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Risky Business: Market Value of Liabilities

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Summary: The following is an outline of the presentation delivered by David Becker at the 2000 Valuation Actuary Symposium.

- I. Background and Overview
 - A. Trends in U.S. Reporting
 1. History
 - FAS 60
 - FAS 97
 - FAS 115
 - FAS 133
 - FAS ?
 2. Continued shift
 - from revenue/expense matching with focus on income statement
 - to measurement of balance sheet (assets and liabilities) with income equal to change in assets less change in liabilities
 - B. Drivers/Players of Fair Value of Liabilities
 1. Drivers
 - FASB
 - IASC
 - Securities

2. Players
 - ACLI
 - CAS
 - AAA
 - IAA
 - C. Perceived Advantages
 1. Eliminate accounting arbitrage that might occur due to blurring of financial institutions
 2. Unbiased, consistent, comparable
 - independent of history (e.g., scrap historic cost)
 - prospective measure
 - based on prices in secondary market or valuation models that estimate such exit values
 - present value of future cash flows
 - similar for similar products
 - independent of specific entity holding assets or liabilities
 - independent of future disposition of assets or liabilities
 3. Values reflect sensitivity to levels of interest rates
- II. Major Issues
- A. General Agreement
 1. General purpose financial statements not meant for insurance regulators
 2. Focus on insurance contracts, not enterprises
 - blurring of financial institutions/functional regulation
 - don't want separate reporting for insurance companies
 3. Focus on measurement of balance sheet, not revenue and expense matching; changes go through earnings

4. Fair value equals “market price,” exit value
5. Gains/loss on issue permitted
6. Reflect a “market value margin”
7. No embedded value reporting
8. No deferred acquisition cost (DAC)
9. Do not reflect insurer’s yields in fair value of liabilities
(IASC divided, AAA—?)

B. Lack of Agreement

1. Examine insurance contracts
 - FASB looks at insurance risks
 - International Accounting Standards Committee (IASC) looks at contracts
2. Insurance risk involves both amount and timing
 - FASB—yes
 - IASC/IAA—either one or both
3. Does not apply to self insurance or contracts where payment is “in kind”
 - IASC agrees
 - IAA disagrees
4. Distinguishes between general insurance and life insurance
 - IASC does
 - IAA does not
 - FASB seems to view this as difference between short-term and long-term contracts.
5. Use of renewal premiums
 - IASC allows renewal premium only if insurer is committed to pricing structure.
 - IAA indicates this area needs much more clarification.
6. Unbundle embedded options in insurance
 - IASC agrees
 - IAA disagrees

7. Fair value of liabilities is subject to floor
 - IASC agrees
 - IAA disagrees (FASB likely supports)
8. Provision for catastrophe risk
 - IASC and FASB do not support
 - IAA has not reached broad agreement
9. Use of market-based assumptions instead of entity-specific assumptions
10. Use of future investment margins
 - FASB—no
 - IASC—split
 - IAA—yes, but . . .
11. Spread reflecting insurer's credit standing used in determination of fair value of liabilities
 - FASB—yes
 - IASC—split
 - IAA/AAA—no

III. Fair Value—FASB

1. Fair value is an estimate of the price an entity would have realized if it had sold an asset or would have paid if it had been relieved of a liability on the reporting date in an arm's-length exchange motivated by normal business considerations. It is an estimate of an exit price determined by market interactions. An asset's or a liability's exit price—the price at which it could be sold or settled at present—represents the market's estimate of the present value of its expected future cash flows. That price reflects the amounts, timing, and uncertainty of future cash flows of the enterprise that holds the asset or owes the liability.
2. Exchange/dealer/broker/principal markets
3. Noted in footnote that one could look at reinsurance transactions, BUT . . .
4. In concept, fair value is the hypothetical amount that another insurer with the same credit standing as the policy issuer would charge to assume the policy liability.

5. The contract liability would be recognized at its fair value, which includes the present value of the expected future policy benefits, policyholder dividends, policy maintenance costs, retrospective and contingent commissions, and experience-based refunds.
6. However, the discount rate would not be based on investment yields. It would be either the current risk-free rate (if all risk factors are considered in development probability-weighted cash flows) or a rate that reflects the credit risk of the policy issuer and other risks.
7. Once the projected cash flows are estimated, they are adjusted for the following.
8. Expectations about possible variations in the amount or timing of those cash flows.
 - The time value of money
 - The price marketplace participants are able to receive for bearing the uncertainty inherent in the asset or liability (the risk premium)
 - Other factors including illiquidity, market imperfections, and anticipated profit margins
9. Fair value of liabilities = expected cash flows discounted at risk-free rate plus a spread for credit risk of insurer.

IV. Fair Value—IAA

- A. Fair value is the amount for which an asset could be exchanged or a liability settled between knowledgeable, willing parties in an arm's-length transaction.
- B. Computation
 - Estimate each source of liability cash flows
 - Due to uncertainty of assumptions, distributions and parameters, add a "market value margin"
 - Determine a "replicating portfolio" of assets with known fair values that match the liability cash flows
 - The fair value of the liability is the fair value of the replicating portfolio

- C. The implied return in the replicating portfolio is the effective discount rate for liabilities. Thus it allows for recognizing future investment margins to the extent of the return in the replicating portfolio. (This is contrary to FASB)
- V. Problem of the Exit Price
- A. For not only unobservable liabilities, it doesn't exist
- B. Valuation models require calibration to real world data in order to be relied upon for decisions
- C. Methods proposed by FASB/IAA
- produce quantity sensitive to changes in interest rates
 - BUT product only relative values, not objective ones
 - therefore, surplus and earnings are relative
- D. Results not comparable between companies and likely not consistent over time
- E. Comparing fair value of liabilities analytics with fair value of assets analytics is suspect and so would be conclusions/decisions
- VI. Assumptions—The Brave New World
- A. The usual suspects (mortality, lapse, expense . . .)
- B. Dynamic
- C. Policyholder, borrower, corporate, competitor
- vary by company, distribution system, and product features
 - vary over time
 - real world assumptions are not risk neutral
- D. Assumptions
- vary by company
 - lack of experience data for some (dynamic)
 - wide range of reasonableness
 - challenge of auditability
 - ease of manipulation (conscious or subconscious)

- VII. Complexity of Models
- A. Major increase in human capital, cost and time
 - B. Validation issues
 - C. How/when to reflect impacts of model improvement or repairing errors
 - D. Manifold issues relating to
 - interest rate models (number of factors, parameters . . .)
 - equity models
 - replicating portfolio issues (how to measure close; how close is close enough?; the universe of securities; robustness of the fair values of assets in universe)
 - E. Significant model complexity, if taxes are needed
- VIII. Volatility of Results
- A. Volatility in assets and liabilities leads to
 - surplus and earnings volatility
 - higher risk-based capital levels
 - higher investor required equity premiums
 - lower share prices
 - B. These, in turn, lead to
 - increased regulatory and investor scrutiny
 - solvency concerns may or may not be justified
 - C. To “outsiders” results are:
 - nonintuitive
 - hard to explain
 - depend on manifold assumptions to complex models
 - may be driven by factors that are temporary, manipulated, or related to items that do not directly affect the ability to meet obligations

- IX. Discounting Using a Credit Spread
- A. FASB—yes; AAA/IAA—no; IASC—?
 - B. “Counterintuitive” results occur:
 - if credit downgrade, fair value of liabilities goes down; earnings and surplus go up
 - if credit upgrade, fair value of liabilities goes up; earnings and surplus goes down
 - AAA—can’t realize extra value from downgrade
 - IAA—host of reasons
 - C. If fair value of liabilities model is based on concept of secondary market, above results are absolutely consistent as liability WOULD trade at lower price
 - D. In an fair value of liabilities framework, a company whose debt was downgraded WOULD have higher earnings and surplus as debt could be retired at a lower price
- X. Natural Questions of Users of General Purpose Financial Statements
- A. What were earnings last period? (backward)
 - B. How robust is the firm? (forward)
 - C. Stakeholders
 - Should I buy/surrender their product?
 - Should I buy/sell their bonds?
 - Should I buy/sell their stock?
 - Do I want to/continue to work there?
 - How should I manage the firm?
 - D. Views of surplus (more or less is better?)
 - safety cushion
 - liquidation
 - going concern
 - franchise

- XI. Can one financial reporting system meet all needs?
- A. Transactions
 - short term
 - long term
 - B. Surplus
 - safety cushion
 - liquidation value
 - going-concern value
 - franchise value
 - C. Stakeholders
 - consumers
 - bond holders
 - equity holders
 - regulators
 - employees
 - management
 - D. Level of surplus
 - more is better?
 - less is better?
- XII. Qualitative Characteristics of Accounting Information
- A. Relevance
 - makes a difference in decision-making
 - data are “fresh” and delivered on a timely basis
 - B. Reliability
 - measure faithfully represents the “reality”
 - verifiable
 - neutral, i.e., free of bias
 - C. Comparability (between/among companies)

- D. Consistency (over time at same company)
- E. Material
- F. Cost justified

XIII. Empirical Observations

- A. 50 Top Insurance Companies—1981
- B. Orange County
- C. Value-at-risk (VAR) and long-term capital management
- D. Pricing model uncertainty

XIV. 50 Top Insurance Companies—1981

- A. How many companies would have been insolvent on a fair-value balance sheet basis in 1981?
 - Probably ALL
- B. How many companies actually went bankrupt due to interest rate risk?
 - None, or maybe one
- C. What happened to those who became insolvent?
 - Lack of sound diversification by asset classes
 - “Bet your company” by asset class over concentration
 - Dangerous asset classes (e.g., illiquid, volatile, credit risk)
 - Run on the bank

XV. Orange County

- A. Study by Merton Miller and David Ross
- B. Findings
 - On December 1, 1994, the pool was neither illiquid nor insolvent
 - Financial condition did not warrant insolvency
 - If pool had not been liquidated but allowed to follow strategy, then Orange County would not only have avoided losses it realized by liquidating but it would also have generated significant cash flow during 1995

- C. Insolvency driven by balance sheet method; historic simulation showed robustness of basic strategy
- D. “Citron’s strategy worked fine until 1994 when the FED started a series of interest rate hikes that caused severe losses to the pool” (Jorion)

XVI. Value at Risk and Long-Term Capital Management

A. *Derivatives Strategy*

- Two roundtables (Vol 3, No. 4, April 1998)
 - “The Limits to VAR”
 - The Limits of Models”
- “What Have We Learned?” (Vol. 3, No. 11, November 1998)

B. Note: VAR is a balance sheet method

C. The Limits to VAR

- Large standard errors, unreliability of correlation matrices
- Nonmeasurable risk, nonstable parameters
- Don’t understand extent of assumptions
- Every major problem was missed by quantitative analysis
- Nonstationary distributions

D. The Limits of Models

- Which models are relevant and which should be used in specific situations?
- The model is a map and not the territory
- Incorporate return measures into VAR
- Current VAR models are mostly static. They measure potential loss of current portfolio with no considerations of future actions or strategies, or even the reinvestment of future cash flows
- We were producing these numbers for portfolio immunization . . . numbers down to the last cent . . . with billions by the time down to last cent . . . perfect random number generator

E. The Limits to Models

- One of the reasons Black-Scholes does so well is because it has only one unobservable variable. This means the single number we call *implied volatility* is, in some sense, just an amalgamation of all the unobservable, untradable parameters
- What inputs do they use? There is always some excuse they can use to manipulate the numbers

F. What have we learned?

- Correlations can be quite unstable.
- Mistake is compounded by regulators putting too much emphasis on risk models (pushing models to edge).
- Remember that VAR is a snapshot of a frozen moment in time, while risk management is a movie.

XVII. Pricing Model Uncertainty

A. Strategic Economic Decisions, Inc.

B. Technological changes as source of volatility

- Black-Scholes, computerized pricing/trading, Bloomberg, first call to computerized data delivery

C. Six sources of overshoot in prices

- speed of response to news (immediate not diffusion)
- short-termism (mark-to-market daily, daily performance)
- correlation of beliefs (and so actions)
- model uncertainty
- leverage
- interactions among above

D. Greatly increased asset price overshoot and periodic illiquidity

XVIII. Reasonableness of Fair Value-Based General Purpose Financials

- A. Will fair-value liabilities' financial results meet the criteria?
- relevant (make a difference, fresh, timely)?
 - reliable (verifiable, neutral, faithfully measure reality)?
 - comparable between companies?
 - consistent over time?
 - cost justified?
- B. Not likely at this time, or maybe never, due to
- exit price definitional problem/credit spread conflict
 - challenge of assumptions, auditability
 - complexity
 - unexplainable volatility
 - empirical evidence for above

XIX. Bibliography

A. *Derivatives Strategy*

- “The Limits of VAR” and “The Limits of Models”
 - Vol. 3, No. 4, April 1998, pp 14–20 and 24–30
- “What Have We Learned?”
 - Vol. 3, No. 11, November 1998, pp 48–51

B. *The Journal of Derivatives (Summer 1997)*

- “Lessons from the Orange County Bankruptcy” (Jorion)
- “The Orange County Bankruptcy and its Aftermath: Some New Evidence” (Miller & Ross)