



**Liability Driven
Investing:
Best Practice, Buzzword
or Baby with a Future?**

October 16, 2007

**Society of Actuaries 2007
Annual Meeting**

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Why the Interest in LDI?

- ◆ **Dramatic decline in funded ratios**
- ◆ **Proposed changes to accounting rules requiring assets & liabilities to use a market-related value**
- ◆ **Criticisms by proponents of financial economics of the traditional actuarial approach to valuing liabilities**
- ◆ **Consideration by actuarial profession**

About LDI Wikipedia Says

- ◆ **A buzzword**
- ◆ **An investment strategy based on risk tolerance, ethics and the target return**
- ◆ **The target return is no longer linked to any external asset index but to the liability of the fund**

BUT WILL OUR PANELISTS AGREE?

Current State of LDI Use: U.S.

- ◆ **Corporate and municipal plans are examining their asset-liability mismatch**
- ◆ **Professional bodies are considering introducing revised rules**
- ◆ **PBGC (in)solvency creates awareness of the risks and consequences**
- ◆ **There are plenty of opportunities for LDI but it has not been implemented widely**

Current State: Canada

- ◆ **MEPP and negotiated flat benefit plans that are concerned about solvency are adopting LDI**
- ◆ **Corporate plans are creeping toward implementation – much greater awareness than 5 years ago**
- ◆ **Revised accounting rules will likely provide a catalyst for adoption**

Liability-Driven Investing (LDI)

- ◆ **Primary purpose of investments is to support pension promise, i.e., to have sufficient assets to make the promised benefit payments as they come due**
- ◆ **Investment risk must *relate* to some measure(s) of the plan liabilities**
- ◆ **Asset mix policy *does not need to match liabilities*, but Sponsor/Trustees should *be aware of the mismatch risk* they are taking**

...Liability-Driven Investing (LDI)

- ◆ **Structuring plan investments based on an asset/liability perspective (using market value of liabilities) is commonly known as liability-driven investing (LDI)**
- ◆ **LDI is a framework to help understand the appropriate risks to incur in a portfolio**

Liability-Driven Investing Some Important Concepts

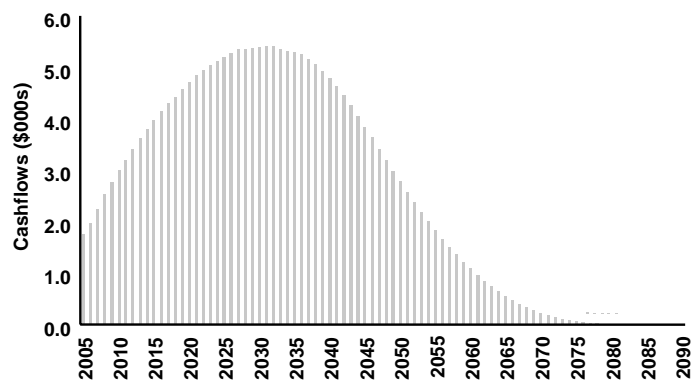
- ◆ **An “*obligation*” is a “real” or “nominal” cashflow expected in the future (e.g. a future benefit payment from a pension plan)**
- ◆ **A “*liability*” is a generic term for the present value of future obligations using a discount rate to price the obligation**

Liability-Driven Investing Some Important Concepts

- ◆ The “*market value of liabilities*” is the present value of future obligations priced using an appropriate current term structure of nominal and/or real interest rates
- ◆ For *dynamic* financial analysis, assets and liabilities must be priced in a consistent way. The dynamics of the market value of assets must be analyzed with the dynamics of the market value of liabilities

Framing the Investment Problem Accrued Pension Liabilities

- ◆ A stream of future benefit payment obligations typically extending for 80+ years

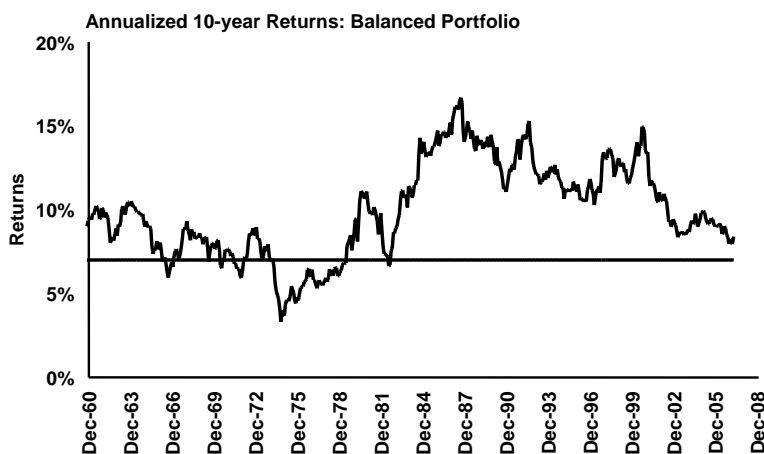


Framing the Investment Problem Typical Actuarial Valuation Balance Sheet



- ◆ In an actuarial valuation, many plans have used a flat discount rate (say 7%) to value their plan obligations
- ◆ Keeping the discount steady through time gives the impression that the investment objective is to earn 7% per annum

Framing the Investment Problem Historical Return Perspective



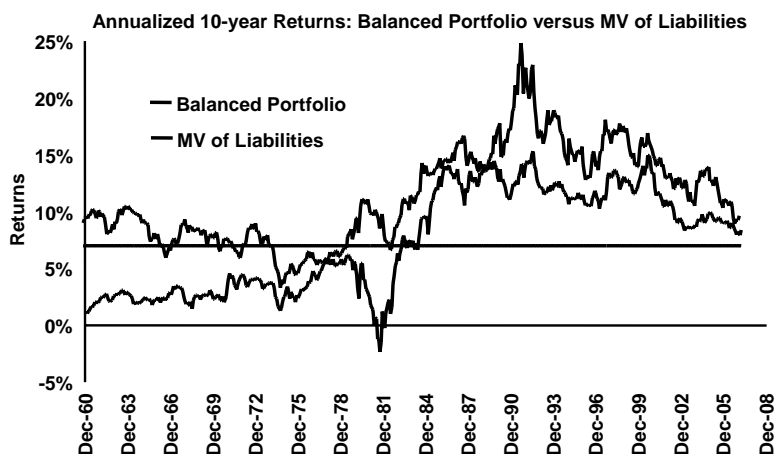
- ◆ From a historical perspective 7% looks reasonable

Framing the Investment Problem True “Dynamic” Picture



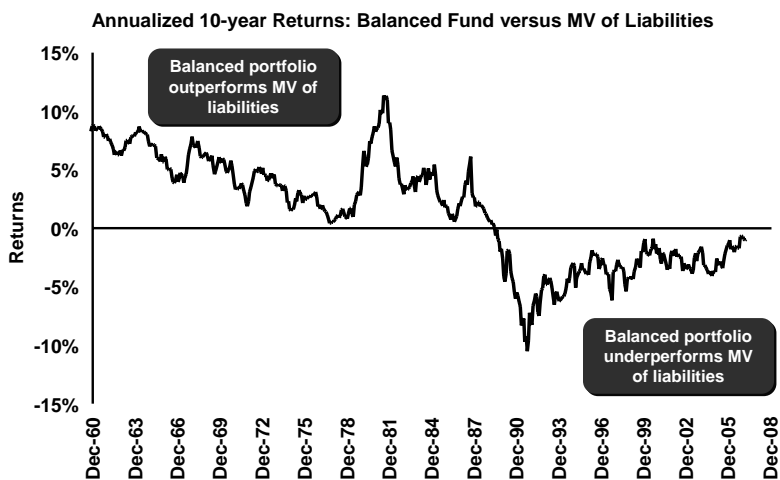
- ◆ Now let’s compare apples-to-apples
- ◆ Using a discount rate that reflects market conditions suggests the value of the liabilities is much higher and that a funding problem may exist
- ◆ The “market value” of the liabilities will grow like a combination of real/nominal bonds with same approximate term structure as the obligations

Framing the Investment Problem Historical Return Perspective

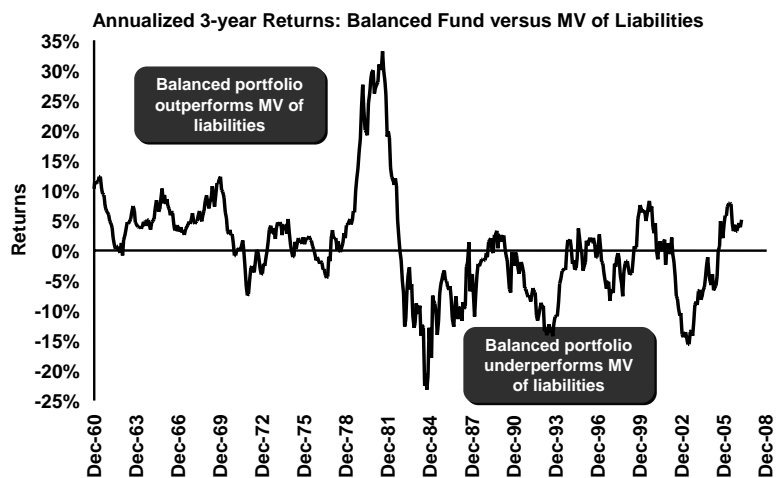


- ◆ Using market interest rates to discount the plan obligations, the market value of the liabilities is much more volatile

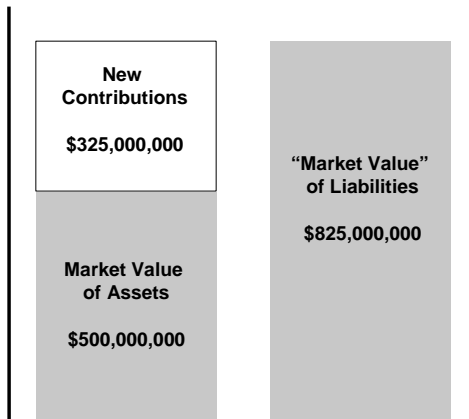
Framing the Investment Problem Historical Return Perspective



Framing the Investment Problem Historical Return Perspective



Framing the Investment Problem Reconciling the Two Balance Sheets



◆ In order to reconcile the MV of Assets and MV of Liabilities, there are three choices:

- increase funding

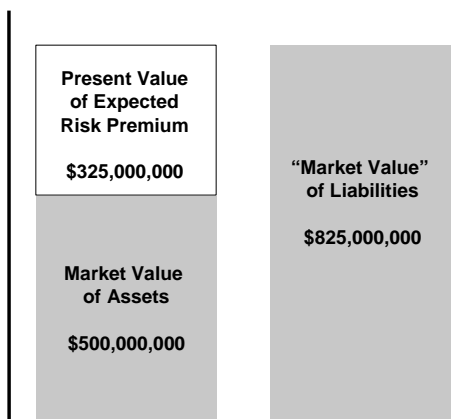
Framing the Investment Problem Reconciling the Two Balance Sheets



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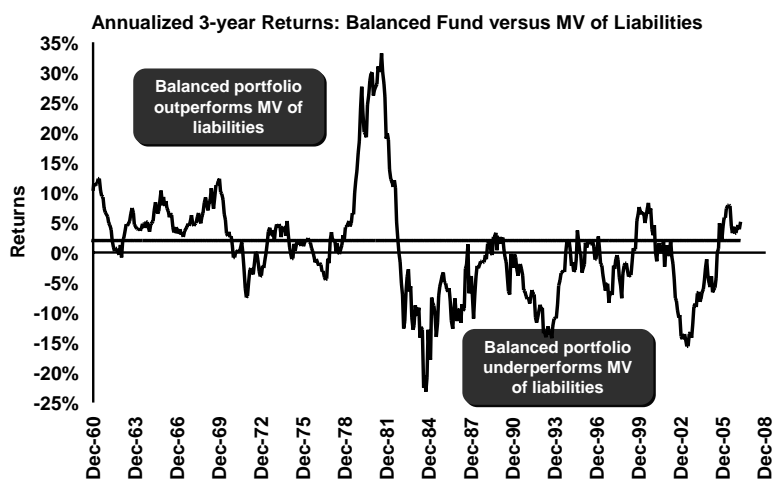
- increase funding
- decrease benefits

Framing the Investment Problem Reconciling the Two Balance Sheets



- ◆ In order to reconcile the MV of Assets and MV of Liabilities, there are three choices:
 - increase funding
 - decrease benefits
 - generate higher returns vs MV of liabilities
- ◆ Typically, the latter approach is desired and, in this example, the assets must grow 2.8% per annum more than the MV of liabilities over the life of the obligations (7.0% less 4.2% = 2.8%)
- ◆ Is this reasonable?

Framing the Investment Problem Historical Return Perspective



Framing the Investment Problem Using Market Value Analysis



	Asset Only	Asset/Liability
Return objective	7%	Change in market value of liabilities + 2.8%
Risk measure	Return volatility	Volatility of difference between market values of assets & liabilities
Minimum Risk Portfolio (MRP)	100% cash	Liability-matched bond portfolio
Outcome if return objective is achieved	Uncertain (plan funded position may improve or worsen)	Plan funded position improves (on market basis)
Outcome if MRP held	Uncertain (plan funded position may improve or worsen)	Plan funded position remains constant (on market basis)

Some Myths About LDI

- ◆ **LDI is an investment strategy**
- ◆ **A going concern plan can match the investment risks of their liabilities with assets**
- ◆ **LDI means “buy long bonds”**

Some Myths About LDI

LDI is an Investment Strategy

◆ LDI is *not* an investment strategy

- it is an *investment process* for developing and monitoring the investment policy against liabilities
- the resulting investment strategy is not constrained by the liabilities
- it is the ability and willingness of the plan to take risk (the “risk budget”) relative to plan specific liabilities that constrains and defines the investment strategy
- a 100% emerging market equity strategy is an LDI strategy if the policy was consciously developed and is being monitored relative to some measure(s) of liability

Some Myths About LDI

Going Concern Plans Can Match Assets and Liabilities

- ◆ A dedicated bond portfolio typically cannot match the obligations perfectly given the lack of very long bond assets globally and a relatively small supply of long real return bonds
 - ◆ Going concern plans have multiple measures of the plan obligations
 - regulatory tests focus on accrued obligations
 - going concern plans have future obligations and contributions to consider as well
- ⇒ there is not one single measure to match

Some Myths About LDI

LDI Means Buy Long Bonds

- ◆ **LDI is an investment process not a strategy**
- ◆ **Plans with little or no ability or willingness to take investment risk in an LDI framework may choose to buy long bonds**
- ◆ **LDI itself does not restrict the asset universe. Risk budgets do**
- ◆ **Many plans have promised indexing of benefits to inflation. For plans like these long *nominal* bonds can actually offer significant funding risks if inflation is higher than expected**

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- ◆ **Many plans have promised indexing of benefits to inflation. For plans like these long *nominal* bonds can actually offer significant funding risks if inflation is higher than expected**
- ◆ **LDI means understanding the investment risks relative to the liabilities**

Best Practices

Steps in LDI Portfolio Construction Process

- 1. Determine appropriate definition of plan obligations (e.g. accrued vs. accrued + future, wind-up vs. going concern funding vs. accounting)**
- 2. Obtain expected obligation amounts and timing (i.e., expected benefit, expense and contribution cashflows) from plan actuary**
- 3. Discount cashflows using government spot rates to determine market value of liabilities (liability benchmark)**
- 4. Develop an MRP (Minimum Risk Portfolio) that matches the investment characteristics of the liability benchmark as closely as possible**

Best Practices

Steps in LDI Portfolio Construction Process (cont'd)

- 5. Increase expected return by adding investment risk to MRP based on Sponsor's/Trustees' investment beliefs/risk budget**
 - interest rate risk**
 - credit risk**
 - illiquidity risk**
 - equity risk**
 - currency risk**
- 6. Monitor performance of portfolio relative to liability benchmark**

What Do Sponsors/Trustees Need to Consider? Investment Options

◆ Option #1: Minimize mismatch risk

- **construct a fixed income portfolio that delivers promised cashflows as closely as possible**
 - 100% government bonds (i.e., no default risk)
 - will meet benefit obligations with high degree of certainty, but
 - low expected return

What Do Sponsors/Trustees Need to Consider? Investment Options (cont'd)

◆ Option #2: Take on mismatch risk to try to earn higher return

- **add interest rate risk, credit risk, illiquidity risk, equity risk and/or currency risk**
- **higher *expected* returns (i.e., may be able to deliver promised cashflows with less \$ today), but**
- **higher risk that benefit obligations may not be met (i.e., higher return may not materialize)**

What Do Sponsors/Trustees Need to Consider? How Much Risk?

- ◆ Depends on ability and willingness to take risk
 - “ability” to take risk
 - funded status
 - ability to raise contributions
 - ability to reduce benefits
 - willingness to take risk
 - general attitude towards risk
 - strength of risk beliefs
 - willingness to deliver bad news to members and/or Board

What Do Sponsors/Trustees Need to Consider? How Much Risk?

- ◆ Many plans actually have very little *ability* to take investment risk
 - little or no economic surplus
 - limited ability and/or willingness to raise contributions
 - ⇒ if risks don't pay off benefits will be cut in some way

Investment Monitoring

- ◆ Probably the most important part of LDI
- ◆ Monitor investment performance against the market value of liabilities (irrespective of investment strategy employed)
- ◆ This monitoring framework distinguishes absolute investment returns earned from changing risk free return expectations and from taking investment risks

Sample Performance Results

As of December 31, 2006

	Three Months (%)	One Year (%)	Two Years (%)	Three Years (%)	Since Inception (%)
<u>Market Value Analysis</u>					
Fixed Income Portfolio	11.74	7.91	14.92	12.31	12.85
Equity Portfolio	7.34	14.64	19.48	19.23	n.a.
Total Portfolio	11.38	8.47	15.32	12.86	12.96
<u>Present Value Analysis *</u>					
Liability Benchmark	10.82	6.76	14.42	11.67	12.43
MV Accrued	9.18	6.23	12.24	9.37	n.a.
MV Accrued + Future ⁺	17.68	8.88	22.83	15.23	n.a.

- ◆ This client's mandate is to minimize interest rate risk. Credit risk exposure has increased significantly in the past 3 years

[†]Valued using the Government of Canada coupon curve

⁺Allows for future accruals and expected contributions over the next 15 years

Other Implementation Issues

- ◆ **Communicating with plan actuary re investment policy, funding policy and cash flow projections**
- ◆ **Use of interest rate swaps**
- ◆ **Portable alpha as a part of LDI**

Other Considerations

- ◆ **Future changes in reporting and accounting requirements**
- ◆ **LDI is not a buzzword for ALM**
- ◆ **LDI experience outside North America**

LDI is Not a Buzzword for ALM

- ◆ **LDI is a process for constructing pension plan asset portfolios in consideration of plan liabilities**
- ◆ **ALM is a tool that may assist Sponsors/Trustees in making decisions in that process**
- ◆ **ALM studies involve stochastically projecting the evolution of plan assets and liabilities over a target time horizon and comparing results for various asset mixes**

...LDI is Not a Buzzword for ALM

- ◆ **ALM studies may be useful in LDI portfolio development, but**
 - **Economic assumptions for liabilities must be market related (e.g., liability discount rate based on market bond yields)**
 - **Bonds and liabilities must be modeled in a consistent manner (e.g., both react similarly to a given change in interest rates)**
 - **Best used for big questions:**
 - **Allocation to equities**
 - **Broad bond portfolio duration**

Summary

- ◆ **LDI provides a framework to understand**
 - the investment risks the plan is taking, and
 - whether and how to take on new/different investment risks
- ◆ **LDI can lead to a swap/portable alpha structure, an active balanced portfolio structure or a minimum risk passive bond structure**
- ◆ **There is no one solution - every plan is unique**
- ◆ **LDI is here, growing and possibly accelerating**