



THE ACTUARIAL PROFESSION



Nanyang Business School

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Chief Pricing Actuary, Life Asia

Munich RE 

Introduction...

- ❑ Chief Pricing Actuary at Munich Re, Life Asia
– since April 2008
- ❑ Corporate Actuary and Regional Pricing Actuary for Swiss Re in Zurich – for over 7 years
- ❑ Client Management roles for Partner Re's Life business in the UK, Israel and South Africa – for 2 years.
- ❑ Started career at Old Mutual in South Africa - and worked in various actuarial product development, pricing & valuation roles – for ca 10 years.
- ❑ Holds the Fellow of the Society of Actuaries (FSA) and Chartered Enterprise Risk Analyst (CERA) designations from the Society of Actuaries. Also a CFA charterholder.



Agenda

- ❑ Introduction to the **Profession**
- ❑ 3 Career **Phases**
- ❑ **Evolution** of the Actuarial Profession
- ❑ The **Singapore** Actuarial Society
- ❑ Actuarial **Salary** Surveys
- ❑ The SoA **Exam** Curriculum
- ❑ Study & Exam **Skills**
- ❑ **ERM** & the new **CERA** Designation

The Best and Worst Jobs in the US

The Best

1. Mathematician
2. **Actuary**
3. Statistician
4. Biologist
5. Software Engineer
6. Computer Systems Analyst
7. Historian
8. Sociologist
9. Industrial Designer
10. Accountant
11. Economist
12. Philosopher
13. Physicist
14. Parole Officer
15. Meteorologist
16. Medical Laboratory Technician
17. Paralegal Assistant
18. Computer Programmer
19. Motion Picture Editor
20. Astronomer

The Worst

200. Lumberjack
199. Dairy Farmer
198. Taxi Driver
197. Seaman
196. EMT
195. Roofer
194. Garbage Collector
193. Welder
192. Roustabout
191. Ironworker
190. Construction Worker
189. Mail Carrier
188. Sheet Metal Worker
187. Auto Mechanic
186. Butcher
185. Nuclear Decontamination Tech
184. Nurse (LN)
183. Painter
182. Child Care Worker
181. Firefighter

Rated on:

- + Income;
- + Outlook;
- + Stress;
- + Environment ;
- + Physical Demands;
- + Job Security



Source: "2009 Jobs Rated Almanac," &
U.S. Bureau of Labor Statistics and the Census Bureau,

Who are Actuaries...

1. An actuary is a **business professional** who analyzes the financial consequences of risk.
2. Actuaries put a **price tag on risk**. They are the leading professionals in finding ways to manage risk, and are experts in:
3. Actuaries use **mathematics**, **statistics** and **financial theory** to study uncertain future events, especially those of concern to insurance and pension programs.
4. They evaluate the **likelihood** of those events, design creative ways to reduce the likelihood and decrease the impact of adverse events that actually do occur.
5. Actuaries are an important part of the **management team** of the companies that employ them.
6. Their work requires a combination of strong **analytical skills**, **business knowledge** and understanding of **human behavior** to design and manage programs that control risk.
7. Valuing **future uncertain cashflows**...

SoA Actuarial Designations...

Designation	Definition
Associate (ASA)	An Associate of the Society of Actuaries has demonstrated knowledge of the <u>fundamental concepts and techniques for modeling and managing risk</u> . The Associate has also learned the basic methods of applying those concepts and techniques to common problems involving uncertain future events, especially those with financial implications. The Associate has also completed a professionalism course covering the professional code of conduct and the importance of adherence to recognized standards of practice. Associates who have been members of the SOA for five or more years may also vote in Society of Actuaries elections.
Chartered Enterprise Risk Analyst (CERA)	A Chartered Enterprise Risk Analyst (CERA) of the Society of Actuaries is an Associate member who has demonstrated knowledge in the <u>identification, measurements and management of risk</u> within risk-bearing enterprises. The CERA has also completed a professionalism course covering the professional code of conduct and the importance of adherence to recognized standards of practice.
Fellow (FSA)	Has demonstrated a knowledge of the <u>business environments</u> within which financial decisions concerning <u>pensions, life insurance, health insurance, and investments</u> are made including the application of mathematical concepts and other techniques to the various areas of actuarial practice. The Fellow has further demonstrated an in-depth knowledge of the application of appropriate techniques to a specific area of actuarial practice.

Top 10 International (outside US & Canada) Markets for SoA

Country	FSA's	FSA's by Mutual Recognition	ASAs	ASA's by Other Than Exam	Total	CERA's	CFA's
Hong Kong	275	6	164	7	452	4	4345
China	178	2	151	3	334	5	
United Kingdom	50	13	26	136	225	3	6368
Taiwan	71	0	134	2	207	6	
Singapore	40	0	32	 6	78	4	2452
Australia	10	5	10	41	66	2	
Malaysia	23	0	27	1	51	1	
Japan	29	0	13	2	44	1	
Bermuda	28	3	10	2	43	1	
Switzerland	21	0	10	4	35	1	1841

FAQs by Location (Indicative Only)

Australia & New Zealand	1,300	UK & Ireland	7,000
Hong Kong	400	Western Europe (rest)	8,200
Singapore	150	Eastern Europe, ME	600
Japan	1,500	Africa (all)	700
India	200	North America	18,000
China & Rest of Asia	450	Mexico & South America	1500
	4,000		36,000

Career Phase 1: The New Actuary

- ❑ Commit yourself to successfully **completing exams**.
- ❑ Seek out a **mentor**.
- ❑ Begin exploring resources available to you through **professional organizations**.
- ❑ Learn about the **history** of actuarial profession.
- ❑ Begin thinking about your **professional interest** areas.
- ❑ Hone your **elevator speech**.
- ❑ Keep the **big picture** in mind.
- ❑ Be on the lookout for **new opportunities**.
- ❑ Seek out training and experience in **complementary fields**.



Phase 2: The Mid-Career Actuary

- ❑ Seek new **leadership** roles.
- ❑ Elevate your **profile** in community.
- ❑ Choose your **professional** interests.
- ❑ Take an **active role** in professional special interest committees.
- ❑ Polish your **networking** skills.
- ❑ Continue working with a **mentor**.
- ❑ Follow the **trends** affecting industries in which you operate.
- ❑ Build your **negotiation** skills.
- ❑ Think about how you're **communicating** your work.



Phase 3: The Seasoned Professional

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- ❑ Ask for meetings with **C-suite** members – e.g. CFO; CRO; CEO; etc.
- ❑ Be a **mentor**.
- ❑ Lead **discussions** about the actuarial profession.
- ❑ Revisit your **professional interests**.
- ❑ Assume **leadership** role with professional actuarial organization.
- ❑ Continue to be **team** player.
- ❑ Never stop **marketing yourself** or your skills



Source: www.imageoftheactuary.org

The Evolution of the Actuarial Profession...

The Evolution of the Actuary	Emergence	Description	Time to Emerge
Actuary of the 1st kind	17th century	life insurance actuaries using deterministic methods	250
Actuary of the 2nd kind	20th century	casualty actuaries using probabilistic methods	
Actuary of the 3rd kind	1980's	investment actauries applying financial economics (Bühlmann)	70
Actuary of the 4th kind	current	actuaries working in ERM (Embrechts)	25

Source: Stephen P. D'Archy, CAS Presidential Address, 2005



SoA tagline: “Risk is Opportunity”
(www.imageoftheactuary.org)



10 Notable Actuaries – the “Poster Boys” of the Profession

1. Edmund **Halley** (British - 1693) first to mathematically and statistically rigorously calculate premiums for a life insurance policy 
2. James **Dodson** (British - 1755) – built statistical mortality tables
3. Frank **Redington** (British - 1952) – interest immunization theory
4. Newton **Bowers** (American) – wrote the book on actuarial mathematics
5. Hans **Buhlmann** (Swiss) – father of modern Credibility Theory
6. Philem **Boyle** (Canadian) – the Magnificent 7 of Financial Economics 
7. Andrew **Smith** (British) – promoter of Financial Economics in Actuarial Science
8. Harry **Panjer** (Canadian) – Risk Theory expert & educator 
9. Prakash **Shimpi** (Singaporean) – ERM pioneer 
10. David **Li** (Canadian) – pioneered the use of Gaussian copula models for the pricing of CDO's; etc. – “the guy who blew up Wall Street ?” 

Philem Boyle's "Magnificent 7" of Financial Economics

1. The no-arbitrage principle
2. Mean-variance portfolio selection



3. Capital structure irrelevance

$$r_E = r_0 + \frac{D}{E}(r_0 - r_D)(1 - T_C)$$

4. The capital asset pricing model (CAPM)

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

5. Equilibrium

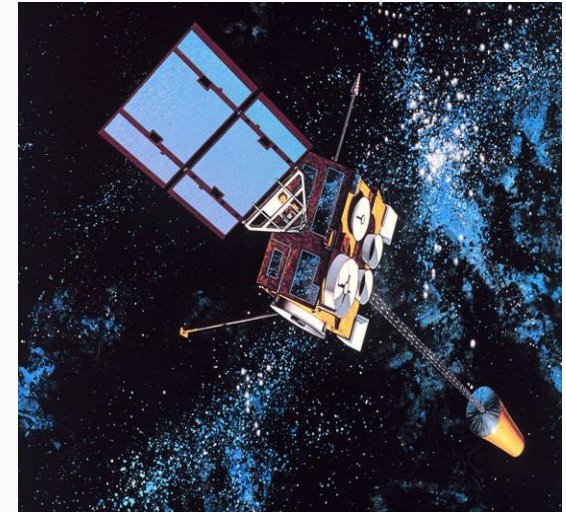
6. The Black-Scholes-Merton option pricing formula

$$C(S, t) = SN(d_1) - Ke^{-r(T-t)}N(d_2)$$

7. Portfolio selection in continuous time

The Evolution of Financial Risk Management

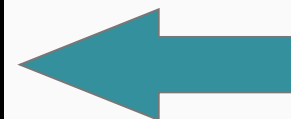
1952	Mean Variance	Markowitz
1958	Indifference Theory	Modigliani & Miller
1960's	Capital Asset Pricing Model (CAPM)	Sharpe
1973	Options-Pricing Model	Black, Scholes & Merton
1976	Arbitrage Pricing Theory	Ross
1979	Binomial Option Pricing Model	Cox
1980's	ARCH Time Series	Engle & Granger
1990's	Dynamic Hedging	Hull, et al
2000	Regime-Switching Lognormal (RSLN)	Hardy



Source: Harvard Business Review, September 2008: "The New Arsenal of Risk Management" modified (red indicates Nobel Prize winning topics)

Real World Imperfections

Agency Costs
 Asymmetric information & signalling effects
 Bankruptcy & financial distress costs
 Behavioral Finance
 Contagion
 Moral Hazard
 Regulation
 Taxation
 Transaction costs



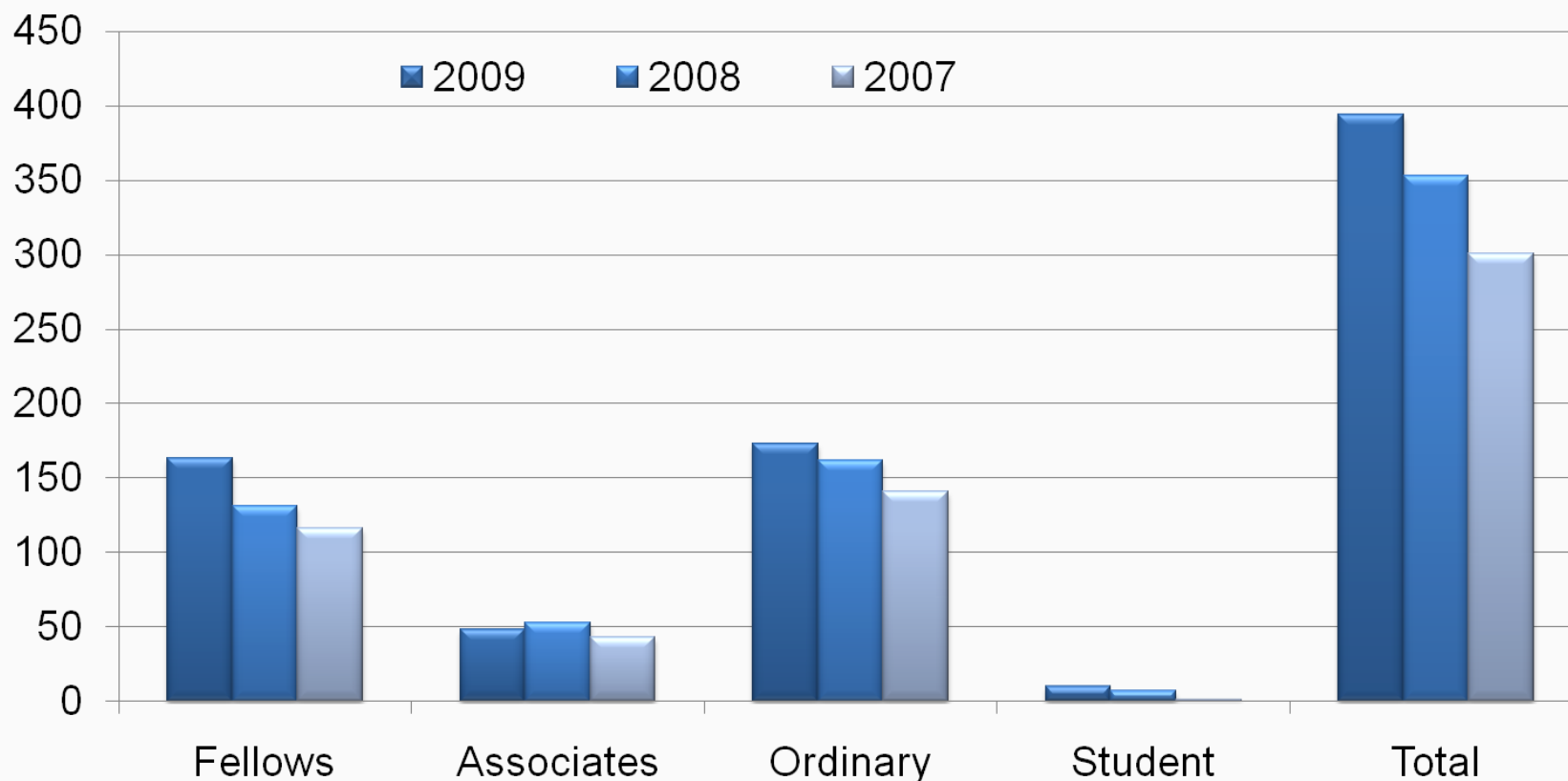
Covered in
 Financial Economics
 FSA Module

Singapore Actuarial Society (SAS) – Council 2009/2010 Session



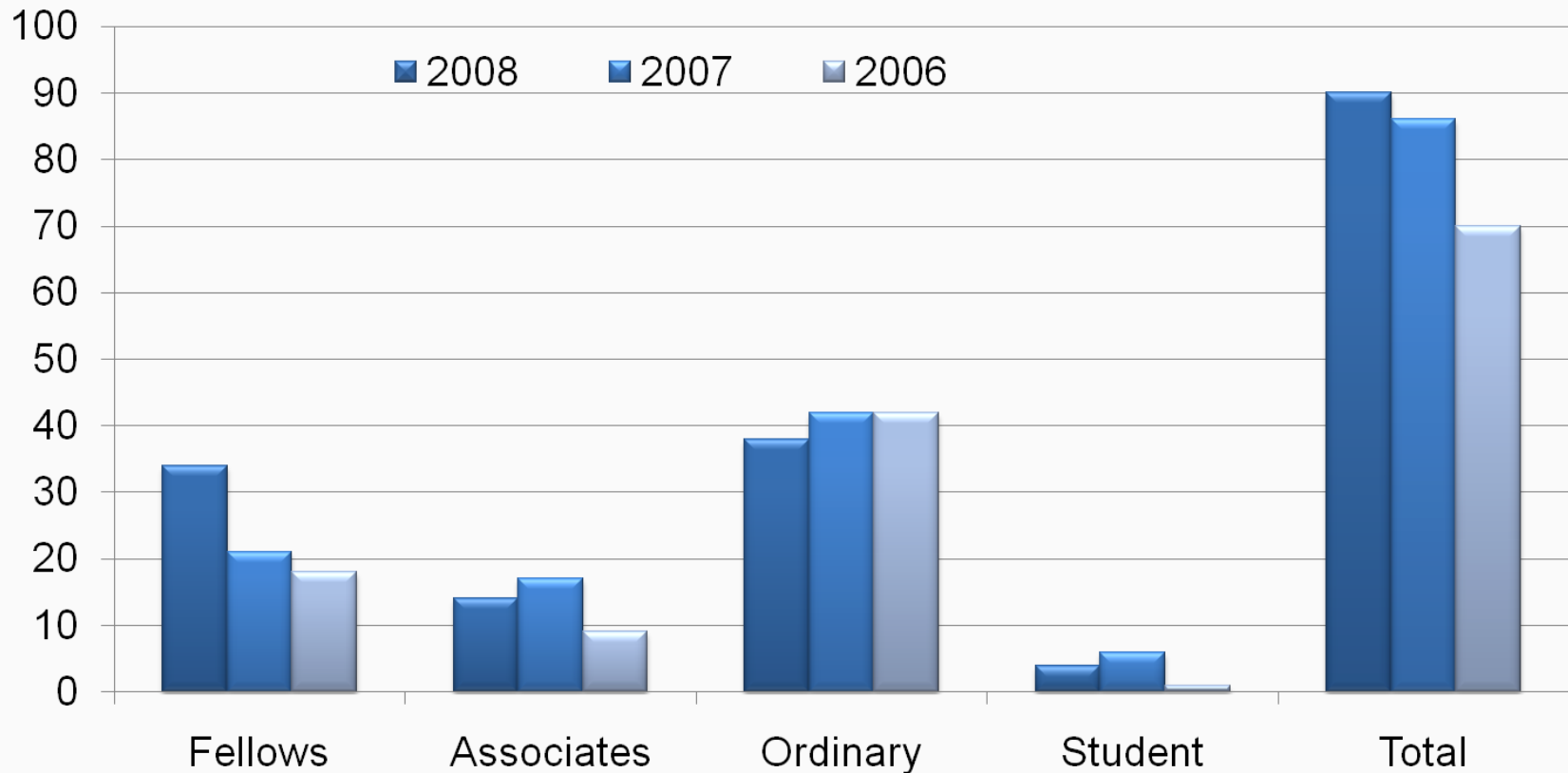
President	Frank McInerney
Vice President	Rani Rajasingham
Hon. Treasurer	Tim Beardsall
Hon. Secretary	Jill Hoffman
Council Members	Angela Koechli
	Chi Cheng Hock
	Colin Pakshong
	Sharon Tan
	Walter de Oude
Ex officio	
Auditors	Gavin Maistry

SAS Hon. Secretary Report: Current Membership



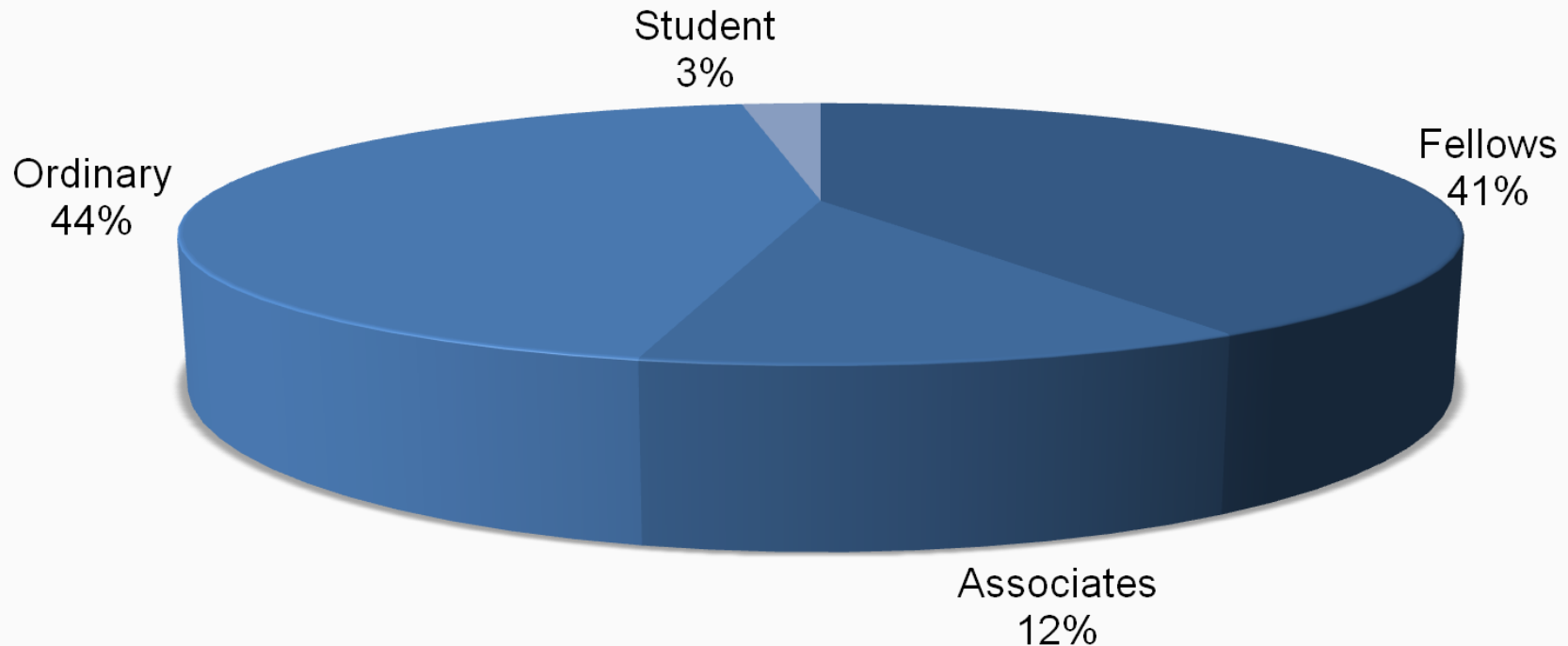
Increase of **12%** from 2008 and **31%** from 2007

Hon. Secretary Report: New Applications



Membership continues to grow

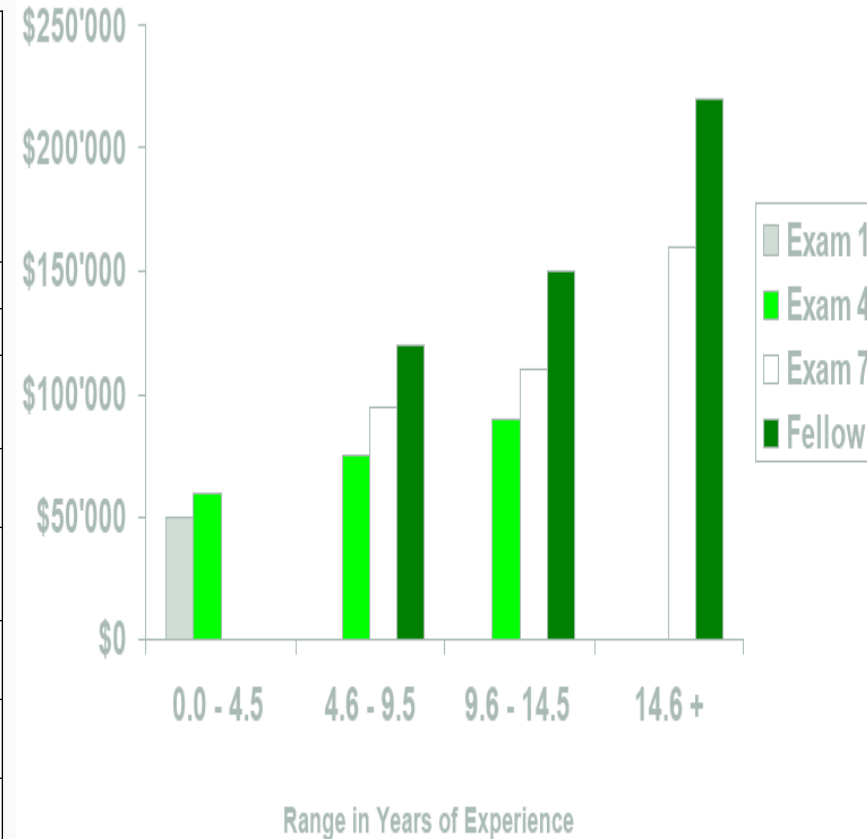
Hon. Secretary Report: 2009 Membership distribution



We encourage members to join at the correct level & upgrade when appropriate.

DW Dimpson Actuarial Survey

Life & Health	0-0.5 yrs	0.5-2.5 yrs	2.5-4.5 yrs	4.5-6.5 yrs	6.5-9.5 yrs	9.5-14.5 yrs	14.5-19.5 yrs	19.5+ yrs
September 2008	(excl. sign-on)							
1 course	45-62	49-64	54-68					
2 courses	47-64	53-68	58-75	61-80				
3 courses	50-66	56-73	61-80	66-87				
4 courses	53-68	60-81	66-86	70-94	73-101			
5 courses		63-86	70-93	78-103	79-114			
ASA		72-95	78-107	88-117	92-130	96-141	108-228	112-242+
7 courses				92-124	98-134			
8 courses				95-131	100-144			
FSA			95-142	101-152	108-164	125-214	142-317	149-341



Note: Compensation may vary significantly according to years of experience, geographic region and responsibilities.
Source: D.W. Simpson & Company, Inc, 2004 Salary Survey

US Dollars

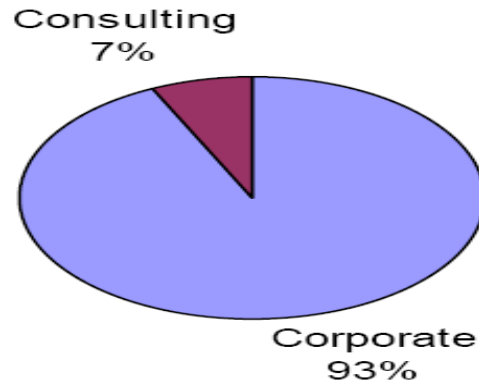
Another Actuarial Salary Survey...

	Annual mean income:	Projected employment in 2016:	Increase between 2006 and 2016:
1. Associate Actuary	\$81,924	22,000	24 percent
2. Attorney	\$88,235	844,000	11 percent
3. Compensation and benefits manager	\$80,011	55,000	12 percent
4. Economist	\$80,817	16,000	7 percent
5. Floor broker	\$83,608	399,000	25 percent
6. Marketing manager	\$86,283	192,000	14 percent
7. Petroleum engineer	\$86,899	18,000	5 percent
8. Pharmacist	\$88,786	296,000	22 percent
9. Risk management supervisor	\$85,655	570,000	13 percent
10. Veterinarian	\$80,069	84,000	35 percent

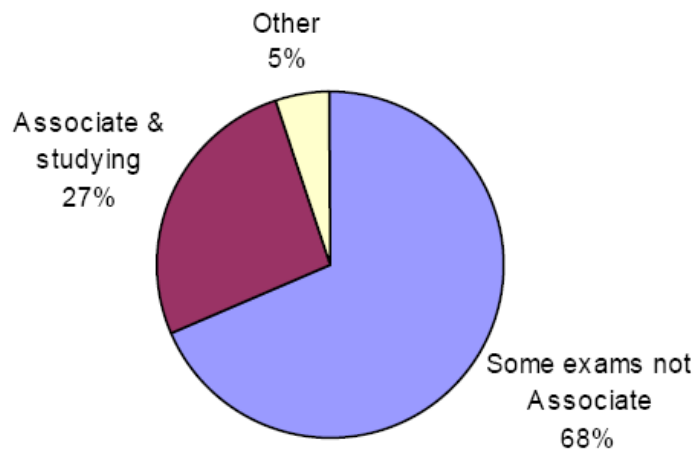
US Dollars

SAS Salary Survey - Actuarial Students & Associates Profile

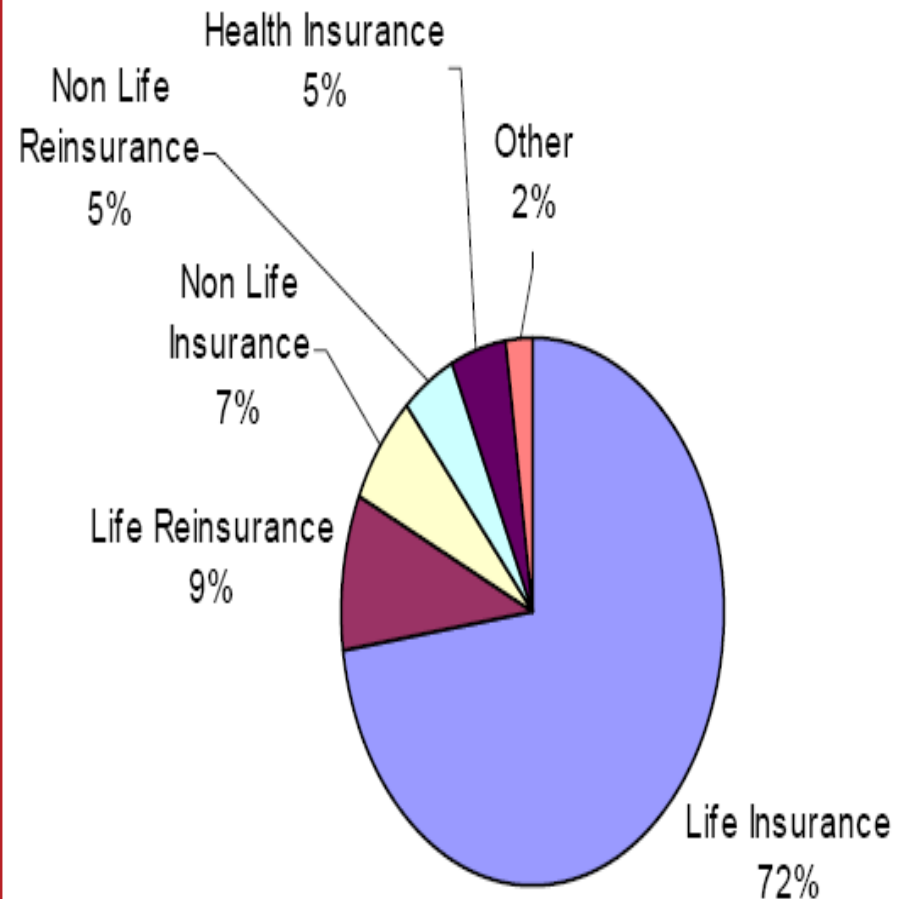
Employer Type



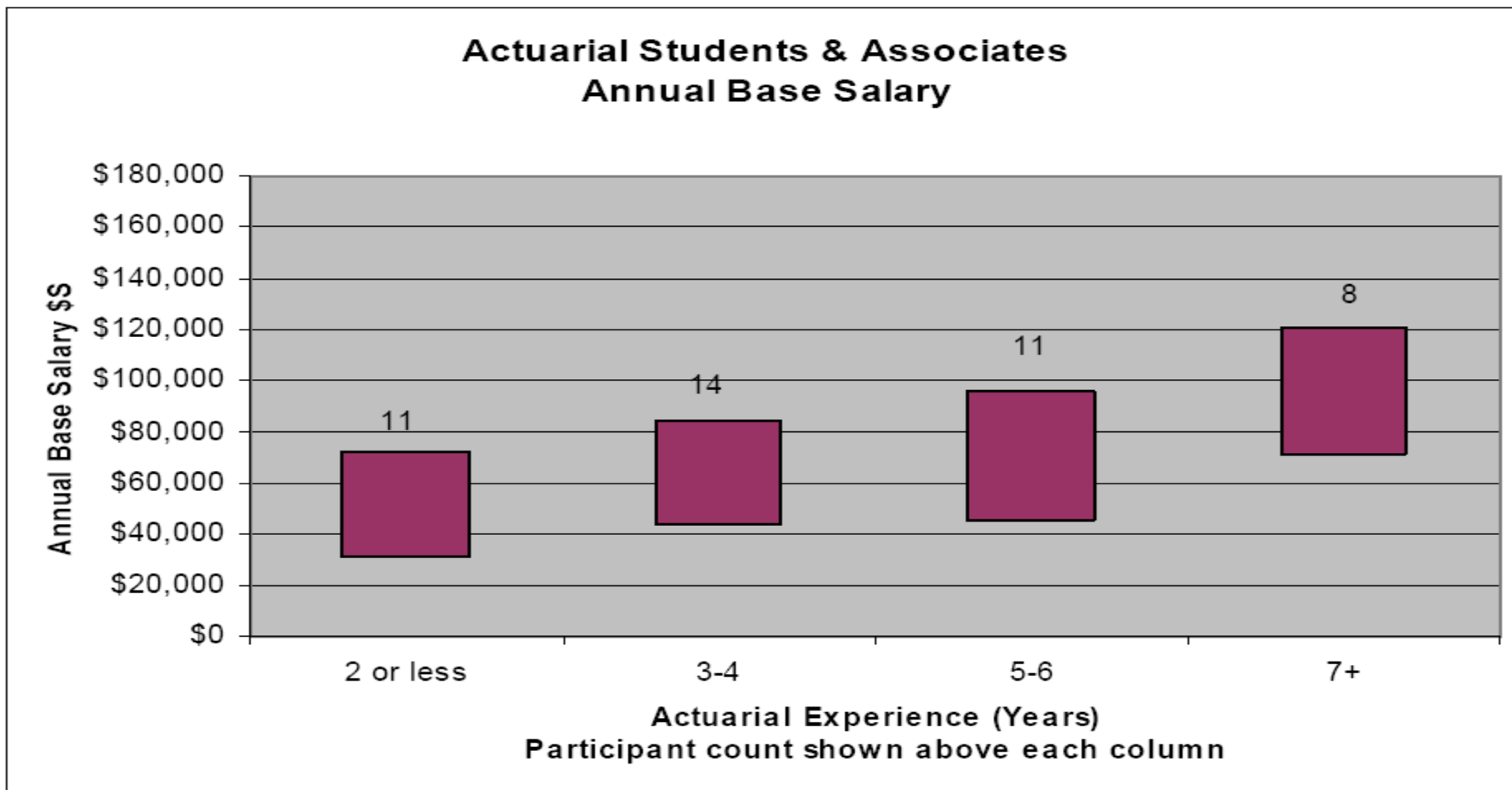
Qualification level



Area of Practice



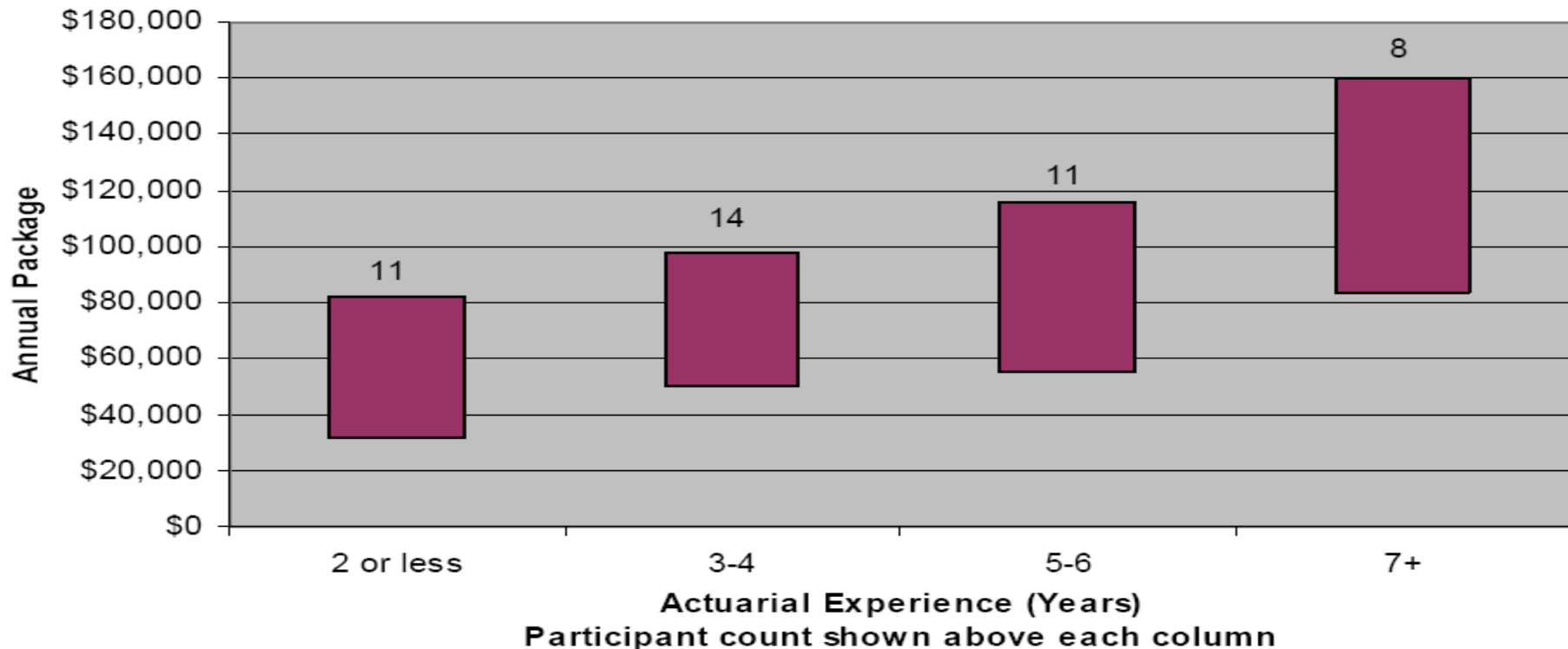
SAS Salary Survey – Students/Associates – Annual Base



Years	2 or less	3-4	5-6	7+
Average	\$44,870	\$59,100	\$66,949	\$97,768
Median	\$39,600	\$56,280	\$66,000	\$95,850

SAS Salary Survey – Students/Associates – Annual Package

**Actuarial Students & Associates
Annual Package**

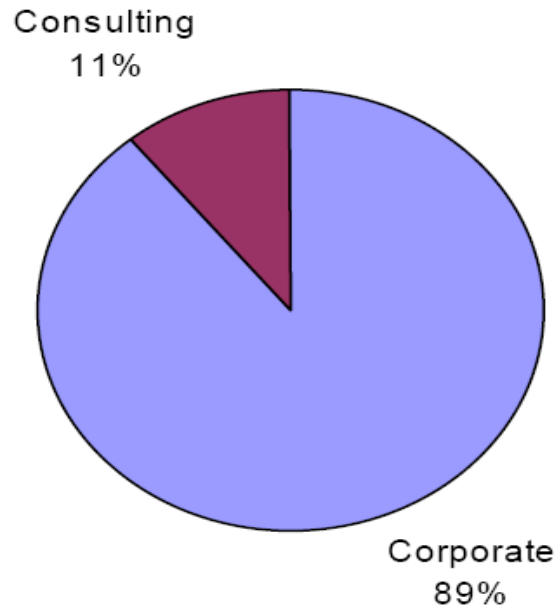


Years	2 or less	3-4	5-6	7+
Average	\$50,738	\$69,328	\$78,902	\$121,675
Median	\$47,079	\$69,328	\$73,224	\$120,363

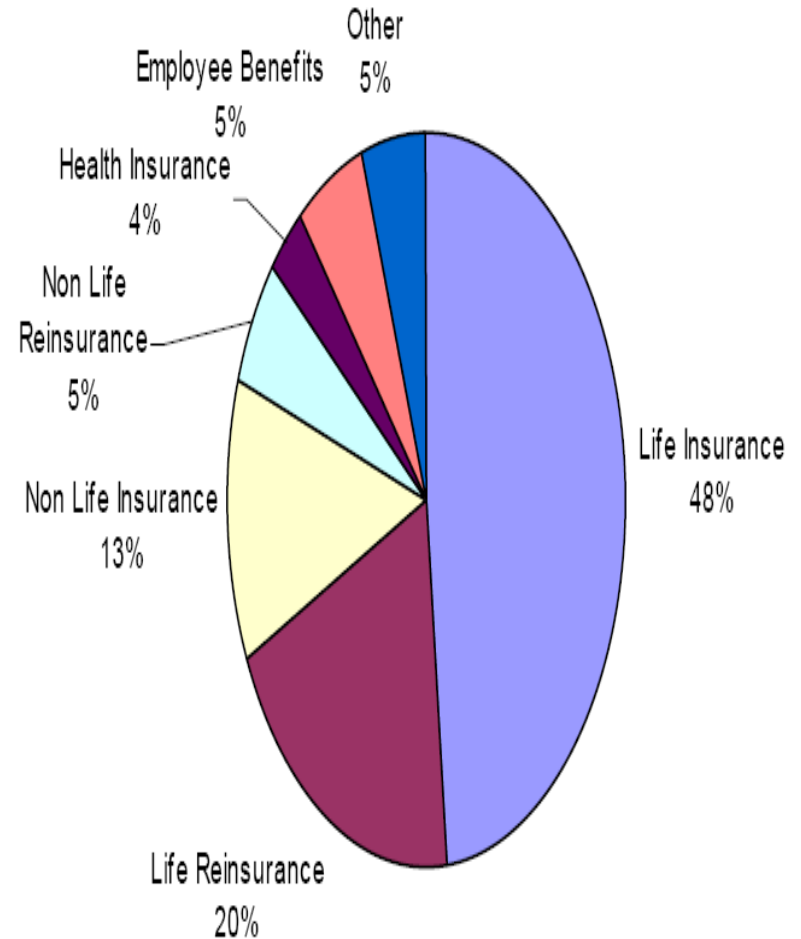
Total Annual Package defined as Base Salary plus Pension plus Guaranteed and Discretionary Bonus

SAS Salary Survey – Fellows Profile

Company Type

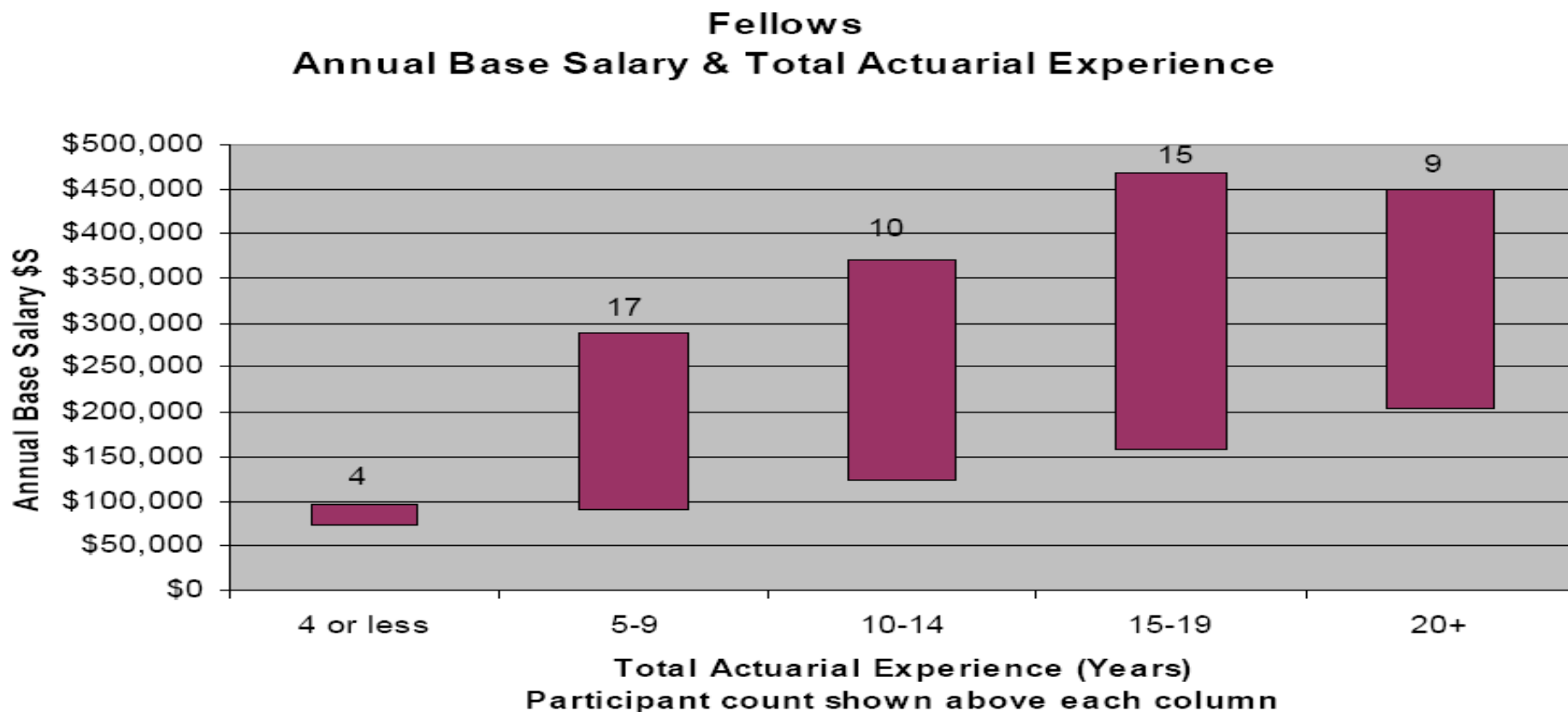


Area of Practice



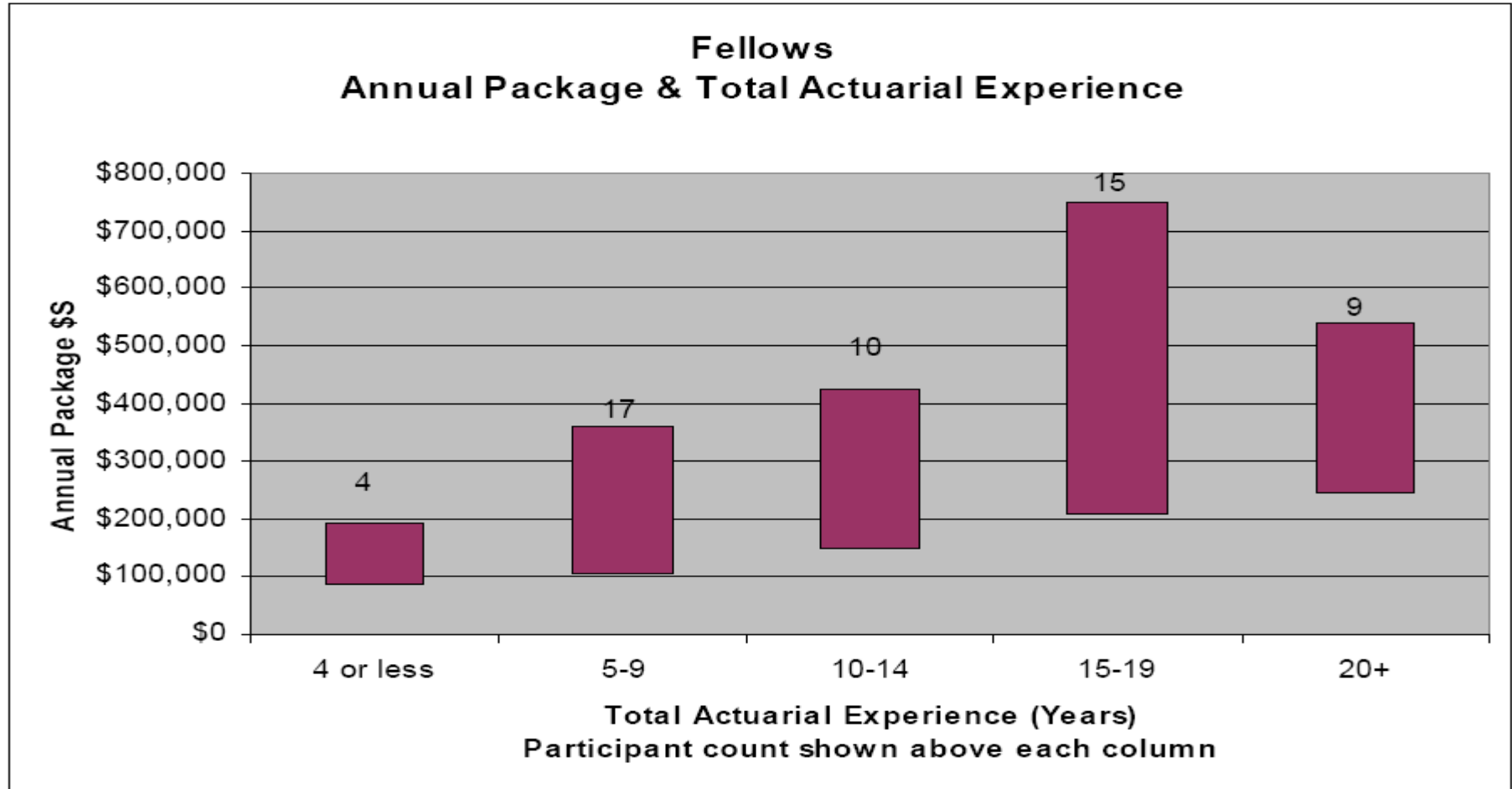
SAS Salary Survey – Fellows – Annual Base

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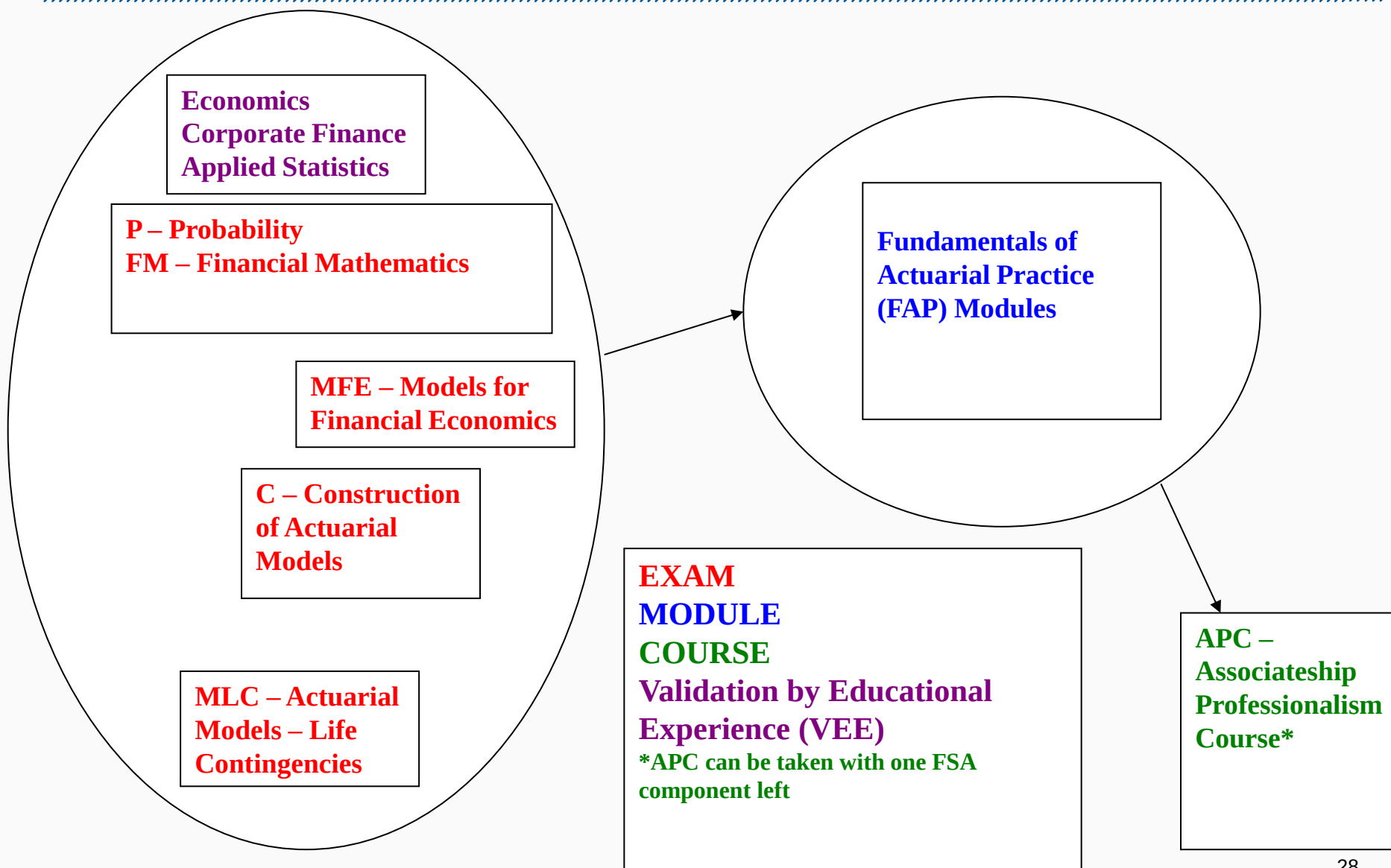
Years	4 or less	5-9	10-14	15-19	20+
Average	\$83,259	\$145,087	\$209,948	\$235,114	\$300,440
Median	\$81,300	\$132,000	\$159,000	\$210,000	\$288,000

SAS Salary Survey – Fellows – Annual Package



Years	4 or less	5-9	10-14	15-19	20+
Average	\$119,558	\$173,497	\$256,460	\$338,569	\$398,971
Median	\$99,696	\$156,000	\$192,582	\$288,000	\$400,000

ASA Curriculum



Example of ASA Level Course Q&A

15. For a group of individuals all age x , of which 30% are smokers and 70% are non-smokers, you are given:

(i) $\delta = 0.10$

(ii) $\bar{A}_x^{\text{smoker}} = 0.444$

(iii) $\bar{A}_x^{\text{non-smoker}} = 0.286$

(iv) T is the future lifetime of (x) .

(v) $\text{Var}[\bar{a}_{\overline{T}|}^{\text{smoker}}] = 8.818$

(vi) $\text{Var}[\bar{a}_{\overline{T}|}^{\text{non-smoker}}] = 8.503$

Calculate $\text{Var}[\bar{a}_{\overline{T}|}]$ for an individual chosen at random from this group.

Let NS denote non-smokers and S denote smokers.

The shortest solution is based on the conditional variance formula

$$\text{Var}(X) = E(\text{Var}(X|Y)) + \text{Var}(E(X|Y))$$

Let $Y = 1$ if smoker; $Y = 0$ if non-smoker

$$\begin{aligned} E(\bar{a}_{\overline{T}|} | Y = 1) &= \bar{a}_x^S = \frac{1 - \bar{A}_x^S}{\delta} \\ &= \frac{1 - 0.444}{0.1} = 5.56 \end{aligned}$$

$$\text{Similarly } E(\bar{a}_{\overline{T}|} | Y = 0) = \frac{1 - 0.286}{0.1} = 7.14$$

$$\begin{aligned} E(E(\bar{a}_{\overline{T}|} | Y)) &= E(E(\bar{a}_{\overline{T}|} | 0)) \times \text{Prob}(Y=0) + E(E(\bar{a}_{\overline{T}|} | 1)) \times \text{Prob}(Y=1) \\ &= (7.14)(0.70) + (5.56)(0.30) \\ &= 6.67 \end{aligned}$$

$$\begin{aligned} E\left[\left(E(\bar{a}_{\overline{T}|} | Y)\right)^2\right] &= (7.14^2)(0.70) + (5.56^2)(0.30) \\ &= 44.96 \end{aligned}$$

$$\text{Var}(E(\bar{a}_{\overline{T}|} | Y)) = 44.96 - 6.67^2 = 0.47$$

$$\begin{aligned} E(\text{Var}(\bar{a}_{\overline{T}|} | Y)) &= (8.503)(0.70) + (8.818)(0.30) \\ &= 8.60 \end{aligned}$$

$$\text{Var}(\bar{a}_{\overline{T}|}) = 8.60 + 0.47 = 9.07$$

Additional FSA Levels Exams/Modules

	Finance/ERM	Investment	Individual Life & Annuities	Retirement Benefits	Group & Health
Spring Exams	Advanced Finance/ERM	Advanced Portfolio Management	Company Sponsor Perspective (CSP)	Company Sponsor Perspective (CSP)	Company Sponsor Perspective (CSP)
Fall Exams	Financial Economic Theory & Engineering		Design & Pricing (DP)	Design & Pricing (DP)	Design & Pricing (DP)
FSA Modules	Financial Economics				Health Systems Overview
	Financial Reporting/Operational Risk*	Investment Strategy	Regulation & Taxation	Social Insurance	Pricing, Reserving & Forecasting
Capstone Experience	Decision Making and Communication (DMAC) Module				
	Fellowship Admissions Course				

Example of FSA Level Course Q&A - Question

(5 points) You are the Chief Financial Officer for Salty Life. Salty Life's core liability products are GIC contracts. Salty Life is exploring a possible purchase of the GIC business of Tugboat Life, and you have been asked to analyze the potential deal.

Tugboat Life's December 31, 2003 GIC business has the following maturity schedule:

<u>Liability Maturity Schedule</u>	<u>Amount</u>
12/31/2004	400 million
12/31/2005	600 million
12/31/2006	750 million

The GICs have no early redemption features so the maturity cashflows as shown are fixed.

Salty Life's business model utilizes the cost-of-capital approach for evaluating business opportunities. The current assumptions used in the model are:

- Risk-free rate is 4%.
- Corporate Tax Rate is 35%.
- Credit Risk Premium on Assets is 1.25%.
- Liquidity Risk Premium is 0.15%.
- Target Risk Based Capital is 5% of Assets backing both Liabilities and Surplus.
- Target return on equity for GIC business is 12%.
- Flat term structure of interest rates.
- Expenses are zero.

- Describe the valuation methods which can be used to determine fair value of liabilities, and indicate which would be appropriate for valuing Tugboat's GIC business.
- Using Salty Life's valuation model, calculate a fair value for Tugboat Life's GIC block.

Example of FSA Level Course Q&A - Answer

(a)

Use Market Value

Market Value may not be Fair Value:

- if market is not deep, wide, and open
- if liabilities are not traded freely (i.e., subject to trade restrictions)
- if size of transaction can influence value
- but there is no market value for insurance contracts, so not appropriate

Use Market Value of similar instruments

- find instruments with same risk profile and related characteristics as the liabilities
- construct "measurement portfolio"
- but there is no replicating portfolio for insurance risks, so not appropriate

Use the Present Value of future cash flows, if there is no Market Value available

- PV model is flexible, with multiple approaches
- if cash flows have no risk, must include adjustment for risk:
 - 1) adjust discount rate
 - 2) use option pricing to weight results across scenarios
 - 3) adjust the cash flows (certainty equivalents)
- can reflect multiple risks with this method
- include all cash flows that could occur under the contract
- include costs incurred in fulfilling obligations
- insurance contracts have risk, so must include risk adjustment
- must reflect all cash flows, including non-guaranteed dividends and floors

(b)

$$r_A = r_f + \text{Credit Premium} + \text{Liquidity Premium}$$

$$r_A = 4\% + 1.25\% + 0.15\%$$

$$r_A = 5.40\%$$

e = Equity/Liabilities

$$\text{Equity} = \text{Assets} - \text{Liabilities} = 5\% * \text{Assets}$$

$$\text{Liabilities} = 95\% * \text{Assets}$$

$$e = (5\% * \text{Assets}) / (95\% * \text{Assets}) = 5.263\%$$

$$r_L = r_A - e(r_E / (1 - t) - r_A)$$

$$r_L = 5.4\% - 5.263\% (12\% / (1 - 35\%) - 5.4\%)$$

$$r_L = 4.713\%$$

Fair Value = PV of Cash Flows at r_L

$$\text{FVL} = \frac{400}{(1.04713)} + \frac{600}{(1.04713)^2} + \frac{750}{(1.04713)^3}$$

$$\text{FVL} = \$1,582.42 \text{ million}$$

Continuing Professional Development (CPD)



SOA CPD REQUIREMENT - SECTION B, BASIC REQUIREMENT 2009 TRACKING SPREADSHEET (FOR EXAMPLE PURPOSES ONLY)									
WHAT	WHEN	MINUTES	UNITS	TYPE OF CREDIT					
				STRUCTURED		SELF-STUDY	JOB RELEVANT	BUS & MGMT	PROFES-SIONALISM
				EMPLOYER	NON-EMPLOYER				
Preparing for Loss Reserving presentation at XYZ Seminar	Feb. 08, 2009	120	2.4			X	X		
Presenting at Loss Reserving session at XYZ Seminar	March 15, 2009	90	1.8		X		X		
ASOP Update session at XYZ Seminar	March 15, 2009	90	1.8		X				X
PBA Update session at XYZ Seminar	March 15, 2009	90	1.8		X		X		
Reading "IASB Update on IFRS" article in <i>The Financial Reporter</i>	April 06, 2009	25	0.5			X	X		

1. must complete 60 units of PD every cycle
2. a cycle is defined as a two-year rolling cycle



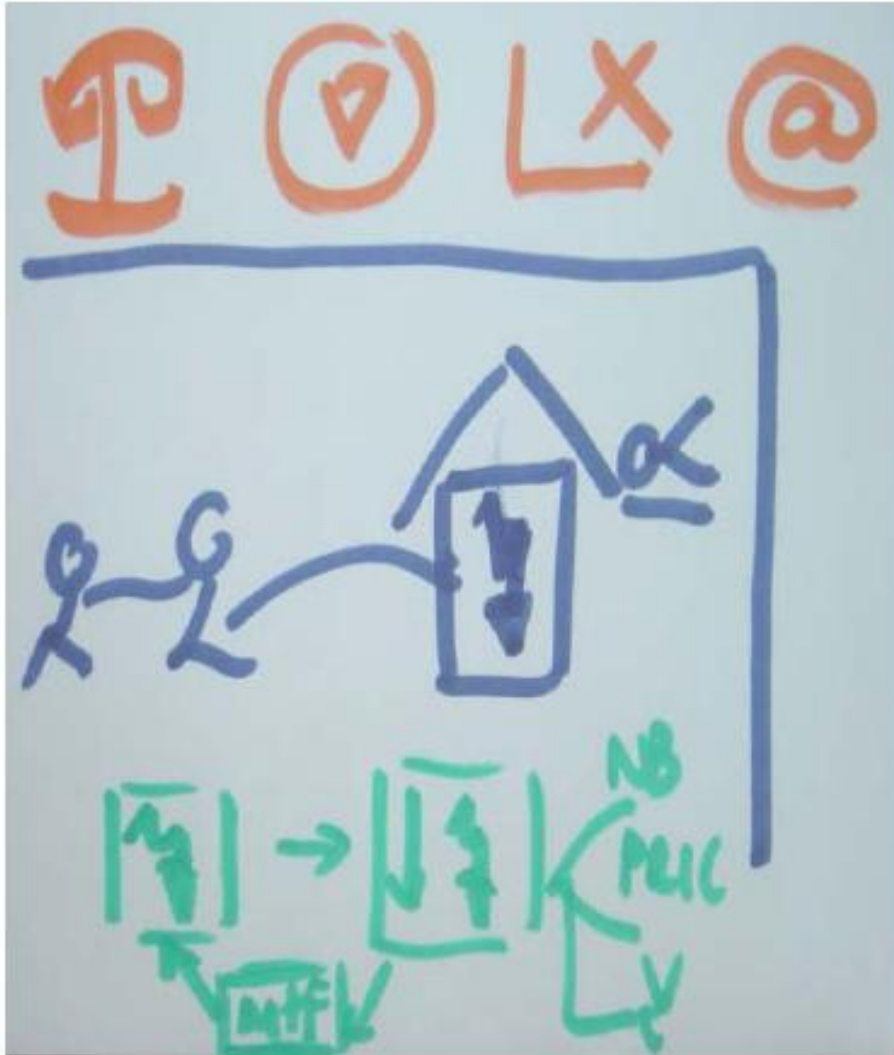
Study Skills – Hours & Basics

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- Various rules – but one that worked for me:
 - 1 hour / minute of exam
 - e.g. SoA Course 8 = $2 \times 3 \text{ hours} = 6 \text{ hours}$
 - = 360 minutes = 360 hours
- Must be quality / active hours
- Plan & start Early – over 6 months = 15 hours / week
- Biggest crimes are:
 - not putting in hours / being fully prepared
 - not writing due to work pressures.
- Where – find a place where you can concentrate without distraction or interruption for at least 45 minutes – e.g. library.
- What – break down material (usually 1000's pages) into manageable sections.
- How – active
 - + understand the concepts
 - + separate the "what" from the "how"
 - + summarise
 - + review
 - + synthesize

Study Skills - Develop a Conceptual Framework

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- Use framework to structure summaries
- Helps generate ideas to difficult questions
- Prevents memorizing endless lists
- Fundamentals do not change

Exam Difficulty

- Among the longest & most difficult professional credentialing examinations the world over
- Mastery of material
- High standards for passing
- Numerous requirements for success:
 - + strong work ethic
 - + good business sense
 - + good writing skills
 - + a little luck
- All this while working full-time.

"...because of my interest in math, I planned to major in mathematics. The only profession I knew of that used mathematics was being an insurance actuary, so that was my intended career. The actuarial profession is a highly specialized profession, which has an association that conducts a series of examinations that a budding actuary must pass to become a fellow and to become established in the profession. As an undergraduate, I took some of those exams. I passed a couple and failed a couple – the only exams I can remember ever failing."

Milton Friedman, Nobel Laureate Economics, University of Chicago



Exam Pass Rates – May 2009 Session...online

EXAMINATIONS P, FM, MFE, MLC, C

Exam	Pass Mark	N	# Effective	# Passing	% Passing	% Effective Passing
P	63%*	3017	2626	1147	38.0	43.7
FM	70%*	3620	3402	2027	56.0	59.6
MFE	60%	3568	3248	1400	39.2	43.1
MLC	60%	2524	2347	1218	48.3	51.9
C	55% - Forms 1 and 2	1957	1861	746	38.1	40.1

EXAMINATIONS AFE, APMV, CSP GH, CSP IU, CSP IC, CSP RU, CSP RC, EA-1, and EA-2,B

Exam	N	# Effective	# Passing	% Passing	% Effective Passing
AFE	283	261	132	46.6	50.6
APMV	261	245	123	47.1	50.2
CSP GH	401	374	163	40.6	43.6
CSP IU	457	426	217	47.5	50.9
CSP IC	89	83	42	47.2	50.6
CSP RU	150	147	60	40.0	40.8
CSP RC	118	116	46	39.0	39.7

Exam Technique

- Exam fitness – practice
- Budget time - calculating time available for each question e.g. $180 \text{ Minutes} / 180 \text{ Marks} = 1 \text{ minute per mark}$
- Order – does not matter too much - you have to answer them all anyway...
- Obvious – read & answer the question asked!!
- Mathematical answers – use quickest method
- Essay answers - use extra paper to brainstorm – generate sparky ideas – plan & structure
- MAKE LIFE EASY FOR THE MARKERS!!

Exam Techniques – “Structured Solutions”

OPEN FORUM

EXHIBIT 3

The reaction from the 45 state regulators may be very different. As the company has just raised the rates of a similar product though with longer in-force, the regulators may question why this new product is ~~more~~ less expensive. Identical scale but the profit margin is higher. The anticipated loss rate 50% may still be too low. There may now be the minimum loss rate of 65% in some states as the Commissioners would see that such level ~~was~~ should be attained. The cut down in the commission scale would be welcomed by the regulator so that is a return in the expense but this may mean a higher loss ratio should be justified. This new product may replace the old product in the new business. Safe. As a result, the superiority of the old product may be diminished. This may then have positive impact in rates for the old product. The

EXHIBIT 2

There has been both state and federal attempts at cleaning up Medicare Supplement products.

NAIC Model Act requires:

1. Maximum benefit standards apply
2. On purchase of coverage, on the policy, should be clearly spelled out
3. A Buyer's Guide to Medicare Supplement Policies will have to be distributed.

4. Split out all non-NAIC

To comply with the above company would have to make sure benefit on policy are at least as good as minimum. Company will also attach proposals 1 & 2 above.

Federal (Barrows Amendment):

1. Require same benefit standards as NAIC
2. Require minimum loss ratio of 60% under 35% group
3. Would require state enact legislation to remove this area, if not federal level of approval would be needed
4. Increase education of buyers
5. Require a state panel be set up to review or practice

On both federal and NAIC proposals there would be penalties met for the act and the co-pay only

misrepresentation. This should be communicated to agents.

Anticipated loss ratio of 50% would not be approved. Will need to have power with a commensurate reduction in profit or commission.

In the primary will need to account for 2 additional items:
(1) Recently enacted legislation makes Medicare the primary payer with the group plan primary, which reduces the claim.

(2) There are new Section 269 limits on Medicare reimbursements from hospitals which penalize excess charges and reduced loss charge.

Should excel for both of them in non-penalty.

Think of the marker when you write your exam

- ☒ Handwriting
- ☒ Headings
- ☒ Concise points
- ☒ Most NB points first

ERM Defined

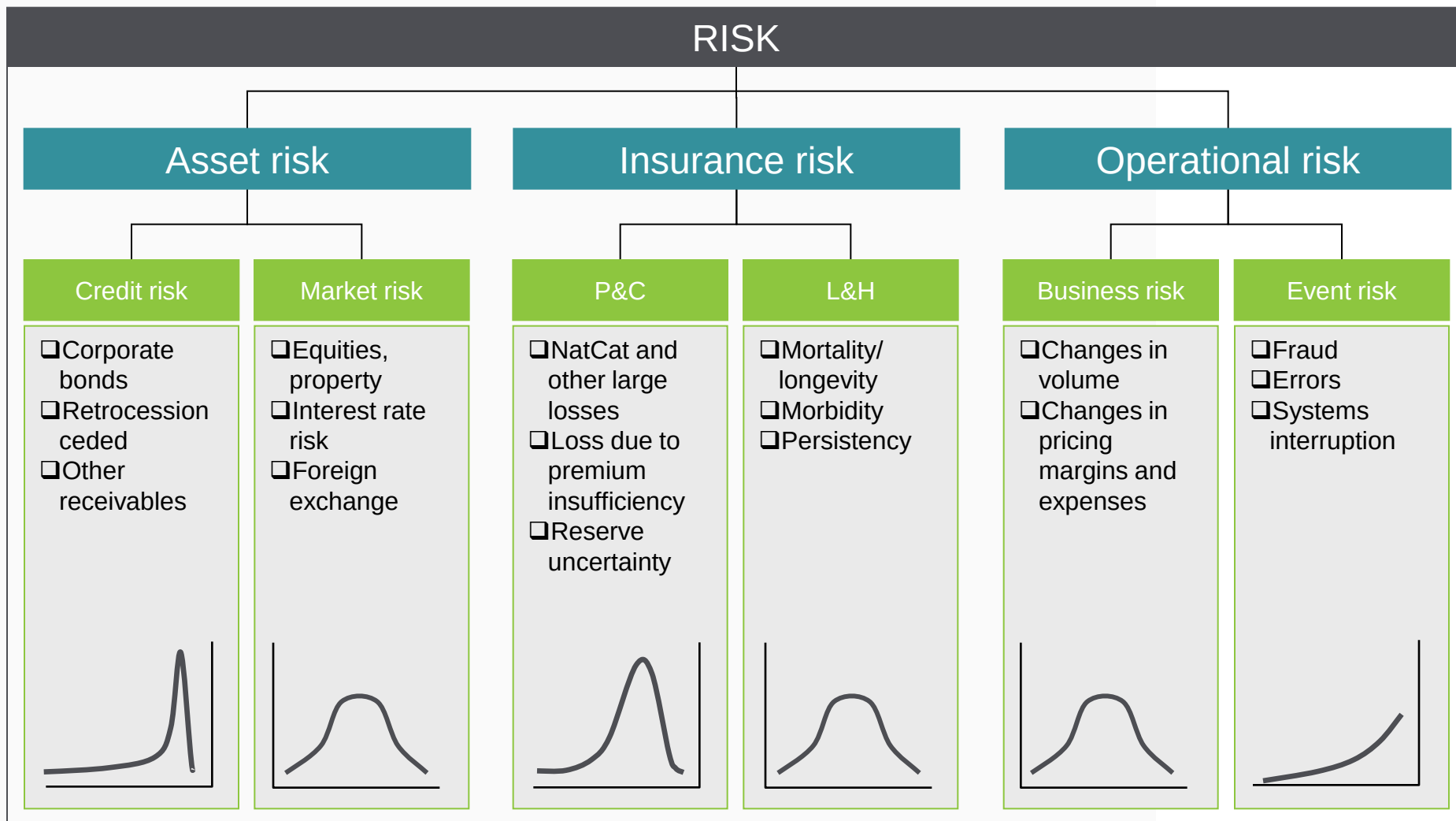
- ❑ Enterprise Risk Management (ERM) is the discipline by which an organization in any industry assesses, controls, exploits, finances & monitors risk from **all sources** for the purpose of increasing the organization's value to shareholders
- ❑ ERM is **co-ordinated** risk management - placing greater emphasis on **cooperation** among units to manage an organizations full range of risks as a whole
- ❑ ERM aims to seek out opportunities in risk
- ❑ Also know as:
 - Integrated Risk Management (IRM),
 - Holistic Risk Management,
 - Corporate Wide Risk Management,
 - etc.



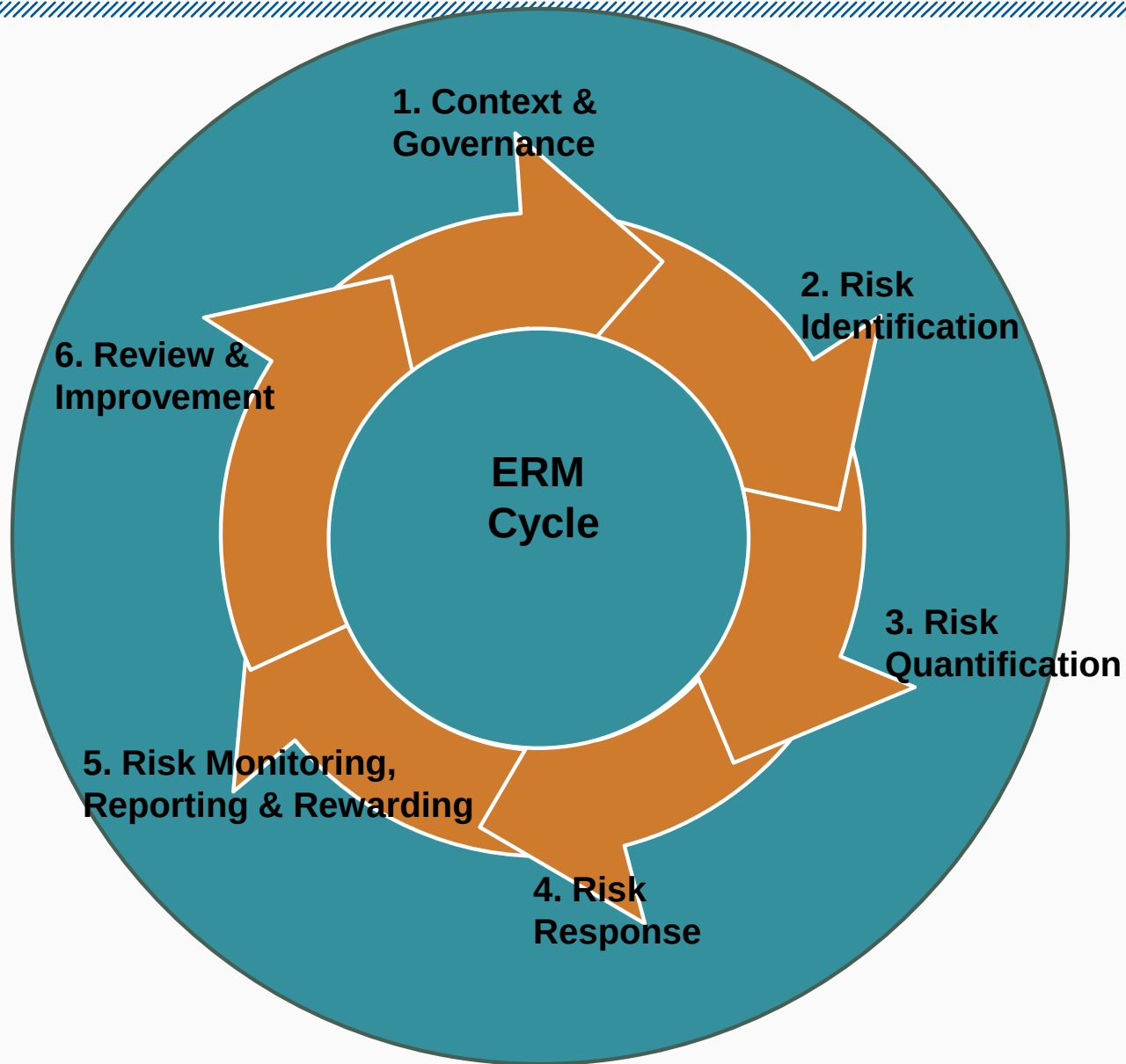
The philosophy of ERM addresses issues that we, as a profession, have always dealt with

Source: The Actuary, July 2008

Modelling Individual Risks



The ERM Cycle

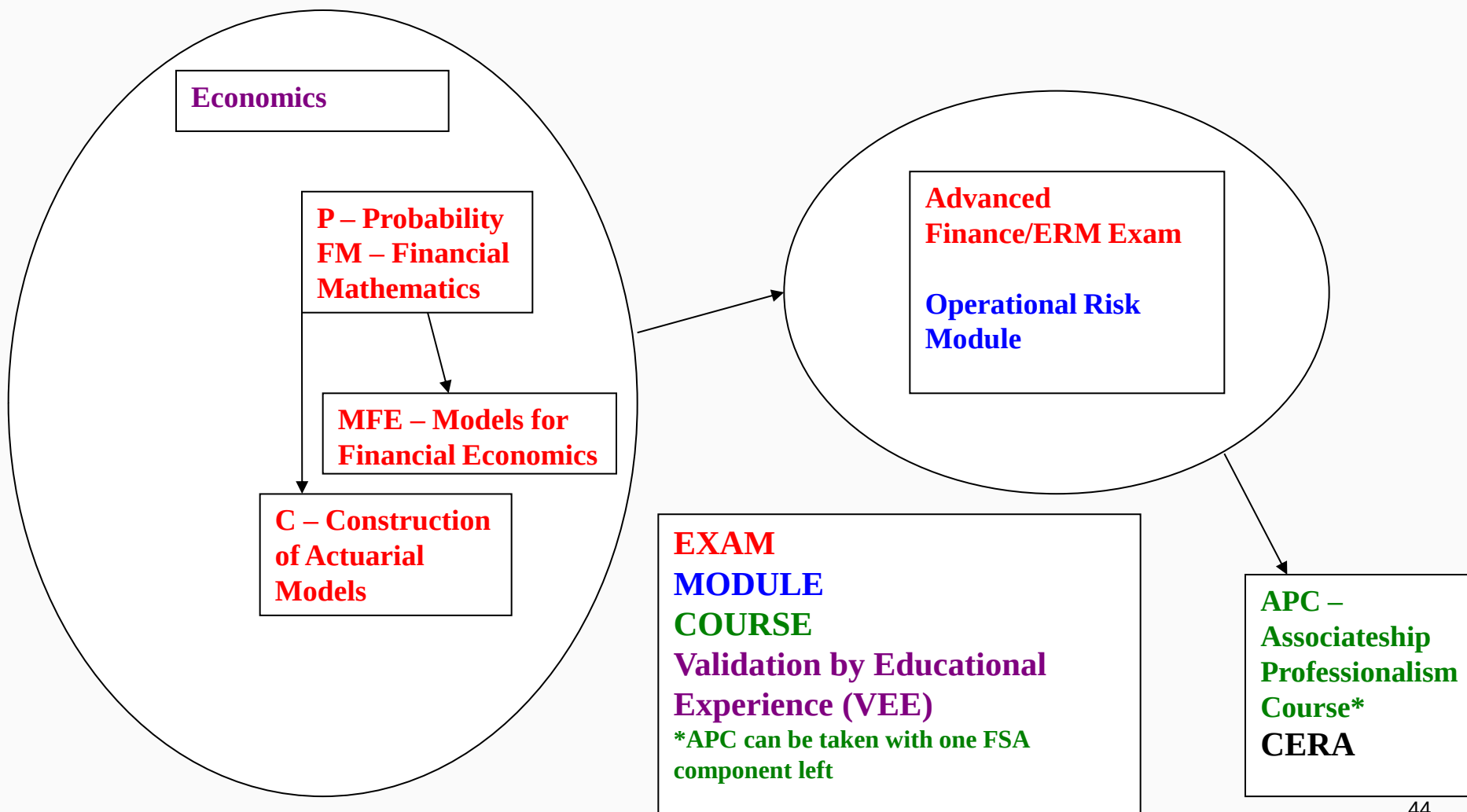


Overview of the SoA's New CERA Credential

- ❑ new **C**hartered **E**nterprise **R**isk **A**nalyst (**CERA**) credential
- ❑ first **new credential** introduced by SOA since 1949 (almost 60 years!)
- ❑ since 2003 the SoA's Board has been fielding interest from **employers**. Approved by SoA's **Board** in November 2005
- ❑ approximately **500** CERA's currently in the workforce.
- ❑ **E**nterprise **R**isk **M**anagement (ERM) is now best practice. CERA brings **consistency** and **standardization** to ERM practice
- ❑ expands actuarial skill set into **non-traditional** sectors, such as broader Financial Services
- ❑ "Leave it to actuaries to not only create a new designation, but to develop an ERM credential that makes ERM seem **logical & clear** while other industries are still struggling with the concept" Risk & Insurance, June 2008
- ❑ will be the basis for a **worldwide** designation soon...

CERA Curriculum – a Subset of the FSA

- approximately **3-4 years** to obtain the CERA credential
- includes **actuarial science**, **ERM principles** and **professionalism**:



Benefits of the CERA Designation

1.Candidate Benefits

- ☐ **comprehensive** and **rigorous** ERM training
- ☐ expands **employment** opportunities
- ☐ **differentiates** them from other risk professionals
- ☐ **advances** the field of ERM
- ☐ expands **professional** network by being a member of the SoA

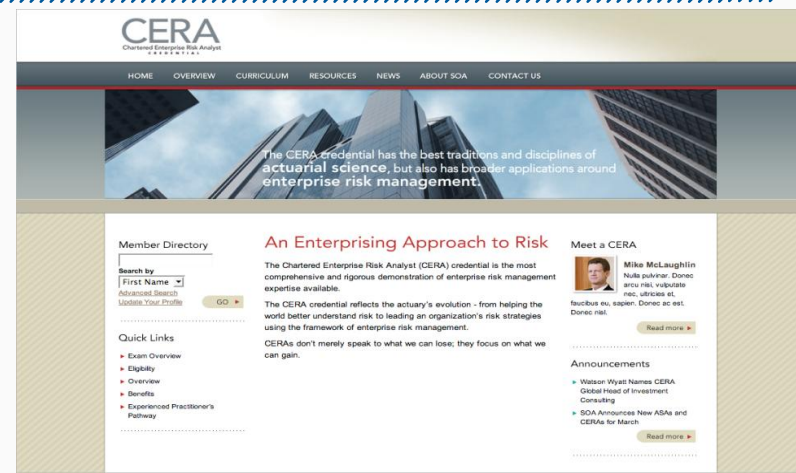
2.Employer Benefits

- ☐ helps **internal** ERM program
- ☐ **differentiates** firm as ERM experts
- ☐ CERA's possess strong **quantitative** and **financial** assessment skills
- ☐ Converts **risk** into **opportunity**

SoA's CERA & ERM Resources

1. www.CERAnalyst.org

- ☐ provides an overview of the CERA credential
- ☐ features current CERAs and their work in ERM
- ☐ the CERA curriculum and registration
- ☐ information about the SoA



2. Joint (with CAS) Risk Management Section

- ☐ ERM Speciality Guide
- ☐ newsletter focusing on ERM topics
- ☐ booklist & SoA Syllabus on ERM
- ☐ research papers – diversification; Copulas; etc.
- ☐ annual ERM Symposium (www.ermssymposium.org)



The Final Few Words on the Actuarial Profession...

 **G**lobal Profession

 **R**elevant

 **E**volving

 **A**sian Growth

 **T**op Career



References

- ❑ www.actuaries.org.sg



- ❑ www.soa.org



SOCIETY OF ACTUARIES

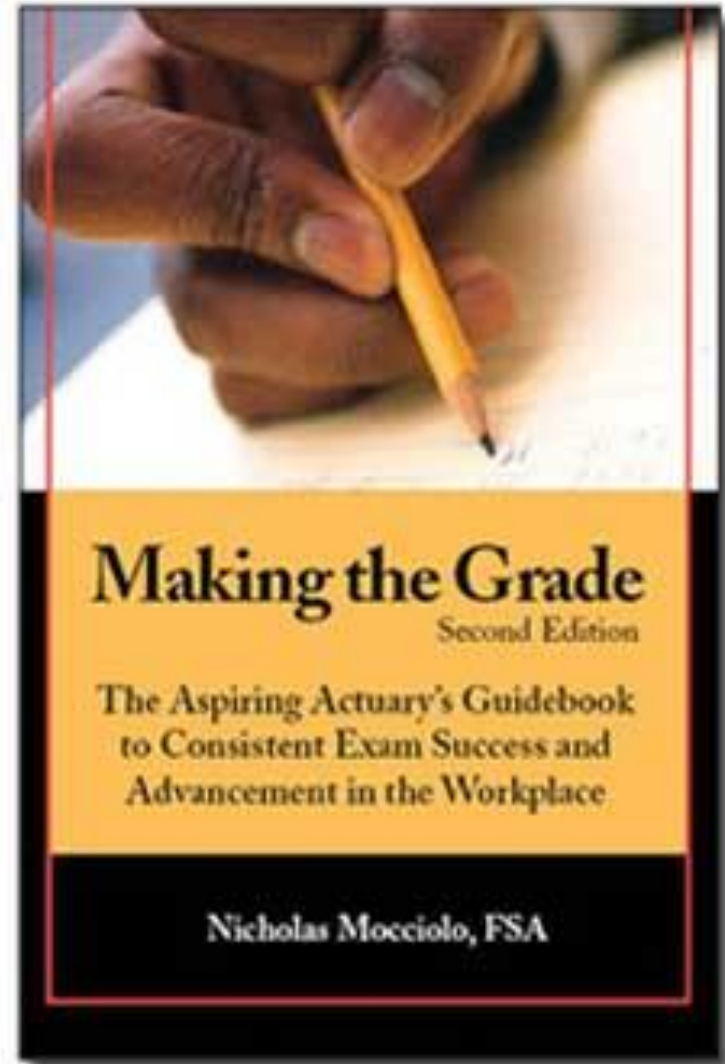
- ❑ www.casact.org



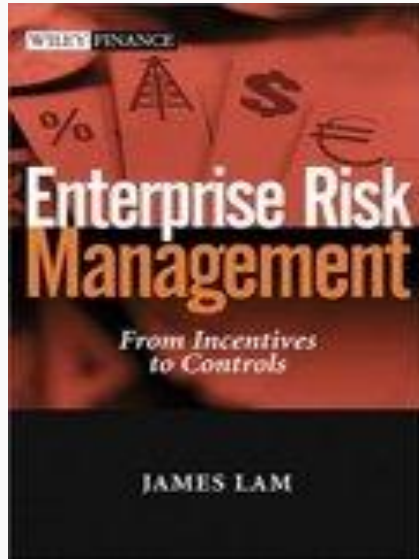
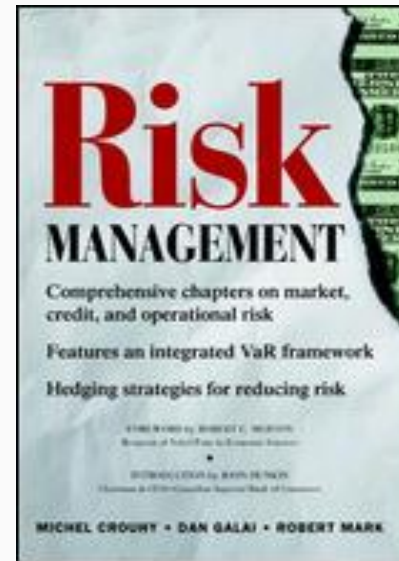
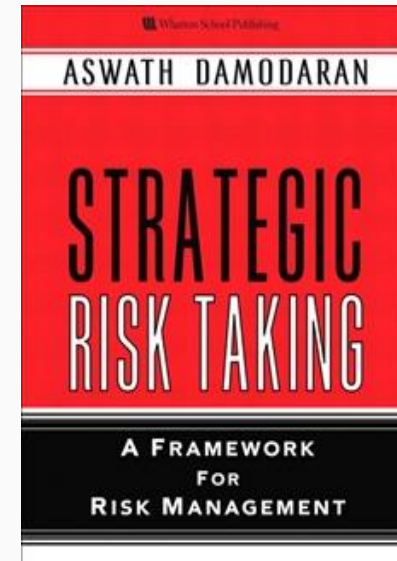
- ❑ www.beanactuary.com

- ❑ www.imageoftheactuary.org

- ❑ www.ceranalyst.org

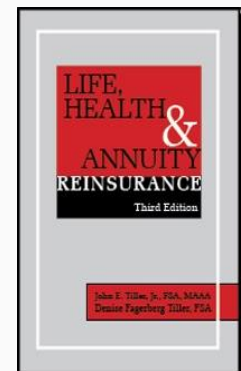


ERM References



Insurance Risk

Definition	mortality morbidity lapse look at components - level, volatility, trend, shock
How Measure	Economic Capital
How Manage	margins capital reinsurance, securitization
References	IAA Solvency Publication; Tilller



ERM References – Market Risk

Equity Risk

Definition	Equity guarantees retained by company
How Measure	VaR, CTE, etc.
How Manage	diversification hedge, ALM dynamic hedging
References	Hardy, CFA readings



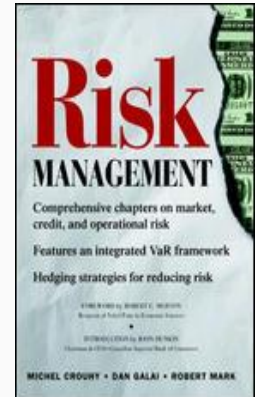
Interest Rate Risk

Definition	Interest rate guarantees retained by company
How Measure	VaR, CTE, etc.
How Manage	ALM hedge dynamic hedging
References	Basle Committee, Fabozzi, CFA readings

ERM References - Credit & Liquidity Risks

Credit Risk

Definition	credit risk as related to fixed income securities. spread risk as related to fixed income securities credit risk as related to derivatives credit risk as related to reinsurance counter-party risk
How Measure	Ratings; capital; etc.
How Manage	credit derivatives, diversification, concentration limits, and credit support agreements. due diligence and aggregate counter-party exposure limits.
Case Study	Enron & subsequent SEC investigations on Rating Agencies
References	Crouchy; Smithson; etc.



Liquidity Risk

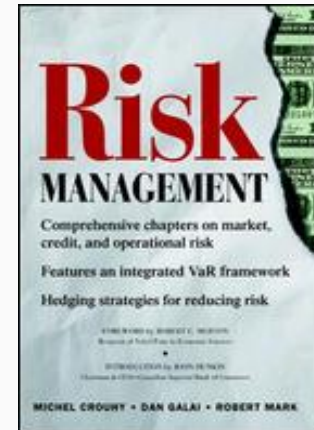
Definition	cashflow strain run on the bank hidden callable options
How Measure	liquidity ratios; scenarios; etc.
How Manage	diversification surrender charges contract design
Case Study	General American
References	"Liquidity Risk Measurement," CIA Educational Note Dynamic Financial Condition Analysis Handbook



ERM References – Operational & Strategic Risks

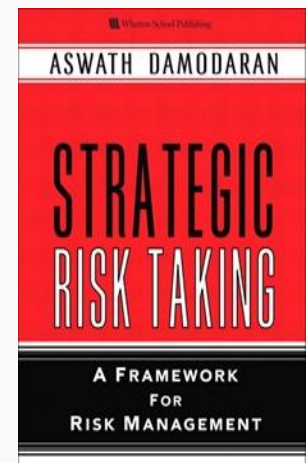
Operational Risk

Definition	the risk of direct or indirect loss resulting from inadequate or failed internal processes, people and systems or from external events.
How Measure	Economic Capital
How Manage	COSO Guidelines SoX



Strategic Risk Management

Definition	Strategic Risks – potential damage to reputation, competition, demographic trends, technological innovation, capital availability and regulatory trends.
How Measure	ERC, MCEV, RAROC, IRR, etc.





THANK YOU VERY MUCH FOR YOUR ATTENTION