sponsor gets to choose and they dictate when (if ever) the hurdle rate changes

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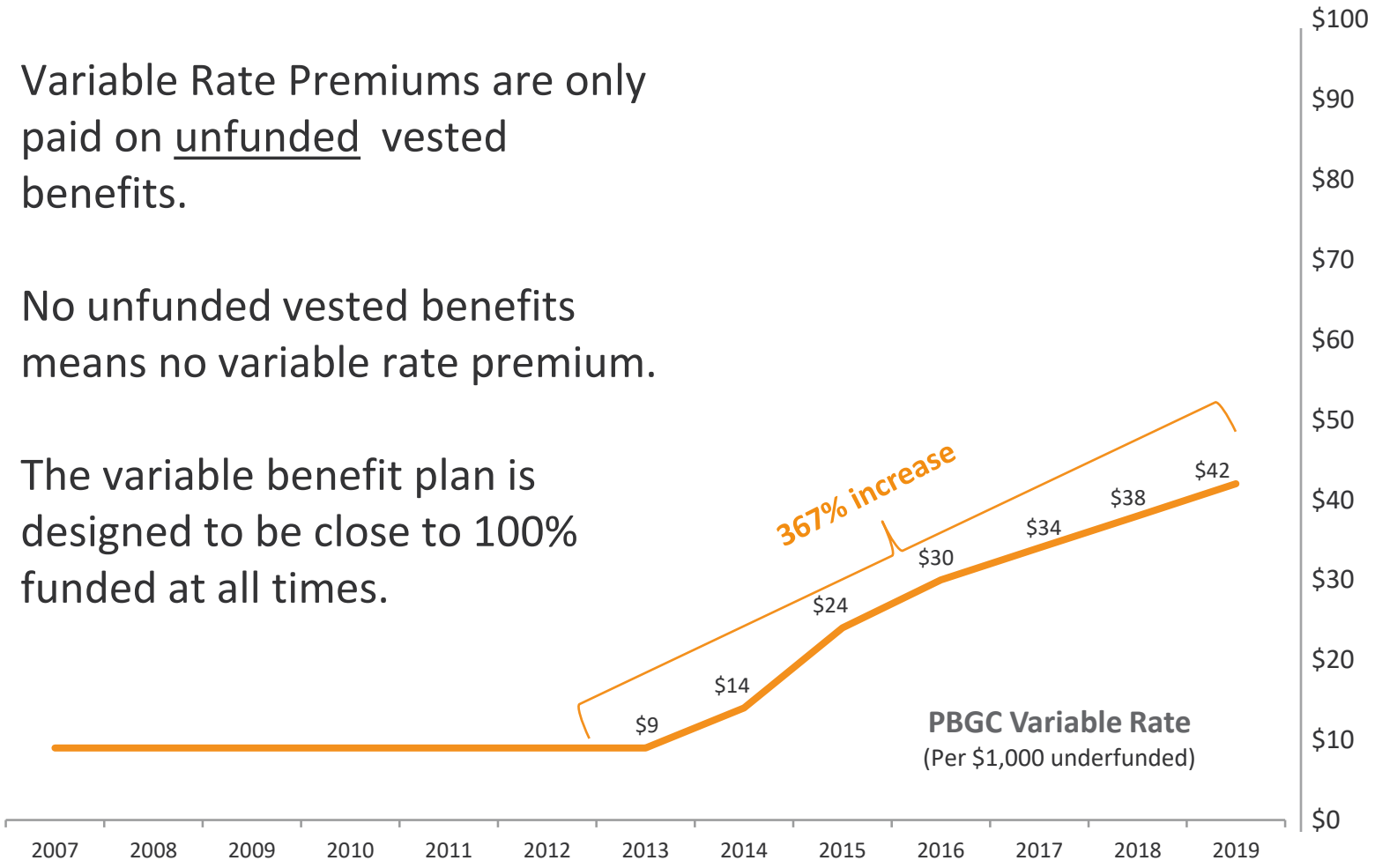
Regulatory Risk Management

Increasing PBGC Premiums

Variable Rate Premiums are only paid on unfunded vested benefits.

No unfunded vested benefits means no variable rate premium.

The variable benefit plan is designed to be close to 100% funded at all times.



Implementing Change

- For existing DB plans, moving to a variable benefit design can only be done prospectively
- Could keep the existing accrual pattern and employ the VB design to take the investment risk off the table
- Does require a well-worded plan document

Best of Both Worlds

Plan Challenges	DB	DC	VB
PBGC Variable Premiums?	Yes	No	No or minimal
Employer Investment Risk?	Yes	No	No
Interest Risk?	Yes	No	No
Employees Manage Money?	No	Yes	No
Employee Longevity Risk?	No	Yes	No
Volatile Funding Pattern?	Yes	No	No
Loss of purchasing power?	Yes	Maybe	No
Reward short service employees?	No	Yes	No
Leakage?	No	Yes	No

Questions?

Webinar recording will be available by Friday.

www.findleydavies.com and www.bpsm.com

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Appendix

DB Plan

- 1% times service times final 5-year average pay

DC Plan

- 7% of pay contributed each year
- 6.5% investment return each year during accumulation phase
- Account balance at 65 converted to an annuity at 5% interest rate and RP-2014/MP-2016 projected to 2040.

VB Plan

- 1.15% of pay payable as an annuity at age 65
  - Hurdle rate 5%
  - Investment return 7%