****BEGINNING OF EXAMINATION****
FINANCE AND ENTERPRISE RISK MANAGEMENT; CORE SEGMENT
MORNING SESSION

Questions 1-2 pertain to the Case Study.
Each question should be answered independently.

1. *(13 points)* Kelly Ratings recently completed their review of Zoolander and sent you the results, which recommend a downgrade in the rating. Tomas Lyon has asked you to provide a report about this situation.

You have gathered the following information as of December 31, 2004:

Term net amount at risk is $3,000 million.
Whole Life net amount at risk is $1,500 million.
The general account annuity business is 100% GICs.

Prepare a report that addresses the following points.

(a) *(2 points)* Describe the roles of rating agencies and how they serve the securities markets and the public.

(b) *(1 point)* Describe how rating agencies develop and use liquidity ratios in assessing a firm's financial strength.

(c) *(4 points)* Calculate Zoolander's capital adequacy ratio as of December 31, 2004, based on Kelly's rating methodology.

(d) *(4 points)* Describe aspects of Kelly's ratings process and models that could be considered inferior to those used by Standard & Poors, Moody's and Fitch Ratings.

(e) *(2 points)* List the requirements to become a nationally recognized statistical ratings organization, as defined in the SEC's proposed rule, and determine whether Kelly meets those requirements.

Questions 1 - 2 pertain to the Case Study.
Each question should be answered independently.

2. *(10 points)* Tomas Lyon, Zoolander's CEO, has asked to speak with you about two concerns: liquidity risk and credit risk.

(a) *(2 points)* Describe the forms of liquidity risk faced by insurance companies and the importance of maintaining adequate liquidity.

(b) *(1 point)* Comment on Zoolander's current liquidity position.

(c) *(4 points)* Lyon is concerned with a drop in the quality of the bond portfolio. He asks you to build a model to quantify the potential exposure over the next year due to credit risk. Lyon wants an expectation as well as a "worst case scenario" based on a confidence interval of 99%.

You have recently become familiar with the CreditMetrics approach to modeling credit risk. Outline a plan to develop a model for Zoolander, including the major calculations and assumptions needed.

(d) *(3 points)* Lyon wants to consider securitization as a means of reducing credit and liquidity risks and as a management tool.

Explain the advantages to Zoolander of securitizing:

i. Private Placement Bonds
ii. A Closed Block of Insurance Liabilities

3. *(12 points)* Your company, New West Life, has been seeking expansion into the Asian market. New West's CEO has negotiated a joint venture opportunity with a Chinese firm, Orient Life.

The joint venture will sell investment products to the expanding Chinese middle class. Each of the two partners will have 50% ownership of the venture. New West will invest \$600 million, and Orient Life will invest \$400 million. Neither partner will be able to exit the venture during the first five years.

In addition, New West will have the option, at the end of five years, to buy Orient Life's share of the partnership, for \$550 million.

You have assessed that the joint venture has a 50% probability of increasing in value to \$2,150 million at the end of five years and a 50% probability of decreasing in value to \$600 million at the end of five years. There are no interim cash flows expected in the five year period.

You are given the following data:

New West Life weighted average cost of capital (WACC):	$k = 10\%$
New West Life Beta:	$\beta_{NW} = 1.2$
Joint Venture Beta:	$\beta_{JV} = 0.8$
Market Return:	$r_m = 9\%$
Risk-free Rate:	$r_f = 4\%$

The CEO of New West has asked you to review the joint venture opportunity.

(a) Determine the appropriate risk-adjusted discount rate to use to assess this opportunity.

(b) Assess the opportunity using a net present value (NPV) approach.

(c) Re-evaluate the joint venture using a contingent claims analysis (CCA) approach.

(d) Explain to the CEO why the NPV and CCA results are different.

(e) Recommend to the CEO whether or not New West should pursue this opportunity. Justify your response.

4. *(8 points)* You are the Chief Actuary of Global Insurance, a public company selling only Universal Life, with divisions located in the U.S., Canada and Australia. Your actuaries have discovered pricing inadequacies on the in-force products. Global's CFO is very interested in the volatility of the company's results due to both the foreign exchange markets and the pricing issues.

(a) Describe the income-based reserve methodology that Global must follow in each jurisdiction in which it is conducting business. Include in your description the accounting implications of the pricing inadequacies and their impact on the current year's country-specific income statements.

(b) Outline a report for the CFO that includes the following:

i. The foreign exchange risks that Global has assumed.
ii. Reasons why Global might consider hedging those risks.
iii. Hedging strategies and instruments that may be used for currency hedging.

5. *(5 points)* You have been hired by Salmon Inc. to provide investment strategy advice for Salmon's Defined Benefit Plan.

Salmon's management is concerned about the accuracy of the plan surplus calculation in light of volatility of the surplus over the past two years.

You have been provided the following plan information:

Plan Assets	$240 million
Plan Liabilities	$250 million

The plan's current investment strategy, valuation and reporting are:

- Required rate of return on assets is 7%. Given this constraint, minimize asset volatility.
- Liability risk is determined using Monte Carlo testing.
- Discount rate for liabilities tied to expected return on assets
- The annual report to Management provides a best estimate, 20-year funding level forecast, measured on a GAAP basis.

(a) Describe weaknesses in the current strategy, valuation and reporting. Recommend improvements to better manage market-related risks of the pension plan.

(b) Outline methods to control pension plan risks that are not market related.

6. *(8 points)* Moby Life is considering selling an in-force block of term insurance. You are the appointed actuary of the company and have been asked by the CEO to estimate the fair value of the block as of December 31, 2005.

Future gross cash flows have been projected as follows:

	2006	**2007**	**2008**
Premiums	500	490	486
Expenses & Commissions	75	74	73
Death Claims	64	66	66

Assume there are no further cash flows beyond 2008.

Moby Life reinsures 50% of the business under a coinsurance treaty and receives 10% of ceded premium as a reinsurance allowance.

You have been provided with the following information:

Risk-free rate:	4%
Rate of return on assets:	8%
Cost of capital:	15%
Benchmark equity to liability ratio:	10%
Effective tax rate:	35%

(a) *(2 points)* Describe the difference between a fair value methodology and U.S. GAAP for valuation of policy liabilities.

(b) *(4 points)* Use a cost-of-capital approach to determine the fair value of the policy liabilities for the term block of business as of December 31, 2005. Assume all cash flows occur at mid-year. Show your work.

(c) *(2 points)* The CEO would like to know how much this block of business is worth if it is kept with Moby Life rather than being sold. Suggest an alternate measure for valuing the business if it is retained by Moby Life. Describe the differences between this measure and the fair value methodology in (b).

7. *(4 points)* Allegro Annuity is an insurance company domiciled in the U.S. that issues a full range of fixed annuity products. Starting this year, Allegro is required to comply with the cash flow testing C-3a risk-based capital requirement. The company has hired you to help them understand the impact of this requirement.

(a) Compare the C-3a cash flow testing requirement with the factor-based C-3a requirement.

(b) Allegro currently holds statutory reserves that are calculated using the CARVM methodology and meet minimum regulatory standards.

Explain why Allegro may still be required to hold additional capital under the C-3a cash flow testing requirements.

****END OF EXAMINATION****
MORNING SESSION

****BEGINNING OF EXAMINATION****
FINANCE SEGMENT
AFTERNOON SESSION
Beginning With Question 8

8. (*8 points)* Desperate Housefires (DH) is a property and casualty (P&C) insurance company specializing in home insurance coverage. Smash and Cash (SC) is a property and casualty insurance company specializing in auto insurance.

In Our Arms (IOA) is an insurance holding company that wishes to purchase a P&C company. IOA wants to evaluate the insolvency risk of DH and SC.

IOA plans to implement the following initiatives in the acquired company:

- The target for the expected policyholder deficit risk measure will be 2.5% or below.
- Dynamic Financial Analysis will be instituted.

You are given the following data:

	Desperate Housefires	Smash and Cash
Assets:	100	75

Scenario	p_x	Desperate Housefires Expected Loss	Smash and Cash Expected Loss
1	0.2	50	50
2	0.6	100	70
3	0.2	150	100

(a) For DH and SC:

i. Calculate the expected policyholder deficit for each company.
ii. Compare the risk of insolvency of the two companies.
iii. Determine the level of additional assets which each company would need to have in order to maintain the target expected policyholder deficit required by IOA.
iv. Calculate the capital held by each firm, assuming the additional assets, if any, determined in (iii) are contributed to each company.

(b) Describe the purposes and uses of Dynamic Financial Analysis.

(c) Describe the elements that should be considered in designing a Dynamic Financial Analysis system for IOA.

9. *(6 points)* Windy City Life Insurance Company sells Universal Life and Term insurance to the affluent market. The UL product is a market leader, mainly because it utilizes state-of-the-art and proprietary investment management strategies. The company's sales have been strong over the last three years and are on pace for another record year. However, the large amount of new business has depleted the company's capital base.

The senior management team at Windy City has identified growth opportunities for the organization, but they need to free up capital in order to pursue those opportunities. Management is contemplating separate financial reinsurance transactions for each of the two lines of business as a way to provide surplus relief. Because the company has never used reinsurance in the past, Windy City would like to keep the reinsurance structure as simple as possible.

Windy City has hired you as a consultant on development of a financial reinsurance program.

(a) *(3 points)* Describe the structure of three alternative forms of financial reinsurance and the products for which each is typically used. Include the advantages and disadvantages of each form.

(b) *(2 points)* Taking into account Windy City's preference for a simple structure, recommend an appropriate financial reinsurance plan for:

i. The Term line of business
ii. The Universal Life line of business

Defend your recommendations.

(c) *(1 point)* Explain uses of financial reinsurance other than surplus relief.

10. *(6 points)* Nirvana Novelties is a theme-based organization selling convenience items at gas stations and truck stops throughout North America. Nirvana is a privately held firm with no debt.

You are given the following current information for Nirvana:

Annual earnings:	\$7.5 million
Assets:	\$225 million
Liabilities:	\$160 million

You are given the following assumptions:

Market Capitalization Rate:	10%
Effective Tax Rate:	0%
Cost of Debt:	9%

At a recent trade show in Las Vegas, Nirvana became interested in expanding into theme-based key chains. Assume that future investment in the key chain market generates a 15% return and that the net present value of this investment will be \$50 million.

(a) Calculate Nirvana's book value, tangible value, and the price-to-earnings ratio, prior to expansion and leverage.

(b) Calculate the updated price-to-earnings ratio for Nirvana with 50% of the expansion cost financed by debt.

(c) Describe the impact on franchise value of assuming an effective tax rate greater than zero.

(d) One of your colleagues has asserted that, "regardless of a firm's financial structure, the fundamental basis for high P/Es is access to substantial franchise investment."

Defend or refute that statement.

Questions 11-12 pertain to the Case Study.
Each question should be answered independently.

11. *(17 points)* Steve Smith, a trusted insurance company analyst at a large investment bank, makes a public comment that Zoolander Life Insurance Company is an attractive takeover candidate. Tomas Lyon asks you, the CFO, for your thoughts on these comments.

(a) *(4 points)* Outline why Zoolander might be attractive as a takeover candidate. Include details on the following:

i. Capital Structure
ii. Product mix
iii. ROE / Financial Results
iv. Corporate Orgainzation and Management

(b) *(2 points)* Describe protections that currently exist as well as further steps that could be taken to prevent a hostile takeover of Zoolander.

(c) *(2 points)* Zoolander's desired capital structure, as described in the Kelly Ratings memo, is 30% debt. Explain the advantages and disadvantages of altering the mixture of debt and equity in the capital structure.

(d) *(4 points)* Using the financial data in the case study, evaluate the appropriateness of the 30% leverage ratio. Assume the standard deviation of return on assets is 10%. Show your work.

(e) *(2 points)* Assume Zoolander moves to its desired capital structure, with a projected total value of outstanding securities of $1.2 billion. Evaluate whether Zoolander's target pre-tax ROE of 15% is reasonable. Show your work.

(f) *(3 points)* Recommend an appropriate capital structure for Zoolander. Describe three ways that the firm can deploy its excess capital.

Questions 11-12 pertain to the Case Study.
Each question should be answered independently.

12. *(8 points)* Zoolander is considering an acquisition of ABC Annuity, a small annuity company. ABC Annuity focuses entirely on selling fixed annuities through independent brokers. The company was founded only five years ago and has grown rapidly.

At December 31, 2004, ABC Annuity reported the following numbers in their financial statements:

- GAAP reserves = $3,450 million
- Statutory reserves = $3,500 million
- Required Capital = $157 million

Projected financial statement values (in millions) for ABC Annuity are below:

Income Statement Data	**2005**	**2006**	**2007**
Premium	267	268	270
Investment Income	226	243	261
Death Benefits	2	7	5
Surrender Benefits	100	101	101
Operating Expenses	30	32	35
Commissions	9	9	9
Taxes	8	9	9

Balance Sheet Data as of December 31	**2005**	**2006**	**2007**
Statutory Reserves	3,763	4,045	4,348
GAAP Reserves	3,462	3,721	4,000
Tax Reserves	3,650	3,923	4,218
Required Capital	169	182	196

In preparation for a potential bid, CEO Tomas Lyon asks you to evaluate the acquisition.

(a) *(1 point)* Identify additional data needed to perform an actuarial appraisal on ABC Annuity.

(b) *(2 points)* Calculate the present value of distributable cash flows for the years provided using Zoolander's desired WACC as the discount rate. Assume cash flows occur at the end of each year. Show your work.

(c) *(3 points)* Outline the key considerations that should be taken into account in deciding to proceed with the acquisition.

12. Continued

(d) *(2 points)* Suggest at least three distinct ways that capital could be raised by Zoolander to acquire ABC Annuity. For each, indicate:

i. how appropriate an option this would be for Zoolander in raising capital for this acquisition

ii. costs associated with implementing that option

iii. the impact on existing Zoolander equity holders.

13. *(4 points)* Leede is a medium-sized Property and Casualty Insurance Company that is publicly owned. Leede's marginal tax rate is 30%.

An investment in one of the following two par bonds is being considered:

- Bond #1 – Fully taxable bond yielding 8% per year maturing in 2 years
- Bond #2 – Tax-exempt bond yielding 6% per year maturing in 2 years

Weather models suggest a 60% chance of extreme hurricane activity over the next two years that would completely eliminate all of Leede's taxable income.

(a) Assuming both bonds have the same risk profile, demonstrate which investment Leede should choose today. Show your work.

(b) Assume after one year the bonds are still trading at par. There has been no hurricane damage and there is only a 10% chance of hurricane loss over the next year. Calculate the level of transaction costs that would make Leede indifferent to switching investments at that time.

(c) Explain how your answer in (b) would be impacted if the risk profiles of the two bonds were no longer the same.

14. *(6 points)* You are the CFO of a mid-sized, publicly traded U.S. corporation that develops software for the retail industry. The firm has been in existence for twenty years. Initial growth was explosive, but over the last four to six years both your firm's and the industry's growth rates have stabilized. Thanks to your efficient management, the firm has shown consistent profits over this period.

The CEO has expressed an interest in instituting a dividend for the first time.

(a) Compare and contrast the signaling model and agency cost model for corporate dividends. Describe what outcomes would be predicted under each if your firm instituted a dividend.

(b) Describe the firm-specific factors to be considered in deciding whether or not to institute a dividend. Relate these factors to your firm's situation and indicate whether or not they support the CEO's idea.

(c) Recommend a dividend policy for the corporation and support your answer.

15. *(5 points)* You are the CFO for TUNA Life Insurance Company. TUNA has three major blocks of business: an annuity line, a life insurance line, and an individual disability line. Below are statistics for the three lines of business:

Line of Business	**Pre-tax Return on Assets (ROA)**	**Allocated Debt Capital**	**Allocated Equity Capital**
Annuity	9%	$90 million	$10 million
Life Insurance	10%	$70 million	$30 million
Individual Disability	11%	$50 million	$50 million

TUNA currently pays 7% to service its debt. Equity investors require a 13% return. The marginal tax rate for TUNA is 30%.

(a) Calculate the Economic Value Added (EVA) for each business unit. Show your work.

(b) TUNA's chief actuary wants to implement product pricing changes so that all lines of business have a positive EVA. Assuming that the allocated debt and equity capital do not change, establish minimum ROAs for each business line to achieve. Show your work.

(c) Explain the advantages and disadvantages of an EVA financial management system for monitoring business line performance.

****END OF EXAMINATION****
AFTERNOON SESSION