



SOCIETY OF ACTUARIES

**Health Valuation Boot Camp
August 12- 13, 2009**

**Session # 1a: GAAP and Statutory
Valuation Principals**

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Health Valuation Boot Camp

Valuation Principles



August 12, 2009

Russ Willard

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Guidance when you need it most

Faculty

- *Donna Novak, ASA, MAAA, Principal NovaRest, Inc.*
- *Darrell Knapp, FSA, MAAA Executive Director, Ernst & Young LLP*
- *Darrell Spell, FSA, MAAA, Consulting Actuary, Milliman Inc.*
- *Russell D. Willard, FSA, MAAA, Actuarial Director, Humana Inc.*

Program Introduction

- **1:10 to 1:30** **GAAP and Statutory Valuation Principles** -- Willard
 - **1:30 to 2:15** **Basic Reserving Principles**
-- Willard
 - **2:15 to 3:15** **Actuarial Liabilities** -- Novak
- Break -- Break -- Break -- Break -- Break

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Program Introduction

- **3:30 to 4:15** **Actuarial Reserves** -- Knapp
- **4:15 to 4:45** **Reserves for Specialized Products** -- Spell
- **4:45 to 5:00** **Resources for Further Study**
-- Spell

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GAAP vs Statutory

- GAAP Benefit Reserves

- GAAP Accounting
- FASB
- Assumptions
- Income Statements
- Balance Sheets
- Impact on Earnings



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GAAP vs Statutory

- GAAP Expense Reserves

- Combinable with benefit reserves
- Could be insignificant if maintenance expense close to level
- May be significant if expenses expected to increase

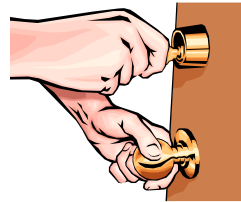


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GAAP vs Statutory

- GAAP Deferred Acquisition Costs

- Capitalization
- “Deferrability”
- Amortization
- Lock-In Principle
- Recoverability



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GAAP vs Statutory

The PAD

- Provisions for adverse deviation
- Profit **emerges** as PAD **releases**
- PAD **is greater** with more uncertainty
- Best estimates + explicit PAD **better** than conservative assumptions with **implicit** PAD
- **Sensitivity** testing – useful source of PAD info.

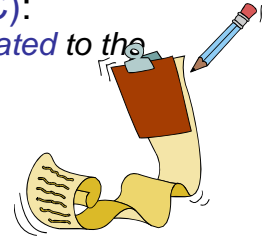


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GAAP vs Statutory

Expense Categories

- FAS 60
- Deferrable Acquisition Costs (DAC):
expenses varying with and primarily related to the acquisition of new business
- Non-deferrable Acquisition Costs
- Direct Maintenance Costs
- Investment Expenses
- Future Utility Expenses
- Overhead



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GAAP vs Statutory

Expenses

- May have a fixed and variable component
- Best determined by company **ABC** expense studies
- May be combined with the benefit reserve
- May be ignored if immaterial



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GAAP vs Statutory

Emergence of GAAP Profits

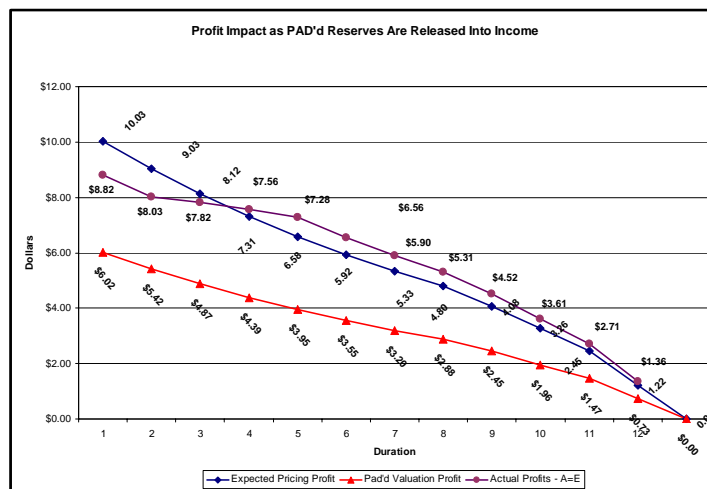
- GAAP Book Profit = Income – Expenses
- Profits emerges as a constant % of premium
- GAAP assumptions with PAD
 - Non-level (Increasing) profits
 - Start lower but higher later (As conservative assumptions release cash flow into income)
 - PV of profits is the same as without PAD



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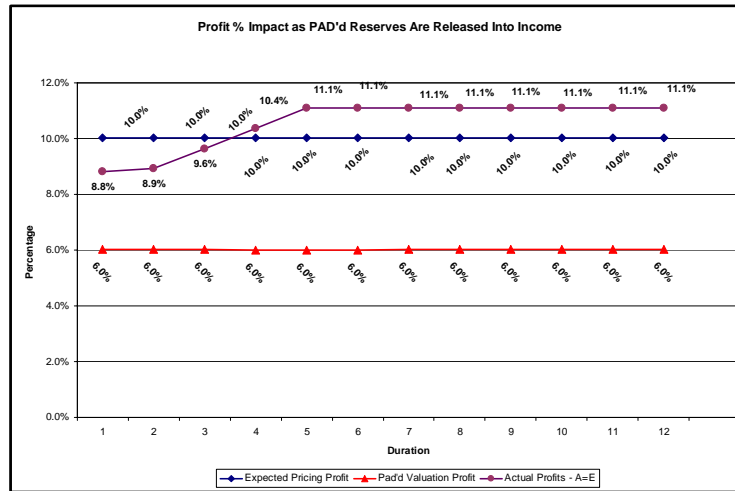
GAAP vs Statutory

GAAP Profits



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GAAP vs Statutory



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GAAP vs Statutory

SEC Filings

- Annual 10-k
- Quarterly 10-q
- External Auditors
- Sarbanes-Oxley -- SOX



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GAAP vs Statutory

Statutory Reserves



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GAAP vs Statutory

Statutory Principles

- Conservatism
 - Primary objective: **Financial Solvency**
 - **Adverse deviation** from pricing assumptions may threaten solvency
 - Therefore, assumptions should be “**reasonably conservative over the span of economic cycles**”
 - To the extent possible, methodology should **prevent sharp fluctuations** in surplus



*Statutory Principles slide provided from Reserve Education Week 2008 materials

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GAAP vs Statutory

Premium Reserves

Paid In Advance* = premiums paid beyond next due date following valuation date

Due and Unpaid – Limits on time carried.

* Typical A&H handling of PIA



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GAAP vs Statutory

Assumptions Regulatory Minimum Standards

- Morbidity
 - Varies by Product Type
 - Minimal Guidance
 - e.g., Nelson Warren Tables, 1985 CIDA
- Mortality – Consistent with Life Insurance
- Interest Discount Rate
 - Whole Life Rate – 4.0% since 2006
- Persistency
 - Almost Always Limited



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GAAP vs Statutory

Regulatory Minimum Standards

Statutory Morbidity Standards

- Individual DI
 - Active Life Reserves
 - 1985 CIDA or 1985 CIB (simplified approximation of 85 CIDA)
 - Claim Reserves
 - Claims incurred on or after 1/1/2002: 85CIB
 - Claims incurred prior to 1/1/2002, can elect one of:
 - ➔ Minimum standard for contract reserves as of incurral date
 - ➔ 85CIB; having elected this option, insurer must continue to use for all future valuations
 - ➔ Optional use of credible insurer experience for years 1–2



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GAAP vs Statutory

Regulatory Minimum Standards

Statutory Standards

- Long Term Care (LTC)
 - New model effective 1/1/2005
 - Lapse rate:
 - Year 1 min(80% of pricing, 6%)
 - Years 2-4 min(80% of pricing, 4%)
 - Years 5+ min(100% of pricing, 2%)
 - Mortality assumption: 1994 GAM Static table
 - No morbidity improvement may be projected
 - First statutory valuation table forthcoming



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GAAP vs Statutory vs TAX?

Tax Reserves



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GAAP vs Statutory vs TAX

Tax Reserves

Once upon a time,...



- Your Grandfather's insurance company deducted the change in statutory reserves from their FIT statement.
- The IRS noticed how Grandfather's company held lower reserves for the same product as Company B. How can this be?
- The IRS wised up, and created DEFRA and TEFRA and COBRA and ...
- Well, now, Grandfather's company has to calculate Tax reserves using FIT methods and assumptions and...

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GAAP vs Statutory vs TAX

Tax Reserve Calculations

- Statutory vs Tax:
 - Tax < or = Statutory
- Contract Reserves
 - Prevailing Tables
 - FPIR
 - Minimum Reserve
- Premium Reserves
 - NO Deficiency Reserves
- Claim Reserves
 - Test the Statutory Reserves Against Claim Run Out.



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Reserves vs Claim Liabilities

Claim Liabilities



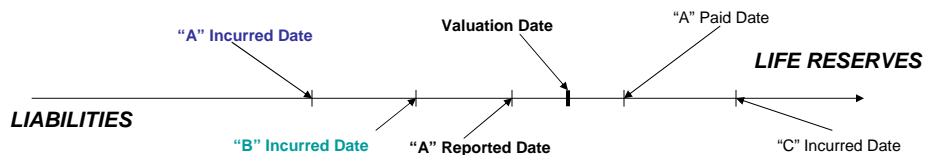
Slide Concepts originally presented by John Lloyd in the SOA Health Valuation Boot Camp 2008

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Reserves vs Claim Liabilities

Reserves = Present Value of Benefits and Expenses accruing **after** the valuation date, (e.g. Active Life and Disabled Life Reserves)

Liabilities = Amounts Accrued on or **before** the valuation date, (e.g., Claim Reserves)



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Claim Liabilities

- Issues with all methods
- Turnaround Time
 - P&C -- months to work up estimates – evolution and recognition of drift is often at least quarterly
 - Medical – often just 2 to 3 working days – evolution is 30-90 days and recognition of drift can be weekly
- Business characteristics
 - Common for a company actuary to have to simultaneously deal with the differing patterns presented by Major Med, Med Supp, High Deductible, PPO vs HMO, multiple legal entities, Dental, large group, growing or declining blocks
 - Common to have a mix of contracting, pricing, or operational issues

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Claim Liabilities

- **Claim Characteristics**

- Often high frequency and fairly homogenous
- Embedded in data – however, long tail and catastrophic claims
- Claim history is subject to revision – provider dispute, COB, litigation
- Ancillary information can be useful and can be developed

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Reserves vs Claim Liabilities

- Advantages and Disadvantages of the following claim liability estimation methods:
 - Loss Ratio
 - Triangle
 - Statistical Methods
 - Principle Based

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Claim Liabilities

- Claims Liabilities – obligations for claims already incurred
 - In Course of Settlement
 - Incurred but Not Reported
 - Claims Payable (Due & Unpaid)
 - Claims Resisted
 - Largest obligation on most health insurance balance sheets
 - Common approaches – Lots of variations



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Claim Liabilities: Today vs Yesterday

- Actual IBNR is smaller
 - Smaller base means greater impact from disruptions
 - Long, thin tail = lags are actually more easily disrupted
 - More impact if processing slows or changes
- Inventory
 - Larger portion of liability is actually in-house
 - Pre-systems edit files can replace the mail-room
 - Systems glitches can replace “backlog” but are more subtle

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Claim Liabilities: Today vs Yesterday

- Adjustments
 - Auto-adjudication sometimes means the claim returns
 - Revised claims show up in the tail - sometimes in batches
- Large Claims
- PMPM Estimates
 - Larger portion of estimate on least credible data
 - Historical base may be distorted by lag problems, or future trends

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Claim Liabilities

- Most Common Theme
 - Estimate Fully Incurred Less Paid Claims
- Methods
 - Loss Ratio
 - Applicability – new blocks, new processes
 - Approach – apply pricing or budget LR against premiums
 - Substitute for lack of lag or incomplete data
 - Pitfalls – if revenue is understated, so is liability, defers recognition
 - Strength – often the only information available early in a program

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Claim Liabilities

- **Methods**

- Triangle “lag-based” Development:

- P&C roots – modified to suit health coverages
 - Data on Processing = Lags:

- Tracks the “development” of the claim
 Event → Reported → Adjudicated → Payment

- Historical lags predict future payment pattern (“completion”)

- Create factors using historical development and assume same pattern in progressing from current to fully incurred.

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Date	Units	Paid T-D	C Ratio	C Factor	Ult Inc	Reserve
3-2006	114,864	14,787,995	1.00000	0.99969	14,792,581	4,586
4-2006	118,067	13,699,893	0.99974	0.99943	13,707,706	7,813
5-2006	120,994	15,720,653	0.99984	0.99927	15,732,134	11,481
6-2006	125,820	15,202,505	0.99993	0.99920	15,214,672	12,167
7-2006	128,129	15,317,725	0.99986	0.99906	15,332,131	14,406
8-2006	129,139	16,271,550	0.99975	0.99881	16,290,926	19,376
9-2006	130,705	15,407,273	0.99980	0.99861	15,428,705	21,432
10-2006	131,837	17,099,915	0.99968	0.99829	17,129,183	29,268
11-2006	133,121	15,430,915	0.99979	0.99808	15,460,573	29,658
12-2006	134,764	13,845,456	0.99780	0.99589	13,902,653	57,197
1-2007	131,884	16,135,659	0.99815	0.99404	16,232,347	96,688
2-2007	130,871	15,433,737	0.99728	0.99134	15,568,565	134,828
3-2007	129,582	16,837,562	0.99872	0.99007	17,006,422	168,860
4-2007	126,615	14,304,742	0.99826	0.98835	14,473,384	168,642
5-2007	125,549	16,063,428	0.99727	0.98565	16,297,295	233,867
6-2007	124,092	13,992,100	0.99569	0.98140	14,257,259	265,159
7-2007	122,894	13,923,877	0.99459	0.97609	14,264,917	341,040
8-2007	121,494	14,376,800	0.99654	0.97272	14,780,072	403,272
9-2007	120,330	13,762,419	0.99678	0.96958	14,194,163	431,744
10-2007	119,556	15,426,034	0.99276	0.96256	16,025,996	599,962
11-2007	119,020	13,193,943	0.99436	0.95713	13,784,839	590,896
12-2007	118,838	12,207,294	0.99312	0.95055	12,842,358	635,064
1-2008	114,460	14,508,486	0.98173	0.93318	15,547,314	1,038,828
2-2008	117,839	14,075,018	0.97980	0.91433	15,393,764	1,318,746
3-2008	119,477	13,677,925	0.95076	0.86931	15,734,218	2,056,293
4-2008	119,402	12,131,113	0.85278	0.74133	16,363,967	3,879,906
5-2008	120,413	4,919,336	0.47883	0.35497	13,858,399	8,939,063
6-2008	121,099	321,337	0.02313	0.00821	39,137,374	14,598,174

Total

Visualization – Common Elements

24,454,553

Slide presented by John Lloyd SOA Health Valuation Boot Camp 2008

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Claim Liabilities

- **Increased Emphasis on Over-rides**
 - More analysis time on projections
 - PMPM, LR, and other *a priori* approaches
 - Alternative projection methods – time series, forecasting
- **Improved use of systems data – beyond the lags**
 - Inventory Reporting
 - Authorizations
 - Dealing with Adjustments
- **Scenarios or Alternative Estimates**
- **Analysis of recast estimates**

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Claim Liabilities

- How many sets of estimates?
 - Market splits, product splits, type of service
 - Credibility of the cells
 - Sharing completion factors or allocations
- How many sets of completion factors - parameters
 - Submission speed: e.g. Inpatient vs DME
 - Processing speed: e.g. Inpatient vs PCP
 - Linkage to Over-rides – creating a base for extrapolation

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Claim Liabilities

- Creating predictive completion factors
 - Picking a predictive period – skipping back to like periods
 - Averaging – how long? 3-mth, 12-mth
 - Smoothing historical fluctuations – high/low outliers
- Estimation – Smoothing Lags
 - Basic premise -- payment lag repeats itself
 - Noise in payment patterns does not repeat
 - Large or catastrophic claims
 - Provider settlements and reprocessing
 - Operational glitches and/or speed-up

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Claim Liabilities

- Adjustments to Lags
 - Function of volume of payments - some noise is absorbed
 - Normalization before lag computation – PMPM lags
 - Weekly payment cycles – 4 week versus 5 week months

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Claim Liabilities

Estimation – How many lag triangles?

- Traditional
 - “Date of Service” versus “Date of Payment”
 - Lag then projects future payments for service month
 - Total Reserve = IBNR, ICOS, Claims Payable
- Discussions of data available
 - “Date of Service” versus “Date Received” = IBNR
 - “Date Received” versus “Date Processed” = ICOS
 - “Date Processed” versus “Date of Check” = Claims Payable
 - Pended Claims Reporting
 - Enhanced inventory reporting

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Claim Liabilities

- Most IBNR model approaches are deterministic
- Session # 78 WS: The Art of Reserving
 - Workshop “Statistical Methods for Health Actuaries IBNR Estimates” by Darrell Knapp and Mark Zanecki.
 - Stochastic Models
 - “... a mathematical simplification of an underlying risk process with an explicit statement of underlying probabilities”

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Claim Liabilities

- From the published Session # 78 WS: The Art of Reserving – Workshop slides,
- “Current Thinking: Simulating reserves stochastically using a chain-ladder method...”

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Claim Liabilities

- From the published Session # 78 WS: The Art of Reserving – Workshop slides,
- “New Thinking: Stochastic model is not just the trends in the mean, or the distribution about the mean. It’s about how well does your model describe the underlying risk process...”

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Claim Liabilities

- From the published Session # 78 WS:
The Art of Reserving – Workshop slides,
- Main features of the Stochastic Models
 - Range of reserve reported
 - Explicit probabilistic statement
 - Worst-case reserve reported (at specified probability level)
 - Range for incurred per member per month (pmpm) trend developed
 - Forecast of incurred pmpm, trend and reserve past valuation date

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Claim Liabilities – Principles Based

- (1) Using stochastic generators and model parameters prescribed by the NAIC; or,
- (2) Using prepackaged scenarios generators as described in (1); or,
- (3) Using Proprietary Predetermined Scenario Sets developed by the company under regulatory guidelines; or,
- (4) Using stochastic models developed by the company that meet certain prescribed calibration requirements

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Claim Liabilities – Principles Based

“The number of scenarios for which Scenario Reserves are computed shall be considered to be sufficient if any resulting understatement in total reserves, as compared with that resulting from running a broader/more robust range of additional scenarios, is not material.”

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