1. Solution

a) Payback Period (PP)
Determine time required to recoup initial investment
PP = Initial Investment ÷ Annual Cash Flows
Doesn't account for time value of money

Net Present Value (NPV)
NPV = PV of cash inflows – initial investment
- where PV is discounted at the firm's cost of capital
- accept projects where NPV > 0
- reject projects where NPV ≤ 0

Internal Rate of Return (IRR)
IRR = The discount rate which equates PV (Net cash inflows) with initial investment
Accept projects where IRR > cost of capital
Reject projects where IRR ≤ cost of capital

Risk-Adjusted Techniques – Certainty Equivalents
NPV, but where cash flows are adjusted depending on probability of receipt

$$NPV = \sum_{t=1}^{n} \alpha(t) \cdot CF(t) \cdot (1+r_f)^{-t} - \text{initial investment}$$

where $\alpha(t)$ = certainty equivalent factor

$CF(t)$ = cash flow in year t

r_f = risk free rate

Risk Adjusted Techniques – Risk Adjusted Discount Rate
NPV, but where discount rate is adjusted to reflect projects' riskiness

IRR recommended
Most common method which incorporates the time value of money

b)

Pecking order hypothesis based on the following assumptions:
- dividend policy is sticky
- management prefers internal sources of funds for financing projects
- management's actions favor existing shareholders
- firms prefer safest forms of external financing
- order of preference for external funds
  safe debt
  risky debt
  convertible securities
  preferred stock

common stock
- severe market imperfections

c)

Doesn't explain taxes, bankruptcy, security issuance costs
Ignores agency problems whereby managers are immune to market discipline

Debt issue recommended
Zest has insufficient cash
Projected income high enough to support leverage

2. Solution

a)

Use dollar-weighted Macaulay Duration
tolerance = .25 years for each line
Individual Term
(67.5*3+45*4+14.1*7+7*0+7*10)/140.7 = 3.92
liability = 7 yrs.
Assets 3.08 yrs. shorter than liabilities; need to consider tightening up
On interest rate decline, assets move less than liabilities
GIC's
(1430.6*3+953.7*4+364.7*7+56.1*0)/2805.1 = 3.80
liability = 3 yrs.
Assets 0.8 yrs. longer than liabilities; need to consider tightening up
On interest rate rise, assets decline more than liabilities
Group LTD
(862.9*3+575.3*4+371.3*7+300.7*0)/2110.2 = 3.55
liability = 4 yrs.
Assets shorter than liabilities by .45 yrs.; may or may not need corrective action
If interest rates decrease, MV of assets increases less than liabilities

b)

Change in Market Value of Equity
A measure of change in value of equity of firm based on some interest rate movement and considering duration of assets and liabilities

Calculate as difference between MV of assets and MV of liabilities

Shareholders are the major constituency

Change in Economic Equity Ratio
Measure the change in MV of equity vs. change in MV of assets
Regulators care about this since it measures true interest rate risk

c)

Change in MV of equity =

$$\left(-D(A)*MVA+D(L)*MVL\right)/\left(MVA-MVL\right)*Chg\ in\ r/(1+r)$$

$$=(-3.8*2805+3*2805/1.1)/(2805-2805/1.1)*.01/1.065$$

$$=-11.08\%$$

Change in Economic Ratio = $MVL/\left(MVA-MVL\right)*\left(D(L)-D(A)\right)*Chg\ in\ r/(1+r)$

$$=(2802/1.1)/(2085-2805/1.1)*(3-3.8)*.01/1.065$$

$$=-7.51\%$$

d)

need to find D(A) for each condition so that change = 0
for hedging MV of Equity, optimal is D(A)*MVA=D(L)*MVL
D(A)*2805 = 3*2805/1.1
D(A) = 2.73

For hedging economic equity ratio, optimal is D(A) = D(L)
D(A) = 3.0

e)

Simulation Method
Models interest risks of each asset and liability
Assumptions needed:

- Growth of business
- Yield curve behavior
- Pricing assumptions for new business

Disadvantages – difficult to program, requires many scenarios
Recommend because it's very accurate

3. Solution

a)

cash bonus
received for better than planned performance
financial performance triggers (profits, sales)
rewards short term performance

stock options
option to purchase stock at fixed price
aligns shareholder and manager's interest
stress long term value growth

deferred cash or stock payments
forfeited if executive leaves/incentive to remain
tax deferral benefits

golden parachute
cash on job loss
reduce executive opposition to takeover

phantom stock options
mirrors stock options
minimizes stock ownership dilution

b)

Cash bonus
low profit component and high sales component
sales – not under each person's control

Suggested changes in bonus
CEO 60% profit; 20% sales; 40% personal
CEO has major profitability impact
VP's 30% profit; 30% sales; 40% personal
Balance profit with sales objectives
Personal objectives should focus on infrastructure improvements

Consider adding stock options or deferred payments
Long term sacrificed for short term results
Tie to profits/base compensation
Add longer term incentive component
Better aligns management focus with shareholders

4. Solution

a)

Role of Financial Intermediaries

Traditional Theory: Reduce transaction costs and provide diversification
New Theory: Transfer/Manage risk while reducing participants' costs.
Provide public access to markets by reducing informational costs.

5 Principal types of asset transformation

Risk Management
Spread Management
Processing Information
Aggregating Funds
Distribution

4 Ways of meeting customer needs

Risk Reduction
Recordkeeping
Advice
Access to capital

Zest's goal is to position itself to provide several of these needs.

b)

Risks

C1,C2, C3, C4 risks all present

C1 Risk: Asset Risk
Higher with increased presence of low grade bonds
Need diversification across macro factors
Need diversification across issuer, geography, maturity, industry
Creates increase in RBC

C2 Risk: Insurance Risk
Recapture of reinsurance will increase risk
Creates increase in RBC

C3 Risk: Interest Risk
Spread Risk: yields change different from Treasuries
Option Risk: Embedded options
Credit Risk: Counterparty risk of swap, risk of settlement

Dealing with risks:

ALM
Option Adjusted Spreads – Effective duration and convexity
Simulations with parallel/non-parallel yield curve shifts
Focus on market values vs. accounting values
Asset and Liabilities modeled with same precision

c)

NARA will react negatively to new strategy
NARA will see Zest as taking larger risks
Zest has no prior experience with derivatives
Growth strategy is capital intensive, will require financing.
Recapture of reinsurance will create earning volatility.

d)

Establish the following:

1. Policies and Procedures
   - Responsibility of personnel
   - Written policies and procedures

2. Product Authorization
   - Establish responsibility for hedging product
   - What types of products/derivatives to manage
   - Authorization limits

3. Management Responsibilities
   - Establish exposure limits
   - Separate management from traders
   - Establish tolerance for risk

4. Establish role of Board
   - Determines capital allocation
   - Authorizes use of derivatives

5. Internal inspection
   - Audit reports generated regularly
   - Monitor performance
   - Model risk with respect to value at risk
   - ALM type models
   - Simulation

5. Solution

a)

Reinvestment rate = current reinvestment rate, ultimate reinvestment rate; interpolate between the two
CRR = i in 1st year after valuation
Based on actual investments and company investment policy
Reduced by margins

URR = i for cash flows in yr 20 and later
Fixed and represents long term risk free return
Consider product sensitivity re inflation & reinvestment rate

Transition results in reserves higher than by straight line transition

URR = 5% + (diff in bond yields) – investment expense
Company bond yields higher than 5%
Company structure could justify:
Lack of smooth transition between CRR and URR
Increase from 6% to 6.5%
PADS decrease valuation interest rate

b)

available capital decreases by increase in reserve change
1675.1 – (130 – 127.9) = 1673.0; difference = 2.1
required capital = $\left(C2\text{^}2+\left(C1+C3\right)\text{^}2\right)\text{^}0.5$

C1
Before: reserve * risk free factor
Value = 127.9 x 0
Final value = 0
After: reserve * mix of factors
Value = 130 x (.5 x 0 + .25 * .01 + .25 x .075)
Final value = 2.7625

C2
Formula = (face amount – reserve) x correct factor (.008)
Before: (33800 – 127.9) x .008 = 269.3768
After: (33800 – 130) x .008 = 269.360

C3
Formula = reserve x correct factor (.005)
Before: 127.9 x .005 = .6395
After: 130 x .005 = .650

Required Capital
Before: (269.3768^2+(0+.6395)^2)^0.5 = 269.3776
After: (269.36^2+(2.7625+.65)^2)^.05 = 269.3816
Change: increase of .004056

6. Solutions

a)
Rating agencies seek to assess relative economic strengths by relying on financial reporting information, and by making appropriate adjustments due to the limitations of stat and GAAP accounting.

The agencies perform qualitative as well as quantitative analysis. They will interview management to reflect the qualitative issues. The analysts need to understand industry-wide issues, particularly: the policy owner's position in event of default, protections by guarantee associations, the impact of regulation, insurer and policyholder taxation, and the competitive environment.

A strong business franchise will tend to improve ratings.

b)
The maturity value of GIC's is 400m * (1 + 6% - 2%) ^ 5 = 486.661m; their current value is then 486.661m / (1 + 6%) ^ 5 = 363.661m. Reflecting liquidation discount of 100% * 35% + 80% * 65% = 87%, current market value is 363.661m * 87% = 316.385m. The loss is 400m – 316.385m = 83.6m. The remaining surplus = 100m – 83.6m = 16.4m.

c)
Some advantages of diversifying into annuities by purchasing PL include:

- Flattening demand for traditional protection products.
- Whole can be more than sum of parts.
- Common ownership provides advantages in dealings with stockholders, lenders, employees, suppliers, and customers.
- Lower taxes – can transfer cash from units with excess funds to units facing deficits.
- Diversifies balance sheet.
- Corporate office can act as an internal capital market.
- Internal capital markets are better at problem solving and providing managerial assistance.
- Expanded distribution force.
- The acquisition allows for making use of shared competencies in the whole paradigm of the new system of financial intermediaries.

Disadvantages include:

- Accumulation products are more competitive since they're easier to compare.
- Accumulation products have less stable and less predictable withdrawal patterns.
- Studies show that companies do not always realize the operating synergies.
- Bureaucracy leads to slower reaction time, higher overhead, and politicized decision making.

d)

Solvency based reserves for variable annuities can be based on the economic value, using a Black-Scholes calculation.

$$PV(GMDB) = \sum_{m=1}^{\omega-x} {}_{m-1|}q_x \cdot P(m, S_0)$$

$$P(T, S_0) = -S_0 e^{-r_{div}T} N(-d_1) + S_0 e^{-r_{dom}T} N\left(-d_1 + \sigma\sqrt{T}\right)$$

$$d_1 = \frac{\left(r_{dom} - r_{div} + \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$

For other variable annuities, the integrated reserve takes the greatest present value of future benefit streams.

For fixed annuities, use CARVM which is the greatest present value of future benefit streams.

For equity indexed annuities, there are two types of reserves. Type 1 is the sum of a fixed component and an equity component. The equity component reflects the option value of the indexing, on a book value type basis. To use Type 1, the insurance company needs to satisfy the "hedged as required" criteria whereas Type 2 does not have investment restrictions.

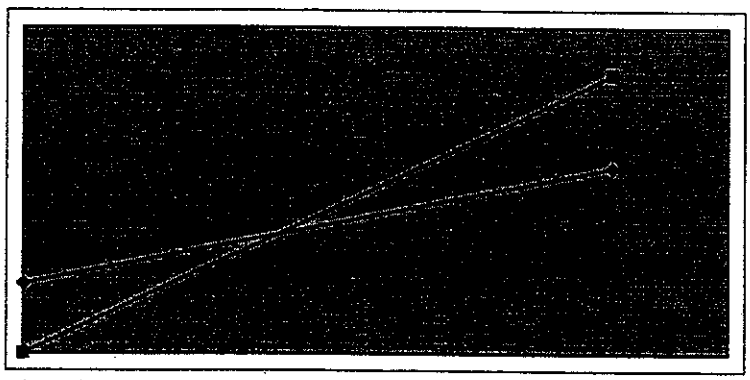
Some extra information needed are the returns and volatilities of the funds.

e)

The process of determining how much additional leverage DP can support at a 10% shortfall level is as follows:

By taking on more debt, the company increases leverage and disperses the leveraged ROE. The company can take on more leverage until Pr(ROE<0) = 10%. To do this, you need the risk and returns for the unleveraged and leveraged firm.

Then, draw the firm line and shortfall line on the risk versus return graph.



The shortfall line is the one that starts at 0% return w/0% risk.
The intersection of the shortfall line with the firm line represents the point of maximum leverage.

7. Solution

a)

Unitary Reserves

- The net premium would equal a level percentage of the gross premium such that PV(benefits) = PV(valuation net premium) = k PV(gross premium) at issue.
- Reserve = PV(benefits) - PV(valuation net premium)
- This is not completely true since the first year expense allowance changes the calculation slightly.

Guideline XXX

- Also requires the calculation of the segmented reserve.
- $GP_{t+1} / GP_t > q_{x+t+1} / q_{x+t}$ would be the condition to define the end of a segment (where GP = gross premium, q = valuation mortality).
- The net premium would then be the level % of gross over the segment (most likely 5 years).
- Reserves would be calculated assuming the policy expires at the end of the segment. Guideline XXX reserve would be the max (unitary, segmented reserve).

b)

- Premium deficiency reserves occur in either method whenever the gross premium is less than the net premium.
- They are calculated by replacing the net premium by the gross premium whenever the gross premium is less than the net premium.
- This situation can arise for many reasons, but generally related to pricing:
  - assume better mortality than allowed in valuation
  - assume higher interest rates on the assets invested than valuation interest rate.
- Under the unitary method, it is possible to reduce or eliminate deficiency reserves at early durations by increasing higher duration gross premiums.
  Under Guideline XXX, each 5 year period would likely be a segment, and deficiency reserves are more likely, but the size of deficiency reserves would depend on the mortality rates that could be justified by the valuation actuary.

c)

- Oz should use Guideline XXX.
- Under the unitary method, the highest age premiums would be paid only by a small number of the least insurable policyholders, so valuation net premiums would be unrealistically high at the lowest durations, and total reserves unrealistically low.
- Under Guideline XXX, total reserves would more closely follow the PV of future benefits within the segment.

8. Solution

Advantages to Issuers

- Cheaper than registered offerings, due to lack of information assymetry
- Less need to reveal company information to public
- More covenants could lead to lower interest on debt
- Easier to work with private investor in times of distress
- Investor takes long term view; investor doesn't care about temporary swings
- Smaller issuers can get financing

Advantages to Investor

- Covenant protection
- More information due to diligence and management meeting

9. Solution

- Highest average surplus and lowest standard deviation means the efficient frontier
  - B and C are on the efficient frontier

- Number of negative scenarios indicate the likelihood additional reserves
  - B, A, C in this order

- Highest "Lowest Outcome" means the least amount of additional reserves required
  - B, C, A in this order

- Recommend B
  - On the efficient frontier
  - Least amount of additional reserves, even in the worst scenario
  - Lowest volatility

10. Solution

a)

"One System of Financial Intermediation: A New Paradigm" highlights various aspects of a financial institution. An acquisition is a good strategic fit if a number of these aspects are shared:

- Method of making money: bearing risk, managing a spread, processing information, aggregation, distribution. These are listed in order of most capital intensive to least capital intensive.
- Customer
- Customer Needs/Wants: reduction in uncertainty, advice, record keeping, access to capital
- Legal Form
- Information: Information is both an input and an output of the model. Information generated in one line of business could be used in another line of business.

Skylark is a traditional insurance company.

- Makes money primarily by bearing risk.
- Satisfies customer need of reduction in uncertainty

Neighborhood is a traditional bank

- Makes money primarily by managing a spread
- Provides borrowers with access to capital
- Customers are middle income (like Skylark) on East Coast

Prosper is an advice providing mutual fund

- Makes money primarily through aggregation
- Provides advice to customers
- Prosper's method of making money is much less capital intensive than Neighborhood's

Thus, neither Neighborhood nor Prosper appears to be a great strategic fit with Skylark. Neither really shares any of Skylark's core attributes (method of making money, satisfaction of customer need, legal form).

However:

1. Customer overlap: a shared customer base could be an advantage. There is more likely to be a shared customer base between the bank and Skylark, as both Neighborhood and Skylark target middle income customers and both are traditional type institutions.

2. Shared Information: Information gleaned from the business of insurance (particularly about customers' changing needs) could be used by either Neighborhood or Prosper. Again, because Skylark and Neighborhood are more likely to appeal to the same customer base, it seems Neighborhood has the strategic edge here as well.

3. Shared Competencies: Companies may share assets or skills.
   - Since selling insurance is more like selling bank products than it is like selling internet based mutual funds, it is likely that Neighborhood shares more competencies with Skylark than does Prosper.

4. Neighborhood would allow Skylark to expand its market to the East Coast.

b)

The purchase of a bank exposes Skylark to the following risks:

- Interest rate risk
- Credit risk of loans
- Liquidity risk

The credit risk of loans can be managed by:

- Having a diverse portfolio
- Making sure the bank only accepts loans with a positive adjusted risk spread
- Issuing equity to lower risk
- Adding shareholder value

Liquidity risk can be managed by:

- Understanding bankruptcy cost
- Understanding the liquidity gap
- Understanding the liquidity profile of the balance sheet
- Having the ability to buy time
- Communicating true financial condition to the public

Can determine liquidity risk through:

- Liquidity gap analysis
- Liquidity duration
- Liquidity costs

Interest rate risk can be managed through:

- Gap analysis
- Simulation analysis
- Model risk/cost of prepayments

Interest rate risks include:

- Yield curve repricing risk
- Balance fluctuation risk
- Spread risk
- Option risk

The purchase of the mutual fund company exposes Skylark to the following risks:

1. 20% of the company is with a foreign subsidiary, so there is foreign exchange risk and political risk
2. Operational risk
3. Legal risk (e.g. lawsuits over investment advice)

Foreign exchange rate risk can be managed through:

- Derivatives – dual currency, exchange linked bonds,
- Swaps, Forwards
- Measure foreign exchange rate risk through:
  1. Foreign exchange gap analysis
  2. Foreign exchange liquidity analysis
  3. Foreign exchange rate volatility analysis
  4. Foreign exchange rate simulation analysis

c)

I would look at the following aspects when choosing a firm:

- What are the risks for purchasing Neighborhood vs. Prosper? (See part b)
- How good of a strategic fit is Neighborhood vs. Prosper? (See part a)
- How much economic value is Neighborhood generating vs. Propser?

Payback period:

Neighborhood = 6 years
Prosper = 10 years

Payback period is a bad measure because:

- Doesn't recognize time value of money
- Doesn't recognize past period cash flows
- Can't tell what the appropriate payback period should be

IRR:
Neighborhood = 22.1%
Prosper = 20.2%

Both companies are generating economic value, as the IRR on each investment is greater than Skylark's cost of capital (15%). However, the IRR measure assumes that cash flows are reinvested at the IRR rate and not at the cost of capital. So, the IRRs might be unrealistic.

NPV:

Tax rate = 1 – (.084 / .12) = 30%

Neighborhood: need to subtract loan loss provision and adjust for taxes to get after tax cash flows

Subtract loan loss provision:
2001: -1.2 + 5.0 = 3.8
2002: -1.0 + 5.1 = 4.1
2003: -0.4 + 5.2 = 4.8

Get after tax cash flows:
2001: 3.8*(1-.3) = 2.66
2002: 4.1* 0.7 = 2.87
2003: 4.8* 0.7 = 3.36

PV of after tax cash flows for years 2004+: 30.9

$NPV = 2.66/(1.15) + 2.87/(1.15)^2 + 3.36/(1.15)^3 + 30.9/(1.15)^3 - 17$
NPV = 10.4

Prosper: need to adjust for taxes to get after tax cash flows

After tax cash flows:
2001: -2.0 * (1-0.3) = -1.4
2002: -1.7 * 0.7 = -1.19
2003: - 1.0 * 0.7 = -0.7

PV of after tax cash flows for years 2004+: 65.5

$NPV = -1.4/(1.15) - 1.19/(1.15)^2 - 0.7/(1.15)^3 + 65.5/(1.15)^3 - 20$
NPV = 20.5

Recommendation:

Neighborhood looks better if you look at payback period (shorter than Skylark's) and IRR. Prosper looks better based on NPV.

Skylark should purchase Prosper because:

- The NPV is higher for Prosper
- Even though Neighborhood's IRR is higher, both investments exceed the cost of capital and IRR may be unrealistic measure.
- Prosper is a more efficient use of capital, based on the new paradigm of financial intermediation
- The purchase of Prosper exposes Skylark to fewer risks than the purchase of Neighborhood (see part b)

11. Solution

Mutual Fund can add value in several ways.

Mutual Fund companies have investment expertise which means the individual investor doesn't have to spend time and money learning about how markets behave or researching industries or individual companies.

Mutual Fund companies also alleviate the burden of having to monitor investments over time to make portfolio rebalancing decisions.

Mutual Fund companies are also able to more efficiently handle risk than an individual investor could. Mutual Fund companies have more access to a broader range of financial instruments than most individual investors do online. (example: international equities, derivatives, etc.)

Mutual Fund companies also add value through general economies of scale. They can also add value by providing record keeping services such as account consolidation, etc.

12. Solution

a)

Preferred stock is better when:

After tax yield for preferred stock	≥	after-tax yield for bond
8% (1 – 0.3t)	≥	10% (1 – t)
t	≥	26.3%

Minimum tax rate is 26.3%

b)

Risk that investor's tax rate will fall below 26.3%.
Remedy – Adapt by selling preferred stock and buying bonds

Risk that preferred stock taxed similarly to bond
Remedy – Require issuer to increase dividend
Remedy – Obtain advance tax ruling from taxing authority
Remedy – Purchase professional legal opinion

c)

Bond:

	Yrs 1-3	Yrs 4-10	Total
Project Income	5	5	50
Interest Expense	1	1	10
Before-tax Income	4	4	40
NOL Used	4	0	12
Taxable Income	0	4	28
Taxes (50%)	0	2	14
Net Income	**0**	**2**	**14**

$$\text{Average Tax Rate} = \frac{\textit{Taxes}}{\textit{Before–Tax Income}} = \frac{14}{40} = 35\%$$

Preferred Stock:

	Yrs 1-3	Yrs 4-10	Total
Project Income	5	5	50
NOL Used	5	0	15
Taxable Income	0	5	35
Taxes (50%)	0	2.5	17.5
After Tax Income (before financing cost)	0	2.5	17.5
Project Income	5	5	50
Interest/Dividend	0.8	0.8	8
Before Tax Income	4.2	4.2	42

$$\text{Average Tax Rate} = \frac{\textit{Taxes}}{\textit{Before-Tax Income}} = \frac{17.5}{42} = 41.7\%$$

13. Solutions

a)

Economic value is created if ROE > cost of capital

Free cash flow is generated if ROE > equity growth rate

Cost of capital = Risk free rate + Risk premium = 6% + 5% = 11%

Traditional Life:

ROE = 10% < 11% = Cost of capital
Thus, economic value is being destroyed

ROE = 10% > 5% = Equity growth rate
Thus, free cash flow is being generated

Universal Life:

ROE = 13% > 11% = Cost of capital
Thus, economic value is being created

ROE = 13% < 20% = Equity growth rate
Thus, free cash flow is being consumed

Flexible Premium Deferred Annuity:

ROE = 15% > 11% = Cost of capital
Thus, economic value is being created

ROE = 15% = 15% = Equity growth rate
Thus, free cash flow is not being generated or consumed

Implications:

Because traditional line is destroying economic value, its ROE should be improved or its growth rate should be reduced.

But the traditional line is needed to provide free cash flow because neither UL nor FPDA sales generate free cash flow. In this situation, the low traditional ROE may be tolerable.

b)

New business generally has a surplus strain associated with it due to high first year commissions and underwriting/acquisition expenses; outflows (expenses,

commissions, premium taxes) exceed inflows (premiums, investment income), resulting in a loss.

Capital Ratio = Capital & Surplus / Required Capital

The first year loss reduces surplus.

But the required capital formula increases with the increase in assets, reserves and net amount at risk due to the sale of new business.

In addition, Neverland can't grow faster than its ROE because capital is needed to fund the business – this is a big problem for UL.

c)

Neverland can use financial reinsurance to transfer a block of liabilities and assets.

Transfer of assets reduces required capital.

Transfer of reserves also reduces required capital (assuming that Neverland gets full credit for liability risk transfer).

Ceding allowance, which is the present value of future profits, offsets first year acquisition expenses, reducing first year loss and, all else equal, increases actual surplus.

So the net impact is reduction in required capital and increase in actual capital, resulting in an improved capital ratio.

Neverland can control the duration of the impact through their ability to recapture the business.

d)

Mutual companies have few options to increase capital. Demutualizing increases capital raising options. New options include public issuance of stock and issuance of holding company debt. Increasing capital through any of these options increases actual capital in the capital ratio formula, improving the capital ratio.

e)

Demutualization is preferable when:

Need long-term structural flexibility

Want easier acquisition financing

Can't raise enough capital through reinsurance

Don't want risk that reinsurer can't fulfill terms of agreement

Concerned about rating agency views (too much reinsurance)

Want to be able to provide management stock-related performance incentives

Need is not immediate – demutualization is a long, costly process

14. Solution

a)

My first recommendation would be an S-Corporation. One positive is that the shareholders are taxed only once, as partners. Also, there is limited liability to the actuaries as corporate shareholders. We could also switch to corporation status in the future, if the need arises.

The drawbacks are as follows:

- There must be less than 35 shareholders in the S-Corporation.
- The S-Corporation can only issue one class of securities

This is appropriate due to the positive tax position and the importance of limited liability to the consultants. Further, the limitation on the number of shareholders will not be an issue for a while. There is little need for raising capital, as the more important need is for expertise in the practice area.

Another recommendation would be a Partnership, where there is no distinction between the business and owners. Again, income is taxed only once. This is a good choice if it is a positive for managers to have control and to make business decisions. Another positive is that a partnership will allow us to pool our capital as well as our expertise.

The drawbacks are as follows:

- There is limited life to partnerships
- Unlimited personal liability for the partners
- Limited access to capital

This is again appropriate due to the positive tax position. While there is limited life to the partnership, a carefully constructed agreement can help. It would also be beneficial for the partners to both have control and decision-making power.

b)

Primary Capital

Primary Capital = sum of capital components

234,000 for Co. A 218,000 for Co. B

Conclusion: Bank A has stronger primary capital position

Risk Based Capital Asset Components	Conversion Factor	Risk Weight	Bank A Value * Conversion Factor * Risk Weight	Bank B
Risk-weighted Assets (RWA)				
Commercial Loans		100%	600,000	800,000
Mortgages		50%	200,000	140,000
Treasury Bills		0%	-	-
Off balance sheet items				
Unused Loan commitments	50%	100%	700,000	600,000
Standby LOCs	100%	50%	960,000	200,000
Total RWAs (sum of above)			2,460,000	1,740,000
Limitation on Loan Loss Allowance (LLA):		1.25% of RWA	30,750	21,750
Total Risk Weighted Assets (RWA)			2,460,000	1,740,000
Less Disqualified LLA			27,250	52,250
Total Adjusted Risk Weighted Assets (ARWA)			**2,432,750**	**1,687,750**

Capital Components	Bank A	Bank B	Bank A	Bank B
Core Capital				
Common Equity	92,000	120,000	92,000	120,000
Target Capital				
Loan Loss Allowance			58,000	74,000
Less Disqualified Allowance			(27,250)	(52,250)
Perpetual Preferred Stock	-	-	84,000	24,000
Totals	92,000	120,000	206,750	165,750
Capital divided by ARWA	3.78%	7.11%	8.50%	9.82%
Minimum RBC Standards	4.00%	4.00%	8.00%	8.00%
Conclusion	Poor	Okay	Okay	Okay

Bank B is Better Positioned

c)

Problems with Primary Capital

- Does not account for off-balance sheet items
- Does not account for asset liquidity
- Causes banks to focus on accounting measures

Problems with Risk-Based Capital

- Credit is not the only risk
- Credit risk among loans is almost ignored
- Accounting capital definitions are used
- High cost to implement
- Banks will find loopholes
- Causes banks to focus on accounting measures

15. Solution

(i)

The investment department is making a bet on interest rate movements. Buying only short assets means that long liabilities are mismatched. Assets are repriced more frequently than liabilities, so net income will increase or decrease with interest rate.

This will not increase shareholder value. Increasing interest rate risk through speculation can only destroy shareholder value, by risking bankruptcy cost. If shareholders want to speculate on interest rate movements, they can do so outside the firm, by buying or selling interest rate futures. The firm should try to stay in the interest rate safety zone, trying to either minimize changes in earnings or changes in shareholder equity (or some strategy in between).

(ii)

Mortgages have default risk and prepayment risk.

Using a level prepayment rate does not capture the options embedded in mortgages. When interest rates fall enough to justify refinancing, prepayments increase. Then we have to invest positive cash flow in a low interest rate environment. Our earned rates would be lower than our competitors. Either our margin would reduce or our profitability would be impacted by less competitive crediting rates.

If interest rates rise, then prepayments slow and we may have to borrow in high interest environments to pay off liabilities.

The alternative measures would be the PSA, which starts at 0.2% (annual) and increases to 5%. This doesn't capture interest rate risk sensitivity.

The best measure would be to partition the mortgages by coupon, and have the prepayment rate tied to the (current rate vs. coupon). The lower the current rate the more prepayment, with a large amount of prepayment if difference is 2% to 3%. Then add this to a fixed rate of 5%, which covers non-interest prepayment causes like house sale, death, relocation.

16. Solution

Information asymmetry is the knowledge gap that exists between management and investors. Management has an incentive to raise capital when the firm is "over-valued". Investors recognize this information gap and the incentive for management to exploit investors. All else being equal, investors tend to discount the value of the firm upon announcement for the need for capital.

Raising capital through a common stock offering has historically had a significantly negative impact on stock prices. Not only for the reasons cited above, but also because the decrease in leverage is also a sign that management is not confident about it's prospects. Common stock offering is generally on the bottom of the pecking order when it comes to capital raising alternatives.

Raising capital through a public debt offering has historically had an insignificant impact on stock prices. Investors recognize management's incentive to exploit investors, but this is counterbalanced by increased leverage which is a sign that management is confident about its prospects.

Raising capital through a private bank loan has historically had a significant positive impact on stock prices. The reasons given for the public debt offering also hold true for a private bank loan. But beyond that, a private bank loan sends positive signals to the market due to the underwriting a bank conducts before it loans money to a company. The bank generally has inside information about the company, will place covenants on the loan, and will monitor the company closely.

The information asymmetry problem can be reduced if management tries to communicate with investors what it plans to do with the capital raised. But even this doesn't completely eliminate the information gap problem because investors recognize that management has a tendency to overexaggerate its prospects.

17. Solution

a)

There are a large number of shareholders, because of the nature of this demutualized company and hence asymmetrical information; which means potential agency costs are large. The market would reward minimizing agency cost through dividends, and since most shareholders are taxable, this needs to be kept in mind when setting a dividend policy.

Being an extremely profitable company, a dividend would signal this profitability to the market and separate it from its weaker peers. There is a need to balance this philosophy with deadweight costs (i.e. frictional taxes).

In developing dividends, earnings levels need to be looked at and there needs to be confidence at sustaining and growing these earnings into the future since the market punishes those companies that cannot continue their dividend payments.

There are a number of other issues to consider including:

The number and type of institutional investors along with their needs.
Whether the company has positive NPV opportunities and hence should lower their dividend payments.
The overall capital intensity of the company should increase.
The free cash flow should increase as well due to the company being well capitalized.

b)

As a way to return profits to shareholders , the company may use stock repurchase which could lower shareholder taxes by shifting income to capital gains. Alternatively, the company may increase retained earnings, possibly through a stock dividend, and invest in new profitable opportunities to increase returns in the future.