## *Appendix 2: Industry Survey on EC*

In the fall of 2002, the EC subgroup conducted an industry survey on Economic Capital. 491 people participated in the survey. The answers we obtained, as well as additional text write-ins, are detailed below:

| | # of answers | % |
|---|---|---|
| **1. At the enterprise level Economic Capital ("EC") is typically defined as "sufficient surplus capital to meet negative cash flows at a given risk tolerance level." Please tell us to what extent you agree with this definition. (Please select one response)** | | |
| Agree Strongly | 118 | 24.03% |
| Agree Somewhat | 282 | 57.43% |
| Disagree Somewhat | 29 | 5.91% |
| Disagree Strongly | 14 | 2.85% |
| Don't Know | 48 | 9.78% |
| If you do not agree with the definition for EC provided above, please provide a more suitable definition below:" | | |
| See Text Answers | | |
| **Total** | **491** | |
| **2. What types of risk should be included in the calculation of Economic Capital? (Please check all that apply)** | | |
| Interest rate risk | 473 | 17.39% |
| Equity market risk | 447 | 16.43% |
| Credit risk | 454 | 16.69% |
| Pricing risk (mortality/morbidity, lapse, expense, etc.) | 455 | 16.73% |
| Liquidity risk | 423 | 15.55% |
| Operational risk | 388 | 14.26% |
| Other (please specify) – See Text Answers | 80 | 2.94% |
| **Total** | **2720** | |
| **3. Have you been using the concept of EC at your company or in your consulting work?** | | |
| Yes | 221 | 45.10% |
| No (continue to Question 9 ) | 269 | 54.90% |
| **Total** | **490** | |
| **3.a. What type of event(s) is the EC designed to cover? (Please check all that apply)** | | |
| Earnings shortfall (STAT/GAAP/Other) | 97 | 18.80% |
| Cash flow losses | 117 | 22.67% |
| Losses from specific lines of business or products | 117 | 22.67% |
| Loss of market value | 103 | 19.96% |
| Loss of fair value | 64 | 12.40% |
| Other (please describe) – See Text Answers | 18 | 3.49% |
| **Total** | **516** | |

| | | |
|---|---|---|
| **3.b. What time horizon has the EC calculation been based upon? (Please select one response)** | | |
| One year | 42 | 23.73% |
| Five years | 34 | 19.21% |
| Ten years | 11 | 6.21% |
| Longer than ten years | 66 | 37.29% |
| Other (please describe) – See Text Answers | 24 | 13.56% |
| **Total** | **177** | |
| **3.c. Which risk tolerance measure has been used to determine EC? (Please check all that apply)** | | |
| Specified percentile (e.g. 95th or 98th) | 135 | 59.73% |
| Conditional Tail Expectation (CTE) | 33 | 14.60% |
| Multiple of standard deviation | 37 | 16.37% |
| Other (please describe) – See Text Answers | 21 | 9.29% |
| **Total** | **226** | |
| **3.d. What % level (if any) was used in determining EC:** | | |
| See Text Answers | 0 | 0.00% |
| **4. What was the main reason for calculating EC?** | | |
| To provide management with the knowledge that risks were being adequately managed and sufficient surplus was available | 77 | 44.25% |
| To identify excess capital for discussion with regulators and rating agencies | 18 | 10.34% |
| As part of the due diligence surrounding a major financial transaction (e.g. securitization, demutualization, purchase or sale, reinsurance) | 6 | 3.45% |
| To better measure the performance of different business units | 56 | 32.18% |
| Other – See Text Answers | 17 | 9.77% |
| **Total** | **174** | |
| **5. How has EC been measured for various lines of business or products? (Please check all that apply) "** | | |
| Stochastic (Monte-Carlo) model | 92 | 33.33% |
| Mean Variance Covariance (MVC) model | 23 | 8.33% |
| Formulaic approach | 59 | 21.38% |
| Deterministic model | 51 | 18.48% |
| All of the above | 27 | 9.78% |
| Don't know | 12 | 4.35% |
| Other (please specify) – See Text Answers | 12 | 4.35% |
| **Total** | **276** | |
| **6. Have you established a formal framework for the calculation of EC at your company or in your consulting work? "** | | |
| Yes | 102 | 58.62% |
| No ( continue to Question 7 ) | 72 | 41.38% |
| **Total** | **174** | |

| | | |
|---|---|---|
| **6.a. If yes, at what level of the organization is the EC frame work applied (Please check all that apply)** | | |
| Line of business | 43 | 35.25% |
| Corporate level only | 19 | 15.57% |
| Across all lines of business | 52 | 42.62% |
| Other (please specify) – <u>See Text Answers</u> | 8 | 6.56% |
| **Total** | **122** | |
| **7. How do you allocate firm-wide Economic Capital at the product level?** | | |
| Calculate EC at each product level and then sum the results to give firm wide EC. | 47 | 28.14% |
| Calculate EC at each product level and separately at the firm level. Then adjust the calculated EC at each level by applying a constant factor such that the sum of the EC at each level equals the firm level. | 34 | 20.36% |
| Calculate EC at the firm wide level but allocate EC to the required level based on the marginal EC calculations. | 33 | 19.76% |
| Not Applicable | 37 | 22.16% |
| Other (please specify) – <u>See Text Answers</u> | 16 | 9.58% |
| **Total** | **167** | |
| **8. If you have been using the concept of EC at your company or in your consulting work, have you allowed for diversification benefits across lines of business?** | | |
| Yes | 103 | 62.42% |
| No (continue to Question 9 ) | 62 | 37.58% |
| **Total** | **165** | |
| **8.a. If yes, how did you allow for diversification benefits?** | | |
| Stochastic model of multiple lines of business combined | 31 | 262.72% |
| MVC approach with covariance factors | 26 | 22.41% |
| Formulaic approach | 37 | 31.90% |
| Don't know | 16 | 13.79% |
| Other (please specify) – <u>See Text Answers</u> | 6 | 5.17% |
| **Total** | **116** | |
| **9. Are you aware of the recent proposals regarding the new stochastic modeling requirements needed to calculate the EC for C-3 risks associated with variable products with guarantees?** | | |
| Yes | 167 | 38.48% |
| No (continue to Question 10 ) | 267 | 61.52% |
| **Total** | **434** | |
| **9.a. If yes, what are the implications of these new proposals for your work? (Please check all that apply.)** | | |
| Will need to build a stochastic model to calculate EC for C-3 risk | 54 | 29.83% |
| Expect to have an increase in our RBC for C-3 risk | 24 | 13.26% |
| No impact | 37 | 20.44% |
| Don't know | 50 | 27.62% |
| Other – <u>See Text Answers</u> | 16 | 8.84% |
| **Total** | **181** | |

| | | |
|---|---|---|
| **10. What are your plans/expectations for the future developments/uses of EC at your company? (Please select one response)** | | |
| Expect this to have greater significance going forward | 248 | 59.62% |
| Expect this to have lower significance going forward | 8 | 1.92% |
| No change | 57 | 13.70% |
| Don't know | 91 | 21.88% |
| Other ( please specify) – See Text Answers | 12 | 2.88% |
| **Total** | **416** | |
| **11. Which of the following best describes your company's primary line of business? (Please select one response)** | | |
| Life insurance | 108 | 25.84% |
| Annuities (fixed and/or variable) | 61 | 14.59% |
| Other insurance (e.g., property/casualty, health, disability) | 44 | 10.53% |
| Diversified financial services | 74 | 17.70% |
| Consulting (go to conclusion of survey) | 101 | 24.16% |
| Other (please specify) – See Text Answers | 30 | 7.18% |
| **Total** | **418** | |
| **12. Which of the following best describes your company's organization structure? (Please select one response)** | | |
| Stock | 210 | 68.40% |
| Mutual | 45 | 14.66% |
| Fraternal | 9 | 2.93% |
| Stock subsidiary of mutual company | 13 | 4.23% |
| Other (please specify) – See Text Answers | 30 | 9.77% |
| **Total** | **307** | |
| **13. How would you describe the scope of your company's operations? (Please select one response)** | | |
| Multinational | 135 | 43.97% |
| North American (significant presence in at least two of: U.S., Canada or Mexico) | 24 | 7.82% |
| National (U.S.) | 97 | 31.60% |
| National (Canada) | 11 | 3.58% |
| Regional or local (US) | 22 | 7.17% |
| Regional or local (Canada) | 1 | 0.33% |
| Other (please specify) – See Text Answers | 17 | 5.54% |
| **Total** | **307** | |
| **14. What were your total assets under management in North America at year-end 2001? (Please select one response)** | | |
| Over $20 billion | 169 | 56.71% |
| $5 - $20 billion | 58 | 19.46% |
| Less than $5 billion | 71 | 23.83% |
| **Total** | **298** | |
| **Thank you for your participation in the Economic Capital Survey. We welcome your feedback about the survey and any other comments below:** | | |
| See Text Answers | 0 | 0.00% |
| **Total** | **0** | |

# Risk Management Task Force Economic Capital Subgroup
# Economic Capital On-Line Survey
# Text Answers

**Question 1, part 2:**

**If you do not agree with the definition for EC provided above, please provide a more suitable definition below:**

- Economic Capital is an amount sufficient to support a sustainable earnings level over a finite planning horizon.
- EC is sufficient to meet company objectives (which may not be negative CFs) at a given risk tolerance level.
- Unexpected negative cash flows
- The given risk tolerance level has to be stated at generally accepted level, say 95%.
- EC at the enterprise level is the expected aggregate losses in excess of the company's funding target. In other words, it's the amount cash you expect to need in order to clean up the mess, if the funding target turns out to be too low. By funding target I mean the stat reserve.
- Our focus is statutory solvency. We also have a 'floor Econ. Cap. level' based on a peer group.
- Right now this floor calculation exceeds the risk calculation.
- At the lay person level 'negative' has a negative meaning. How about 'significant cash outflows' instead. Some of what we spend our surplus on ends up being very positive.
- Add the words 'over a specified time horizon' (this may be the term to maturity of all liabilities, but this should be spelt out); What about changes in asset values and liability values over the time horizon, i.e. non-cash items?; Definition could.
- If a company has more capital than required by that definition is such capital non-economic or just low efficiency capital? Added capital to support a credit rating would be Economic Capital.
- Negative cash flows might be met by borrowing, which goes beyond surplus.
- The capital required to ensure that the value of the enterprise does not fall below zero (or a stated amount) within a given time horizon with a given degree of confidence. The value of the enterprise could be measured in a number of ways depending on the constraints of the individual company, including the present value of free cash flows.

- It sometimes also includes the cost of that capital.
- I would add that the cash flows would be more adverse/severe than expected
- Sufficient surplus capital to meet LOSSES at a given risk tolerance level
- My hesitation is with the 'given' risk tolerance level. Shouldn't it be a risk tolerance level that balances the needs of all parties... investors in the enterprise and those that represent them as well as consumers of the enterprise's product and those that represent them.
- Sufficient capital so that the enterprise has a high probability of remaining solvent over a long period of time
- The definition given above seems more like a risk capital definition. The term 'Economic' connotes something more than covering negative cashflows. I would use the term Economic Capital to refer to something more broad - along the lines of capital required to continue operating the business in a consistent way in a highly likely future economic environment. In particular, the demands on such capital would include the ability to generate future sales.
- At the enterprise level, Economic Capital ("EC") is typically defined as "sufficient surplus capital to meet negative cash flows at a given confidence level
- Replace 'cash flows' with 'losses' in the above statement.
- Sufficient surplus capital to meet unexpected negative cash flows
- The amount of GAAP capital needed to ensure that future GAAP capital will meet or exceed a given minimum with a given level of certainty.
- To meet negative changes in market value
- I would call this amount risk based capital - Economic Capital would also include amounts needed to maintain flexibility.
- Should we say at any time, or over a specified time horizon or projected period?
- 'Risk tolerance' s/b 'risk'
- For a financial institution, such as a life insurance company... sufficient surplus capital to maintain solvency at both a) a given risk tolerance level, and b) a given expected loss to clients
- Given the range of financial outcomes, Economic Capital is the surplus required to maintain solvency over a stated time period and with a stated confidence level.
- EC = 'sufficient surplus capital to meet the present value of negative statutory income plus 100% of RBC at a given risk level.' Policyholders are not the only stakeholders that must be considered when determining EC.
- Don't know what others do but that is not how my company defines EC. We define capital on a market value basis not a cash flow basis.

- You exclude capital allocations due to requirements external to the immediate control of the enterprise. The definition may satisfy the counter-party's cash needs only. Such economic costs/allocations cannot be ignored. Additionally, the concept of a 'risk tolerance level' implies one has knowledge and can quantify cash losses from all risks. That is impossible (9/11). Nothing comes to mind, other than a reference to absorb negative cash flows for a range of results for certain quantified risk exposures.

- I would agree more if it changes to '...to meet negative cash flow...' to '... to meet negative cash flow and devaluation of balance sheet ...'

- At a given risk tolerance level, sufficient capital to fulfill all business need

- To me, Economic Capital has represented economic value of assets less economic value of liabilities (perhaps market value). The definition above sounds like a statutory definition. I'm happy with the definition, just not quite satisfied with the term.

- Misses issues like downgrades which can very negatively effect a company's viability. It is also too focused on cash flows in the definition, often problems are critical on the balance sheet long before there is a cash flow issue. Liquidity as noted below is a critical risk but is not one solved by capital.

- What is the need for this survey? Regarding 'Economic Capital' or 'Surplus Capital', with a ring-side seat for a dozen or more insurance acquisitions, I've never heard nor seen written either phrase.

- Not sure I agree with Economic, maybe Emergency or Required.

- At the enterprise level, Economic Capital (“EC”) is typically defined as “sufficient surplus capital to ensure solvency at a given risk tolerance level'

- We should distinguish between 'Economic Capital' and 'Required Economic Capital.' The term 'Economic Capital' should mean the fair value of the assets less the fair value of the liabilities of a company. 'Required Economic Capital' should be the minimum value of 'Economic Capital' needed - taking into account all of the risks, options, and financial resources of the company - so that the probability of 'Economic Capital' becoming negative while existing obligations remain in force is below a given risk tolerance level. (Note: It would be worthwhile to try to develop a definition that meets the requirements of a 'coherent risk measure' in the sense of Artzner, et. al.)

- Replace 'negative cash flows' with 'negative cash flows or valuation changes'

- Sufficient capital to meet all company obligations at a given risk tolerance level.

- Negative cash flows' is not sufficiently clear whether this refers to the NPV or simply in a given period (e.g. most front-loaded policies have negative cash flows in the first year due to compensation, yet the NPV of cash flows is positive). The concept of avoiding insolvency or meeting all obligations seems more relevant.

- Add a time element; Also capital may be required in a MV solvency world without any negative cash flow.

- I have normally seen this refer to an amount of capital implicit in the conservative GAAP reserves, with a minimum of zero. No specific risk tolerance was specified, nor can a risk tolerance be accurately calculated.

- Seems to me that there should be a 'time' factor taken into account, e.g. when involving financial instruments such as insurance, when can be long-term.

- Sufficient capital to avoid surplus depletion at any point in the future at a given risk tolerance. This makes the concept linked to statutory accounting and makes it clear that it is on a 'lowest ever' basis.

- Add ', meet ratings capital requirements at the desired level and ensure regulatory capital requirements remain met at an appropriate risk tolerance level'

- I do not have a good definition, but the one shown does not take into account regulatory and rating agency capital requirements. It also does not define a time horizon.

- Would change negative cash flows to potential negative cash flows

- I prefer 'sufficient surplus capital to cover losses at a given risk tolerance level' and still meet a minimum surplus level.

- The focus should be on required assets, not required capital. Required assets are 'sufficient assets to meet cash flows at a given risk tolerance.' Economic capital is the excess of required assets over however the liabilities are defined.

- 'Sufficient capital at the corporate level to meet negative cash flows of lines of business, including capital allocated directly to the line of business, at a given risk tolerance level.'

- Free surplus in an amount at least equal to the potential losses at a pre-defined percentile of the loss distribution. 'EC' is usually or predominantly statistically based and reflects correlations within and, where appropriate or reasonable, among risk classes. A key characteristic of 'EC' is the existence of 'diversification benefits' when risks are 'aggregated up'.

- Suggest to add 'at any point in time' to 'negative cash flows'

- EC should be sufficient to meet extreme adverse events. Often, this is quantified as the 5% tail-end of the distribution.

- Sufficient capital to keep operating without significant loss of franchise at a given risk tolerance level.

- Not a definition, but a clarification question: does this definition intend to address unexpected destruction of real assets, which would have to be replaced quickly for business continuance?

- I think the term EC will be confused with 'The fair value of its financial instruments, i.e. the net asset-liability position' The term Risk-Based Capital or Economic Risk-Based Capital should be used. It should be defined as 'sufficient surplus capital to ensure that the net fair value of it's financial instruments remains positive at a given risk tolerance level.

- Sufficient surplus capital to meet unanticipated negative cash flows at a given tolerance level for a reasonable time.

- The definition should include explicit recognition of capital for regulatory requirements.

- Sufficient surplus capital such that the assets will be sufficient to provide for all obligations at a given risk tolerance level over an agreed upon time horizon.

- Economic Capital is sufficient surplus to ensure the present value of net cash flows is positive at a given risk tolerance level.

- The excess of the market value of the assets over the fair value of liabilities required to ensure that obligations can be satisfied under a given level of confidence.

- Perhaps, I'm naive but the definition sounds more like 'Risk Based Capital' to me. If the two are meant to embody similar concepts than I would agree more strongly. However, when I see the word Economic I tend to focus more on value than sufficiency.

- The excess of the market value of the assets over the fair value of liabilities required to ensure that obligations can be satisfied under a given level of confidence.

- 1. This definition sounds like a liquidity capital. I think that the intent is to represent sufficient capital to meet cash flow needs in excess of the amount of the liability held; 2. I am not sure whether the term 'surplus capital' is a great one; it certainly is unclear; and 3. 'provide for' would be better than 'meet.'

- I am not certain of my answer to question 2, as I am not sure whether its intent to include the full amount of that risk or whether it would be appropriate to also include a portion of that risk in 'surplus capital'. I generally prefer to look at the amount of risk in general, as the components may not add up to the total needed. I am answering Q2, interpreting it to mean that the risk should at least be reflected, whether or not fully.

- The definition is stated terms of 'surplus capital' without defining the term. Is this a reference to statutory, GAAP or market value capital? Generally the testing procedures determine the asset inventory that it necessary to discharge the company's negative cash flows, and then the implied capital in any particular valuation system is determined.

- 'Sufficient capital & surplus to maintain solvency at a given risk tolerance level over a given time horizon.'

- Definition: Economic Capital instruments with respect to a class of liabilities consists of equities, both shareholders and debt, whose claims to cash are subordinate to those of that class, either contractually or de facto because of timing.

  Comment: Various metrics can be utilized to judge its sufficiency, but there is not correct answer in a market economy. With disclosure, consumers evaluate price / risk tradeoffs. Economic Capital and the liability side instruments that give rise to it are two distinct concepts. Economic Capital instruments do not provide the cash flows; the assets (capital) purchased from their issuance do. Post issuance, the value assigned to Economic Capital instruments should be a measure of the value of the Economic Capital instruments' claims to future cash flow.

- EC should also provide the surplus for future opportunities.
- Sufficient surplus capital to meet negative ---net income--- cash flows at a given risk tolerance level.'
- 1. capital is usually the excess over reserves; so it is a relative measure covering such that some aggregate level of risk tolerance is covered; 2. it is not just negative cash flow; a company may have assets that have declined significantly in value but cash flow haven't change at all; capital is required to ensure a point in time assessment of solvency not just cash flow;
- Sufficient surplus to meet required cash flows at a given risk tolerance level and satisfy regulatory and rating agency requirements
- 'Sufficient surplus capital to meet the enterprise´s required risk/return profile, given the enterprise´s current strategy and business plan'
- Defined as amount of capital to cover unexpected losses
- The surplus would not only need to cover negative cash flows but also any increases in reserves required in the adverse scenarios within that risk tolerance level.

<u>**Question 2:**</u>

### What types of risk should be included in the calculation of Economic Capital?

### Other (please specify):

- Legal (may be included in operational)
- All risks that can be reasonably measured
- strategic risk, marketing risk
- Unspecified catastrophic risks
- Legal & Legislative
- 1) Expense Mgmt Risk; 2) Product Risk (making buggy whips right up to the point where Autos took over personal transportation; and 3) All other operational risks
- Political, Regulatory
- growth limit
- model risk

- currency
- Catastrophic Event Risk (or its effect on the above included in ea. separately)
- currency
- regulatory risk
- All risks should be included
- Governance & audit
- economic risk
- catastrophic
- Unidentified risk
- Legal
- random
- currency rate risk
- unique sector risks
- fluctuations under pricing risk
- regulatory risks
- Anything else relevant
- legal risk
- All experience, including new business levels, product mix, litigation, management failure, etc.
- model
- Asset Liability Mismatch Risk (Includes Liquidity, Reinvestment)
- Are lawsuits and regulatory risk considered 'Operational'?
- all
- regulatory (e.g. changes in valuation requirements
- political risk (especially for multinationals)
- Currency

- Business Risk
- sales risk
- Legal, model error, etc.
- Unforeseen events, such as terrorist actions.
- exchange risk
- Finance of new business/other things for a minimum period into future, minimum of winddown expenses
- Litigation, tax, regulatory, product (obsolescence)
- foreign exchange
- regulatory risk
- currency, real estate price risk
- All risks that can require money (including litigation, catastrophes, etc.
- Political risks, legal risks, event risk, currency risk
- Interaction effects of the above; demographic/geographic risks (e.g. 9/11)
- Regulatory
- Mismanagement
- Forex, Legal Risk
- Spread Risk
- Legal
- diversification, or the lack of
- Concentration
- Any risk that can result in a financial loss
- Legal/regulatory
- Any risk that can cause a financial loss
- general business risk - regulatory risk, reinsurer failure, etc.

- catastrophe risk (although it could be viewed as 'liquidity risk'
- currency risk
- political and overall market security risk
- regulatory, tax, reputation
- Traditional Act'l risks like mortality
- legal
- Prepayment risk
- regulatory and tax
- regulatory
- Asset/Liability Mgt Risk
- Chaos Risks according to 'Chaos Theory'. I think the most dangerous risks are not the risks we know and prepare for, but the risks we are not aware of. For example, we foresaw the September 11 event before it happened.
- Real Estate
- currency
- separate account risk, EC on EC risk, transfer risk
- contingency
- other asset value related risk and model risk
- legal
- tax & legal
- Legal, Regulatory, Strategic

**Question 3.a.:**

**What type of event(s) is the EC designed to cover?**

**Other (please specify):**

- None
- statutory solvency

- 1) Loss of mkt share 2) Need for major Investment in products/processes
- fair value increase of liabilities
- volatility in all drivers of financial situation
- market value of what?
- credit, bad debts, etc
- estimated operational risk 'losses'
- loss of regulatory statement value
- all unexpected events
- solvency
- learning curve on administration of health products
- catastrophes
- it is better to separate the components of risk into their components; volatility, uncertainty risk and catastrophic risk.
- experience fluctuations
- pension surplus/shortfall
- any event that compromises policyholder claims
- C-1 (I am not quite sure whether C-! is covered in the categories above.)

<u>**Question 3.b.:**</u>

**What time horizon has the EC calculation been based upon?**

**Other (please specify):**

- length of contract
- varies by application
- depends on the product
- time horizons for risk analysis vary by risk type
- portfolio specific
- expected Maturity of Inforce Block

- longer than one year if a new business requiring funding over longer than one year
- risk horizon
- 3 years
- period depends on product and the guarantees within the products
- estimate, not actual projection
- depends on risk nature
- depends on type of insurance product 3 to 90 years
- observation period for selection of model parameters was based on at least 5 years (& generally 10+) years of data. Time horizon for application of EC is 1 year (i.e. looking at distribution of losses over 1 yr) ... not sure which you were wanting
- typically for the lifetime of the business being valued, however their are strong cases for looking at volatility risk over a shorter horizon (e.g. one year)
- over the life of the liability
- 1 to 20 years
- by product type by scenario
- we have defined it in terms of RBC, rather than through any kind of horizon testing.
- greater of term of assets or liabilities
- varies based on appropriate risk horizon of the business line being analyzed.
- life of the business
- all time horizon
- one year for existing business; life of product for pricing

**Question 3.c.:**

**Which risk tolerance measure has been used to determine EC?**

**Other (please specify):**

- R126 scenarios
- penalized shortfall

- target surplus
- 10% sensitivity
- % of sum assured
- rules of thumb, using other companies in a peer group
- past experience
- implicit in reserves
- point on distribution such that, with a high confidence level, you would expect to have better results X% (e.g., 99%) of the time.
- estimate, 95th percentile in conceptual discussion
- depends on the risk tolerance level e.g. credit rating of the company
- specified margin for adverse deviation
- Note - are considering CTE as an alternative to %-tile
- 99.95% CL
- must use a 'coherent' risk measure!
- State Stat Minimum
- volatility of it
- defined in terms of RBC
- you discover the risk in the current structure and disclose it
- not very scientifically determined.

**Question 3.d.:**

**What % level (if any) was used for calculating EC?**

- 99%
- 99%
- 90%
- various levels were used for different companies
- 95%

- 95%
- 95%
- 95th at the LOB level
- 90%
- 95%
- 99.95%
- We look at multiple percentiles.
- 99%
- 96%
- 99%
- 95th
- no specific % level is universally applied
- 95%
- 99%
- 10%
- 95%
- 4x
- 99.99%
- 99%
- 95%
- 95%
- 0.01%
- 98%
- 95%
- 95 CTE

- 95th
- 99%
- 95th (but this was at a product level)
- 99.95%
- 99%
- 95th
- Generally A Level - 99.93%
- 98%
- 98.18%
- 75th, but we apply it separately to lines of business (shooting for 99% cumulative but we don't have good covariance measures between risks to combine them effectively)
- 95%
- 200% RBC
- 99%
- 99.80%
- 99.95%
- 95th
- 99.95%
- 99.95%
- 98th
- 90%
- 95%
- 99.95%
- 95th
- 99.93%

- proprietary
- 99.95% CL
- 99.90%
- varies by purpose; >90%
- 99%
- RBC
- CTE(95%)
- 95%
- 96-99%
- 99.95%
- 98%
- multiple
- 95%
- 90th % 99th percentile
- 95% CTE is becoming used more often.
- 4% stat liabilities
- 95%
- 99%
- 95%
- 95%
- 99%
- 95%
- 95%
- 98%
- 99.9%

- 95%
- 99.97%
- 99%
- 99.97%
- 95%
- 95%
- 95%
- 95%
- 95%
- none, it was calculated as a forward curve of default rates
- 230%
- 99.7%
- generally 3 std devs (around 99%)
- don't know
- 99th
- 95%
- 95%
- 95%
- 90-98%
- 95%
- 20%
- 95%
- 99.5%
- 98%, 99%, 99.95%
- 99%

- 99.9%
- 97.5%
- 99.70%

**Question 4:**

## What was the main reason for calculating EC?

## Other (please specify):

- Kind of all of the above but fundamentally to begin aligning the profit targets with the product lines and to form the enterprise level whole that is needed to be the backdrop for product management. Trying to tie in surplus management for the enterprise with revenue management via product management.
- Statutory
- Maintain total capital and to price/measure product lines
- Comply with CIA and OSFI Guidelines
- Item 1 above + optimize the capital allocation between various entities and lines of business
- Pricing
- To alert mgmt to the risks implicit in their bus. config. and the effect of mgmt techniques
- Pricing on a 'return on capital' basis
- To examine capital adequacy and to provide a benchmark for pricing certain benefits.
- Pricing for an appropriate return on capital
- All of the above
- Identify excess capital & optimize capital use
- To evaluate reinsurance strategies
- First and fourth
- To create an overall capital standard for various businesses and countries within the organization.
- To provide actionable information to all claimants: stockholders, creditors, and policyholder
- Manage the bottom line

**Question 5:**

**How has EC been measured for various lines of business or products?**

**Other (please specify):**

Not yet.

Firm new to concept

AMBEST BCAR

Heuristic estimation of worst case (e.g. a CARVM type approach with respect to lapse)

Conceptual discussion of what might occur

if possible

Industry Standards

with scenario tests

judgment

arbitrage free

200% NAIC RBC

industry proxies

**Question 6.a.:**

**If yes, at what level of the organization is the EC framework applied?**

**Other (please specify):**

business unit

Applied at the corporate level for all equity market risk related products

major legal entities across risk categories; major risk categories across entities

corporate level

Enterprise

NA

Global

**<u>Question 7:</u>**

**How do you allocate firm-wide Economic Capital at the product level?**

**Other (please specify):**

- Working that way.
- Calculate EC at the product level; separately calculate EC at enterprise level. The whole is permitted to be less then the sum of the parts.
- EC is calculated on a risk type basis and then allocated to the product lines by risk type
- Not Sure
- Application of a covariance matrix to capture diversification benefits between risk types and countries.
- Not sure
- Calculate at firm level, then allocate to lines of business to develop target surplus factors for pricing
- Not yet being done at firm-wide level
- Calculate at product level then adjust for diversification benefits using correlation matrix
- Calc at Line of Business, then sum surpluses, but discount at a composite rate
- Calculate EC for each risk and apply covariance adjustments to get totals.
- You really don't need to. Allocated capital is a fiction.
- Only EC at the firm wide level. No Product EC.
- Calc EC and business line level and aggregate, with some recognition of impact of synergies at firm level.
- combination of above and judgment.
- Calculate EC at each product level and separately at the firm level. The excess of the firm level over the sum of the product levels remains in the Corporate segment.

**<u>Question 8.a.:</u>**

**If yes, how did you allow for diversification benefits?**

**Other (please specify):**

- different risks are measured at different levels - not all at product line level
- rating agencies viewpoint
- seat of the pants combination of relevance, stochastic when available, covariance when insight exists
- diversification factor
- stochastic models, with relatively simple adjustments at company level (i.e., not a total company stochastic model)
- look at results at the corporate level

**<u>Question 9.a.:</u>**

**If yes, what are the implications of these new proposals for your work?**

**Other (ple ase specify):**

- work primarily in health
- need to improve model - not sure of impact (up or down)
- regulatory review
- may build rather than buy a stochastic model
- anticipate modifying existing stochastic models
- probably depends on portfolio risk
- new effort required to review RBC reports filed.
- already a requirement for Canadian companies.
- will need more resources
- have model in place based on Canadian requirements
- much time wasted in this effort
- decrease
- possible pricing implications if capital requirements increase

- will need to tailor existing stochastic model

**<u>Question 10:</u>**

**What are your plans/expectations for the future development/uses of EC at your company?**

**Other (please specify):**

- not applicable
- regulatory review
- not an insurance company
- not used, nor contemplated
- not applicable
- don't understand question.
- none
- currently planning implementation of an EC framework
- not relevant since statutory required capital far exceeds Economic Capital needs.
- hope that is will have greater significance, but statutory has to go first.
- our company uses EC for what if testing, capital adequacy testing, particularly for guaranteed benefit on equity based products. this use of EC will increase in the future.

**<u>Question 11:</u>**

**Which of the following best describes your company's primary line of business?**

**Other (please specify):**

- education
- retail bank
- accounting/auditing
- consulting broker
- software
- individual life and annuities
- teaching/research

- telecommunications
- academic
- am consultant...the primary 'life insurance' client is a fraternal benefit organization essentially providing a single product under a concept of fixed premium (dues) defined benefit that if necessary, can be reduced.
- state regulator of life & annuities
- reinsurance
- reinsurance
- retirement services
- asset mgmt.
- I'm retired
- bank
- health insurance
- multi-national Life Co with significant Annuity, Life & Health businesses)
- Financing of Life Insurers
- Institutional
- life reinsurance
- Credit Insurance
- different lines of business in different jurisdictions
- software
- multiple
- life & annuity (option to pick one not appropriate)

**Question 12:**

**Which of the following best describes your company's organization structure?**

**Other (please specify):**

- Not applicable
- Nonprofit
- LLP
- privately held
- partnership
- fully owned sub of a stock company
- non profit
- non-profit
- not for profit
- see 11
- bank
- Mutual Holding Company
- consulting
- Bank Assurance
- MIHC
- Privately-Owned
- manufacturing
- Non-public Stock company
- Privately Owned
- sub of European Parent
- private
- privately held

- partnership
- stock subsidiary of a not-for-profit health system
- wholly owned subsidiary
- Stock subsidiary of mutual holding company structure

**Question 13:**

**How would you describe the scope of your company's operations?**

**Other (please specify):**

- Not applicable
- PRC
- Taiwan
- see 11
- local (China)
- Australian Bank Assurance
- Swedish
- U.S. with some small foreign subs
- Caribbean
- China
- National (India)
- Foreign Insurer
- foreign
- National (Pakistan)
- US plus small South American

**General Feedback/Comments:**

- I answered the survey using the NAIC RBC, since we also use this internally and are involved with the calculations.
- I apologize if it was inappropriate for me to respond to this survey. If so, it was inadvertent.

- Economic Capital is an irrelevant intellectual exercise. It makes otherwise bright people take their eyes off the ball. It is a stealthy way to make a rival business unit look bad. And since results are not auditable from time to time, it results in less accountability for operating results. It is a chimera, a humbug, a red herring, baloney, and a fair excuse for helping part a fool client from his money.

- As a regulator, many of these questions don't apply to me. I expect oversight to get more difficult as the source of the numbers becomes more complex.

- Get some qualified people on these committees or don't bother at all.

- I was not given the opportunity to answer questions #4 - 8.

- It would be useful to clarify how EC is different from past use of the concept of 'target surplus', if at all.

- Should call it something besides 'Economic Capital'. The definition given is specifically risk oriented whereas the term 'Economic' is not. It's misleading to use the term this way.

- I used a Deterministic Model based on Ruin Theory to determine the level of Surplus needed to prevent insolvency due to chance claim fluctuation for a given line of business and Reinsurance Retention Level. Also used it as an aid to assist Companies in determining their Reinsurance Retention Level.

- maintaining an A+ AM BEST rating for CGU Life has been critical and is the overall driving force.

- When the results of this survey will be available?

- I would suggest that the committee should review the work being done at RiskLab in Switzerland, which is quite advanced in the development of risk management theory for both banking and insurance: http://www.risklab.ch/

- EC is a very important item for risk managers of any financial institution and I applaud the SOA for moving in this direction

- More background on Economic Capital might have helped. The term is barely defined in the survey, and it is really impossible to know what you are really trying to do with the info.

- We do not sell variable products. We have not been considering Economic Capital at all. We are probably not good subjects for this survey. I appreciate its brevity.

- I am a pension investment consultant. I don't think this survey is relevant to my works so my answers are of limited value.

- My comments have been submitted partly as a consulting actuary and partly through my role as Chair of the IAA Working Party developing a global RBC framework (draft report due late fall).

- We have begun to utilize the concept of Economic Capital to our management, but have not yet developed a specific framework for the calculation of EC.

- In our consulting work we apply the Economic Capital concepts in analyzing asset mix decisions for pension funds. This work is still in the developmental stage, but we believe it has many potential applications related to pension plan investment and funding.

- I hope this effort will not result in yet another attempt to 'fix' SAP and GAAP accounting by grafting more 'add-on' surplus requirements using modern financial engineering constructs.

- That reminds me of creating an unending sequence of Ptolemaic epicycles, when what is truly needed is a Newtonian explanation and revolution.

- Isn't it time to slay the net valuation beast and move on to something modern, internally consistent, and less subject to economically empty manipulation (financial reinsurance)?

- Even GAAP with its lock-ins does not provide meaningful information to market participants.

- This was easy to take/navigate.

- This is an area where companies will be free to use whatever standards they like. You cannot dictate standards that actuaries must follow. You can educate actuaries about the variety of practices and techniques. I hope this is the focus.

- We do not ignore rating agency and regulatory requirements (including statutory reserves) in determining Economic Capital. We view it as a real cost of writing the business, even if the formulas prescribed are arbitrary or 'uneconomic'. Our internal formulas are developed by corporate finance in consultation with the lines of business and the capital is allocated to each line of business primarily based on our view of the economics (including risk diversification and/or concentration effects on the enterprise). Total capital requirements are managed at the enterprise level to insure we satisfy rating agency and regulatory requirements.