

# Actuary: What's that?

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# Travel Can Be Hard...



Huh? What's that?



Actuary ... Eh?



Oh là là ... Qu'est-ce que c'est?

# Actuarial Science: A Calm Profession

The Thrill of Victory

The Agony of Defeat



## The Mother Joke



My mother regarded me with a puzzled frown when I told her I wanted to be an actuary. “Isn’t that where they put dead actors?”

# Questions to answer

- ▶ What is actuarial science?
- ▶ Who are actuaries?
- ▶ Where do actuaries work?
- ▶ What does the work include?



# What is Actuarial Science?



Actuarial science applies  
Statistics, Mathematics, Economics, Finance, Government policies,  
Business management principles  
to assess risk in the insurance and finance industries

# Who Are Actuaries?

Actuaries are professionals who use their knowledge of statistics, finance, and business to  
Define, analyze and solve business problems involving the cost of possible future events



# Where Do Actuaries Work?



- ▶ Insurance industry
- ▶ Financial institutions
- ▶ Consulting firms
- ▶ Government agencies
- ▶ Accounting firms

An actuary could...



An actuary could place a monetary value on various aspects of life.

# Talent Valuation



Determine the monetary value of unusual items, such as a concert pianist's hands.

## Property Casualty



Price property insurance for homes, given their location and the likelihood of a natural disaster.

# Retirement



Analyze statistical information about people over age 55 to estimate deaths, disabilities, and retirement rates.

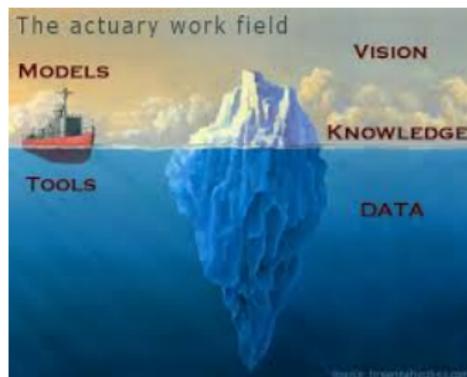
# Movie Industry



Advise movie studio owners about how much liability insurance they should purchase to cover dangerous sets.

# What Does the Work Include?

- ▶ Projecting how a new auto-safety law will change insurance claims
- ▶ Estimating the benefit cost of a labor contract
- ▶ Projecting financial costs of an epidemic
- ▶ Analyzing investment risk



# Property and Casualty (P&C) Actuaries



- ▶ Estimate the probability and likely cost to the company of an event such as loss of property, car or equipment accident
- ▶ Help design insurance policies using their expertise in evaluating various types of risk.

## Property and Casualty (P&C) Actuaries (cont.)

- ▶ Calculate the expected number of claims resulting from automobile accidents, which varies depending on the insured's age, sex, driving history, type of car, etc.
- ▶ Ensure the premium will cover potential claims and other expenses and that it is profitable, yet competitive with other insurance companies.



# Life and Health Actuaries



- ▶ Estimate the probability and likely cost to the company of an event such as death, sickness, injury or disability
- ▶ Help design insurance policies using their expertise in evaluating various types of risk

# Health Actuaries

Help companies develop health and long-term-care insurance policies by predicting the likelihood of occurrence of heart disease, diabetes, stroke, cancer, other chronic ailments among a particular group of people who have something in common such as living in certain area or having a family history of illness



# Life Actuaries



Help companies develop annuity and life insurance policies for individuals by estimating how long someone is expected to live

# Actuaries in Financial Industry



- ▶ **Manage** credit and help set a price for corporate security offerings
- ▶ **Devise** new investment tools to help their firms compete with other companies
- ▶ **Address** financial matters how a company should invest resources to maximize return on investments

# Pension Actuaries



- ▶ Work under provisions of **ERISA** - Employee retirement income security act of 1974 which sets minimum standards for pension and health plans in private industry
- ▶ **Address financial matters** how an individual should invest in order to attain a certain retirement income level

# Government Actuaries



Help manage **social programs** such as

- ▶ Social security
- ▶ Medicare
- ▶ Health care reform

# Reinsurance Actuaries

A field in which one insurance company arranges to share a large prospective liability policy with another insurance company in exchange for a percentage of the premium.



# Actuary vs Accountant: Question

Q: Mr. Smith, why did you become an actuary?

**EXPERIENCE THE RAW GUT-WRENCHING  
DRAMA OF HUMAN CONFLICT THROUGH  
ACTUARIAL CONSULTING**



Preparing to do battle



The thrill of victory



The agony of defeat

## Actuary vs Accountant: Answer

A: Well, I didn't have enough personality to become an accountant

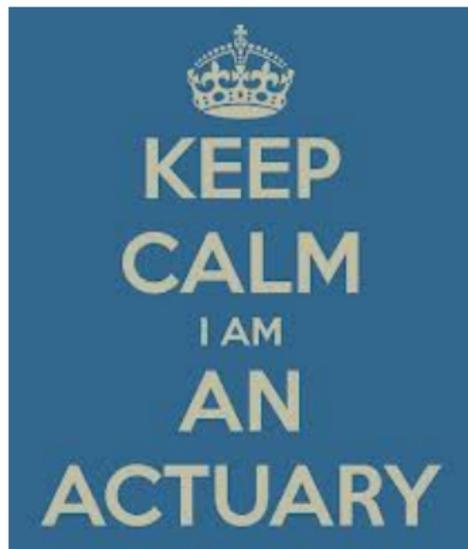


## Actuary: the Extrovert. Question

Q: How can you tell when you meet an actuary who is an extrovert?



## Actuary: the Extrovert. Answer



A: He is the one who looks at YOUR shoes when he talks to you!

# Actuaries: More Projects



- ▶ Determine corporate policy on risk
- ▶ Explain complex technical matters to company executives, government officials, shareholders, policyholders or the general public
- ▶ Testify before public agencies on proposed legislation that affects their business
- ▶ Explain changes in contract provisions to customers
- ▶ Help companies develop plans to enter new lines of business or new geographic markets by forecasting demand in competitive settings

# Consulting Actuaries



*A Step Beyond Traditional Consulting*

- ▶ Provide advice to clients on a contract basis
- ▶ Evaluate company pension plans by calculating the future value of employee and employer contributions and determining whether the amounts are sufficient to meet future needs of retirees
- ▶ Help companies reduce their insurance costs by offering them advice on how to lessen the risk of injury on the job
- ▶ Testify in court regarding the value of potential lifetime earnings of a person who is disabled or killed in an accident
- ▶ Calculate the current value of future pension benefits in divorce cases, QDRO

# Overview of Retirement Plans

Financial Security at retirement is the main concern of retiring employees



- ▶ Vehicles used to obtain Financial Security
- ▶ Differences between defined benefit and defined contribution plans
- ▶ Incentives employers and employees have for contributing to employees retirement.

# The “Three-Legged Stool”

Components of financial security at retirement



Sources of retirement income

- ▶ Government = Social Security
- ▶ Individual = Personal Savings
- ▶ Employer = Employer-Provided Retirement Plans

## Government: Social Security



- ▶ Provides most basic level of retirement income
- ▶ Emphasis on lower-income earning individuals

## Government: Medicare



- ▶ Basic level of post-retirement medical coverage
- ▶ Significant out of pocket costs for enrollees:
  - ▶ Prescription Drugs
  - ▶ Deductibles
  - ▶ Coinsurance

# Individual



## Encompasses:

- ▶ Establishing retirement income goals
- ▶ Maintaining a standard of living consistent with those goals
- ▶ Contributing to an individual retirement vehicle

## Ways to invest:

- ▶ Contribute to an IRA account or 401(k) plan
- ▶ Purchase life, disability, or medical insurance
- ▶ SAVE, SAVE, SAVE!!!

# Employer



- ▶ Defined Contribution Plan
- ▶ Defined Benefit Plan
- ▶ Post-Retirement Medical Plan

# DC VS DB PLANS

Defined Contribution Plans	Defined Benefit Plans
An individual account is established for each employee	Promises to pay a specified benefit at retirement age.
Employers can contribute by matching the ee contribution	Can provide benefits payable upon death, disability, or prior to retirement.
The future value is indeterminable due to unknown investment returns and contributions	Benefits based on pay, service, expected SS benefits.

## DB or DC? Situation One



An employee who is planning to change employers every 3 to 5 years

## DB or DC? Situation Two



A 55 years old expecting to work to age 65 and expecting for the market over the next 10 years to be a bear market

## DB or DC? Situation Three



A company starting a retirement plan and wishing to control costs associated with the plan.

# References



- ▶ Bureau of labor statistics  
<http://www.bls.gov/oco/ocos041.htm>
- ▶ Watson wyatt co. pension plan training manual

## More Information



Want to know more about actuarial field?

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