

# Module 22: PM for Institutional Investors

## 22.1: Overview of Institutional Investors

Common characteristics.

- size
- long-term investment horizon
- Regulatory framework.
- Governance framework
- Principal - agent issues

## 22.5: IPS of institutional investors

IPS should include:

- mission & investment objectives
- discussion of investment horizon & liabilities that need to be paid
- external constraints (e.g. legal, regulatory, tax & accounting)
- asset allocation policy
- rebalancing policy
- reporting requirements

Model	Description
Norway's sovereign wealth fund	<p><i>Asset allocation:</i></p> <ul style="list-style-type: none"> <li>■ Passively managed allocation to public equities and bonds (with traditional 60% equity/40% bonds base case allocation)</li> <li>■ Little or no exposure to alternative assets</li> <li>■ Tight tracking error limits</li> </ul> <p><i>Advantages:</i></p> <ul style="list-style-type: none"> <li>■ Low costs and fees</li> <li>■ Easy for board to comprehend</li> </ul> <p><i>Disadvantages:</i></p> <ul style="list-style-type: none"> <li>■ No opportunity for outperformance of markets</li> </ul>
Yale University endowment	<p><i>Asset allocation:</i></p> <ul style="list-style-type: none"> <li>■ High allocation to alternatives</li> <li>■ Significant active management</li> <li>■ Externally managed assets</li> </ul> <p><i>Advantages:</i></p> <ul style="list-style-type: none"> <li>■ Potential for outperformance of markets</li> </ul> <p><i>Disadvantages:</i></p> <ul style="list-style-type: none"> <li>■ Difficult for small institutions without expertise in alternatives</li> <li>■ May also be difficult for large managers due to capacity issues of external managers</li> <li>■ High fees/costs</li> </ul>
Canada Pension Plan	<p><i>Asset allocation:</i></p> <ul style="list-style-type: none"> <li>■ High allocation to alternatives</li> <li>■ Significant active management</li> <li>■ Internally managed assets</li> <li>■ Uses a reference portfolio of passive public assets as benchmark that can be easily understood/communicated</li> </ul> <p><i>Advantages:</i></p> <ul style="list-style-type: none"> <li>■ Potential for outperformance of markets and development of internal capabilities</li> </ul> <p><i>Disadvantages:</i></p> <ul style="list-style-type: none"> <li>■ Potentially expensive and difficult to manage</li> </ul>
Liability driven	<p><i>Asset allocation:</i></p> <ul style="list-style-type: none"> <li>■ Focus is on maximizing expected surplus (assets – liabilities) return and managing surplus volatility</li> </ul> <p><i>Advantages:</i></p> <ul style="list-style-type: none"> <li>■ Explicitly recognizes liabilities as part of investment process</li> </ul> <p><i>Disadvantages:</i></p> <ul style="list-style-type: none"> <li>■ Certain risks of liabilities (e.g., longevity) are difficult to hedge</li> </ul>



### MODULE QUIZ 22.1

1. Eris Private Wealth, Inc., (EPW) provides investment advice to high-net-worth individuals. After a recent merger, EPW acquired some institutional clients. The board of EPW has asked the post-merger management team to prepare a report detailing the key differences between institutional clients and individual clients. The report makes the following two statements:

Statement 1: It is likely that the different scale of institutional clients versus individual clients will narrow the available investment universe.

Statement 2: The governance structure of institutional clients is likely to be more formal than the governance structure of the investment account of an individual client.

How many of the post-merger management team's statements are correct?

A. Only one statement is correct.

B. Neither statement is correct.

C. Both statements are correct.

2. The board of the SJT Foundation has specified the following objectives:

- Make an aggressive allocation to alternative investments in order to diversify and hedge against long-term inflation risk.
- Outsource investment management to external managers due to the lack of experience by internal investment staff in investing in alternative investments.
- Pursue actively managed strategies to generate long-term outperformance of benchmarks.

The investment approach *most likely* to meet these objectives is:

A. the Canada Pension Plan model.

B. the Yale University endowment model.

C. the Norway sovereign wealth fund model.

1. C  
2. B

## Module 22.2: Pension Funds.

2 major types : defined benefits (DB) & defined contribution (DC)

	DB	DC
Benefits	usually dependent on FINAL SALARY	usually dependent on PERFORMANCE OF INV. T.
Payment	Creates liability for sponsor	no liability for sponsor
Contributions	Primarily by <b>EMPLOYER</b>	Primarily by <b>EMPLOYEE</b>
Investment decision-making	Pension fund (sponsor & investment staff)	Sponsor provides suite of available investment funds Employee decides asset alloc
Investment risk	Faced by <u>SPONSOR</u>	Faced by <u>BENEFICIARY</u>
Mortality / longevity risk	Pooled @ the fund lv.	Employee bears it

### DB Pension Plan

**Stakeholders** : Plan sponsors (Employers), Plan beneficiaries (employees & retirees), investment staff, government & shareholders in the corporate employer

## Liabilities of Investment Horizon:

$$\text{funded ratio} = \frac{\text{fair value of plan assets}}{\text{PV of DB obligations}}$$

Plan beneficiaries can be split into active lives (those still employed & earning benefits) & retired lives (those receiving payments)

higher % of retired lives in the plan  
↔

shorter investment horizon of the plan  
(lower risk tolerance)

## Risk Considerations:

- plan funded status (higher funded status usually increases ability to take on risk but if the plan is in surplus & the sponsor wants to remain in surplus to minimize contribution to the plan, LDI might be more appropriate)
- Sponsor financial status (sponsor's debt ratio & profitability will impact risk tolerance / ability to make contributions)
- size of plan compared to sponsor
- Common risk exposure (the lower the correlation is b/w the plan returns & sponsor operating results, the higher the risk tolerance is)
- Provision of early retirement
- Workforce characteristics

#### EXAMPLE: Viewpoint Research Corporation (defined benefit plan)

Viewpoint Research is a leading U.K. producer of polling and survey-based market research. Viewpoint is a relatively new company that has taken advantage of new online methods of collecting research data. Viewpoint's costs are largely related to wages and technological support in the U.K., while revenues are generated from clients across Europe. Five years ago, the company introduced a DB pension plan. All participants of the plan are currently either still working for the company or have left the company for alternative employment. The plan currently has a small deficit. While similar plans often offer early retirement and lump-sum distributions as options to plan participants, Viewpoint's plan does not offer such options.

The company has seen rapid growth in earnings over the previous year, with return on equity being higher than the industry average. The company employs significant leverage, with a debt-to-assets ratio 50% higher than that of established industry competitors.

Based solely on the information provided, discuss two factors that increase the plan's ability to take risk and two factors that decrease the plan's ability to take risk.

2 factors that increase ability to take risk :

- 0 retired lives (liabilities have long duration & has time to recover from short-term losses)
- does not have early retirement provision ( $\uparrow$  duration & predictability)

2 factors that decrease ability to take risk :

- High debt ratio
- plan running  $\textcircled{a}$  a deficit

#### Liquidity Needs

- must maintain enough liquidities to pay liabilities
- needs are higher when
  - the proportion of retired lives is higher
  - workforce is older
  - plan has higher funded status.
  - plan participants has the ability to switch / withdraw

#### External Constraints

Regulations vary by country.

Europe : Institutions for Occupational Retirement Provision

(IORP II) Directive.  $\rightarrow$  requirements for governance  
risk management & disclosure.

US : Employee Retirement Income Security Act (ERISA)

regulates investing, funding req, payout of corp. pension  
plans.

## Investment Objectives

- primary objective : achieve target return over a specified long-term horizon while assuming a level of risk consistent w/ meeting its contractual liabilities.
- secondary objective : minimize the cash contributions (in PV term) the sponsor will be required to provide.
- target return should reflect the plan assets need to grow thru contributions & investment returns in line w/ growth in liabilities of the plan.

## DC Pension Plan

### Stakeholders :

- Plan sponsors
- Plan beneficiaries
- The board
- Government

### Liabilities & Investment Horizon :

Individuals in a DC plan have investment horizon linked to their age.

DC plans offer a default life-cycle option (aka. target date option). life-cycle options can either be participant-switching options (auto switch members to more conservative asset allocation) or participant/cohort option which involves pooling the participant with other investors w/ similar retirement date of the fund being managed more conservatively as retirement nears.

## Liquidity Needs

Similar to DB

## External Constraints

Similar to DB.

DC plan sponsors are required to educate participants  
DC plans are tax-deferred

## Investment Objectives

grow assets prudently to meet retirement spending needs.

if plan offers funds w/ active management,  
secondary objective = outperform the passive asset class returns.



### MODULE QUIZ 22.2

1. An increase in which of the following factors will most likely lead to a decrease in the liabilities of a DB pension plan?
  - A. Life expectancy.
  - B. Years of service.
  - C. Expected employee turnover.
2. Which of the following changes would most likely increase the risk tolerance of a DB pension plan?
  - A. An increase in the average age of the workforce.
  - B. Poor investment performance causing the plan to move from overfunded to underfunded status.
  - C. An increase in allocation to asset classes that have a low correlation with the operating results of the sponsor.

1. A

2. C

Investment fund owned by gov.

## Module 22.3: Sovereign Wealth Funds

5 broad categories:

- Budget stabilization funds.: set up when nation revenue is heavily linked to natural resources.
- Development funds : prioritizes in national socioeconomic projects. in infrastructure.
- Saving funds.: invests revenues from nonrenewable assets for the benefits of future generations.
- Reserve funds: earn returns on excess foreign reserves held by central banks.
- Pension Reserve funds: save & invest to meet future pension liabilities of gov.

Stakeholders:

- current & future citizens.
- Investment offices.

### Liabilities & Investment Horizon & Liquidity Needs

Budget stabilization funds:

- Uncertain liabilities linked to commodity prices / cyclical industries.
- Short-term investment horizon b/c budget support req. on short-term basis.

Development funds :

- Nature of liabilities linked to socioeconomic investments
- medium/long - term horizons.

## Saving funds:

- liabilities linked to future generations, long-term horizons.

## Reserve funds:

- liabilities = yield promised on bonds issued (funds will target higher returns).
- long-term horizon

## Pension Reserve funds:

- liabilities linked to future pension pmt, long-term horizons.
- may have accumulation & decumulation stage.

## Liquidity Needs.

Budget stabilization funds.	HIGH.
Development funds	LOW
Saving funds.	LOW
Reserve funds.	LOWER than stabilization fund, higher than saving
Pension Reserve funds.	vary (low during accumulation, high during decumulation).

## External Constraints.

usually established by law from legal/regulation perspective

Santiago Principles established by Int. Forum of SWF. (IFSWF)  
addresses

## Investment Objectives.

### Budget stabilization funds.

- Capital preservation.
- Aims to earn returns above inflation w/ low prob. of losses.
- avoids assets w/ correlation

### Development funds

- Support econ growth
- (Implicit) earn real rate of growth greater than real GDP / productivity growth

### Saving funds:

- maintaining purchasing power of asset while making ongoing spending on budgetary needs.

### Reserve funds.

- earn rate of return in excess of the yield over bonds issued.

### Pension Reserve funds.

- earn returns to meet future unfunded pension

### Asset Allocations

Budget stabilization funds. : FI & Cash

Development funds : driven by socioeconomic mission

Saving funds: high alloc. towards Equities & Alt.

Reserve funds: similar to Saving but lower alloc to alt. b/c of high liquidity needs.

Pension Reserve funds: high alloc. towards Equities & Alt.  
b/c. of long investment horizon & low liquidity needs.



#### MODULE QUIZ 22.3

1. A strategic asset allocation of 10% equities, 60% fixed income, and 30% cash is *most appropriate* for which type of SWF?
  - A. Savings funds.
  - B. Development funds.
  - C. Budget stabilization funds.
2. To boost its foreign currency (FX) reserves, the Bank of Canada (BoC) buys USD currency from domestic Canadian exporters that received USD for their export products. In the context of reserve funds, which of the following statements is *most accurate*?
  - A. The BoC's excess FX reserves are invested in riskier, higher yielding assets.
  - B. The BoC's financing of its purchase of USD can cause deflationary pressures.
  - C. The BoC's issuance of monetary stabilization bonds result in a positive carry.

1. C

2. C

## Module 22.4: University Endowments & Private Foundations

### University Endowments

Main Features / Mission: earn to support ongoing operating budget.

Stakeholders: current & future students, uni employees

Liabilities / Investment Horizon: perpetual Investment Horizon,  
liabilities = future payouts

$$\begin{aligned} \text{Spending}_{t+1} &= \omega \times \text{Spending}_t \times (1 + \text{inflation}) \\ &\quad + (1 - \omega) \times \text{spending rate} \times \text{avg. AUM}. \end{aligned}$$

3 types of spending rules resulting from diff. values of  $w$ :

- 1) Constant growth rule ( $w=1$ ).
- 2) Market Value rule ( $w=0$ ).
- 3) Hybrid rule ( $0 < w < 1$ ) : mix of ① & ②

Liquidity Needs: usually very low

**External Constraints:** varies by jurisdiction but typically require investment on total return basis (i.e. earning returns from both income & investment returns, not simply generating spending via income returns). & diversification.

In US, uniform prudent mgt. of Institutional Funds Act (UPMIFA) allows flexibility in spending decisions & enforces adoption of MPT.

shift to MPT allows broader range of asset classes.  
usually tax-exempt status.

Both Endowments & Foundations are subject to **Unrelated Business Income Tax (UBIT)**.

**Investment Objective:** preserve the purchasing power of assets in perpetuity while achieving returns adequate to maintain level of spending.

primary objective = generating real return of about 5% over 3-5 yrs.

AA

Majority = Alt. (for large US university).  
more towards domestic equities & FI.

**EXAMPLE:** The Capital University endowment

The Capital University endowment supports 10% of the university's operating budget. The investment office of the endowment is relatively small, and the endowment has an annual spending policy to pay out 4% of the five-year average asset value to the university.

The endowment has historically allocated 30% to public U.S. equities and 70% of the portfolio to fixed income. The board has historically set the objective that annualized volatility should be no more than 15%, and this is not expected to change. A recent review of the endowment's investment policy yielded the following assumptions for expected asset class returns and recommended strategic asset allocation for the endowment:

Asset Class	10-Year Nominal Expected Return	Recommended Strategic Asset Allocation
Fixed income	3%	25%
U.S. equities	6%	35%
International equities	7%	20%
Real estate	8%	10%
Private equity	10%	10%

Expected consumer price inflation over the next 10 years is 1% per year. Higher education price inflation, as measured by the HEPI, is expected to be 100 basis points per year above consumer price inflation.

1. **Formulate** the investment objectives for the Capital University endowment's IPS. **Calculate** the nominal required return of the endowment that is consistent with this objective.
2. **Discuss** whether the recommended shift in strategic asset allocation weights should be accepted based on the expected return.
3. **Discuss** one factor that could make the recommended strategic asset allocation inappropriate for the endowment.

1. Investment Obj = maintain purchasing power

nominal required return

$$= 4\% + \underbrace{1\% + 100 \text{ bps}}_{\text{HEPI}} = 6\%$$

Annual vol should not exceed 15%

2. Yes b/c current asset alloc. fails to meet nominal

$$\text{req. return} = (30\% \cdot 6\%) + (70\% \cdot 3\%) = 3.9\%$$

$$\text{after adj: } (25\% \cdot 3\%) + (35\% \cdot 6\%) + (20\% \cdot 7\%) \\ + (10\% \cdot 8\%) + (10\% \cdot 10\%) = 6.05\%$$

3. Concerns :

- small investment office w/ no experience in investing in alt. investment.

- new asset alloc. must adhere to max. vol. of 15%.

## Private Foundations.

**Main Features / Missions**: make grants to support specified charitable causes (e.g. Bill & Melinda Gates Foundation). main objective : maintain purchasing power in perpetuity & earn returns sufficient to support grants.

**Stakeholders**: (possibly) the founding family, donors, recipients & wider components.

**Liabilities & Investment Horizon**: perpetuity horizon, (by-law) pay out 5% of assets + investment expenses. & must spend any donations in the year the donations is received (known as **flow-through**)

lower risk tolerance than endowment funds. b/c of higher liquidity needs & fewer sources of revenues.

**Liquidity Needs**: legally required to spend 5%

**External Constraint**: subject to similar laws (UPMIFA in US & Trustee Act in UK).

**Investment Objectives**: generate real return.

**AA** : similar to endowment



#### MODULE QUIZ 22.4

1. A university endowment has an annual spending policy of 5% of the three-year rolling asset value. Consumer price inflation is expected to be 3% per annum, while the Higher Education Price Index (HEPI) is expected to be 2.5% per annum. The investment objective of the endowment should be to achieve a total real rate of return of at least:
- A. 5.0%.
  - B. 7.5%.
  - C. 8.0%.

(A). the real required rate of return should be equal to the spending rate of 5%.

## Module 22.5 : Bank & Insurers.

### Main Features / Missions :

- earn profit from deposits
- safeguard assets.
- executing transactions in securities & derivatives
- advising & investing in securities

### Stakeholders:

External: Depositors & borrowers, creditors, rating agencies, regulators, communities

Internal: Bank employees, managers & directors

**Liabilities & Investment Horizon:** investment horizon is influenced by diff b/w long-term illiquid assets & short-term liquid liabilities

Banks are perpetual organizations but instruments held in bank port are short in nature.

### Liquidity Needs:

- required to cover near-term expected cash outflows (liquidity coverage ratios / LCRs). & have adequate level of capital from stable sources (net stable funding ratios / NSFRs).

- retail bank will have better liquidity than commercial bank.

### External Constraint:

Main regulatory goal = make sure banks have adequate cap. to absorb losses

if considered SIFIs (Systemically important financial inst.):

- increased cap to absorb losses
- limit amt of dividend & share buybacks. (to avoid over-leverage).
- Restrict ability of subordinated debtholders & preferred shareholders to exert claims in bankruptcy.
- Restrict use of deriv. & prop trading.

### 3. diff. accounting systems:

1. Std. financial reporting (GAAP & IFRS)

2. Statutory accounting (to make the accounts more conservative).

3. economic accounting

### Investment Objectives:

Primary objective = manage liquidity & reduce risk mismatch

banks will have asset liabilities mgt. committee (ALMCs). to oversee investment activities.

## Insurers

### Main Features / Missions:

- life insurer
- property & casualty insurers (P&C)

### Stakeholders:

Key external stakeholders: Shareholders & policyholders, derivatives counterparties, creditors, regulators & rating agencies

For traditional life insurance & fixed annuities, life insurers maintain general a/c. to fund the liabilities. b/c. insurer bear the investment risk associated w/ meeting claims.

For variable life insurance & var. annuities, life insurers maintain separate a/c. w/ assets invested according to investment choices of policyholders.

### Liabilities & Investment Horizon:

life insurer: face long duration liability stream via their contract payouts.  $\Rightarrow$  investment horizon of 20 - 40 yrs.

P&C insurers: faces liabilities w/ shorter duration & higher uncertainty

Frequently occurring underwriting cycles  $\Rightarrow$  fluctuations in profitability driven by changes in the level of competition.

## Liquidity Needs:

Need to manage INTERNAL LIQUIDITY. (cash from operating & investing activities). & EXTERNAL LIQUIDITY. (ability to borrow in debt markets).

## External Constraint:

Legal & Regulatory: Similar to banks.

Accountancy: standard fin. reporting, statutory reporting & true economic accounting rules like bank..

Fully taxable.

## Investment Objectives:

Similar to banks, manage liquidity & reduce risk mismatches.

# Module 22.6: Bank & Insurers, Balance Sheet Management & Investment Considerations. / /

$$\% \Delta E = \% \Delta A(M) - \% \Delta L(M-1).$$

where  $M = A/E$ .

## EXAMPLE: Percentage change in the value of equity

A bank has an equity-to-assets ratio of 5%. Calculate the estimated percentage change in the market value of equity if liabilities rise by 1.5% and assets remain stable.

$$\% \Delta E = (0\% \times 20) - (1.5\% \cdot 19) = -28.5\%$$

$$D_E = D_A(M) - D_L(M-1) \left( \frac{\Delta i}{\Delta y} \right)$$

$D_E$  = modified duration of equity capital.

$D_A$  = modified duration of asset

$D_L$  = modified duration of liabilities.

$$M = A/E$$

$\frac{\Delta i}{\Delta y}$  = estimated chg in yield of liabilities,  $i$ , relative to a unit chg in yield of assets,  $y$ .

**EXAMPLE: Computing duration for life insurer**

WellLife Holdings is a life insurer with equity capital to financial assets of 12.5%. In a recent report to the board by the investment committee, the duration of assets was listed as 3, with the duration of liabilities listed as 2. It is also estimated that the yield on the liabilities of the insurer is likely to move by 70 basis points for every 1% move in the yield of the asset portfolio.

1. Calculate the duration of the insurer's shareholder capital.
2. Estimate the impact of a 25-basis-point fall on the value of shareholder capital in yields of the asset portfolio.
3. Management of the insurer is considering changing the ratio of equity-to-assets to 10%. Assuming all else stays the same, discuss the resulting impact on the duration of shareholder capital.

$$1. D_A = 3, D_L = 2, M = A/E = 1 \div 0.125 = 8$$

$$\Delta i / \Delta y = 0.70.$$

$$D_E = (3 \times 8) - (2 \times 7 \times 0.70) = 14.2.$$

2. 1% chg in level of yield of asset portfolio will lead to  $\sim 14.2\%$  chg in value of equity.

$$\Rightarrow 25 \text{ bps fall} \Leftrightarrow \sim 0.25 \times 14.2\% = 3.55\% \text{ increase.}$$

$$3. \text{ New } D_E = (3 \times 10) - (2 \times 9 \times 0.70) = 17.4.$$

$$\text{Recall : } \sigma_{H2}^2 = \omega_1^2 \sigma_1^2 + \omega_2^2 \sigma_2^2 + 2\omega_1 \omega_2 \sigma_1 \sigma_2 \rho_{12}. \\ \omega_1 = M \cdot \omega_2 = -(M-1).$$

**EXAMPLE: Computing volatility for life insurer**

WellLife Holdings maintains a common equity-to-assets ratio of 12.5% and estimates that the annualized volatilities of assets and liabilities are 7% and 4% respectively. The investment committee estimates that the correlation between asset and liability returns is 0.3.

1. Calculate the standard deviation of changes in the value of shareholder capital.
2. New regulations are being introduced that will force WellLife to increase its equity-to-assets ratio to 20% and lower the volatility of its assets to 5%. Calculate the expected volatility of shareholder capital after the new regulations come into force, assuming all else stays the same.

$$1. \sigma_E^2 = (8^2 \times 0.07^2) + (7^2 \times 0.04^2) \\ - (2 \cdot 8 \cdot 7 \cdot 0.07 \cdot 0.04 \cdot 0.03) \\ = 0.298$$

$$\sigma_E^2 = (8^2 \times 0.05^2) + (4^2 \times 0.04^2) - 2 \cdot 5 \cdot 4 \cdot 0.05 \cdot 0.04 \cdot 0.03 \\ = 0.0641$$

Figure 22.7: Strategies for Changing Volatility

Strategy	Impact on Factor	Impact on $\sigma_E$	Comments
Hold diversified fixed-income investments	Lowers $\sigma_A$	Falls	Diversified fixed income has a lower standard deviation than other riskier asset classes.
Hold high-quality fixed-income investments	Lowers $\sigma_A$	Falls	There's a lower chance of significant loss in asset value.
Maintain similar asset and liability durations, and match asset/liability exposure to borrower and claimant options	Increases $\rho_{AL}$	Falls	Regulators penalize institutions with high asset/liability mismatches.
Hold common stock investments	Increases $\sigma_A$ Lowers $\rho_{AL}$	Rises	Most regulators require reserves of 100% to be held against investments in common stock.
Derivatives transparency and collateralization	Lowers $\sigma_A$ and $\sigma_L$ Increases $\rho_{AL}$	Falls	The more understood and protected against counterparty default the institution is, the less chance there is of unexpected losses.
Hold more liquid portfolio investments	Lowers $\sigma_A$	Falls	
Surrender penalties for insurance contracts	Lowers $\sigma_L$	Falls	Penalties cushion losses when policyholders cash in after interest rates have risen.
Prepayment penalties on debt investments	Increases $\rho_{AL}$	Falls	Prepayments will occur in a low interest rate environment. Penalties on prepayments help offset rising liabilities in a falling rate environment.
Catastrophic insurance risk	Increases $\sigma_L$	Rises	Such losses are large and unpredictable and will cause regulators to demand higher reserves, investment in more liquid assets, and more robust reinsurance agreements.
Predictability of underwriting losses	Decreases $\sigma_L$	Falls	Total insurance liabilities are less uncertain.
Diversifying insurance business	Decreases $\sigma_L$	Falls	Total insurance liabilities are less uncertain.
Variable annuities	Increases $\rho_{AL}$	Falls	Asset investment gains and losses are passed through to policyholders due to the nature of the contract.

#### EXAMPLE: Switching to riskier investments

The ALMCo of SJT Bank recently conducted a quarterly review of business and investment conditions. The main findings are as follows:

- There is evidence that current corporate spreads are significantly below historical norms. It is expected that economic conditions are likely to deteriorate with corporate spreads widening.
- The bank expects disruption in the securitization and secondary loan markets to lower the liquidity of the bank's loan book. They also expect that withdrawals from depositors are likely to become larger and less predictable as economic conditions worsen.

As a result of these findings, the investment management team plans to switch a large portion of its investment portfolio from high-yield corporate floating-rate securities into investment-grade fixed-rate government securities. The team also plans to enter a plain vanilla pay-fixed/receive-floating interest rate swap under standard mark-to-market collateral terms with counterparties.

1. Discuss how the planned investment switch addresses the two main findings of the quarterly review conducted by the ALMCo.
2. Discuss the likely impact of the switch on required regulatory risk-based reserves.
3. Describe how the switch, including the swap position, likely affects the asset and liability duration mismatch of the bank.
4. What is the effect on expected earnings and expected volatility of earnings?

1. 1st finding indicates widening corp spread and therefore switch to IG securities to lower exposure to widening credit spread.

2nd finding states the liquidity position of the bank will likely worsen → Asset in loan book will be harder to sell & demand from depositor will go up.  
IG bonds will be more liquid than HY. & offset deterioration in liquidity conditions.

2. The risk-based capital the company is required to hold will likely fall. b/c the credit quality after the switch has gone up.

3. The switch doesn't change. the company's risk/reward profile. b/c pay-fixed/receive-floating swap will create synthetic liab. increasing duration since fixed-leg payments made under the swap. will have higher duration than the floating-leg. payment received.  
⇒ the increase duration in liability will counterbalance the increase duration in assets

4. Lower earning & volatility b/c. gov. securities will have no spread & liquidity of gov. bond is higher.



#### MODULE QUIZ 22.5, 22.6

1. Capital requirements for banks and insurance companies are typically set with reference to:  
A. statutory reporting.  
B. true economic reporting.  
C. standard financial reporting.

2. SAJ Assurance (SAJ) is a life insurance company that underwrites a diverse range of life assurance and annuity products. The following is an excerpt from the IPS of SAJ:

SAJ splits the firm's general account into two components: the reserve portfolio and the surplus portfolio. The objective of the reserve portfolio is to provide liquidity to pay policyholder claims in the normal course of insurance operations. The objective of the surplus portfolio is to hedge interest rate mismatches that occur between the reserve portfolio and the liabilities of the firm.

This excerpt is best described as:

- A. correct.
  - B. incorrect because it is the separate account of the life insurer that is broken down into the reserve and surplus portfolios, not the general account.
  - C. incorrect with respect to the objective of the surplus portfolio. The surplus portfolio should be run with the objective of taking higher risk in order to earn higher returns to grow the surplus over the long term.
3. A bank has an equity capital ratio of 20%. Assets are expected to have a standard deviation of 7%, and liabilities are expected to have a standard deviation of 5%. The correlation of assets and liabilities is estimated to be 0.5. The volatility of shareholder capital for the bank is closest to:  
A. 9.3%  
B. 16.3%  
C. 30.4%.

1. A

2. C

$$\sigma_E^2 = M^2 \sigma_A^2 + (M - 1)^2 \sigma_L^2$$

$$+ 2M(M-1) \sigma_A \sigma_L \rho_{AL}$$

$$= 5^2 (0.07)^2 + (5-1) (0.05)^2$$

$$+ 2(5)(5-1) (0.07)(0.05) (0.5).$$

$$= 0.0925$$

$$\sigma = 30.4\%$$

/ /

