BETWEEN SCYLLA AND CHARYBDIS:

Improving the Cost Effectiveness of Defined Benefit Retirement Plans

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SPONSORS ARE UNDER PRESSURE TO SHIFT TO DC PLANS

The perception is that pension funding risks and costs are unmanageable, particularly at corporate plans – but public plans are beginning to feel this also

- Today's investment policy practices aren't effective at controlling pension funding risk
- Today's active management policy practices are inefficient
- Today's contribution practices can be improved
- Today's pension costs seem too high too high to be sustainable

As a result, defined benefit pension plans are in danger

- United Kingdom, Australian experience
- CIEBA survey of US corporate DB plans: mark-to-market makes DB plans risky!
- Many corporate sponsors have added DC plans
  - Shifting reliance from DB to DC

But the perception is not correct: We *do* have the tools to fix DB plan risks, and to design even better retirement plans

If we want to have meaningful retirement plans in the future, we have to be "on a mission" to adopt and use these new tools

WHAT'S WRONG WITH DC: THE U.S. CORPORATE PLAN EXPERIENCE

Flexible, yes

Transportable, yes

But they seldom if ever grow large balances by the time of retirement

- In US, $150,000 average balance; $44,000 median balance!
- This won't support much of lifestyle in retirement
- This would provide only a small augmentation of social security

However--they are fully funded! (Or are they?)

DC plans—as implemented today--aren't *really* retirement plans

But an increasingly large portion of the population is dependent on them!

DB PLANS HAVE MANY ADVANTAGES

The biggest advantage is the "insurance principle," offered on economically fair terms:

- Spread mortality risk across a large group through life annuitization
- Allows all to have lifetime protection at reduced cost
- Personal example: For DC, I need to fund for 105 year possible life
  - In DB, I only need 88 years because of the built-in annuitization!
  - Generally, DC plans have very costly annuitization, if any at all
- Result: A male age 65 retiree needs only 65% as much savings in a DB plan as in an unannuitized DC plan, for the same monthly draw

DB plans are successful in replacing some realistic part of income on retirement; DC plans generally are not:

- As implemented today
- Some countries do a little bit better: Australian example, for one
- And we can do better with DC, also; BGI is at the forefront in these efforts

Net result: DB provides a more meaningful retirement benefit than DC

FOUR KEY PENSION POLICIES CONTROL ALL COSTS

Actually, they control not just costs, but the total pension plan experience

1. Accounting and Reporting Policy
   - We have to tell ourselves the truth if we want to control costs
2. Benefit Policy
   - Once benefit policy is set, all costs are set and determined, the rest is just timing
3. Contribution Policy
   - You can pay sooner, or you can pay later, but you will pay for the present value of all benefits granted
4. Investment Policy
   - By far the weakest method of reducing costs

ACCOUNTING AND REPORTING POLICY
AN ECONOMIC (OR MARKET) VIEW OF THE LIABILITY IS ESSENTIAL

Actuarial view of the liability is expressed as if it were in dollars, but it's a different kind of dollar!

- "**Sasquatches**," because they use wrong discount rate
- The *units* are different than dollars, and so 100 dollars and 100 Sasquatches aren't the same amount

As a result, Sasquatches can't be directly compared to asset values, or be plotted on the same surplus efficient frontier graph

- Neither funding decisions nor investment policy decisions can be made correctly using Sasquatches!

An *economic* measure of the liability, by construction, is in genuine dollars, not in Sasquatches

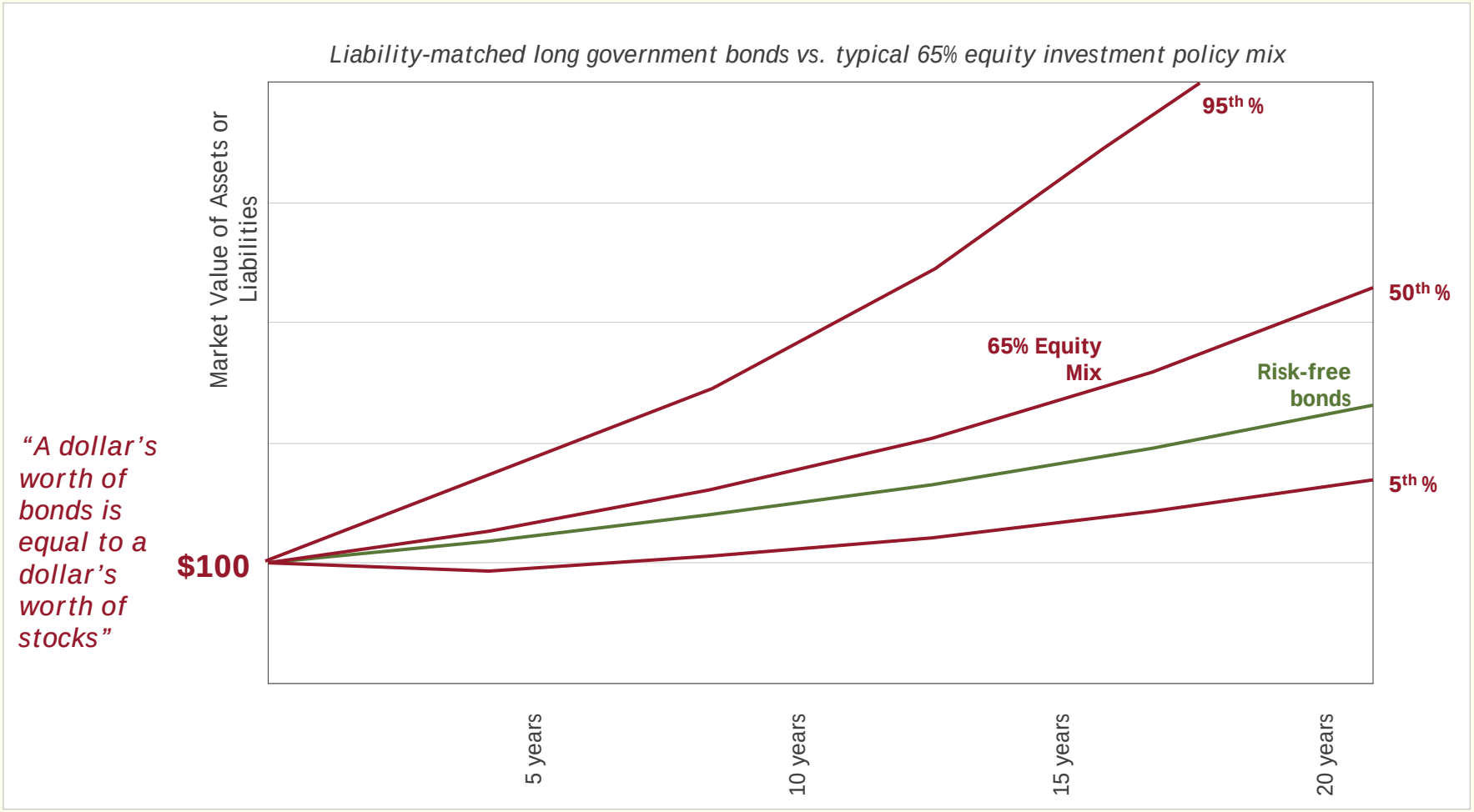
- So its value can be compared to assets to evaluate funding, and its returns and risks can be used in surplus optimization, making surplus optimization meaningful

Sasquatches violate the Law of One Price!

- A liability that appears to be fully funded based on a Sasquatch measure is in reality pushing today's contributions out to future generations
- And a liability measured in Sasquatches can't be hedged – what is the hedging asset? So risks will always be high to:
  a. manage the required funding each period, and to
  b. choose a sensible investment policy, only true measures of valuation will work over the long term

NORMAL VIEW OF RISK-RETURN EQUIVALENCE

The higher expected returns of equities don't make equities worth more than bonds, because equities have higher <u>risk</u> to their returns than do bonds



INVESTMENT POLICY CHOICES: The actual value of future stock returns is <u>probably</u> higher than future bond returns, but it <u>might be lower</u>, so the discount rate is also higher (in fact, it is the same as the expected return)

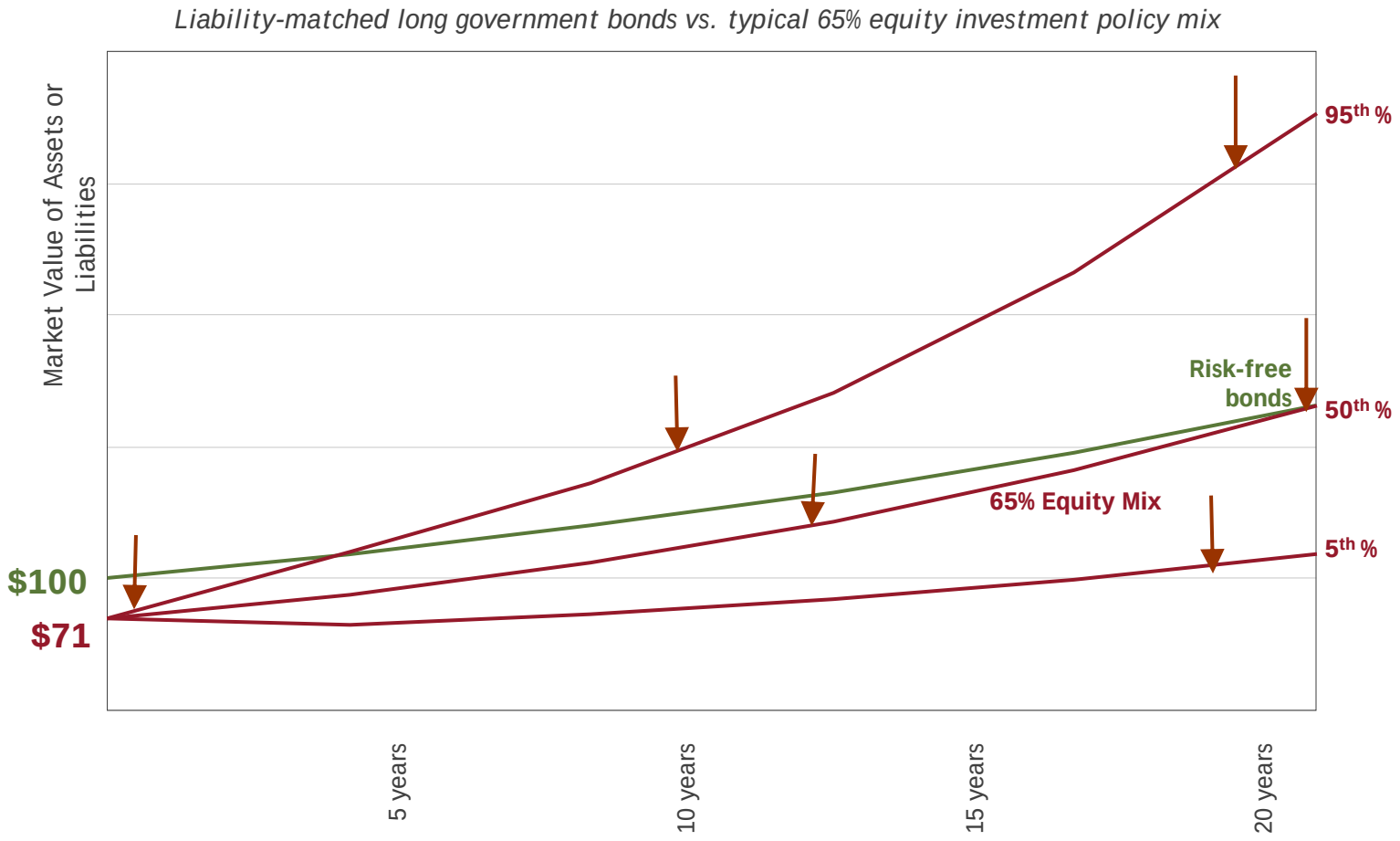
(I show no risk in the bond portfolio because a properly configured portfolio of long bonds and interest rate derivatives can match the liability through all interest rate changes; it is risk-free relative to the liability.)

TODAY'S PENSION ACCOUNTING VIEW OF RISK-RETURN EQUIVALENCE

"The higher expected returns of equities make equities worth more than bonds, so that we can increase the liability discount rate and reduce funding requirements"

The higher expected return of equities is presumed to occur, in advance, and without regard to the risk of the liability. This presumption is taken to mean that fewer asset dollars are needed to fund the liability.

However, when the mismatch between equity risk (high) and liability risk (low) is considered, the plan is underfunded.



Moral: Don't count your Sasquatches until they hatch!

THERE REALLY IS ONLY ONE CORRECT DISCOUNT RATE FOR DB

Example - One employee, retiring today, owed one payment of $100,000 due in ten years.

It is to be fully funded and secure.

Funding Alternatives:

1. Contribute $64,390; invest in 10 year government zero coupon bond at 4.5%

- As discount rates change, this obligation remains fully hedged--which is the same as to say that is remains fully funded at all times, with absolute assurance of security

2. Contribute $46,320; invest 75%-25% stocks-bonds with expected return/discount rate of 8%, standard deviation of 12%

- At end of 10 years, with good experience, fund will be ***more*** than $100,000
- But with below-expectations experience, it will be with ***less*** than $100,000. Perhaps *much* less.
- In that event, contribution levels will be going up to cover the shortfall, and/or benefits will be insecure, less than fully funded.

Still a non-believer?

Mental experiment: Set up a laddered portfolio of zero-coupon bonds, with payments coming due in each future year sufficient to pay for the forecast benefit payments in that year, for your own plan.

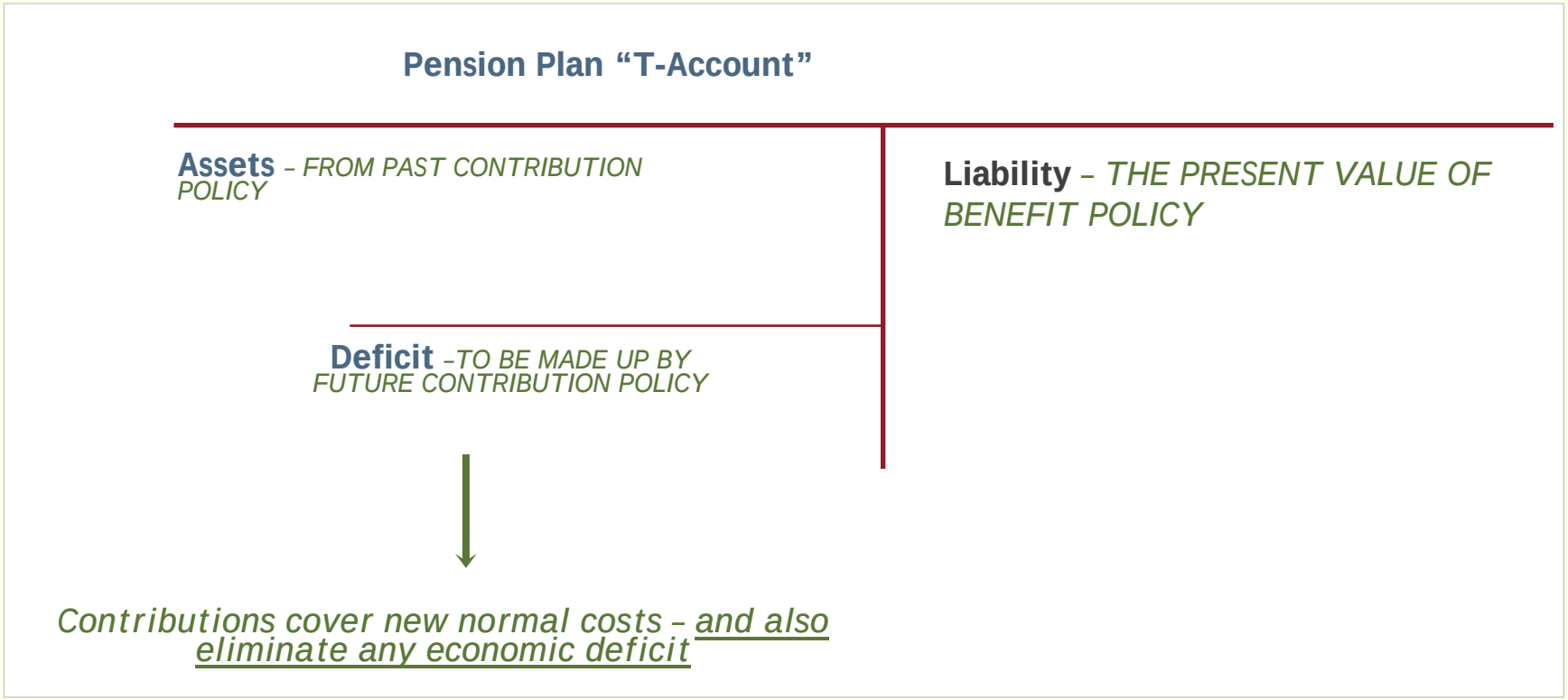
It will cost a good deal more than the present value taken at equity-like discount rates—as example 1 costs more up front than example 2

And the benefits will be securely funded, other than for non-hedgeable actuarial estimation errors.

"Hedging" and "benefit security" are two sides of the same coin, and this means that the right discount rate for a funded DB plan is the hedging rate: a risk-free, or government bond rate (with multiple long horizons)

FIXING DB PLANS: WHAT ARE THE CHOICES?

The "Three Levers" Discussion



How do you fix a big deficit and return a plan to fiscal soundness? It isn't easy:

- Powerful tools: Increasing the assets (substantially increased contributions) and/or decreasing the liabilities (moderating benefits)
- Weak tool: More aggressive investing trying to "get" higher expected returns

BETWEEN SCYLLA AND CHARYBDIS. . .

Getting to full economic funding, while avoiding legislative termination, DC plan conversion

The "tough love" plan of action for underfunded plans (I wish it was easier):

- ***Reporting policy:*** Announce a plan for regular decreases in discount rate, let's say .5% each year, until it gets to the long term government bond rate (take the tonic of increasing book liability in small, regular doses).
- ***Contribution policy:*** If your employee and employer contribution rate doesn't sum to 20% of payroll or better, push them up, keep them up until good funding level is restored.
  - Aggressive contribution rates beginning now can start a path towards recovery, if big enough
  - Insist that contribution calculations be done with long term treasury discount rate, moderate term for amortization (no more than ten years)
- ***Benefit Policy:*** Announce a joint labor and management effort to review existing benefit levels *using market data*
  - A move intended to pre-empt stronger legislative action, taken early by the parties with the most interest at stake; take it seriously
  - The Question to be answered: Can existing benefit levels really be afforded over the long term, by some combination of realistically obtainable employer and employee contributions that move the plan steadily to full economic funding? How big and costly should benefits be, and who should/will pay for them?

- This is obviously all very tough to do, and will require great leadership and courage
- ***There is some good news here: At least <u>there is a path</u> to an affordable DB plan that will be fiscally sound for generations***

Remember: "The worst DB plan is better than the best DC plan"

WHAT WILL DB PLAN *INVESTMENT* POLICIES LOOK LIKE IN THE FUTURE?

Assets will be hedged against interest rate changes, and unhedged in beta and alpha to some intentionally decided degree

Total return surplus optimization: A variation on a "two-fund theorem" problem

1. The Liability-Matching Asset, or "Hedging Portfolio:" Duration matching controls the interest rate mismatch between the assets and the liabilities, or "surplus duration"
   - Duration is a measure of how a financial asset or liability changes in value when interest rates change
   - Pension surpluses have dual durations: Inflation sensitivity and real interest rate sensitivity
   - Think of these net surplus durations as just "factor betas" for explaining surplus changes with rate changes

2. The "Risky Asset Portfolio:" Controlling "surplus beta," the net market risk exposure of the assets relative to the liabilities
   - Market risk is rewarded, but it is risky!
   - How much market risk do you want to take?
   - If good equity returns are realized, they can offset and reduce contributions—but only as they come in, and not in expectation!

3. Adding alpha through active management:
   - Manager structure optimization manages your active managers, tactical positioning, hedge funds, etc.
   - Rewarded if, and only if, skillful!

See Waring, et al, *Journal of Portfolio Management*, Summer 2004[1], Fall 2004[2], Spring 2000[3], Spring 2003[4]

THE ULTIMATE QUESTION THAT WE ARE ADDRESSING: *HOW DO WE TAKE CARE OF OUR RETIRED PEOPLE?*

Aging populations are too large to be supported by working populations

- Soon there may be as many as 9 retirees for each working person
- But we make a new observation: Each generation can pay for its own way, requiring no generation shifting
- It just requires our using what we know from financial economics, to solve the pension funding problem

The bottom line: DB plans need to be fully funded, on a meaningfully determined basis

- This will require courageous leadership and difficult decisions
- And DC plans need to work much better than they do today
- The current generation must pay for its own retirement needs

The same holds true for national social security plans

- Typically pay-as-you-go
- But probably need to move more to full funding to inhibit generational inequities and ultimate failure

It is unacceptable to fail; we'll all be old and need security, soon enough

THE FUTURE OF RETIREMENT BENEFIT DESIGN: DB AND DC

"Defined benefit" and "defined contribution" are limiting concepts

Real question: Just how generous and how risky should the promised retirement benefit be? (Ambachtsheer)

- Final pay; career average; annual purchase of annuity dollars; whatever?
- If there are risks, who will bear them?
- What will it cost, properly measured, and who will pay?

With today's understanding of economic valuation techniques, it is now possible to be completely flexible, designing plans that eliminate even forecasting risks, and to compare the true value and true cost of one type of plan against another

- We can accurately "cost out" any benefit design, comparing features and their costs
- And we can determine a contribution amount that pays for all of this year's accrual in this year, no deferrals to the next generation
- This assures security of benefits even if the population demographics shift

These observations apply to corporate retirement plans, public employee retirement plans, and social security-type safety nets for older people

In this manner, we assure that the current generation, as it retires, does not become a burden on the next generation

CONCLUSION: IF WE'RE GOING TO SAVE DB PLANS, THEY HAVE TO BE MORE COST EFFECTIVE!

Prescription: Use core teachings from modern portfolio theory to control true pension funding risks and costs in the DB plan

Costs can be managed if ***benefit policies*** are negotiated using *economic* measures of the liability, revising our ***accounting and reporting policies***

- If costs are controlled, then ***contribution policy*** will also be comfortable
- Shared responsibility between labor and management

Investment policy can help, but is weak

3 new tools will improve investment policy substantially:

- **The Risky Asset Portfolio:** Surplus efficient frontiers help manage equity, or market, risks
- **The Hedging Portfolio:** Dual duration management techniques manage both types of interest rate risks (real interest rate, and inflation)
- **Active management**, skillfully employed, can significantly improve surplus performance

DC plans are not a complete substitute for DB; but they can have an important role if designed well

- **It is imperative that we do a better job with DC plans going forward**

New benefit formulas may help control even difficult forecasting risks, sidestepping them

- **Avoid risks of unexpectedly high levels of final pay, etc.**

There are many challenges, but there is a future for DB plans

BIOGRAPHY

M. BARTON WARING

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Chief Investment Officer for Investment Policy & Strategy, *Emeritus*

Barton Waring ran BGI's Client Advisory Group from 1996 until his recent decision to retire. His research and published articles on investment policy and strategy issues have significantly contributed to the ability of today's investors to control their risks and enhance their returns, in both beta and alpha dimensions.

While most of his client work has been for BGI's "strategic" clients, the largest of the world's institutional investors (defined benefit retirement plans, foundations, endowments, social security systems, and central banks), it was also often directed at the needs of individuals in their personal and defined contribution retirement plan accounts. He has published over two dozen articles on surplus asset allocation, manager structure optimization and risk budgeting, as well as many on defined contribution/individual investor investment strategy. Five of these articles have won "outstanding article" awards from their respective journals, and these and many others are widely cited as setting today's standards of practice. He serves on the Editorial Advisory Boards for the Journal of Portfolio Management, the Financial Analysts Journal, and the Journal of Investing.

His background prior to BGI also dealt intensively with classical investment strategy and policy issues. He was the manager of the specialist investment strategy consulting firm Ibbotson Associates, co-leader of Towers Perrin's asset-liability practice and the head of its Central and Western regional asset consulting practices. He started and led the original defined contribution business for Morgan Stanley Asset Management in 1992, implementing the lifestyle fund concepts that he pioneered in 1989 and which he has written about frequently. Barton received his BS degree in economics from the University of Oregon, his JD degree from Lewis and Clark, with honors, and his masters degree in finance from Yale University.