Survey of Reflecting Risk in Pricing

Sponsored by
The Joint Risk Management Section
Canadian Institute of Actuaries
Casualty Actuarial Society
Society of Actuaries

Prepared by
Donna Megregian
Rob Stone
Wing Wong
Oliver Gillespie
Margaret O'Connor
Milliman, Inc.
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Background

The Canadian Institute of Actuaries ("CIA"), the Casualty Actuarial Society ("CAS"), and the Society of Actuaries' Joint Risk Management Section ("JRMS") engaged Milliman, Inc. ("Milliman") to undertake a research project regarding the Update to Reflecting Risk in Pricing Survey. The prior survey was completed in 2003 and those results may be found at http://www.soa.org/professional-interests/joint-risk-management/jrm-survey-statistics.aspx.

The 2010 survey is meant to update and expand upon the 2003 survey in terms of techniques employed by companies to capture and quantify varied risks as well as the pricing measures used to evaluate them. The survey was expanded to include questions relevant to life, health, and property and casualty (P&C) practices, as well as non-North America insurance companies.

Acknowledgements

The research team and the SOA would like to thank the Project Oversight Group for their insight and review of this report: Peter Bondy, Ing Chian Ching, Ron Harasym, Todd Henderson, Stephen Marco, Mary Neumann, Wendy Guo, Barbara Scott and Steven Siegel.

Project Overview

The survey asked participants to respond to some general questions about profit measures, reflection of risk, asset risk, liability risk, and some miscellaneous risks. Participants were asked about their specific area of practice (life, health, P&C), products for which they are responsible, and what techniques are employed in monitoring and pricing those product lines. A list of the survey questions can be found in Appendix A.

There were 374 participants that completed some or all of the questions. Responses are broken down into the following primary areas of practice:

Life Insurance	255
Health Insurance	53
Property/Casualty	66

There were 187 respondents that completed all aspects of the survey. Many of the incomplete responses came from not filling out the demographic information. All responses were used in the analysis when data was available for any particular question.

Of the 187 complete responses, over 82% of the responses came from insurance companies and 12% from reinsurance companies. 76% of parent companies are located in North America, 15% in Europe and 8% in Asia. 81% of respondents target North America, and 15% target Asia. Responses regarding size included 28% having less than 10 credentialed actuaries, 17% having 10-29, 18% having 30-79, 13% having 80-150, and 22% having over 150 credentialed actuaries. 60% of responses came from pricing actuaries,

24% from corporate/risk management actuaries, 6% from the valuation area, 2% from investment area and 8% from other. Categories with less than 5% of the total were not shown due to small sample sizes.

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The results provided herein come from a variety of insurance companies with unique areas of practice, product structures, target markets, distribution methods and regulatory environments. As such, these results should not be deemed directly applicable to any particular company or representative of the insurance industry as a whole. Results shown based on the any demographic data include only those respondents who filled out that portion of the survey. These results may vary from aggregate results shown in the various lines of business – life and annuity, health, and property/casualty.

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Definitions

Throughout this report and the survey, the following definitions were used to help understand the meaning of the specified terms.

Assumption PADs – additional margin added to assumptions for conservatism (Provision for Adverse Deviation)

Assumption Stress Testing – testing assumptions for extreme situations

Break-even Year (BEY) – policy year when accumulated profits relative to surplus strain become positive and stay positive

Capital Allocation – specific designation of funds/capital to cover risks within a product or line of business

Conditional Tail Expectation (CTE) – expected loss given that the loss falls in the worst (1-a) part of the distribution (also known as Tail Value at Risk)

Contribution to Surplus – infusion of capital into surplus

Covariance of Risk – the degree to which two risks move in tandem (also known as Correlation)

***Earnings (Value) at Risk (EaR/VaR)* –** threshold value such that the probability that the mark-to-market loss on a portfolio over a given time horizon exceeds this value is the given probability level. A x% VaR loss amount means that probability of losses exceeding such loss amount is (1-x)%.

***Economic Capital (EC)* –** amount of risk capital which is required to cover risk to secure survival in the worst case scenarios

***Efficient Frontier* –** the set of portfolios which cannot be improved upon for risk and return

***Embedded Value (or Economic Value Added)* (EV/EVA)–** present value of future profits plus adjusted net asset value or distributable earnings at a specific hurdle rate

***Internal Rate of Return (IRR)* –** solved for discount rate that results in the present value of a series of cash flows equal to zero

***Expected Loss Ratio (ELR)* –** present value of claims & claims related expenses divided by present value of premium

Combined Ratio – Expected Loss Ratio plus Expense Ratio (PV underwriting expenses/PV premium) plus Policyholder Dividend Ratio (PV dividend payments/PV premium)

Market Consistent Embedded Value (MCEV) – represents the present value of shareholders' interests in the earnings distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business. The allowance for risk should be calibrated to match the market price for risk where reliably observable.

Mean-Variance Analysis – evaluation of risk prospects based on expected value and variance of possible outcomes

Premium Margin – present value of profit divided by present value of premium

Problem Scenario Analysis – process of analyzing possible future events through consideration of alternative possible outcomes

Reduction to Yield – decrease of overall earned rate due to risks within the market

***Regulatory Formula (RBC/MCCSR) Multiple* –** multiple based on a governing body specific calculation

***Return on Asset (ROA)* –** present value of profits divided by present value of assets

***Return on Capital (ROC)* –** present value of profits divided by present value of capital

Return on Equity (ROE) – present value of profits divided by equity

***Return on Investment (ROI)* –** solved for discount rate that results in the present value of a series of cash flows equal to zero (similar to IRR)

Return on Liabilities (ROL) – percentage change in the present value of liabilities over the evaluation period

Revenue Margin - subtraction from gross margin (sales less cost of goods divided by sales) of all selling costs

Risk-adjusted Profit Target – revised profit measure due to compensation for risks

Risk-adjusted Return on Capital (Risk Adj ROC) – present value of profits divided by present value of capital revised due to compensation for risks

Stochastic Scenario Analysis – creation of multiple alternative outcomes to produce a risk curve for a specific assumption tested

Executive Summary

The profit measure most commonly indicated as the primary profit measure used by the life and annuity responses is internal rate of return (IRR). Larger life writers favor EV/EVA to break-even year, still ranking IRR and premium margin in their top three. The profit measure most commonly used by health writers is expected loss ratio. The profit measure most commonly used by P&C writers is ROE. Although not listed as primary, the most commonly used profit measure is profit margin. Outside of North America, MCEV and EV/EVA tend to be commonly used profit measures.

Companies using IRR/ROI assess risk through assumption stress testing and capital allocation. Companies using ROE/ROC/Risk Adj ROC/ROA/ROL assess risk through assumption stress testing and capital allocation. Companies using premium/revenue margin assess risk through assumption stress testing and assumption PADs. Companies using EV/EVA/MCEV assess risk through assumptions stress testing and stochastic scenario analysis. Companies using expected loss ratio and combined ratio assess risk through risk adjusted profit targets and assumption stress testing. Companies using break-even year assess risk through assumption stress testing and assumption PADs. Companies using contribution to surplus assess risk through assumptions stress testing and risk adjusted profit targets.

Most companies (53%) use post-tax, after cost of capital for the basis of profit.

The accounting bases used favor US statutory (37%) and US GAAP (29%).

Most companies do not believe their profit measure is substantially different from their competitors. Those that do believe there is a difference more often feel they are at a disadvantage rather than an advantage.

72% of companies have changed their primary profit measure in the last 3 years. The profit measure most commonly falling out of favor is IRR. The profit measure reportedly moving into favor is generally MCEV or EV/EVA.

Companies using capital allocation lean toward using a regulatory formula multiple to allocate capital. Companies using assumption PADs utilize recent experience to determine the PADs. 50% of companies using risk-adjusted profit targets use judgment to determine the target. 64% of companies using assumption stress testing also use judgment to determine those parameters. Companies using stochastic scenario analysis use CTE 34% of the time to analyze risk results.

Life and health companies using premium or revenue margin generally use present value of premium to determine the denominator. P&C companies using premium or revenue margin more often use some other specified time frame to determine the denominator. 37% of companies using ROE use a lifetime ROE calculation.

26% of companies utilize a discount rate for calculating profit measures that falls between 3% and 5%. Life and annuity companies are more likely to have rates in the 5% to 7% range than health and P&C

companies. 26% of companies base their discount rate on their earned rate, but 21% each use risk-free rates or internally-defined hurdle rates.

63% of companies report employing ERM areas/actuaries. 8% are considering adding ERM, 19% are not considering and 10% are unsure if ERM will be added or not.

45% of companies use reduction to yield to reflect asset default in pricing, while 15% consider asset default as not material. 30% of companies get this assumption from the investment area, but 25% use a combination of investment, actuarial and ERM areas. 38% determine the amount of default through an internal model.

Interest rate risk is generally captured through assumption stress testing and stochastic scenario analysis. Volatility of equity returns was reported as not material by 24% of respondents, notably 54% of health indicating volatility as not material. When modeled, volatility is usually captured through stochastic scenario analysis and assumption stress testing. Risk neutral data and historical information are generally used to generate scenarios for companies doing stochastic scenario analysis.

Assumption stress testing and assumption PADs are the predominant methods for capturing risk associated with claims deviation/severity, short term fluctuations/frequency, and expense assumptions. P&C companies are the most likely to use stochastic scenario analysis for capturing risk associated with frequency and severity of claims.

Distribution risk in pricing is captured through assumption stress testing and model point selection. Customer/agent/broker behavior risk is captured through assumption stress testing and dynamic lapse. Operational risk is generally not specifically captured (36%) or captured through capital allocation (16%). Reinsurance risk is modeled through removal of reinsurance, but the majority of responses believe this risk is not material (17%), not applicable (17%) or not specifically captured (15%).

39% of companies assume no covariance of risk. Companies that capture covariance of risk mainly use a covariance matrix and capital allocation.

32% of companies feel they have limited regulation of pricing and 26% feel they have no regulation at all by an outside body. 19% of companies indicated they are regulated in both premium rates and pricing, mainly in the health and P&C markets.

Weighting of answers were dependent upon insurance product (life/annuity, health, P&C), location (North American, Europe, and Asia) and size. Limited responses were provided by companies outside of North America, Europe and Asia, so those results were not reported here. Not all respondents filled out the entire survey.

Life and Annuity Results

Question 1d – Which of the following profit measures do you use in pricing products?

The profit measure chosen as the primary profit measure was IRR, closely followed by premium margin, and break-even year. The 2003 study indicated the primary profit measures were premium margin, IRR, then ROE.

Individual life and individual annuity products as well as products listed as "Other" rated IRR as primary overall, with profit margin second and then break-even year. Most life product lines actually ranked premium margin as number 1. Pricing actuaries chose premium margin rather than IRR as their primary profit measure. Actuaries in the corporate/risk management area prefer EV/EVA to break-even year. EV/EVA was consistently ranked fourth for individual life insurance products. The ranking of profit measure by product line is shown below.

Profit Measure Ranking – Life	Whole Life	Endowment	Term Life	Universal Life	Variable life	Variable Universal Life	Life Total
Return on Investment	7	9	6	6	10	7	6
Return on Equity	5	8	5	5	10	5	5
Return on Liabilities	16	14	15	16	13	15	15
Risk-adjusted Return on Capital	9	7	9	10	7	9	9
Premium Margin	**1**	**1**	**1**	**2**	**1**	**2**	**2**
Embedded Value/Economic Value Added	4	4	4	4	4	4	4
Expected Loss Ratio	14	15	13	14	15	14	14
Combined Ratio	15	16	16	15	15	16	16
Break Even Year	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Internal Rate of Return	**2**	**2**	**2**	**1**	**2**	**1**	**1**
Return on Assets	13	13	14	11	8	11	12
Return on Capital	10	11	10	9	9	12	10
Contribution to Surplus	6	6	8	7	6	8	8
Revenue Margin	12	10	12	13	14	13	13
Market Consistent Embedded Value	8	5	7	8	5	6	7
Other	11	12	11	12	12	10	11

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Profit Measure Ranking - Annuities	Fixed Deferred Annuity	Variable Deferred Annuity	Fixed Immediate Annuity	Variable Immediate Annuity	Annuity Total
Return on Investment	7	10	7	9	7
Return on Equity	6	6	6	11	6
Return on Liabilities	12	12	12	14	12
Risk Adjusted Return on Capital	9	7	10	7	10
Premium Margin	**2**	**3**	**2**	4	**2**
Embedded Value/Economic Value Added	5	5	5	5	5
Expected Loss Ratio	15	15	15	14	15
Combined Loss Ratio	15	16	15	14	15
Break Even Year	**3**	4	4	**2**	**3**
Internal Rate of Return	**1**	**1**	**1**	**1**	**1**
Return on Assets	4	**2**	**3**	6	4
Return on Capital	10	9	9	**3**	8
Contribution to Surplus	8	11	8	8	9
Revenue Margin	13	13	14	13	13
Market Consistent Embedded Value	11	8	11	10	11
Other	14	14	13	12	14

The 2003 study reported the most popular profit measure for annuities was Return on Equity (ROE). ROE has fallen to sixth in this 2010 study for individual annuities. Again, larger companies favor EV/EVA to break-even year when measuring profit on annuities. Mid-size companies use ROA and ROE along with IRR as their primary profit measures.

Group Life ranked premium margin as primary, followed by IRR and expected loss ratio. Group annuity ranked IRR as primary, Return on Equity second, and break-even year as third. Group life and annuity companies have moved away from ROE in favor of IRR since the 2003 study. Larger group life writers favor EV/EVA to expected loss ratio. Smaller companies reported using MCEV or ROE to expected loss ratio. Mid-sized and the largest companies reported using EV/EVA on their group annuity products rather than ROE.

Profit Measure Ranking – Group/Other	Group Life	Group Annuity	Other
Return on Investment	7	9	13
Return on Equity	5	**2**	7
Return on Liabilities	14	11	15
Risk-adjusted Return on Capital	12	6	6
Premium Margin	**1**	7	**2**
Embedded Value/Economic Value Added	4	5	4
Expected Loss Ratio	**3**	11	5
Combined Ratio	8	11	9
Break Even Year	6	**3**	**3**
Internal Rate of Return	**2**	**1**	**1**
Return on Assets	15	4	15
Return on Capital	11	15	12
Contribution to Surplus	9	10	11
Revenue Margin	13	14	14
Market Consistent Embedded Value	10	8	8
Other	15	16	10

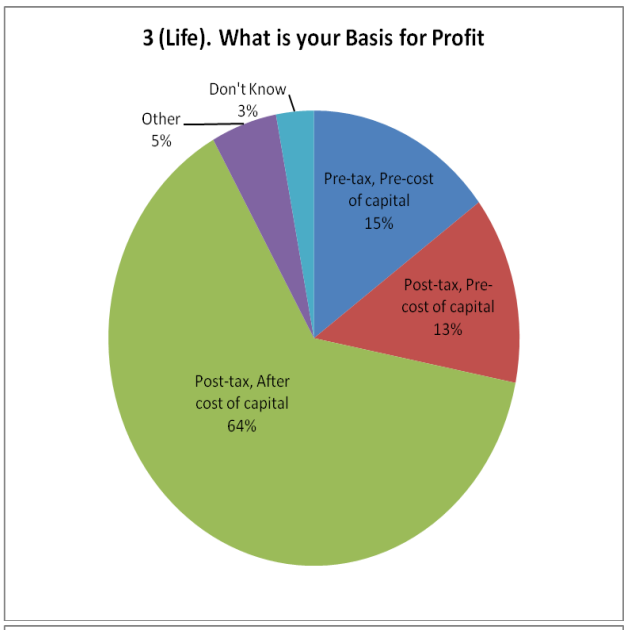
Question 2 – If you use the following profit measure, how is risk assessed when using the profit measure?

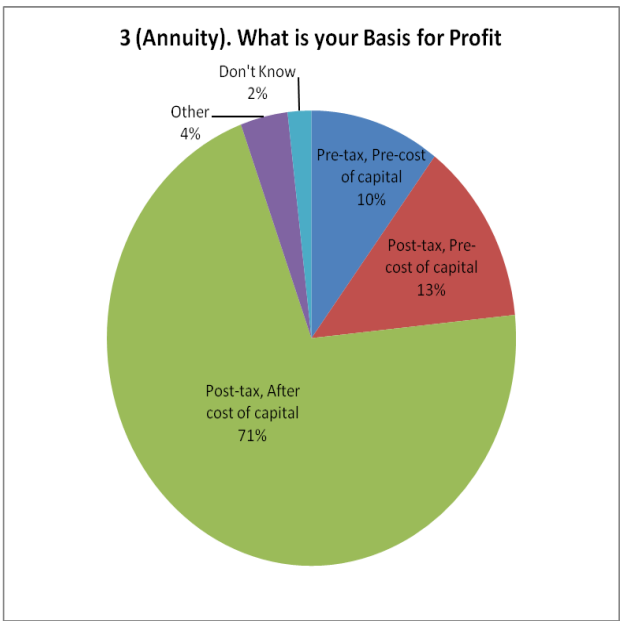
If IRR/ROI/ROE/ROC are used, stress testing and capital allocation are the primary tools for risk assessment. When premium margin/ROA is used, stress testing and stochastic scenario analysis are used. When BEY/combined ratio/contribution to surplus/revenue margin/EV/EVA is used, stress testing and assumption PADs were most commonly used.

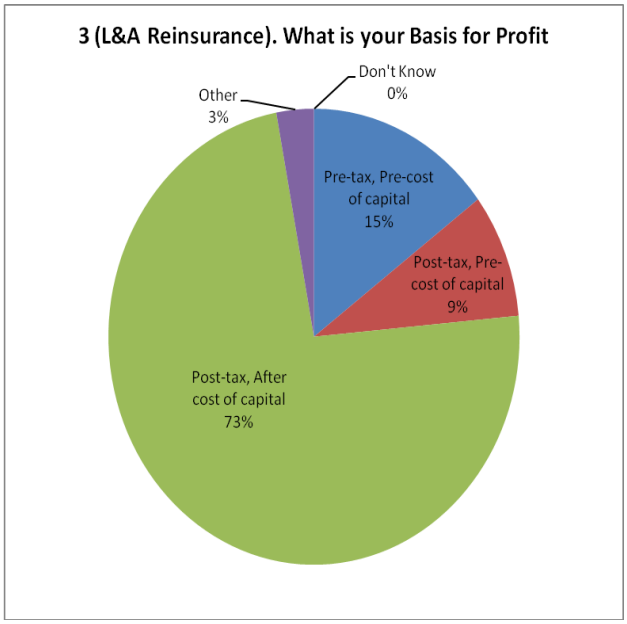
Assumption stress testing is by far the leading tool when assessing risk in a profit measure. Only expected loss ratio, return on liabilities, and market consistent embedded value show stress testing as secondary. ELR uses assumption PADs as primary, and both ROL and MCEV use stochastic scenario analysis primarily. The least common method used is risk-adjusted profit targets.

Question 3 – When defining your profit measure, what is the basis for profit?

For life writers, 64% choose post-tax, after cost of capital as their profit basis. 71% of annuity writers and 73% of life and annuity reinsurers chose post-tax, after cost of capital. Less than 15% of companies chose pre-tax, pre-cost of capital, and less than 13% chose post-tax, pre-cost of capital.

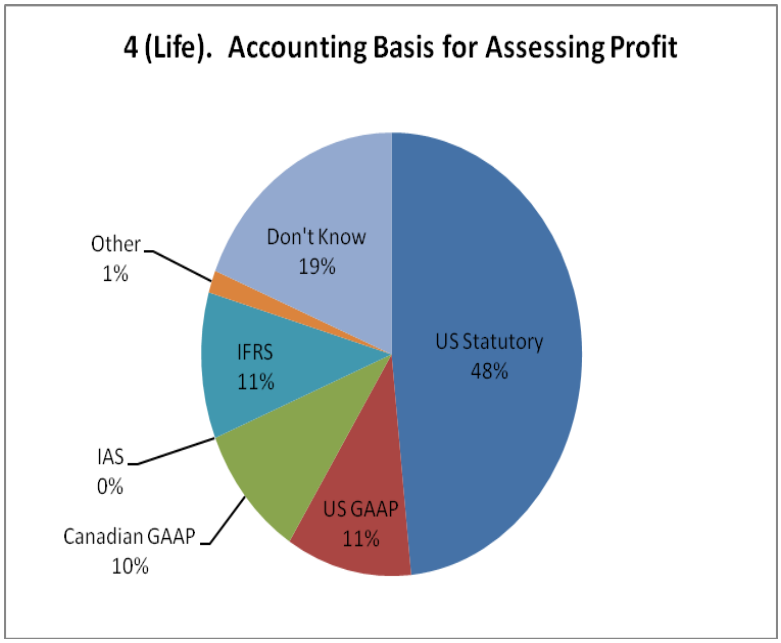


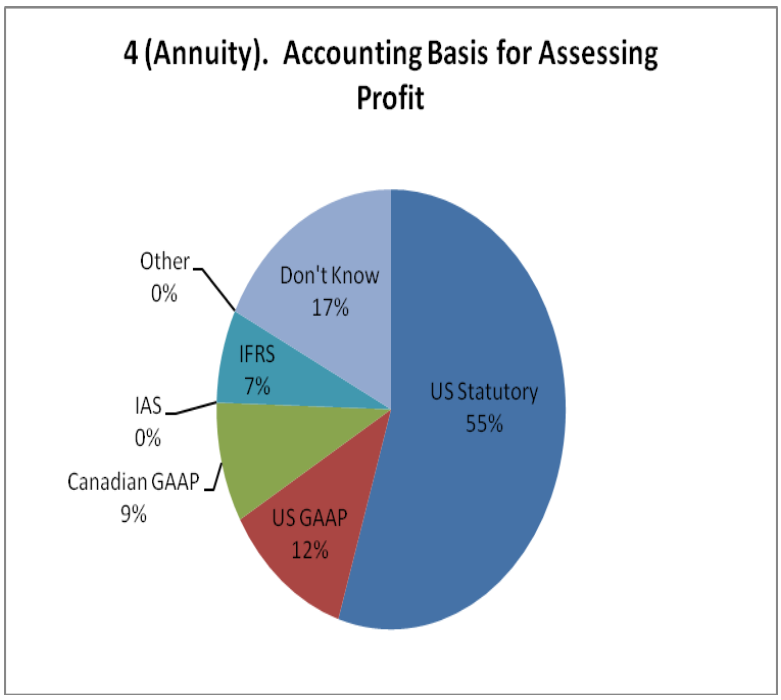


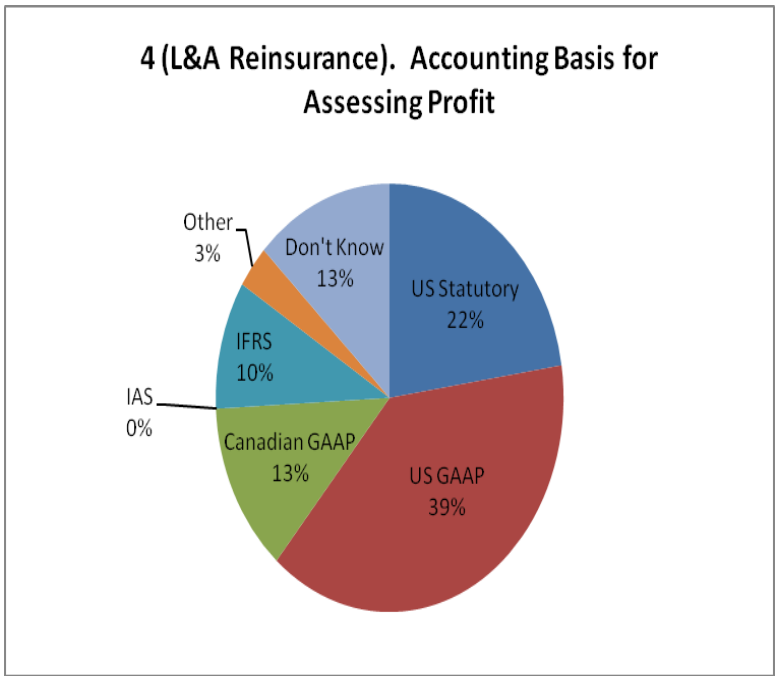


Question 4 – What accounting basis is used for assessing your primary profit measure?

Given the majority of respondents indicated they are located in North America, life insurers reported using US Statutory (48%), US GAAP (11%), IFRS (11%) and Canadian GAAP (10%). Annuity writers reported using US Statutory (55%), US GAAP (12%), IFRS (7%) and Canadian GAAP (9%). Life and annuity reinsurers reported using US GAAP (39%), US Statutory (22%), Canadian GAAP (13%), and IFRS (10%). Larger companies reported more use of US GAAP while smaller to mid-size companies use more US Statutory as their accounting basis for the primary profit measure. The largest companies showed the highest percentage for using IFRS.







Question 5 – Do you measure actual profitability against projected pricing profitability?

48% of life writers, 52% of annuity and 45% of reinsurers reported they occasionally measure actual to projected profitability. 41% of life insurers, 34% of annuity writers and 39% of reinsurers reported "yes" they frequently measure actual to projected profits. Generally, as the size of companies increase, the percentage of "yes" responses increased as well.

Question 6 – If you measure actual profitability versus projected profitability, is this information passed back into the pricing process for future pricing?

For those that do measure actual to projected profit, 62% of life insurers, 55% of annuity writers and 55% of reinsurers responded "Yes," that information is passed back through the pricing process frequently. Information is occasionally passed back by 29% of life insurers, 36% of annuity writers and 37% of reinsurers. "No" was answered by 4% of life insurers, 7% of annuity writers and 4% of reinsurers.

Question 7 – Do you feel your profit measures are substantially different from your competitors?

Most respondents do not believe their profit measures are substantially different from their competitors - 49% of life insurers, 54% of annuity writers, and 48% of reinsurers. However, 28% of life, 22% of annuity and 23% of reinsurers feel they are different. The largest and smallest companies reported the highest prevalence (31% largest, 26% smallest) of believing their profit measures were substantially different than their competitors.

Question 8 – Do you feel your primary profit measures give you an advantage against your competitors?

Most companies are neutral in their assessment of any advantage or disadvantage when using their primary profit measure against their competitors – corresponding to 54% of life, 60% of annuity and 64% of reinsurers. More companies felt they were at a disadvantage (23% of life, 20% of annuity and 13% of reinsurers) than those who felt they had an advantage. Only 8% of life, 6% of annuity and 10% of reinsurers felt they had an advantage in using their primary profit measure.

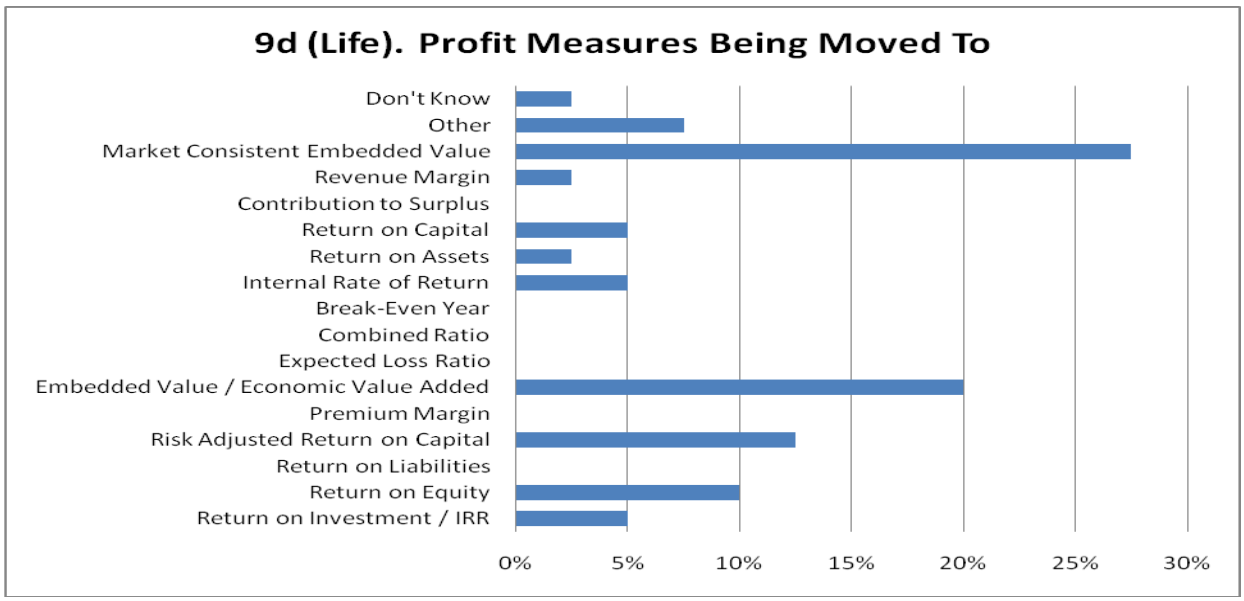
Question 9 – Have you changed your primary profit measure within the last 3 years? If so, what profit measure did you move away from? Do you plan to change your primary profit measure? Which profit measure are you moving to?

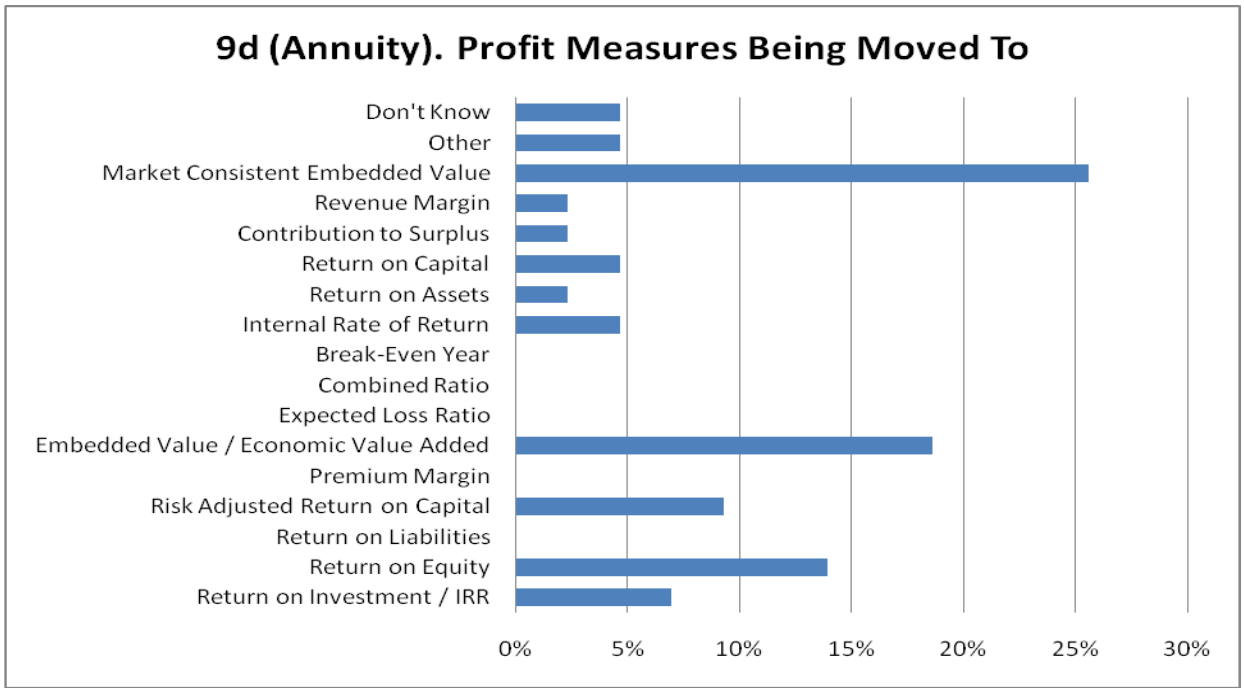
The majority of respondents said yes, they have changed their primary profit measure in the last 3 year (72% of life, 72% of annuity and 71% of reinsurers). More smaller and mid-sized companies reported changing their profit measure recently than larger companies.

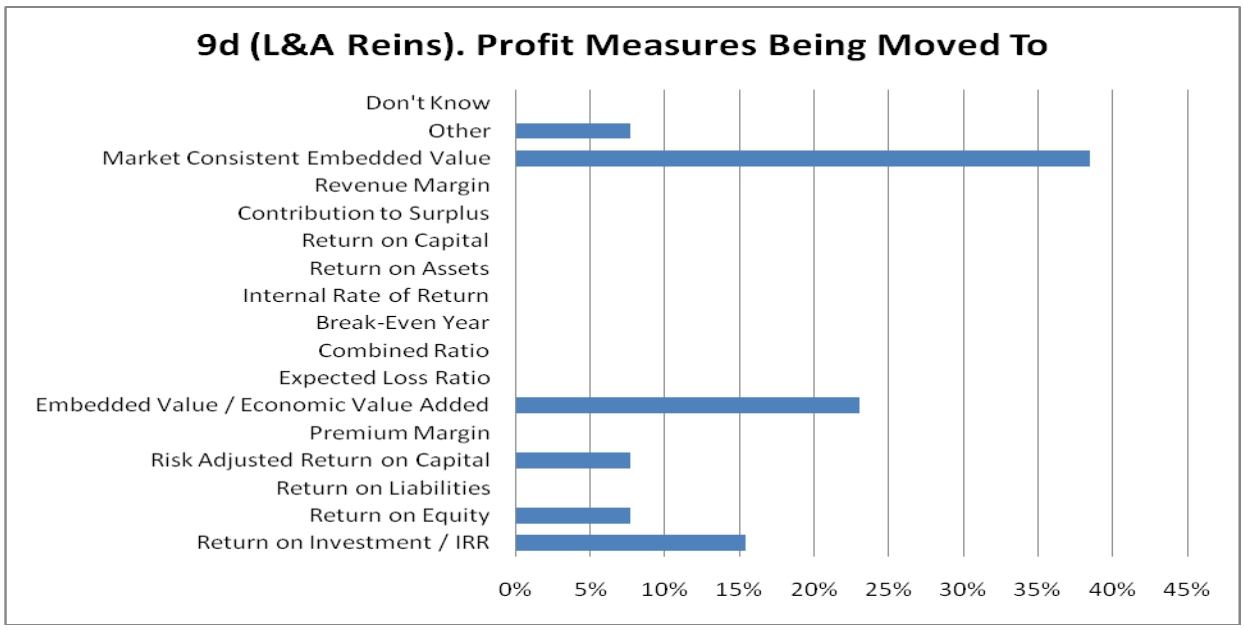
IRR was the leading measure being replaced, followed by premium margin and embedded value. These answers were fairly consistent among sizes of companies.

The majority of companies who have not changed their measure in the last 3 years do not plan to change their profit measure any time in the near future (58% of life, 55% of annuity and 71% of reinsurers say no change in the next 5 years). Those that do plan a change among all life, annuity and life/annuity reinsurers include 4% predicting change within 1 year, 11% within 1 - 3 years, and 3% within 3 - 5 years.

For those who have made or plan to make a change in their primary profit measure, most companies are moving or have moved toward MCEV or EV/EVA measure. Some annuity writers plan to use return on equity as their new profit measure.



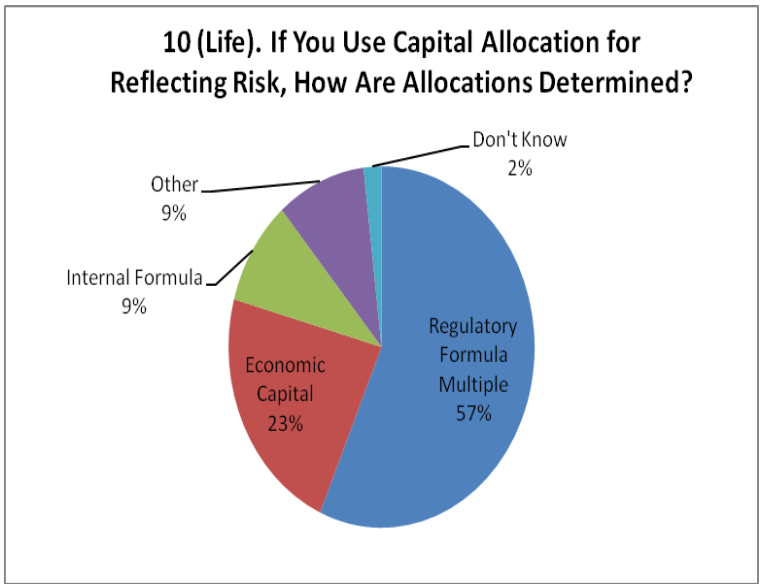


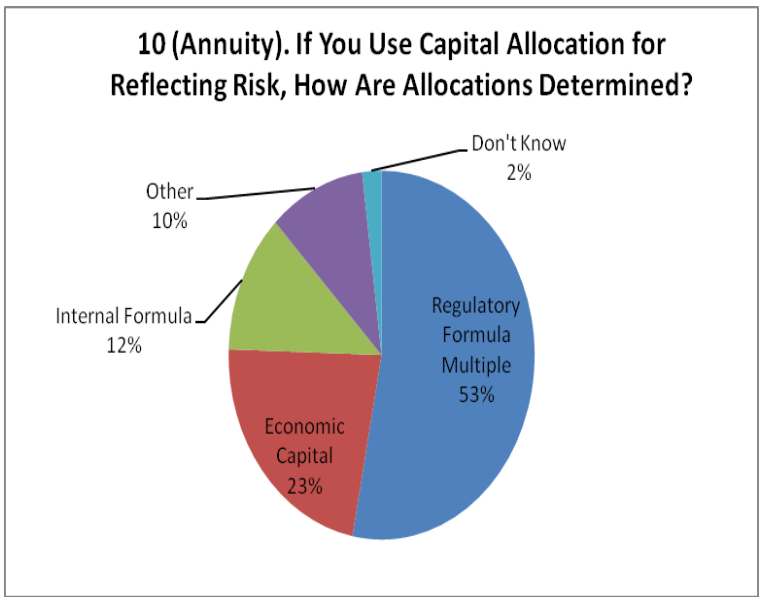


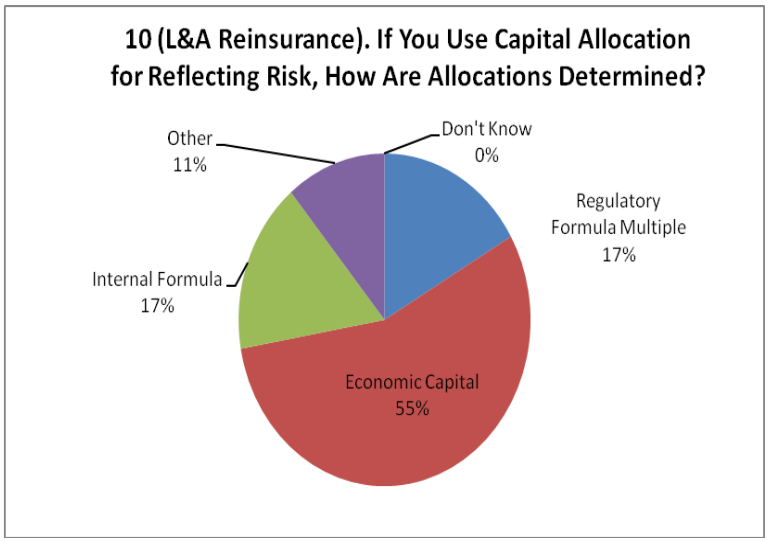
Question 10 – If you use capital allocation for reflecting risk, how are these allocations determined?

For life and annuity companies, over 50% responded with use of a regulatory formula, while 23% use economic capital. Life and annuity reinsurers used economic capital over 50% of the time, contrasted with 17% each using an internal formula or regulatory formula. Companies choosing "other" answered with calculations based on rating agency requirements, regulatory requirements and economic capital.

Economic capital has grown in its use since the 2003 study, overtaking the use of an internal formula. Economic capital is the primary choice among risk management/corporate actuaries a well. Smaller companies tend to use a regulatory formula multiple. Larger and Non-North American companies are using economic capital more for capital allocation.



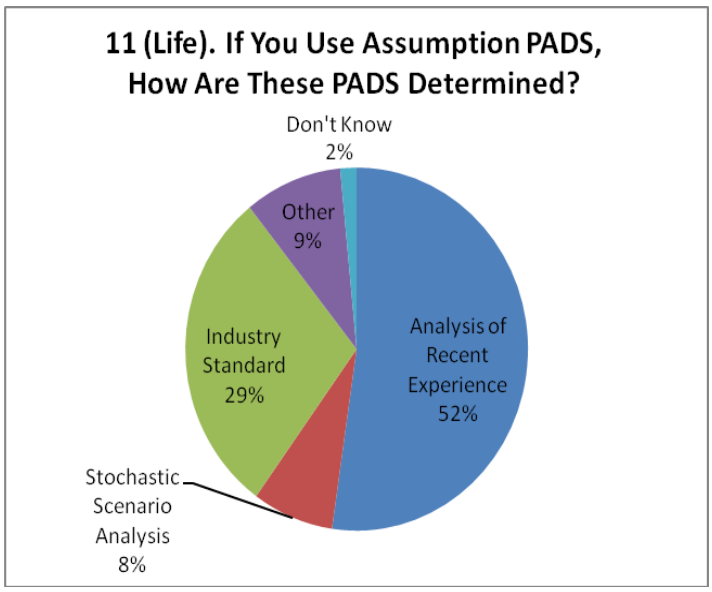


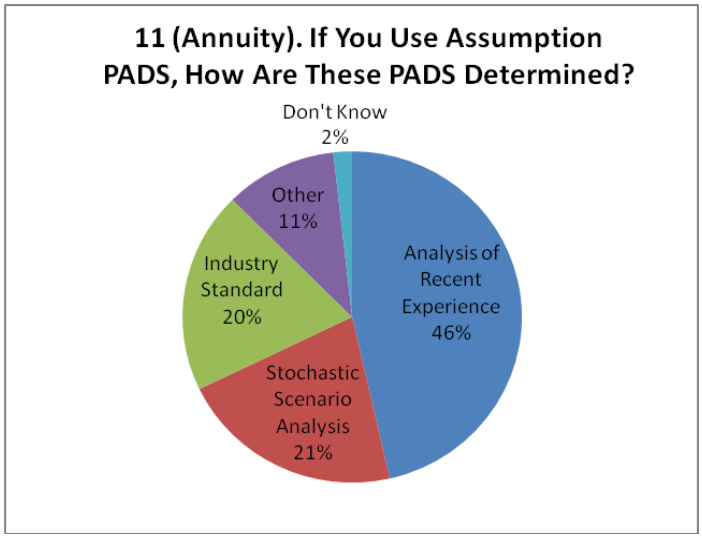


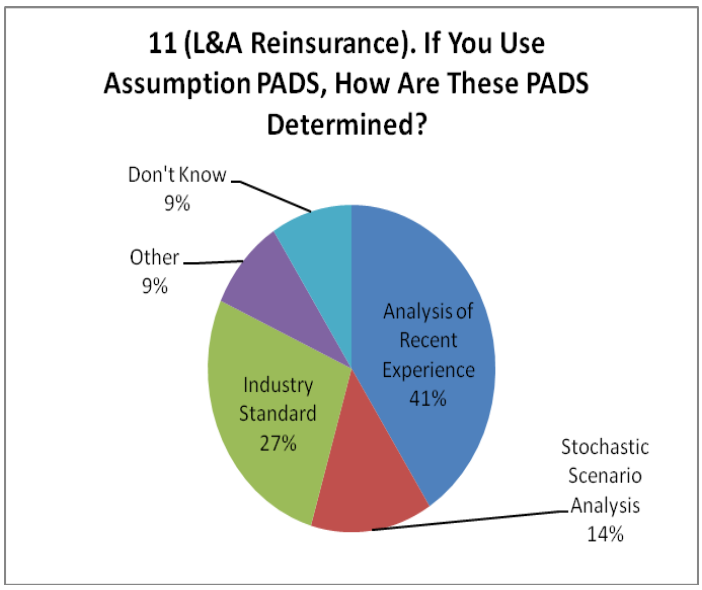
Question 11 – If you use Assumption PADs, how are these PADs determined?

PADs are determined through analysis of recent experience for 52% of life writers, 46% of annuity writers and 41% of life & annuity reinsurers, making it the most popular method. This result is the same as the 2003 study. Industry standards are incorporated by 29% of life writers, 20% of annuity writers, and 27% of life& annuity reinsurers. Annuity writers used stochastic analysis 21% of the time, slightly more than they use industry standards. Use of judgment is indicated in almost half of the responses in the "other" category.

Larger companies reported more use of stochastic analysis than smaller to mid-size companies when determining assumption PADs, although analysis of recent experience is still most used among all companies.



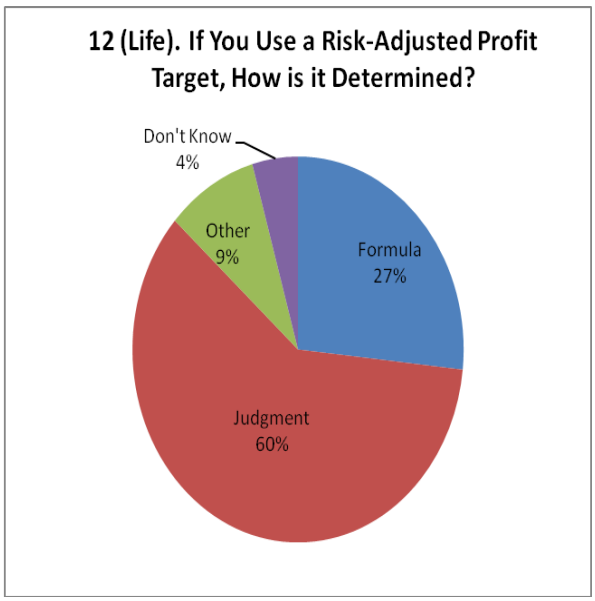


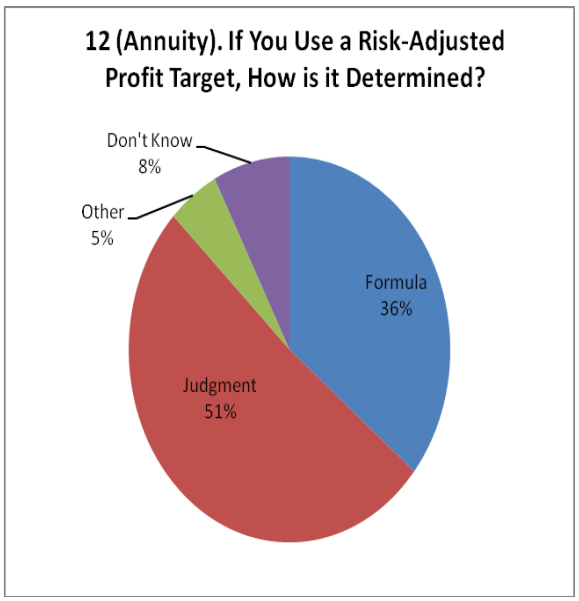


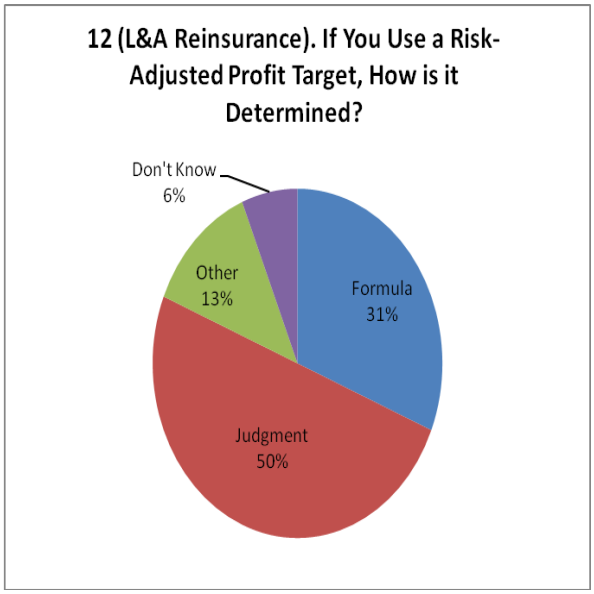
Question 12 – If you use a Risk-Adjusted Profit Target, how is it determined?

Judgment is used by 60% of life writers, 51% of annuity writers and 50% of life & annuity reinsurers when calculating a risk-adjusted profit target. Formula is used by 27% of life respondents, 36% of annuity, and 31% of life & annuity reinsurers. A combination of formula and judgment or other analysis was chosen for those in the "other" category. These results are consistent with the 2003 study.

Mid-size and larger companies use more judgment for determining risk-adjusted profit measure. The largest companies were more formula driven.



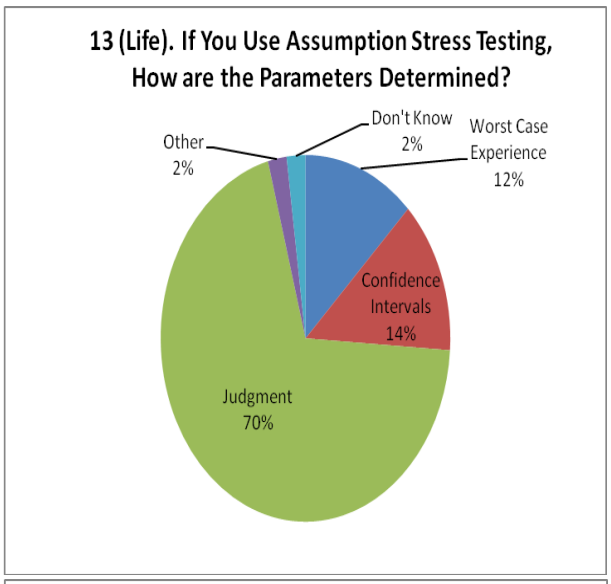


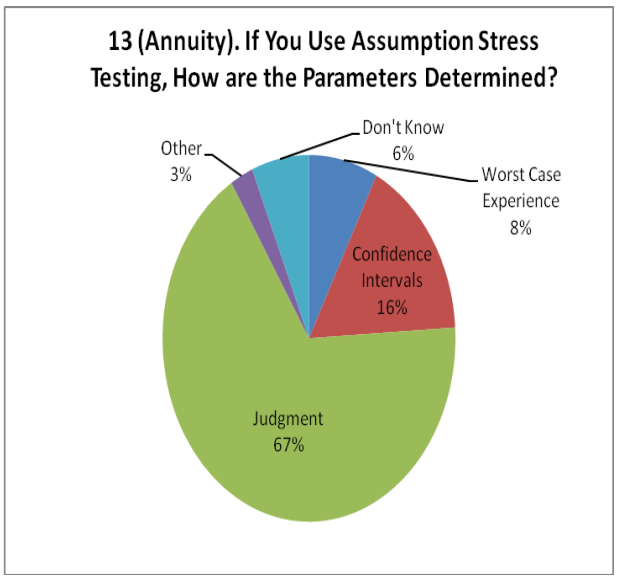


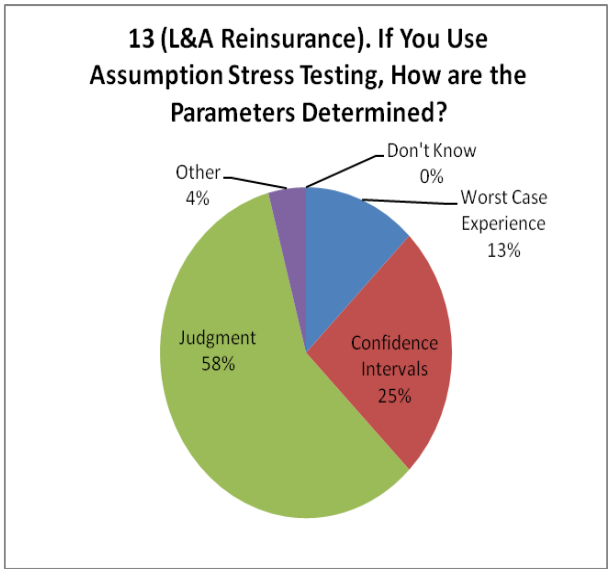
Question 13 – If you use Assumption Stress Testing, how are the parameters determined?

Judgment is used by 70% of life writers, 67% of annuity writers and 58% of life & annuity reinsurers. Confidence intervals are used by 14% of life companies, by 16% of annuity companies, and 25% of life & annuity reinsurers. Worst case was chosen by 12% of life writers, 8% of annuity writers and 13% of life & annuity reinsurers. Those reporting "other" often use some analysis of CTE.

Larger companies reported using more confidence intervals relative to other sized companies, but judgment is still the primary method for determining parameters for assumption stress testing. Overall results are consistent with the 2003 study.



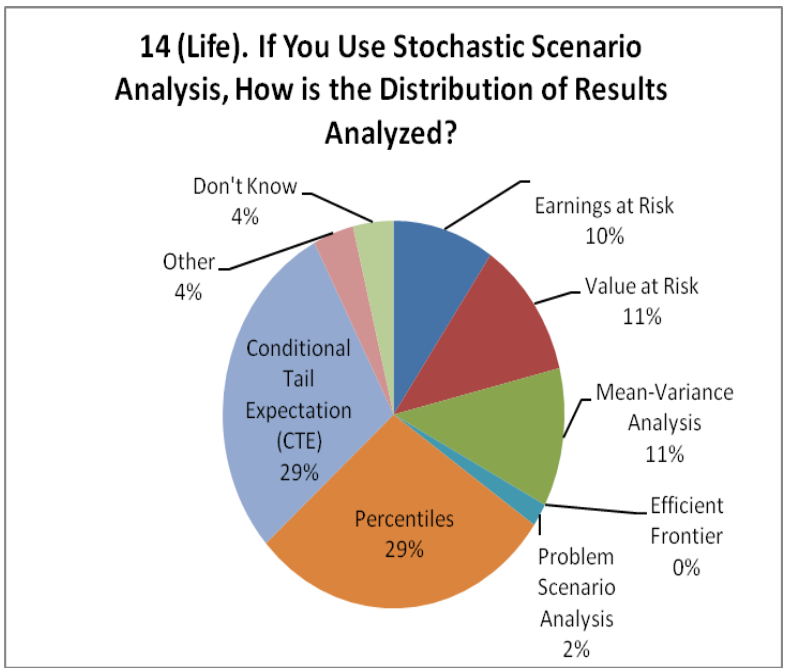


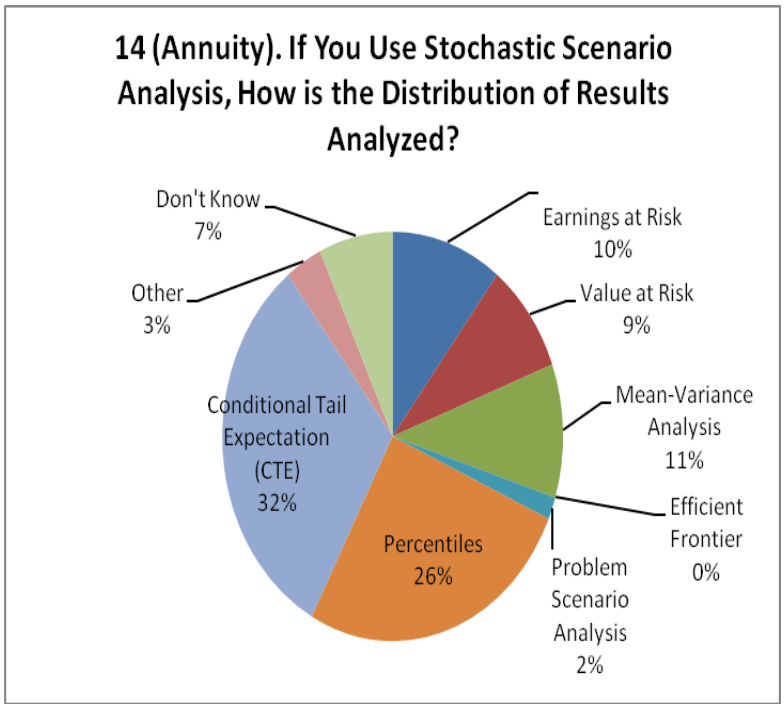


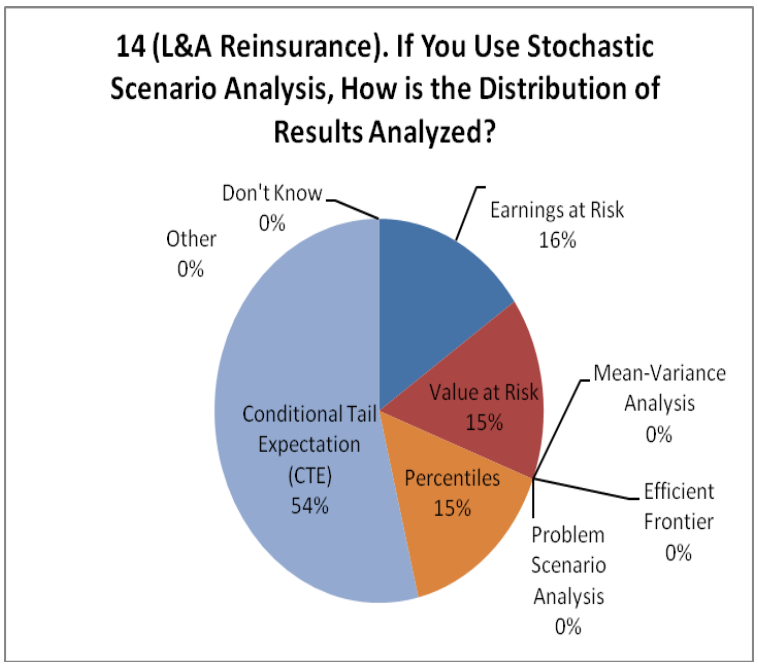
Question 14 – If you use Stochastic Scenario Analysis, how is the distribution of results analyzed?

When performing stochastic scenario analysis, distribution of results is analyzed by Conditional Tail Expectation (CTE) by 29% of life companies, 32% of annuity companies, and 54% of life & annuity reinsurers. Percentiles are used by 29% of life respondents, 26% of annuity respondents and 15% of life & annuity reinsurers. The prevalence of employing earning at risk, value at risk and mean-variance analysis is quite evenly split among the responses.

CTE has overtaken percentiles for companies using stochastic scenario analysis since the 2003 study.

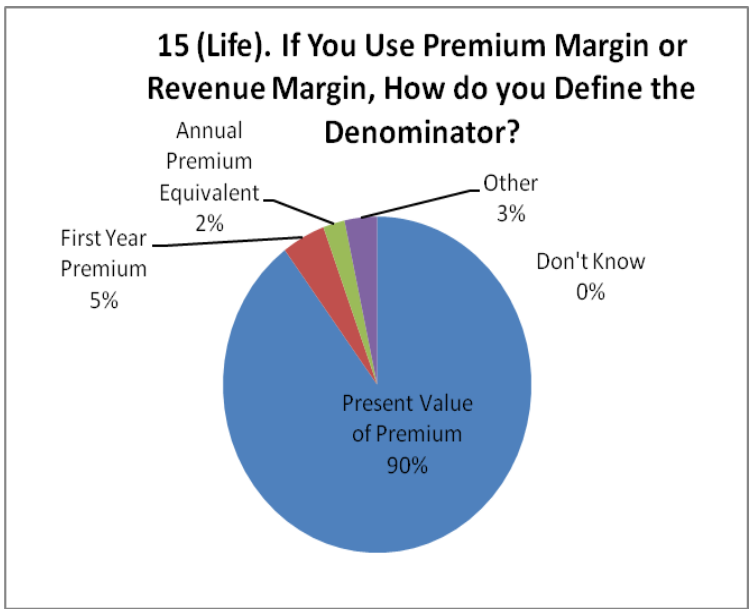


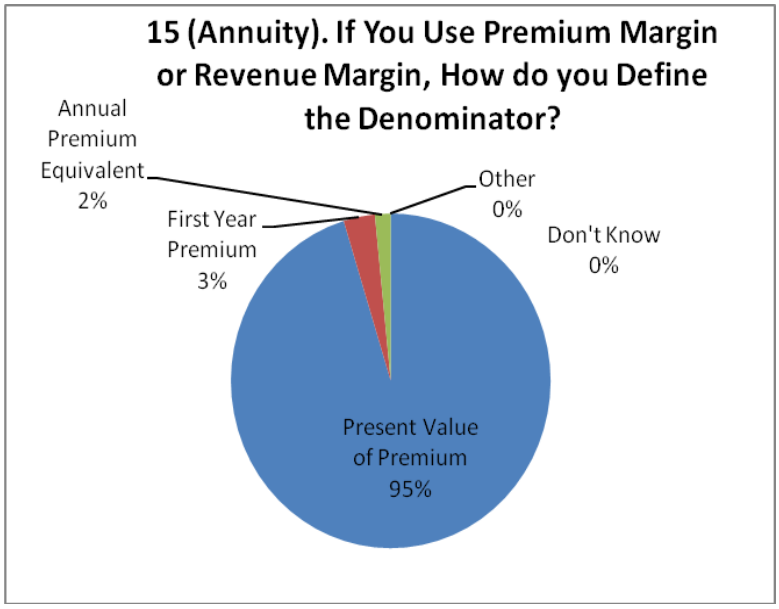


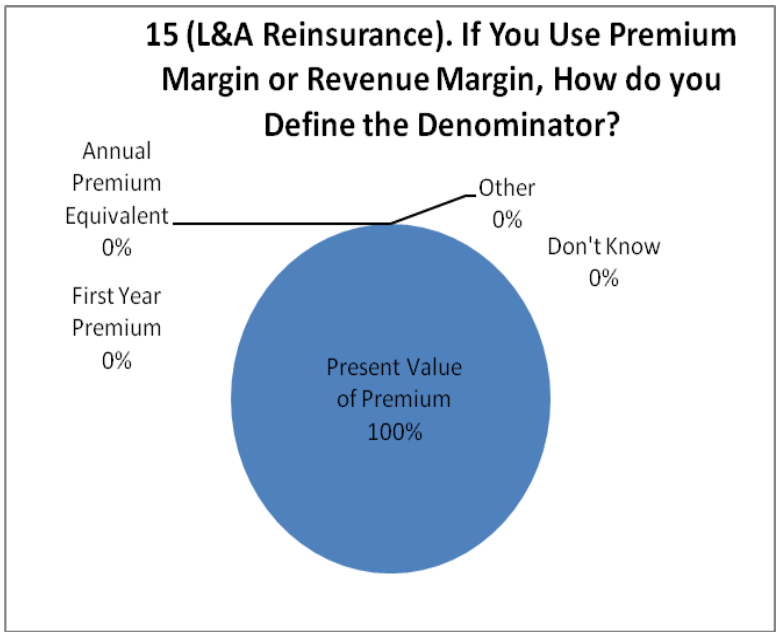


Question 15 – If you use Premium Margin or Revenue Margin, how do you define the denominator of the equation?

For companies using premium or revenue margin, present value of premium is used by 90% of life respondents, 95% of annuity respondents, and 100% of reinsurers. First year premium and annual premium were a distant second and third respectively. Other responses included using both first year and all years of premium.



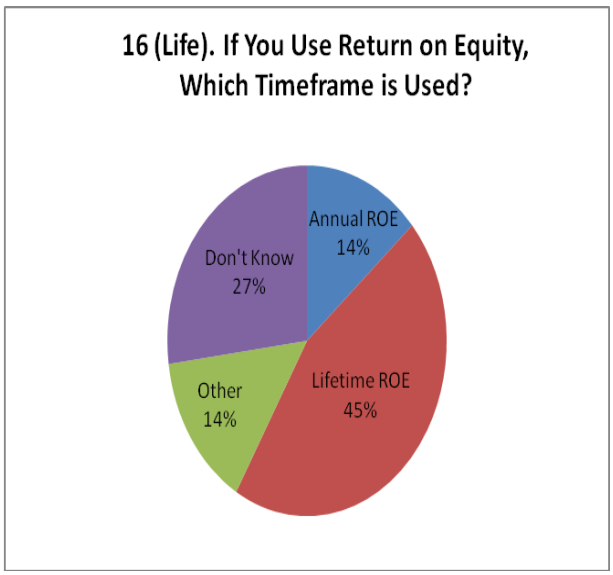


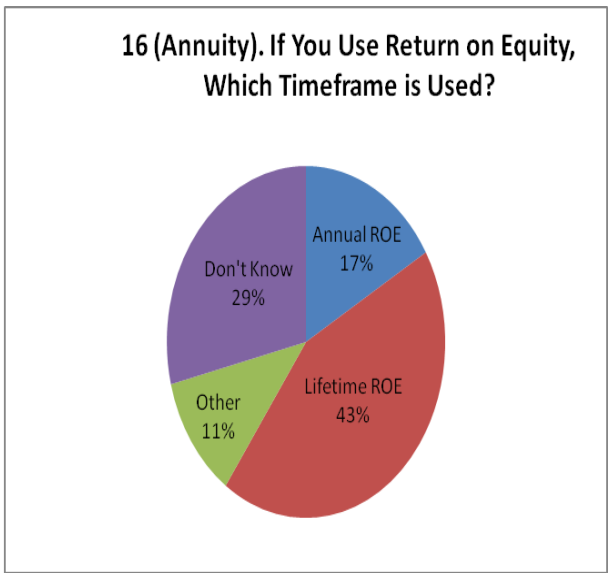


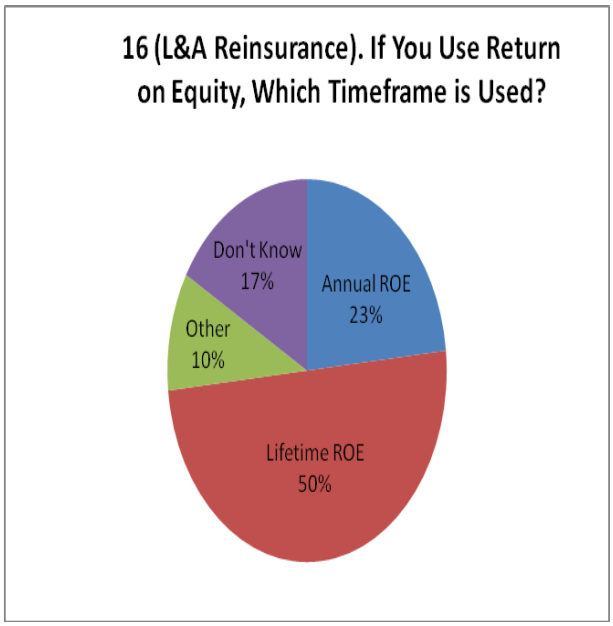
Question 16 – If you use ROE, which of the following timeframes is used?

Lifetime ROE is used by 45% of life writers, 43% of annuity writers, and 50% of life & annuity reinsurers. Annual ROE is used by 14% of life issuers, 17% of annuity issuers, and 23% of reinsurers. Those that responded "other" often use a specific time frame to calculate ROE (ex. number of year, amortization period, pricing horizon).

Midsize to larger companies show a higher percentage of lifetime ROE (between 47%-49%). The smallest and largest companies were more evenly split between lifetime and annual ROE.

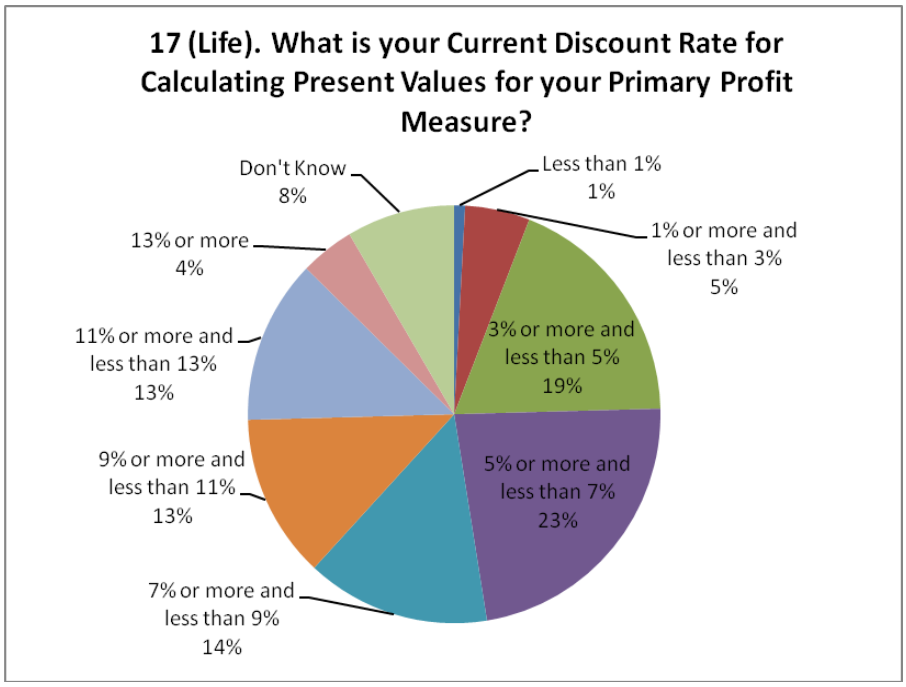


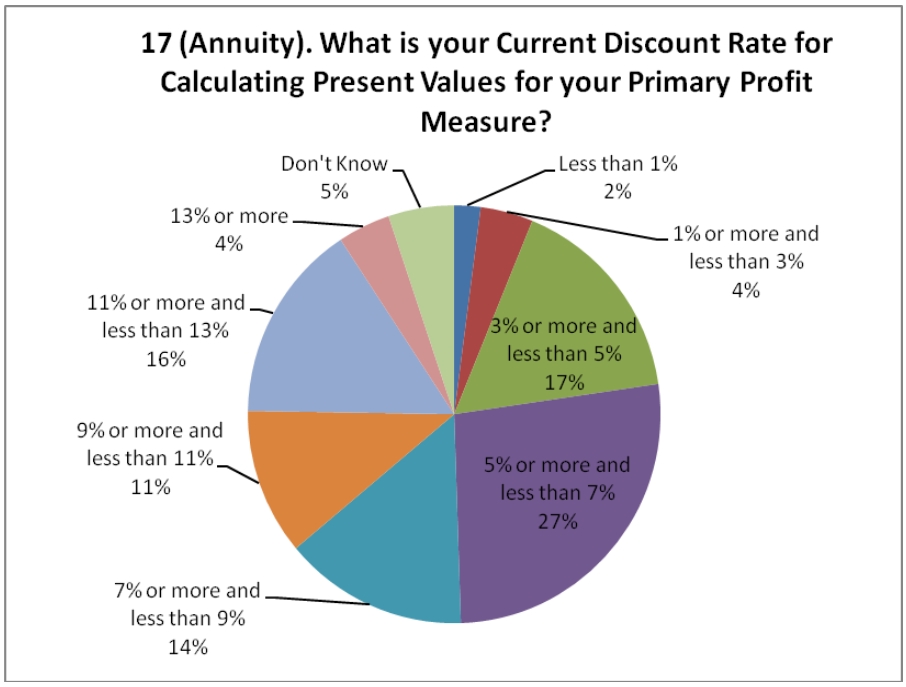


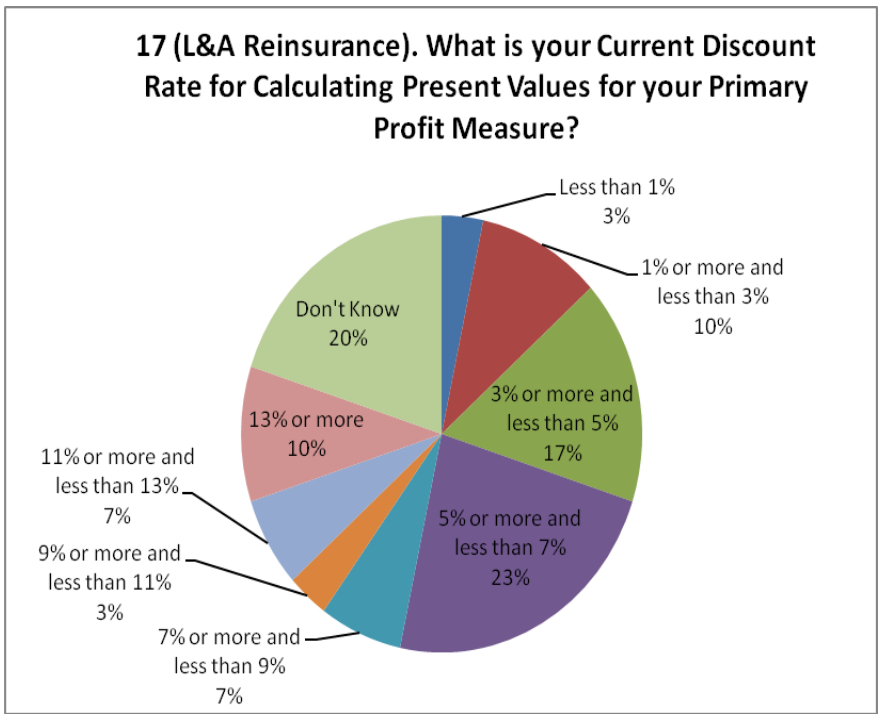


Question 17 – What is the level of your current discount rate when calculating present values for your primary profit measure?

The most popular discount rate is between 5% and 7%, but the distribution of discount rates is quite large.





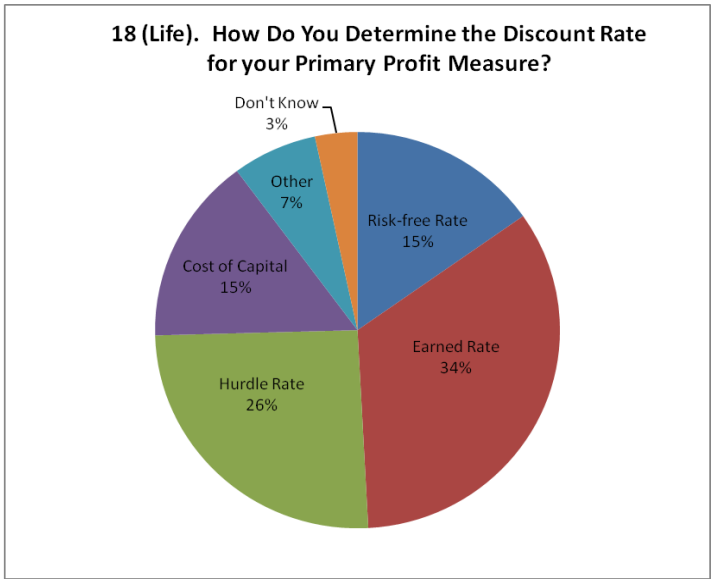


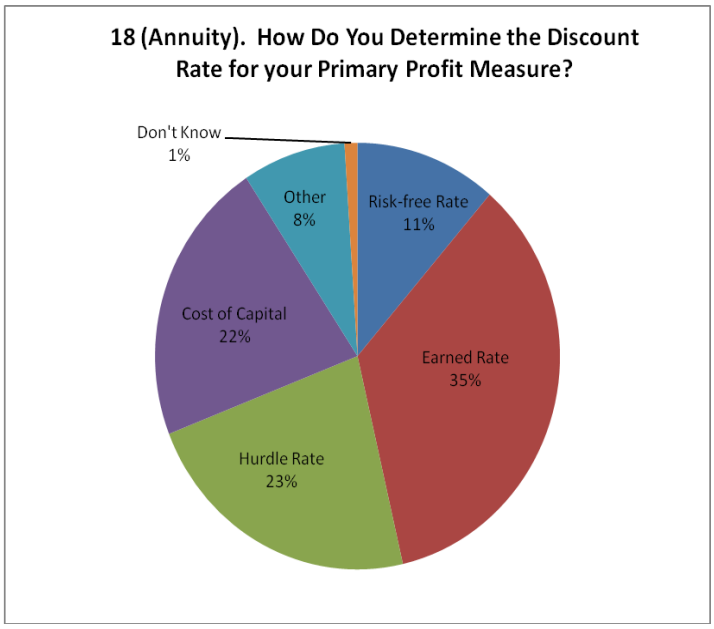
Companies that completed the size of the company question report heavier weighting in the 3%-5% rather than 5%-7%.

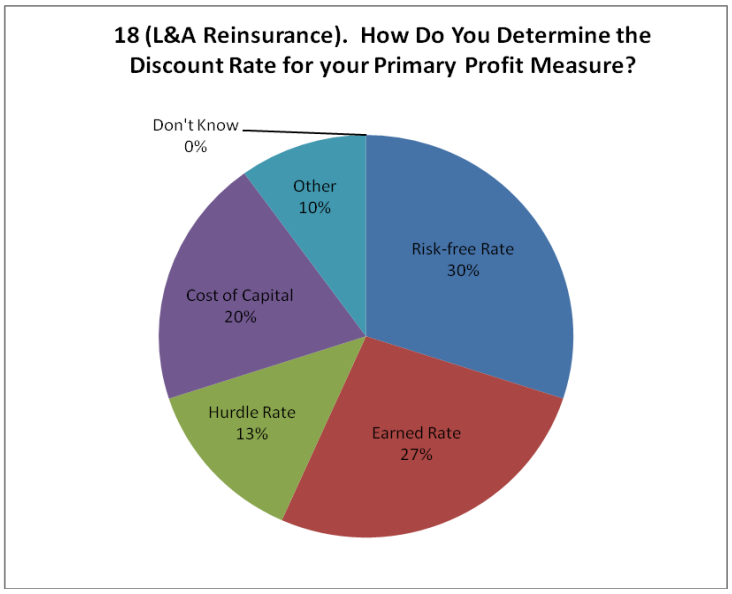
Question 18 – How do you determine the discount rate for your primary profit measure?

The discount rate is tied to the earned rate for 34% of life, 35% of annuity, and 27% of reinsurance companies. Hurdle rates are used by 26% of life respondents, 23% of annuity respondents, and 13% of reinsurers. Risk free rates are used by 15% of life, 11% of annuity, and 30% of reinsurance companies. Cost of Capital is used by 15% of life writers, 22% of annuity writers, and 20% of reinsurers.

Earned rate is more popular among the smallest and mid-sized companies. Smaller and the largest companies favor risk free rates. Larger companies in the survey use hurdle rates more often.







Question 19 – Given the recent economic environment, has your company made changes to its risk assessment practices?

Risk assessment practices have changed for 41% of life writers, 47% of annuity writers and 47% of reinsurers due to the recent economic environment. No change was reported by 47% of life, 45% of annuity and 43% of reinsurance companies.

Larger companies have made more changes based on the economic environment relative to smaller companies.

Question 20 – Do you employ an enterprise risk actuary or have an enterprise risk management area in your company?

Companies employing an enterprise risk actuary or having an enterprise risk management area include 65% of life issuers, 68% of annuity issuers and 77% of reinsurer responses. Those companies that do not have but are considering some enterprise risk strategy include 9% of life, 11% of annuity and 3% of reinsurance companies. No change is perceived necessary by 16% of life companies, 13% of annuity companies and 13% of reinsurers.

Smaller companies are less likely to employ ERM areas/actuaries in their organizations, with only 32% responding "yes" and 43% not considering hiring ERM areas/actuaries.

Question 21 – How do you capture risk associated with asset default in pricing? Who determines the parameter and magnitude of the asset default in pricing? How is the amount of the asset default adjustment determined?

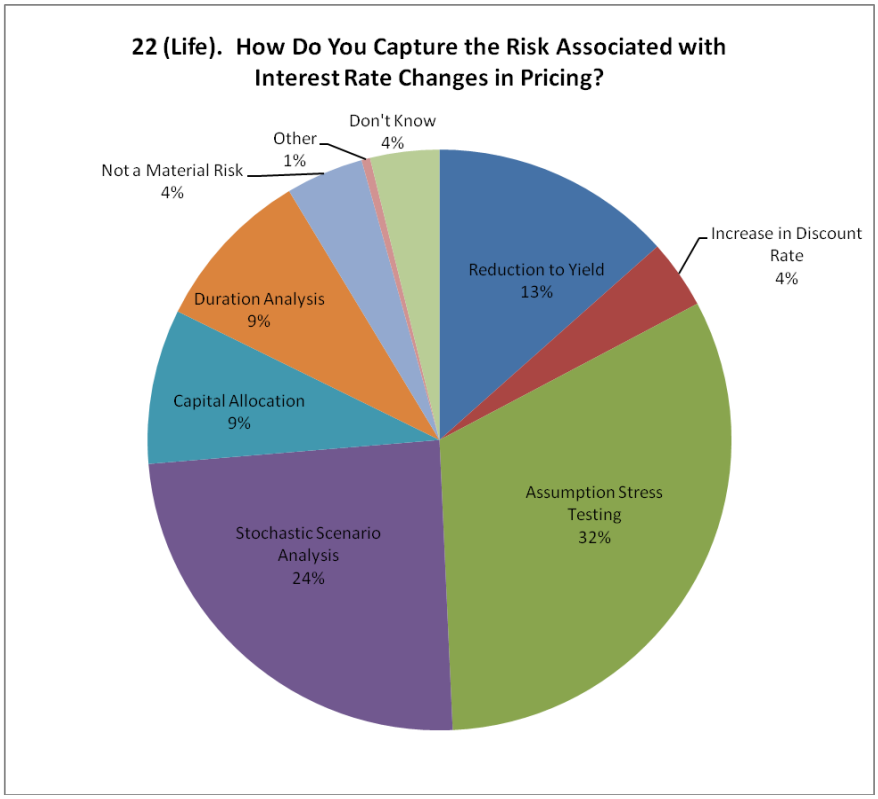
Asset default risk in pricing is captured through reduction in yield for 58% of life, 59% of annuity, and 42% of reinsurance companies making it the most popular choice, similar to the 2003 study. Capital allocation was chosen by 12% of life and annuity companies, and 21% of reinsurers. These parameters are generally developed by the investment area (33%) or a combination of areas (34%) that include the

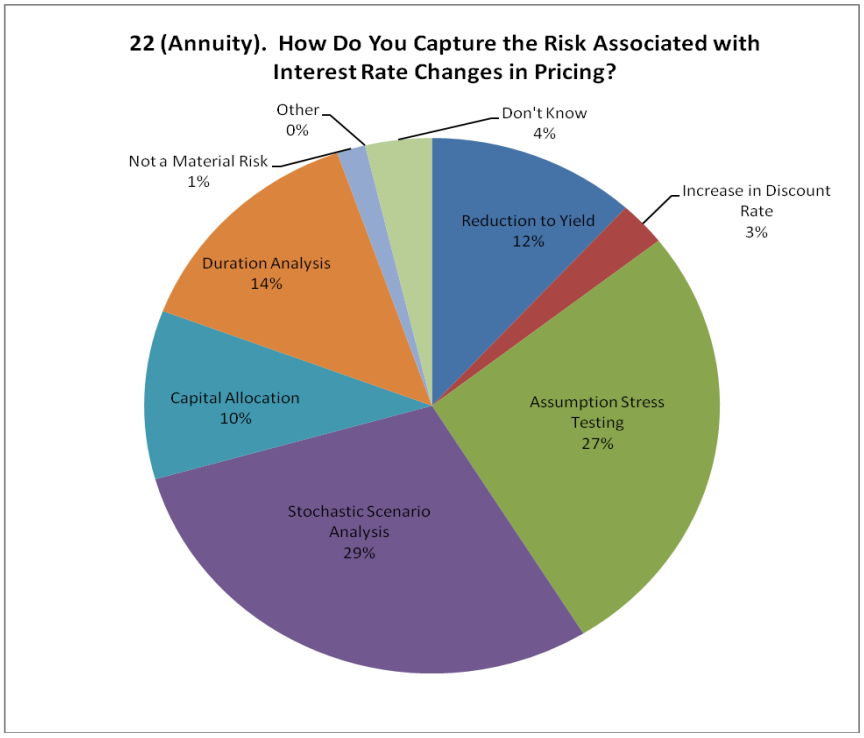
investment area, enterprise risk management and actuarial. Most life and annuity companies use an internal model (43%) or regulatory rating formula (17%) to determine the amount of the default adjustment.

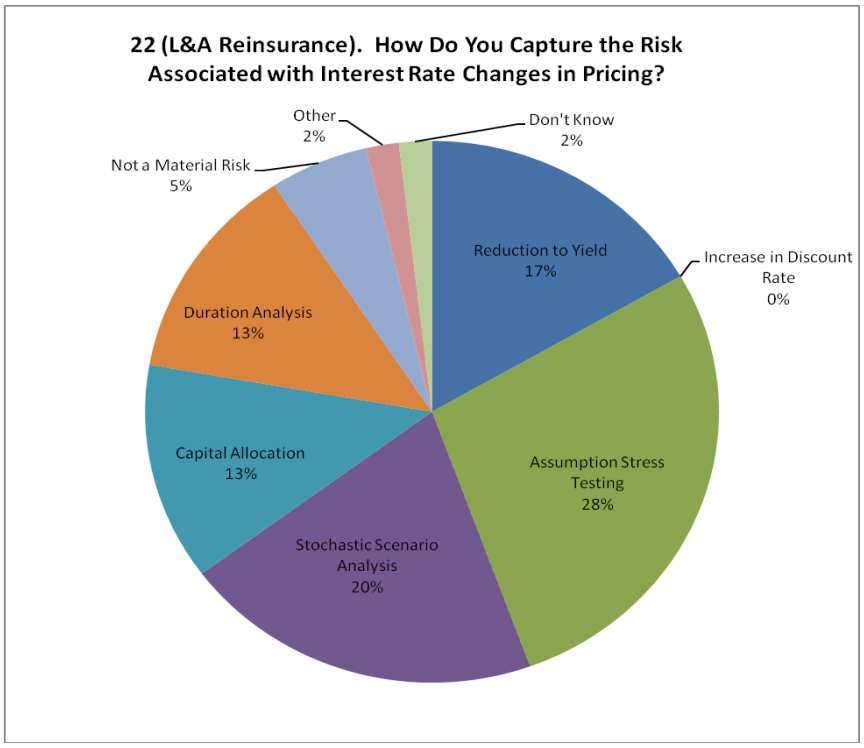
20% of the smallest companies did not consider default risk as material. The largest companies tend to use a wider variety of tactics than reduction to yield for capturing their asset default relative to other companies. Smaller companies tend to use only one source area rather than a combination of areas to determine the parameters and magnitude of defaults. Internal models are the most popular method, but rating agency formulas are used by smaller companies more often than larger companies.

Question 22 – How do you capture risk associated with interest rate changes in pricing?

For life writers, interest rate change risk is captured through assumption stress testing (32%), stochastic scenario analysis (24%), followed by reduction to yield (13%). For annuity writers, interest rate change risk is captured through stochastic scenario analysis (29%), assumption stress testing (27%) and duration analysis (14%). Reinsurers use assumption stress testing (28%), stochastic scenario analysis (20%) and reduction to yield (17%). Larger companies slightly favored stochastic scenario analysis to assumption stress testing.



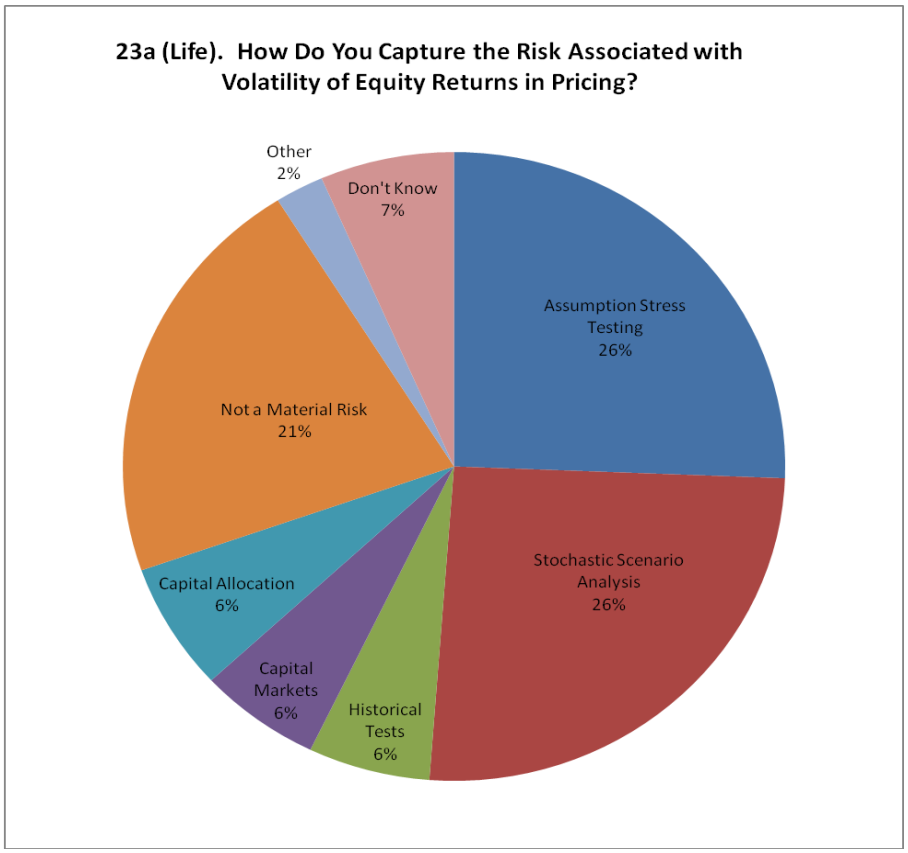


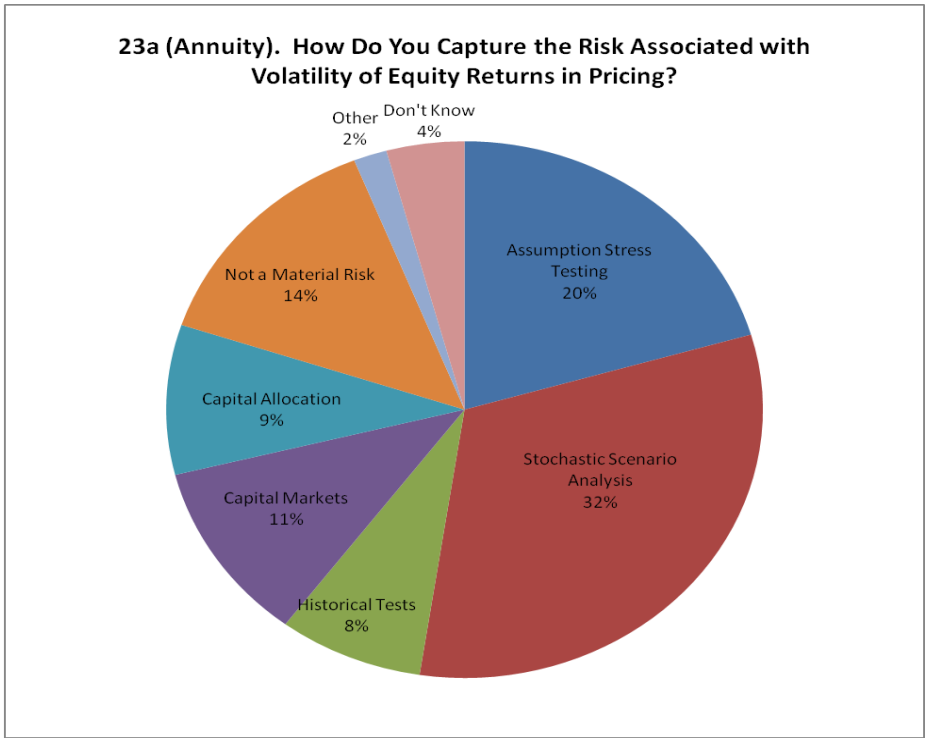


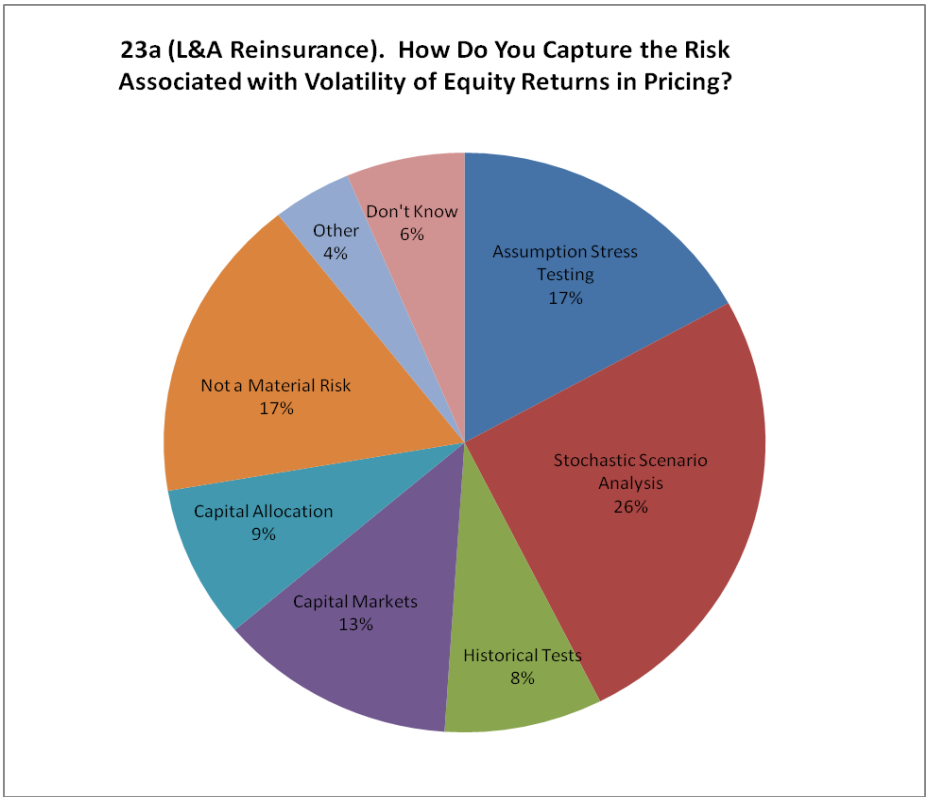
Question 23 – How do you capture the risk associated with the volatility of equity returns in pricing? If you use stochastic analysis, what areas do you look at for assumptions used in generating the scenarios?

Life insurers capture volatility risk using stochastic scenario analysis (26%) and assumption stress testing (26%). A large number (21%) do not consider volatility of equities a material risk. Annuity writers tend to use stochastic scenario analysis (32%) and assumption stress testing (20%). Reinsurers tend to use stochastic scenario analysis (26%) and are split 17% each between assumption stress testing and "not a material risk". Almost half of the smallest companies reported this risk as not material. Stochastic analysis remains the most popular method since the 2003 study.

For life insurers using stochastic scenario analysis, the main sources for assumptions include risk neutral (27%), historical (23%), capital markets (21%), and mean reversion (18%). For annuity writers, the key areas looked at are risk neutral (26%), historical (24%), capital markets (22%) and mean reversion (18%). Reinsurers tend to look at historical (26%), capital markets (23%), risk neutral (23%) and arbitrage free (18%). Larger companies favor risk neutral while smaller companies utilize historical more often when building their assumptions. The 2003 study reported historical and mean reversion as the leading sources which have changed in the 2010 study in favor of risk neutral.

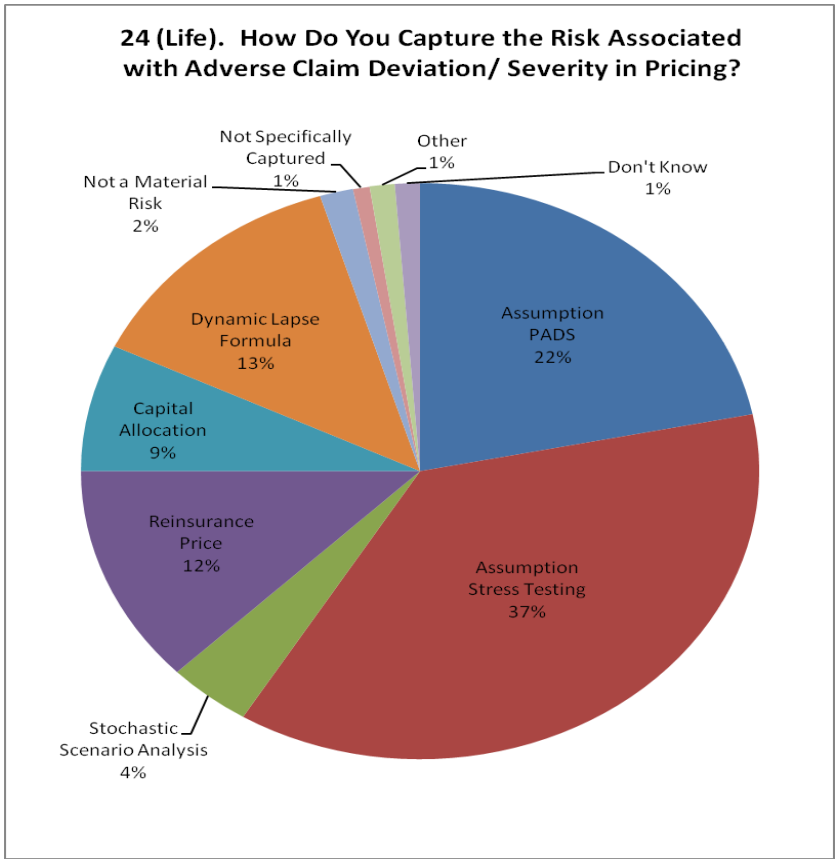


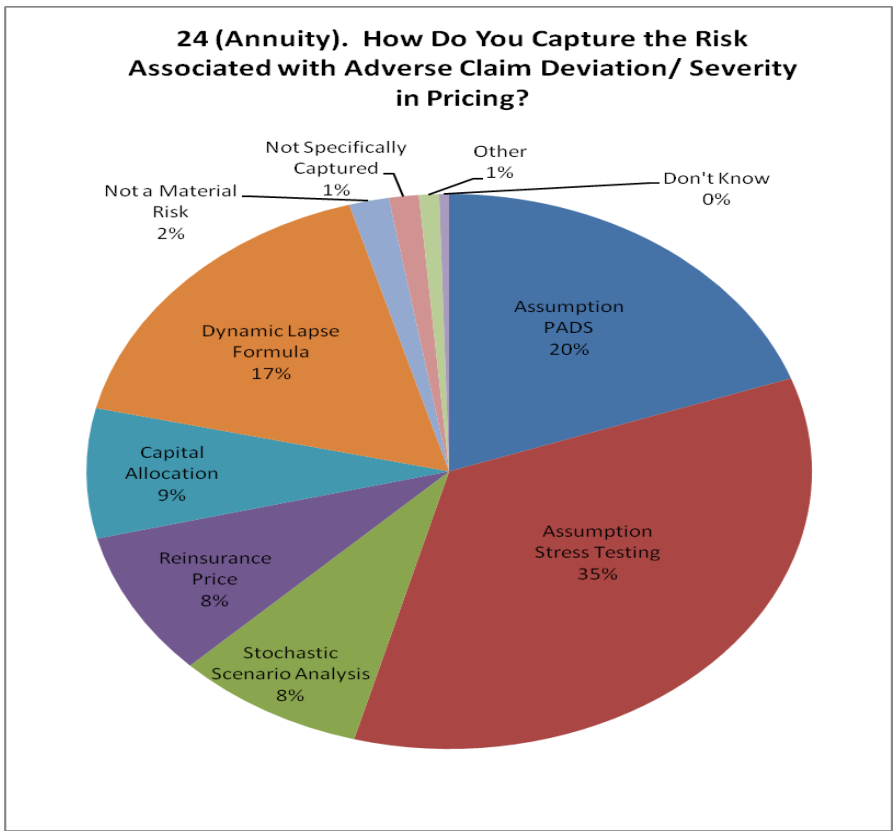


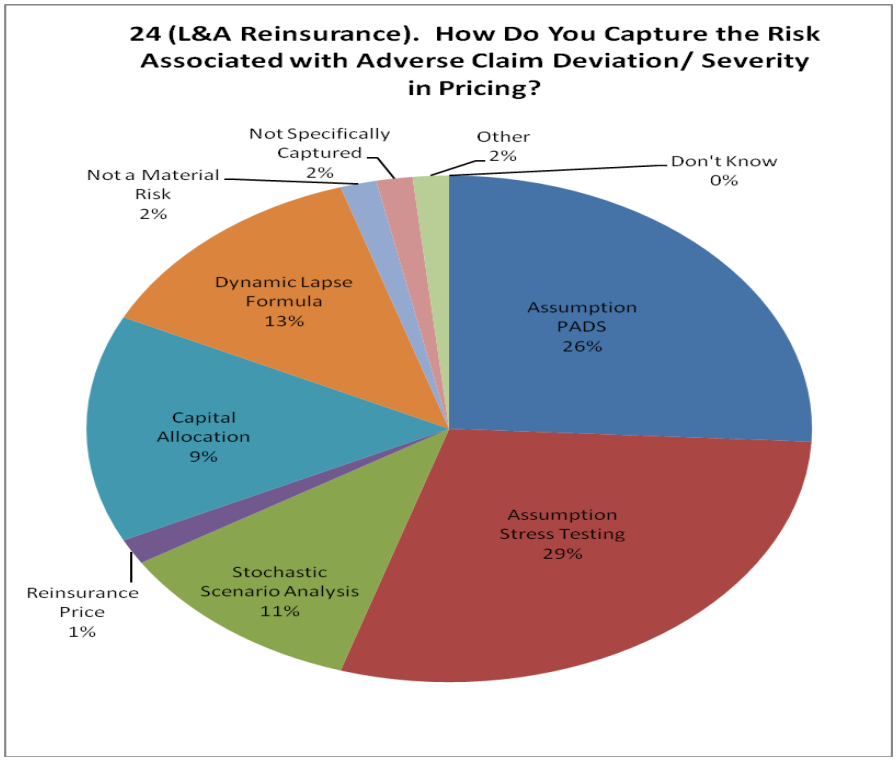


Question 24 – How do you capture the risk associated with adverse claim deviation/severity in pricing?

Life insurers mainly capture risk in claims deviation/severity though assumption stress testing (37%) and assumption PADs (22%). Annuity writers also mainly capture this risk through assumption stress testing (35%) and assumption PADs (20%). Reinsurers utilize assumption stress testing (29%) and assumption PADs (26%). These results are substantially unchanged from the 2003 study. Assumption stress testing becomes less popular as the size of the company increases.

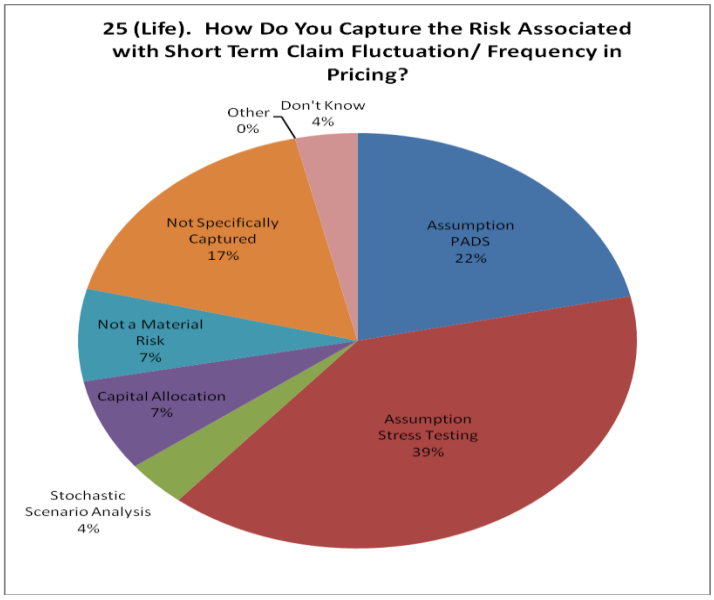


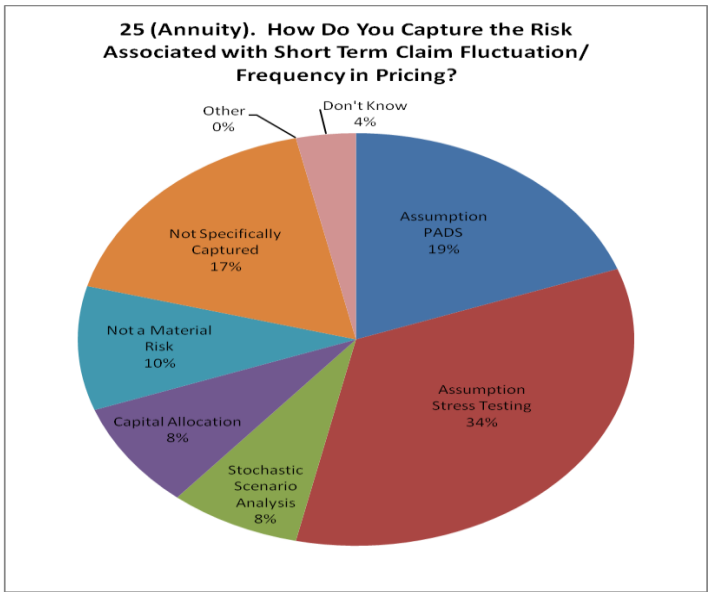


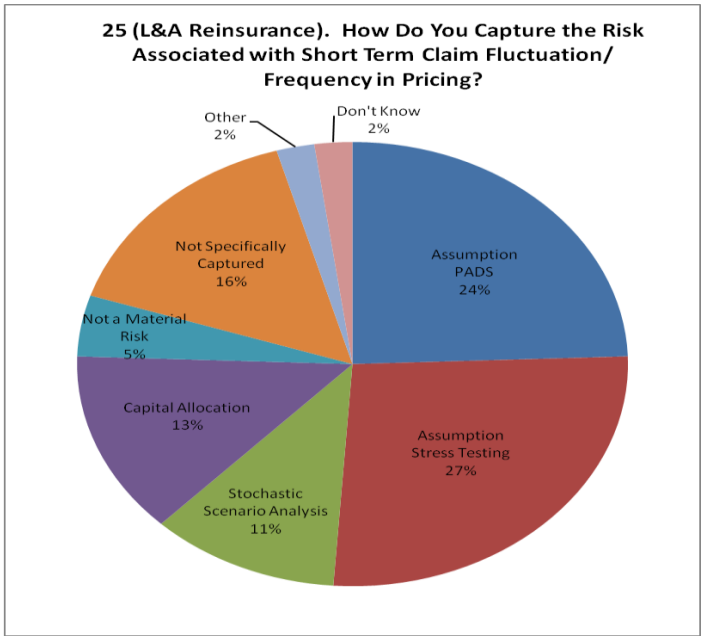


Question 25 – How do you capture risk associated with short-term claim fluctuations/frequency in pricing?

Life carriers reported using assumption stress testing (39%) and assumption PADs (22%), while 17% report not capturing this risk specifically. Annuity carriers use assumption stress testing (34%) and assumption PADs (19%), while 17% report this risk is not specifically captured. Reinsurers use assumption stress testing (27%) and assumption PADs (24%), while 16% reported short-term claim fluctuation/frequency risk is not specifically captured. Assumption stress testing and PADs were the leading means for capturing risk in the 2003 study as well. Smaller companies tend to rely on assumption stress testing more so than larger companies. Almost one quarter of the smallest and larger companies did not consider this risk as material. A larger percentage of corporate/risk management actuaries use capital allocation for this risk.

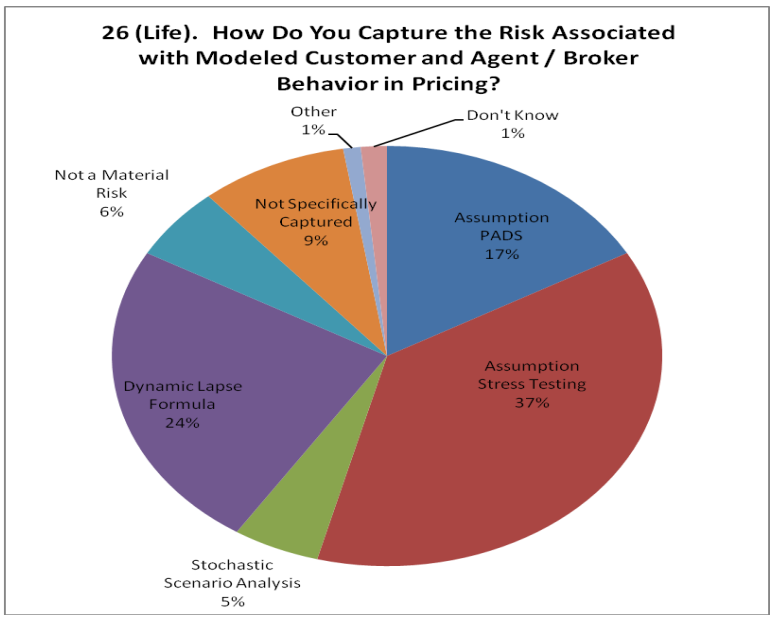


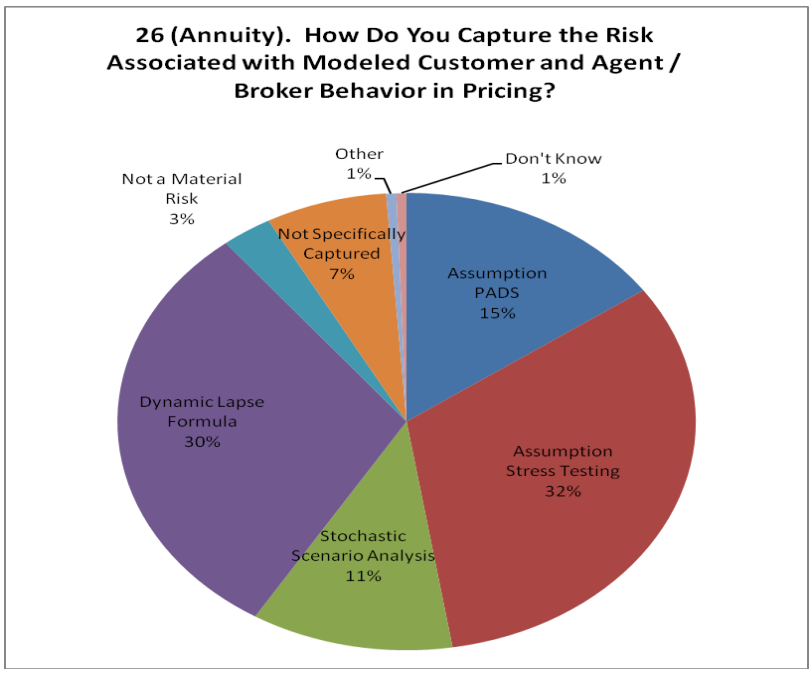


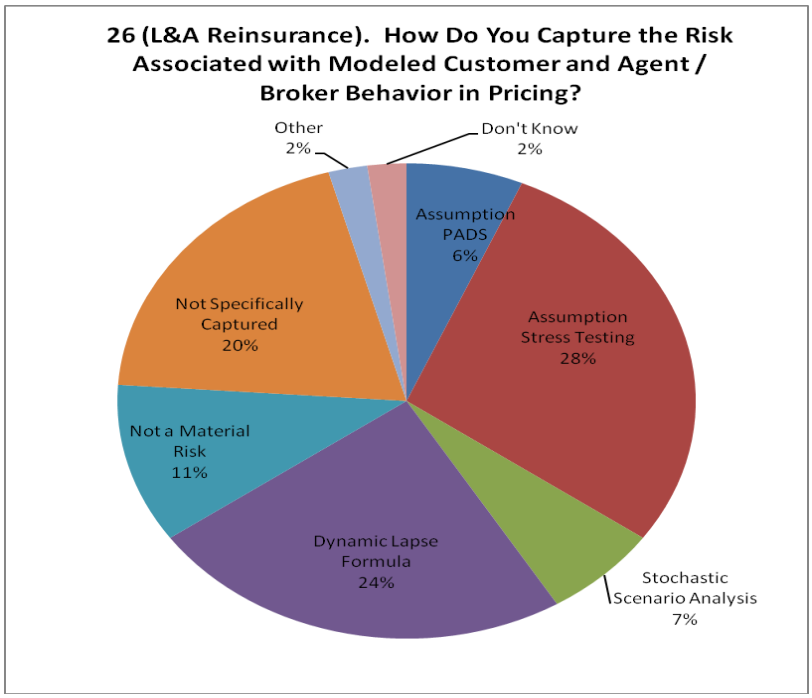


Question 26 – How do you capture the risk associated with modeled customer and agent/broker behavior in pricing?

Life carriers reported using assumption stress testing (37%) and dynamic lapse formula(24%), while 17% use assumption PADs. Annuity carriers use assumption stress testing (32%) and dynamic lapse formula (30%), while 15% report using assumption PADs. Reinsurers use assumption stress testing (28%) and dynamic lapse formula (24%), while 20% reported customer/agent/broker behavior risk is not specifically captured. The smallest of companies tend to not capture this risk specifically as much as other companies. The largest of companies report that dynamic lapse formula is used as often as assumption stress testing.

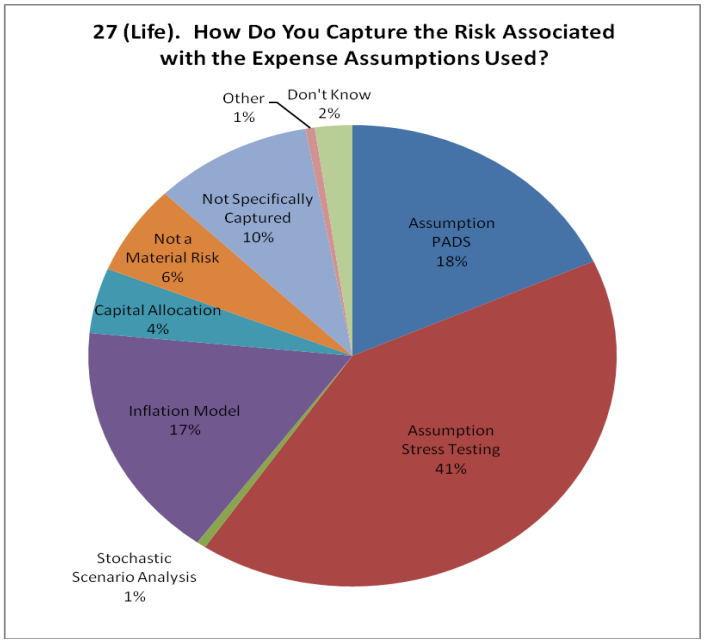


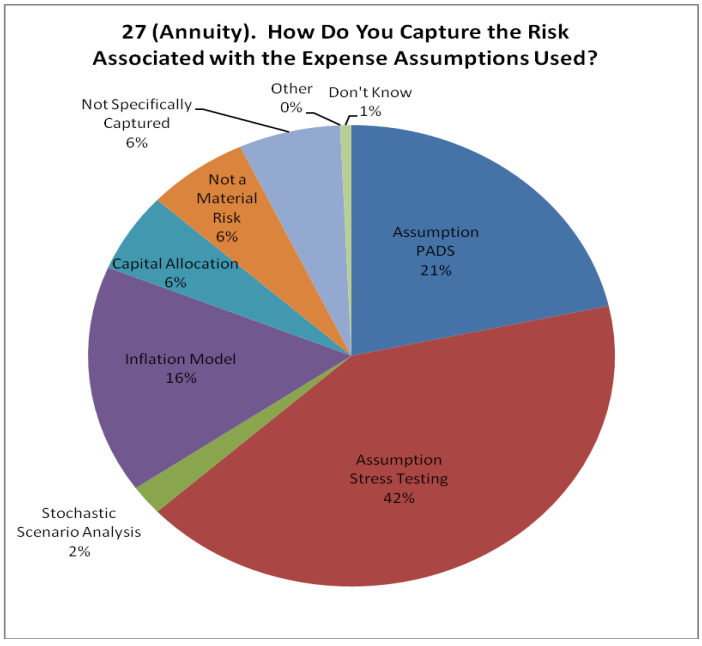


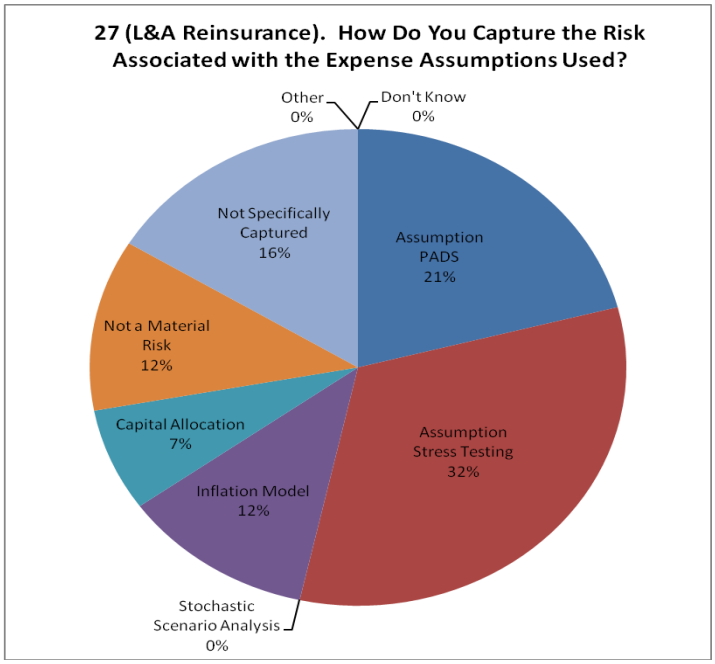


Question 27 – How do you capture the risk associated with the expense assumptions used?

Life carriers reported using assumption stress testing (41%) and assumption PADs (18%), while 17% use an inflation model. Annuity carriers use assumption stress testing (42%) and assumption PADs (21%) while 16% report using an inflation model. Reinsurers use assumption stress testing (32%) and assumption PADs (21%), while 16% reported expense assumption risk is not specifically captured. Use of assumption stress testing appears to be positively correlated with the size of the company with the exception of the largest companies. The largest companies report the smallest use of assumption stress testing and the highest percentage of capital allocation for risk associated with expense assumptions.

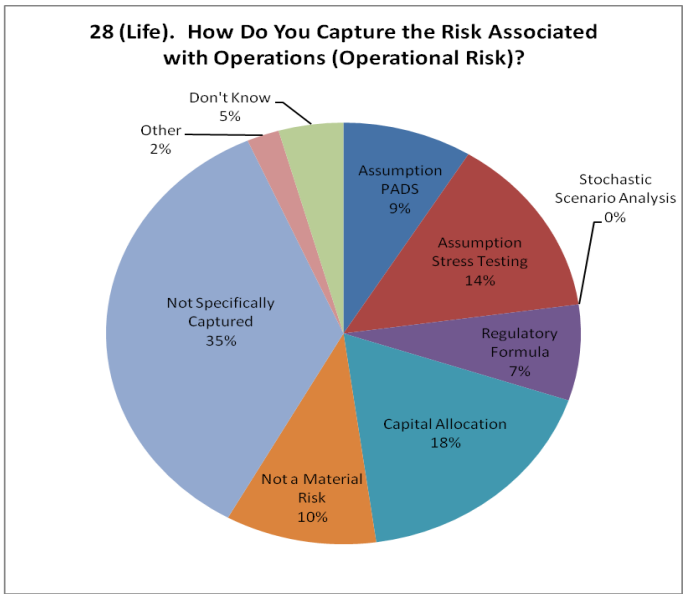


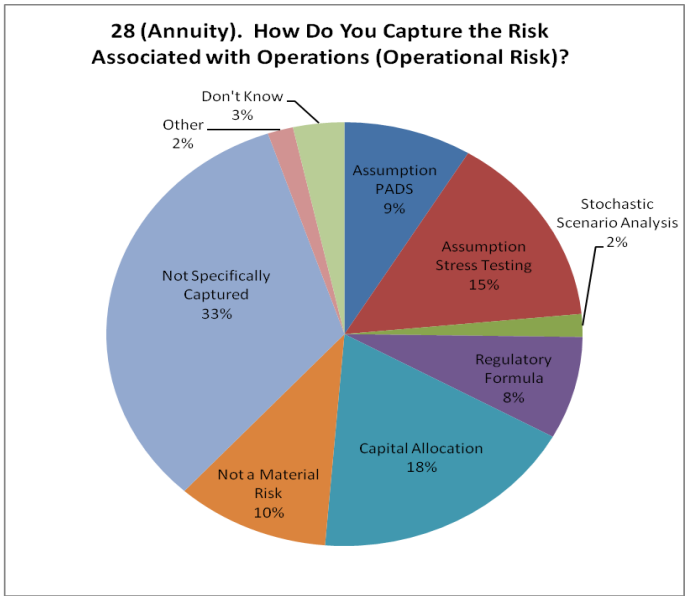


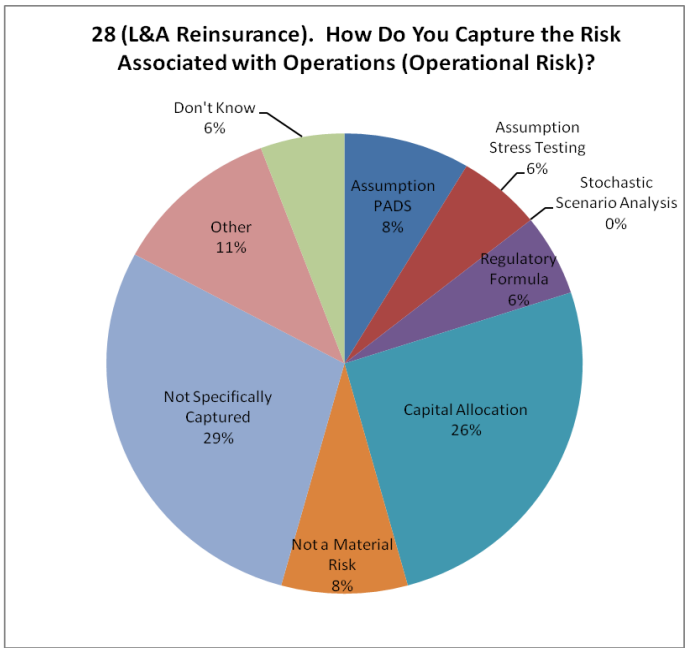


Question 28 – How do you capture the risk associated with operations (operational risk)?

Over one-third of life carriers (35%) do not specifically capture operations risk in pricing. Those that do capture risk reported using capital allocation (18%) while 14% use assumption stress testing. One-third of annuity carriers (33%) reported operational risk is not specifically captured. Those that do capture the risk use capital allocation (18%) and assumption stress testing (15%). 29% of reinsurers do not specifically capture operational risk. Reinsurers that do capture operational risk use capital allocation (26%) and assumption PADs (8%). The largest companies report capital allocation as the most popular means of capturing operational risk. Other sized companies generally do not consider this risk specifically. Corporate/risk management actuaries use capital allocation to capture operational risk.

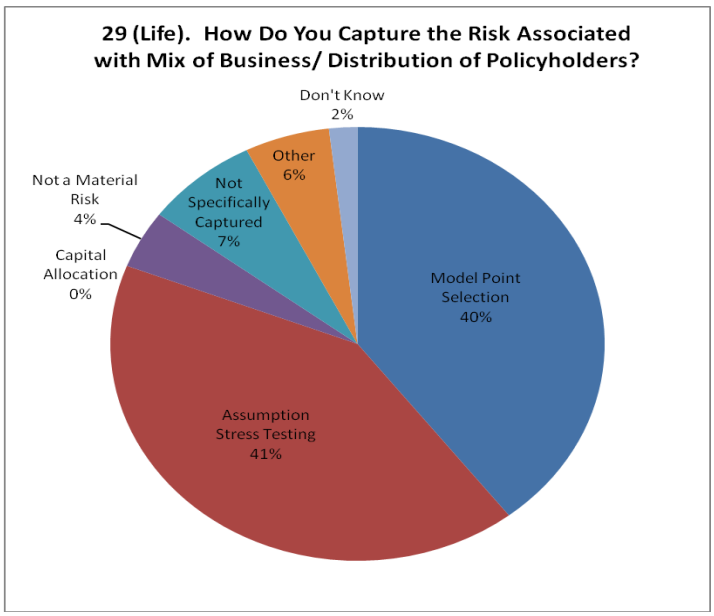


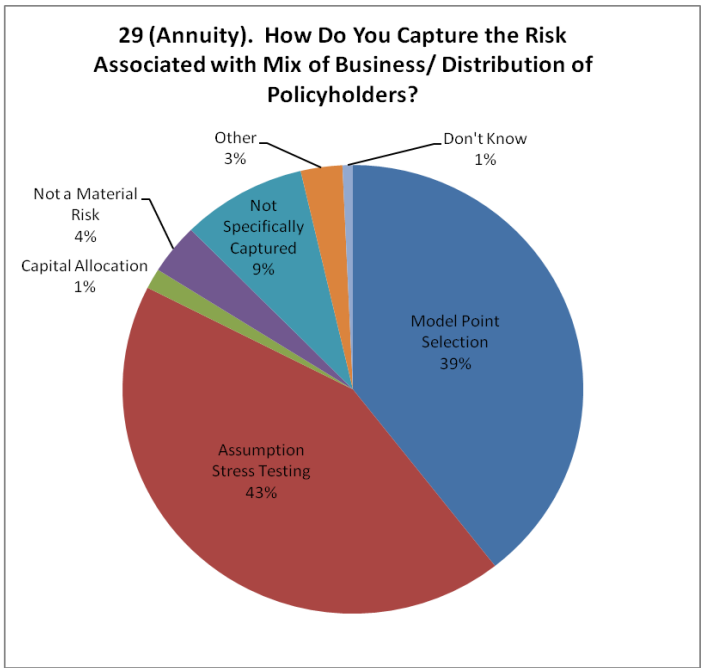


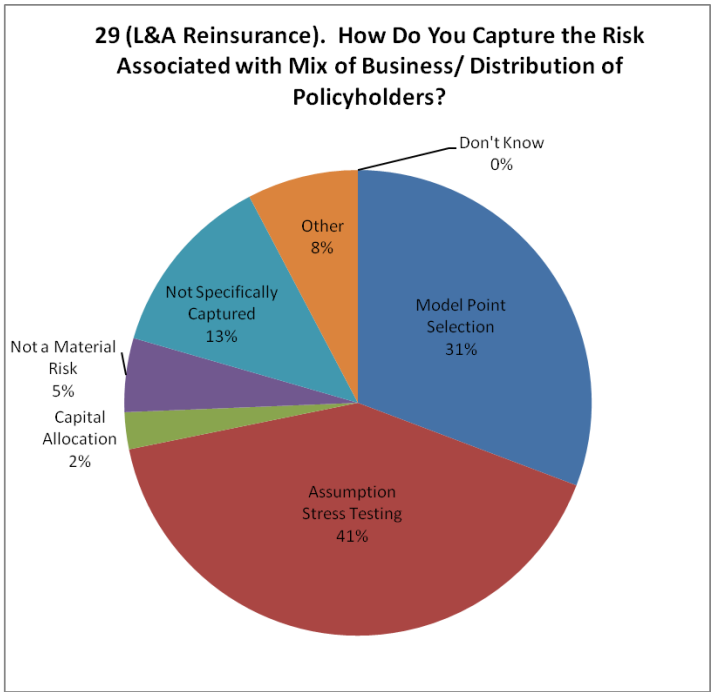


Question 29 – How do you capture the risk associated with mix of business/distribution of policyholders?

Distribution risk is captured by life companies through assumption stress testing (41%) and model point selection (40%). Annuity carriers reported using assumption stress testing (43%) and model point selection (39%). Reinsurers reported using assumption stress testing (41%) and model point selection (31%). Almost 30% of the smallest companies reported they do not specifically capture distribution risk.

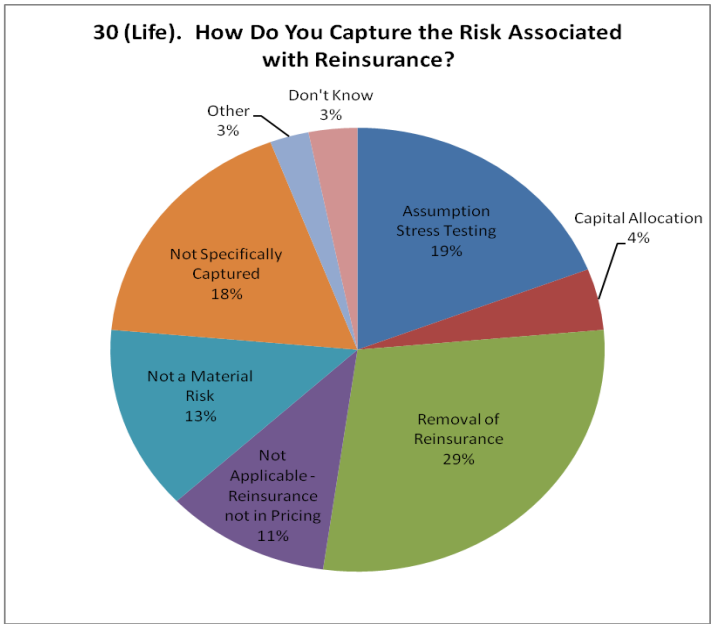


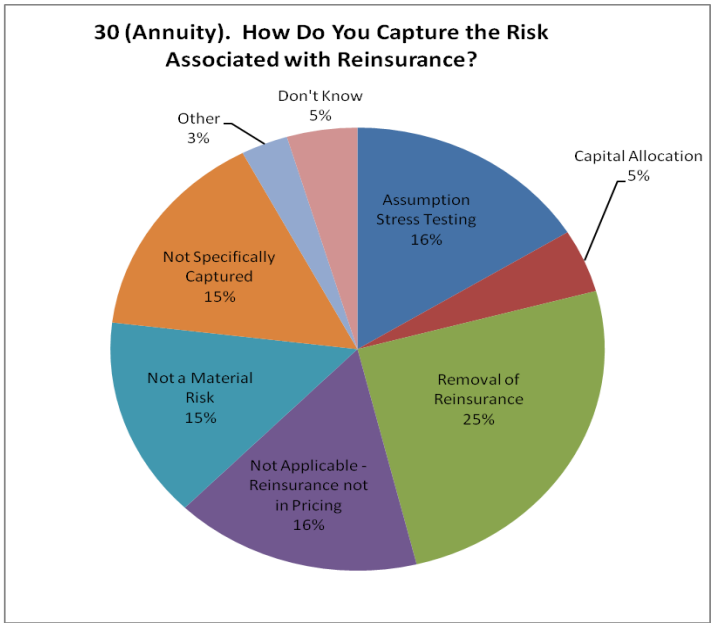


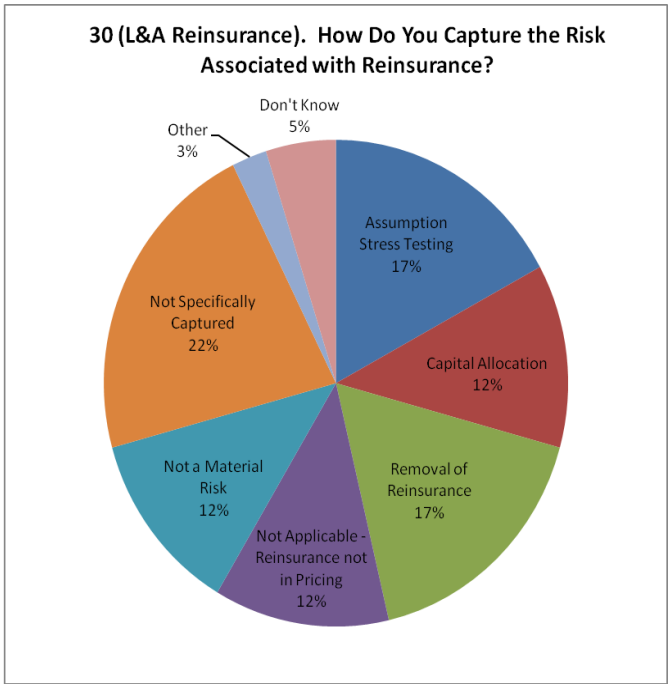


Question 30 – How do you capture the risk associated with reinsurance?

Life carriers reported using removal of reinsurance (29%) and assumption stress testing (19%), while 18% do not specifically capture reinsurance risk. Annuity carriers use removal of reinsurance (25%), and are evenly split (16% each) for assumption stress testing and no use of reinsurance. 30% (15% each) reported this is not a material risk or is not specifically captured. Reinsurers use assumption stress testing (17%) and removal of reinsurance (17%), while 22% reported reinsurance risk is not specifically captured. Reinsurance risk is captured and considered material in larger companies relative to smaller companies.

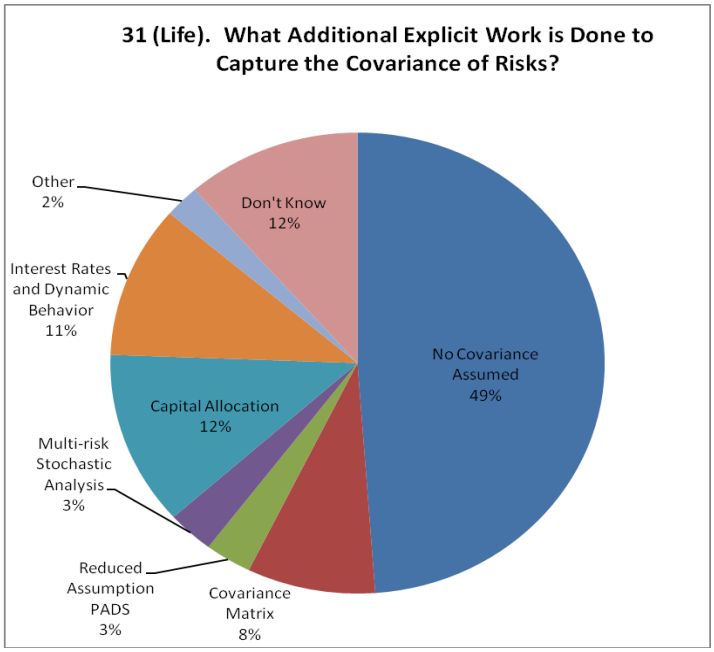


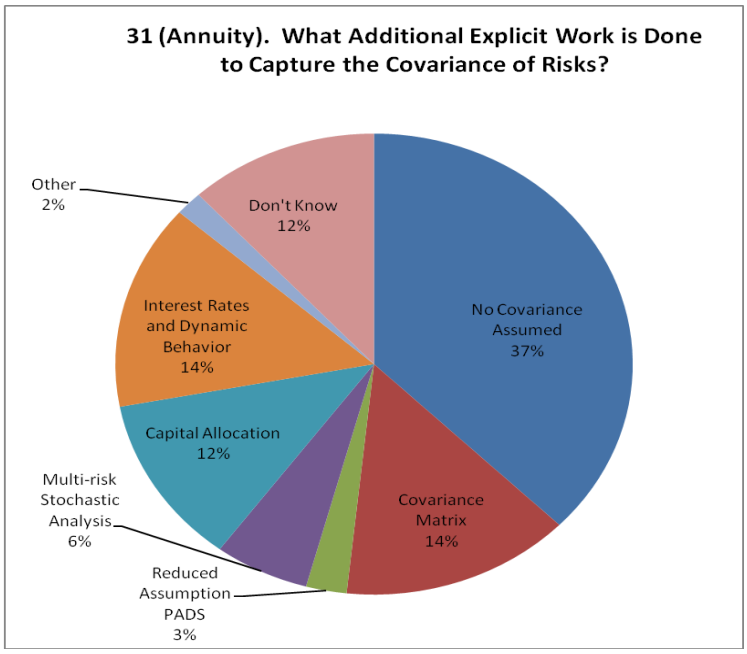


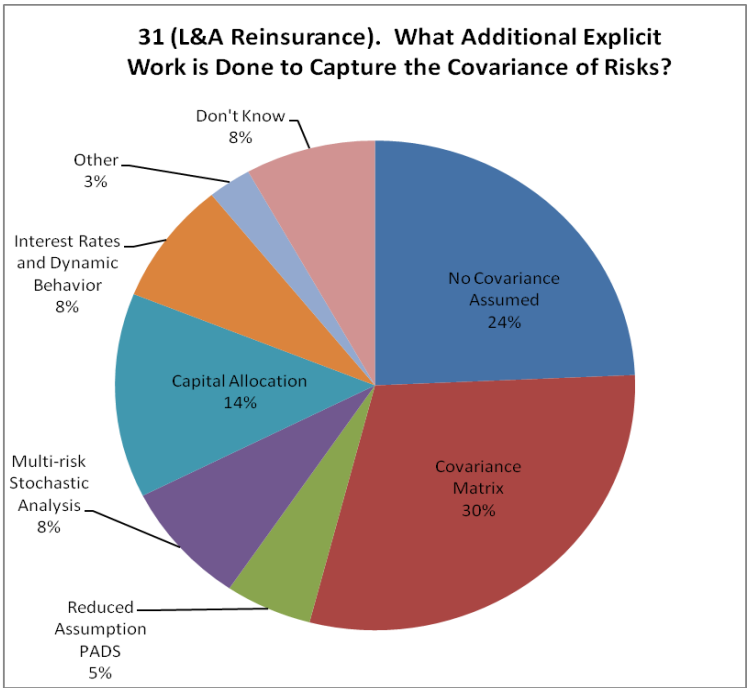


Question 31 – What additional explicit work is done to capture the covariance of risks?

For life carriers, 49% assume no covariance of risk while 12% use capital allocation and 11% use interest rates and dynamic behavior. For annuity writers, 37% assume no covariance of risk while 14% use a covariance matrix and 14% use interest rates and dynamic behavior. Reinsurers capture covariance of risk with a covariance matrix (30%) and capital allocation (14%), while 24% assume no covariance. 60% of the smallest companies do not assume any covariance of risk.

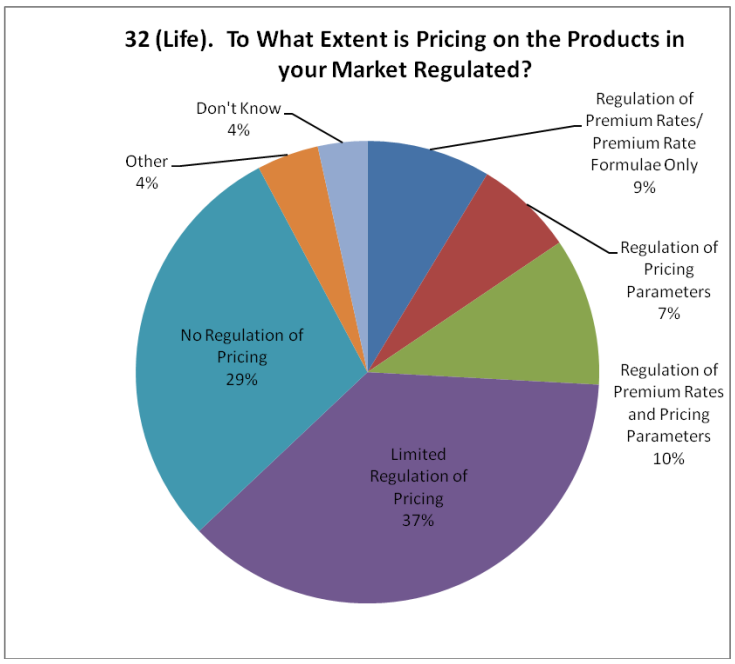


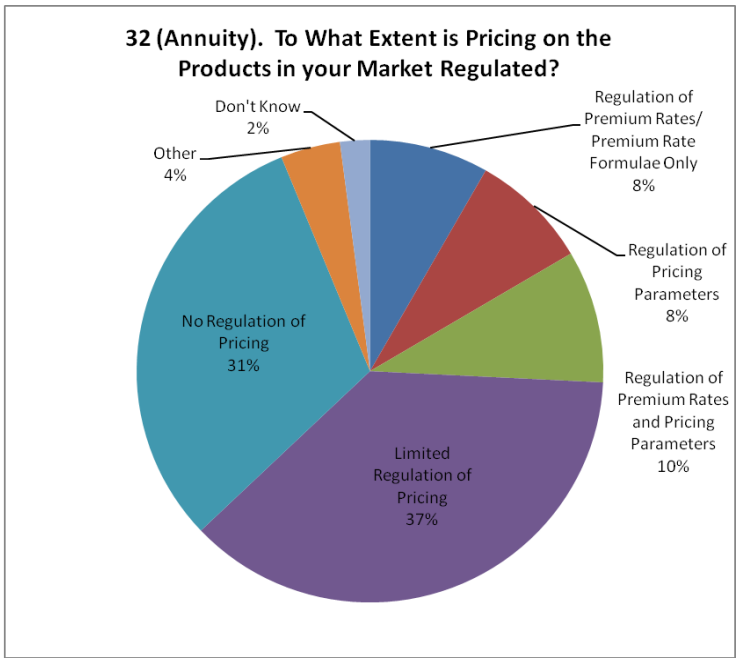


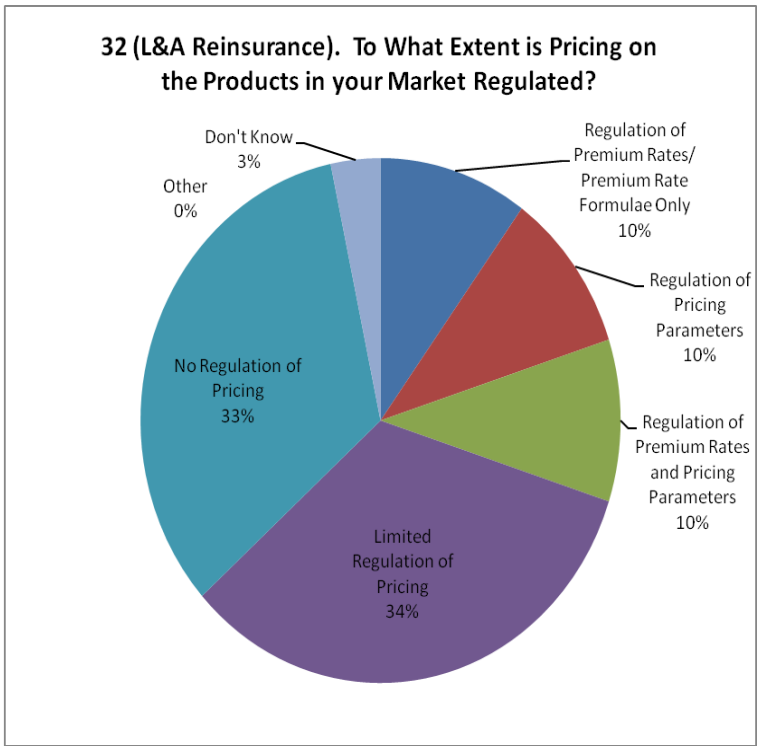


Question 32 – To what extent is pricing on the products in your market regulated?

Life carriers reported limited regulation (37%) and no regulation of pricing (29%). Annuity writers reported limited regulation (37%) and no regulation of pricing (31%). Reinsurers reported limited (34%) regulation and no regulation of pricing (33%).







Health

No respondents reported being a health reinsurer. Reinsurers may have taken the survey, but did not fill out the demographic information. Therefore, no separate results are shown for health reinsurance.

Question 1d – Which of the following profit measures do you use in pricing products.

Expected loss ratio and premium margin were ranked highest as the primary profit measures for all health products. Individual and group A&H as well as stop loss showed revenue margin as the third most popular measure. Critical illness and Long Term Care (LTC) used IRR as the third most popular measure. The following table shows the ranking of the profit measures by product line.

Profit Measure Ranking	Individual A&H	Group A&H	Stop Loss	Critical Illness	LTC	Other	Total
Return on Investment	11	11	-	-	3	4	10
Return on Equity	9	5	-	6	6	6	9
Return on Liabilities	14	13	-	-	8	-	13
Risk Adjusted Return on Capital	11	12	7	8	-	6	12
Premium Margin	**2**	**2**	**2**	**2**	**2**	**1**	**2**
Embedded Value/Economic Value Added	9	9	-	9	7	-	11
Expected Loss Ratio	**1**	**1**	**1**	**1**	**1**	**2**	**1**
Combined Ratio	8	7	5	10	-	**3**	7
Break Even Year	6	10	-	5	5	10	6
Internal Rate of Return	5	8	-	**3**	**3**	4	4
Return on Assets	16	14	-	-	-	-	16
Return on Capital	4	4	6	6	-	9	5
Contribution to Surplus	7	5	4	-	10	-	7
Revenue Margin	**3**	**3**	**3**	4	8	6	**3**
Market Consistent Embedded Value	14	-	-	-	11	-	14
Other	13	-	-	-	-	-	15

"-" denotes that this profit measure was not indicated as used in any form for that product line.

The 2003 study reported premium margin, ROE and IRR as the leading measures. For A&H companies, expected loss ratio was not an option in that study, so it is difficult to extrapolate a shift in profit measures since 2003. Of the companies answering demographic questions, break-even year was more often in the top three choices rather than revenue margin. Health corporate/risk management actuaries preferred premium margin and return on capital.

Question 2 – If you use the following profit measure, how is risk assessed when using the profit measure?

Risk-adjusted profit target was primarily used in 9 of the 16 profit measures in the survey. Assumption stress testing was primary for 6 measures. Capital allocation was least used for risk assessment in health companies.

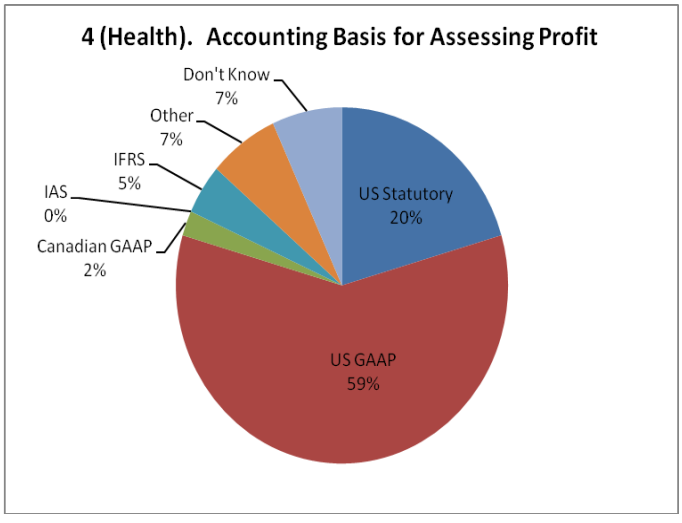
Those using expected loss ratio or revenue margin used risk-adjusted profit targets and stress testing. Those using premium margin used risk-adjusted profit targets and assumption PADs.

Companies using ROI generally use assumption stress testing. Companies using ROE use risk-adjusted profit targets. Companies using return on liabilities were evenly split between capital allocation and risk-adjusted profit targets. Companies using risk-adjusted return on capital use risk-adjusted profit targets. Companies using EV/EVA predominantly use assumption stress testing. Companies using a combined ratio mainly utilize risk-adjusted profit targets. Companies using break-even year and IRR use assumption stress testing. Companies using ROA use risk-adjusted profit targets. Companies using return on capital were evenly split between assumption stress testing and assumption PADs. Companies using contribution to surplus mainly use risk-adjusted profit targets. Companies using MCEV were split between assumption stress testing and stochastic scenario analysis.

Question 3 – When defining your profit measure, what is the basis for profit?

Pre-tax, pre-cost of capital was chosen by 53% of health respondents, while 27% chose post-tax, after cost of capital. Only 6% chose post-tax, pre-cost of capital.

Question 4 – What accounting basis is used for assessing your primary profit measure?



Health insurers use U.S. GAAP (59%) primarily when assessing their primary profit measure, followed by 20% using U.S. Statutory as their accounting basis. IFRS is used by 5% of health respondents, and 2% use Canadian GAAP. IFRS is mainly used outside of North America.

Question 5 – Do you measure actual profitability against projected pricing profitability?

Health insurers confirm "Yes, frequently" to measuring actual to projected profitability in 75% of responses. 18% of respondents report occasionally measuring actual to projected profitability. Generally, as the size of the companies increase, the percentage of "yes" responses increased as well.

Question 6 – If you measure actual profitability versus projected profitability, is this information passed back into the pricing process for future pricing?

Health insurers reported frequently (51%) and occasionally (35%) feed the actual to projected information back through the pricing process.

Question 7 – Do you feel your profit measures are substantially different from your competitors?

Most health insurers (61%) feel their profit measures are not substantially different from their competitors. 14% feel that their measures are different, and the remaining 25% do not know. The largest and smallest companies reported the highest percentages (31% largest, 26% smallest) of believing their profit measure was substantially different than their competitors.

Question 8 – Do you feel your primary profit measures give you an advantage against your competitors?

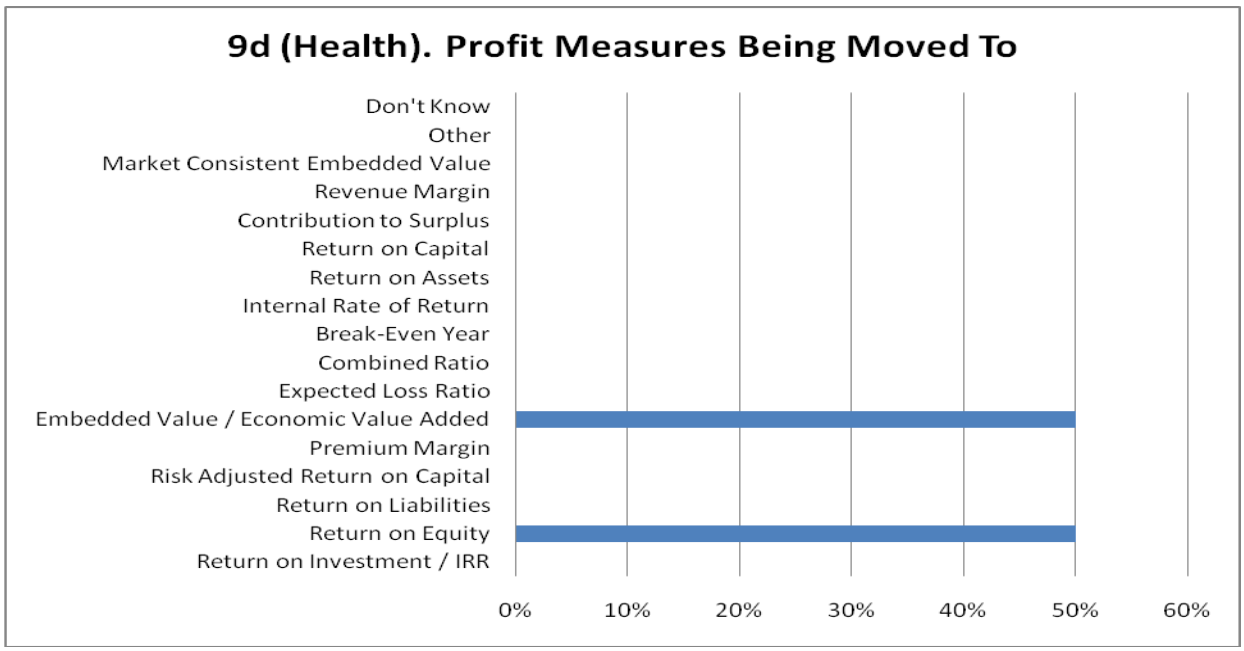
70% of health insurer responses indicate they are neutral in their use of their primary profit measure. Only 5% of issuers feel disadvantaged and 9% feel an advantage in the use of their primary profit measure.

Question 9 – Have you changed your primary profit measure within the last 3 years? If so, what profit measure did you move away from? Which profit measure are you moving to?

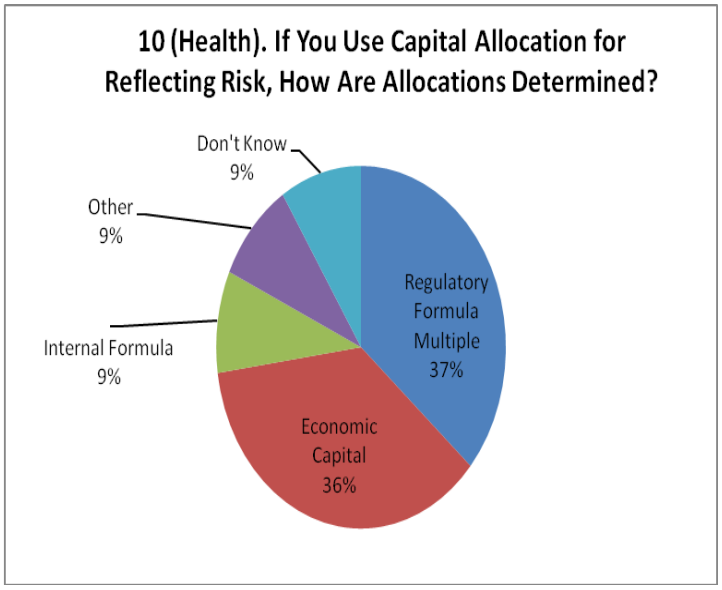
75% of health insurers reported changing their primary profit measure in the last 3 years, while 18% reported no change. More smaller and mid-sized companies reported changing their profit measure recently than larger companies.

Measures falling out of favor include IRR, risk-adjusted return on capital, combined ratio and contribution of surplus. The profit measures coming into favor include embedded value and ROE.

Most companies (71%) do not plan to change their profit measure in the next few years or are unsure (25%) if any change is planned.

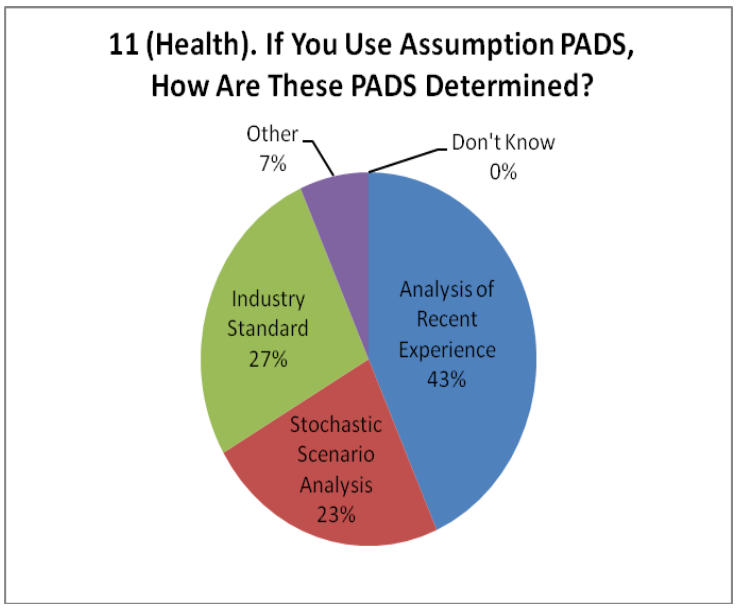


Question 10 – If you use capital allocation for reflecting risk, how are these allocations determined?



Health companies are closely split between using regulatory formula multiple (37%) and economic capital (36%). 9% chose internal formula and the remaining responses use some combination of formulas, economic capital and rating agency requirements. Smaller companies tend to use a regulatory formula multiple. Larger companies are using more economic capital for capital allocation.

Question 11 – If you use Assumption PADs, how are these PADs determined?



Anslysis of recent experience is chosen by 43% of health companies, with 27% using industry standard and 23% using stochastic scenario analysis. Larger companies reported more use of stochastic analysis than smaller to mid-size companies when determining assumption PADs, although analysis of recent experience is still more used among all companies.

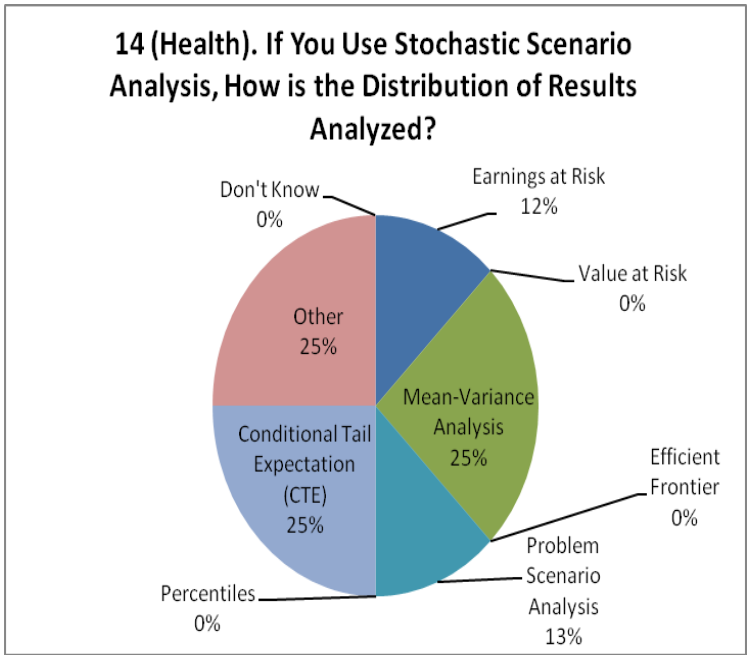
Question 12 – If you use a Risk-Adjusted Profit Target, how is it determined?

Judgment is used 46% of the time in determining risk-adjusted profit targets, and formula is used 36% of the time. Mid-size and larger companies use more judgment for determining risk-adjusted profit measure. The largest companies were more formula driven.

Question 13 – If you use Assumption Stress Testing, how are the parameters determined?

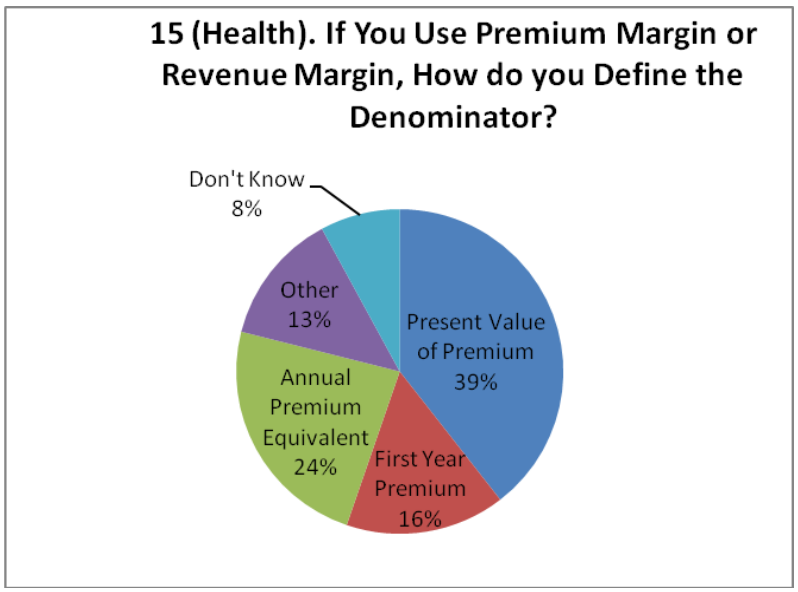
Judgment is used 76% of the time in assumption stress testing, with an even 12% split each for confidence intervals and worst case experience. Larger companies reported using more confidence intervals relative to other sized companies, but judgment is still the primary method for determining parameters for assumption stress testing.

Question 14 – If you use Stochastic Scenario Analysis, how is the distribution of results analyzed?



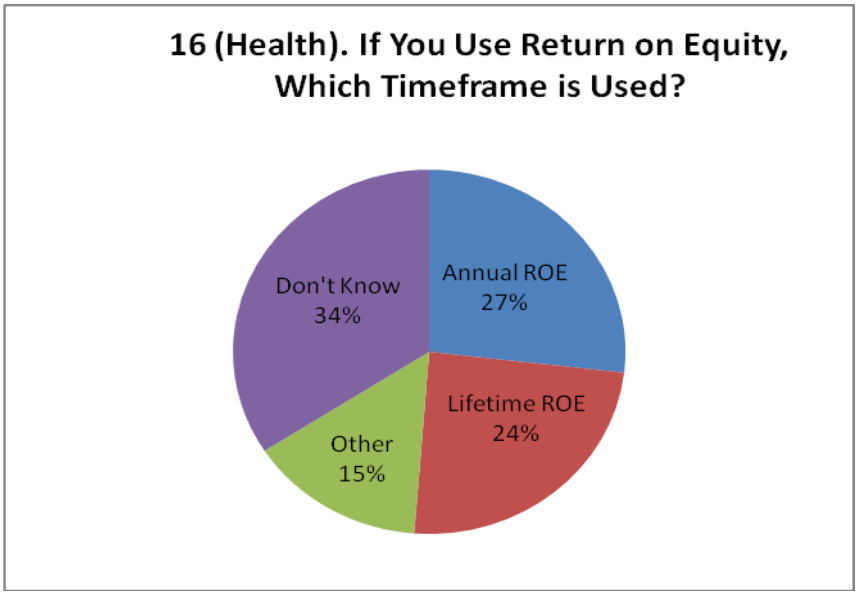
CTE and mean-variance analysis are used in 25% of responses. "Other" responses include combinations of CTE and judgment. Smaller and the largest companies report using more percentiles than using CTE when analyzing distribution results from stochastic scenario analysis.

Question 15 – If you use Premium Margin or Revenue Margin, how do you define the denominator of the equation?



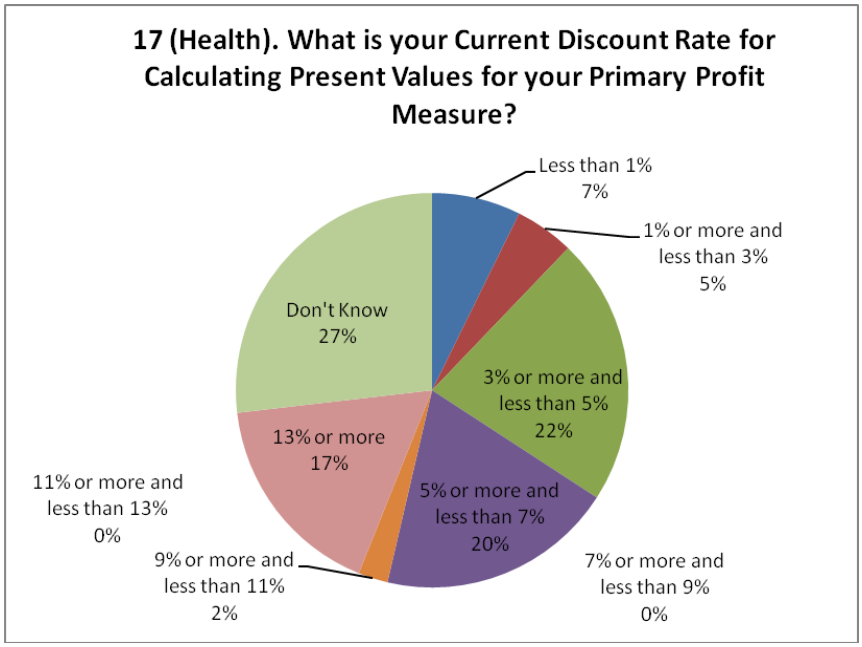
Present Value of premium is chosen by 39% of health respondents, while 24% choose annual premium equivalent.

Question 16 – If you use ROE, which of the following timeframes is used?



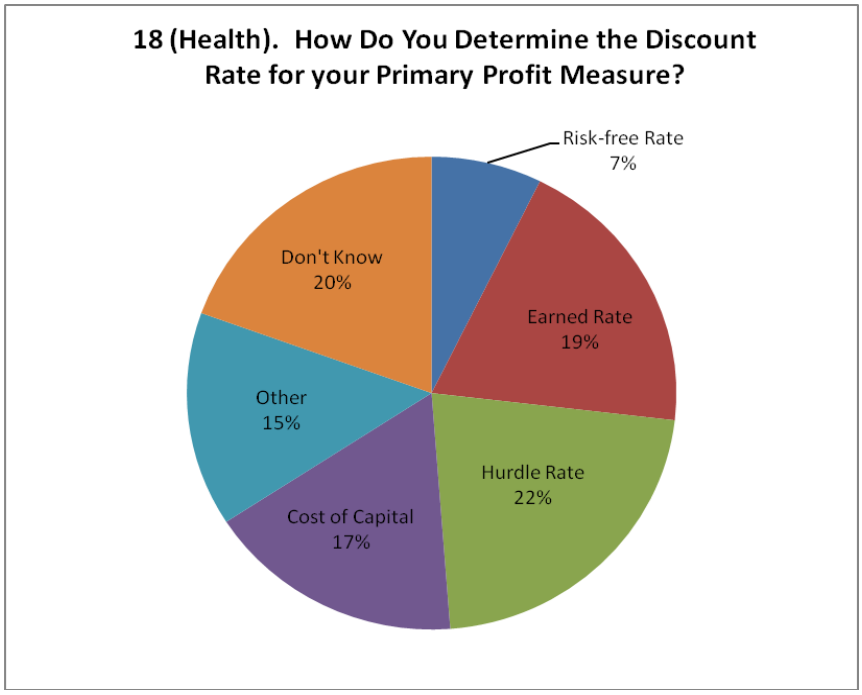
Annual ROE is chosen by 27% of health respondents, while 24% chose lifetime ROE. Midsize to larger companies have a higher percentage of lifetime ROE (between 47%-49%). The smallest and largest companies were more evenly split between lifetime and annual ROE.

Question 17 – What is the level of your current discount rate when calculating present values for your primary profit measure?



42% of responses are between 3% and 7% for a discount rate on their primary profit measure. 17% of issuers report a discount rate of 13% or more. Companies that completed the size of the company question report heavier weighting in the 3%-5% rather than 5%-7%.

Question 18 – How do you determine the discount rate for your primary profit measure?



There is no clear leader for determining the discount rates among health insurer responses. From the responses, the least popular is using the risk-free rate or some other means of determination. Cost of capital, earned rate and hurdle rate are fairly evenly split. Earned rate is more popular among the smallest and mid-sized companies. Smaller and the largest companies favor risk free rates.

Question 19 – Given the recent economic environment, has your company made changes to its risk assessment practices?

46% of health responses report no change due to the recent economic environment. Responses were evenly split (27% each) between those making a change and those that were unsure if any change was made. Larger companies have made more changes based on the economic environment relative to smaller companies.

Question 20 – Do you employ an enterprise risk actuary or have an enterprise risk management area in your company?

44% of health respondents report having enterprise risk actuaries or enterprise risk management in place in their companies. Only 5% are considering an addition while 36% report no employment and are not considering any enterprise risk actuaries or management areas. Smaller companies are less likely to employ ERM areas/actuaries in their organizations, with only 32% responding yes and 43% not considering hiring ERM areas/actuaries.

Question 21 – How do you capture risk associated with asset default in pricing? Who determines the parameter and magnitude of the asset default in pricing? How is the amount of the asset default adjustment determined?

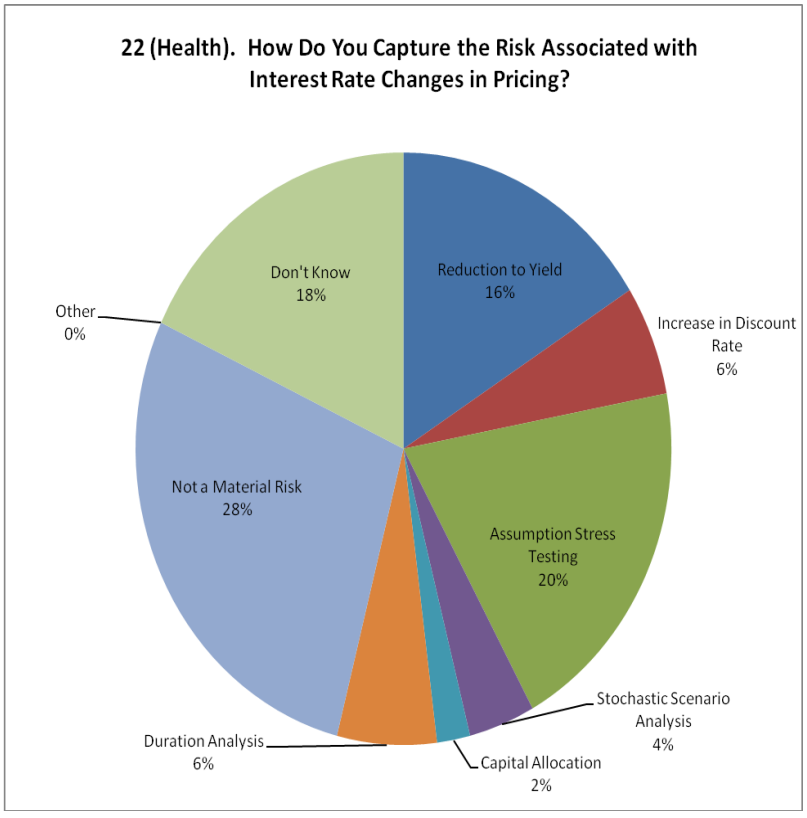
Asset default risk is captured through reduction to yield (33%). 31% of health insurers do not consider this a material risk, and 20% of respondents were unsure how this risk was captured. For health insurers capturing default risk, parameters and magnitude are determined through the investment area (35%), actuarial (10%), and enterprise risk management (5%), or some combination of the above (10%). The

amount of adjustment is determined through internal model (30%) or rating agency formula (7%). 30% each chose "don't know" or "not applicable" for this assumption adjustment.

20% of the smallest companies did not consider default risk as material. The largest companies tend to use more tactics than reduction to yield for capturing their asset default relative to other companies. Smaller companies tend to use only one area rather than a combination of areas to determine the parameters and magnitude of defaults. Internal models are the most popular method, but rating agency formulas are used by smaller companies more often than larger companies.

Question 22 – How do you capture risk associated with interest rate changes in pricing?

The most popular answer for capturing interest rate risk was "not a material risk" (28%). For those that do capture this risk, 20% use assumption stress testing, 16% use reduction to yield, and 6% each use increase in discount rates and duration analysis. Larger companies actually slightly favored stochastic scenario analysis to assumption stress testing.



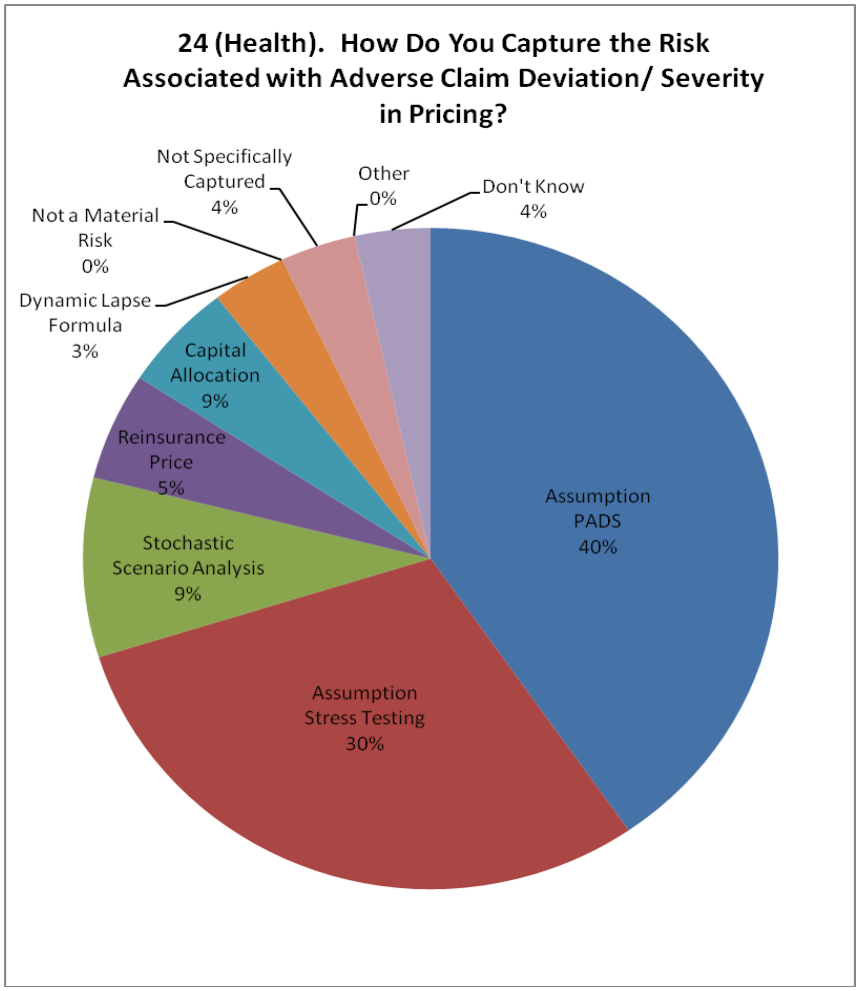
Question 23 – How do you capture the risk associated with the volatility of equity returns in pricing? If you use stochastic analysis, what areas do you look at for assumptions used in generating the scenarios?

Most health insurers (57%) do not consider volatility of equity returns to be a material risk to be captured, of which 20% did not know how it was captured. Those that capture the risk use assumption stress testing (9%) and stochastic scenario analysis and historical trends (each 5%). Those responding to using

stochastic scenario analysis were not able to answer the areas looked at for assumptions in generating the scenarios. Larger companies favor risk neutral scenarios while smaller companies utilize historical data more often when building their assumptions.

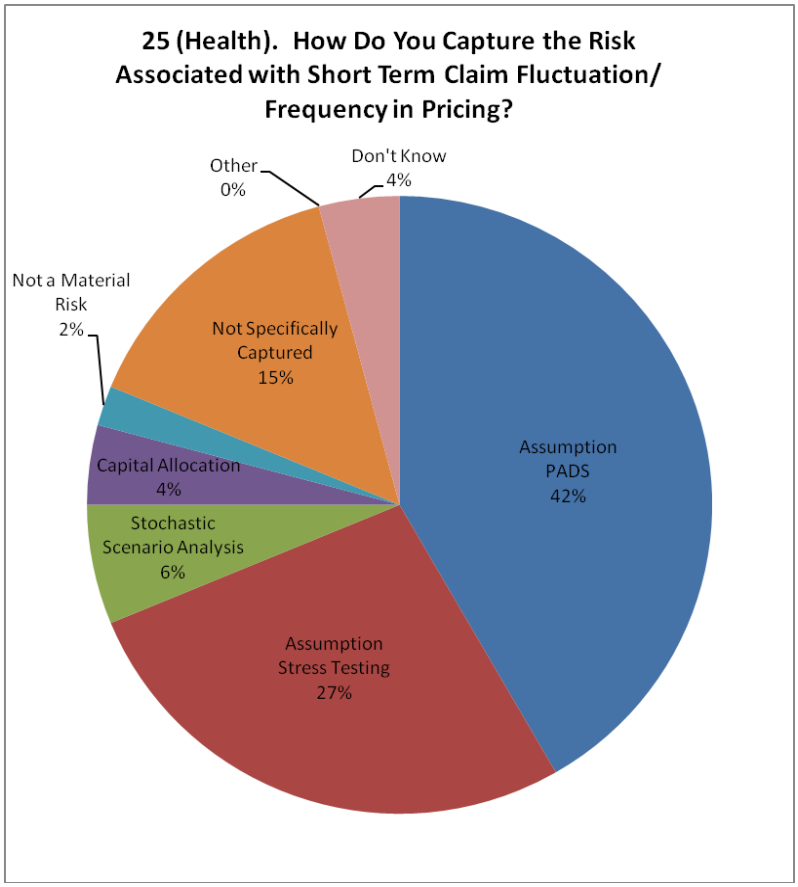
Question 24 – How do you capture the risk associated with adverse claim deviation/severity in pricing?

Health insurers use assumption PADs (40%) and assumption stress testing (30%). Assumption stress testing becomes less popular as the size of the company increases when assumption PADs slightly beat assumption stress testing in the largest of companies.



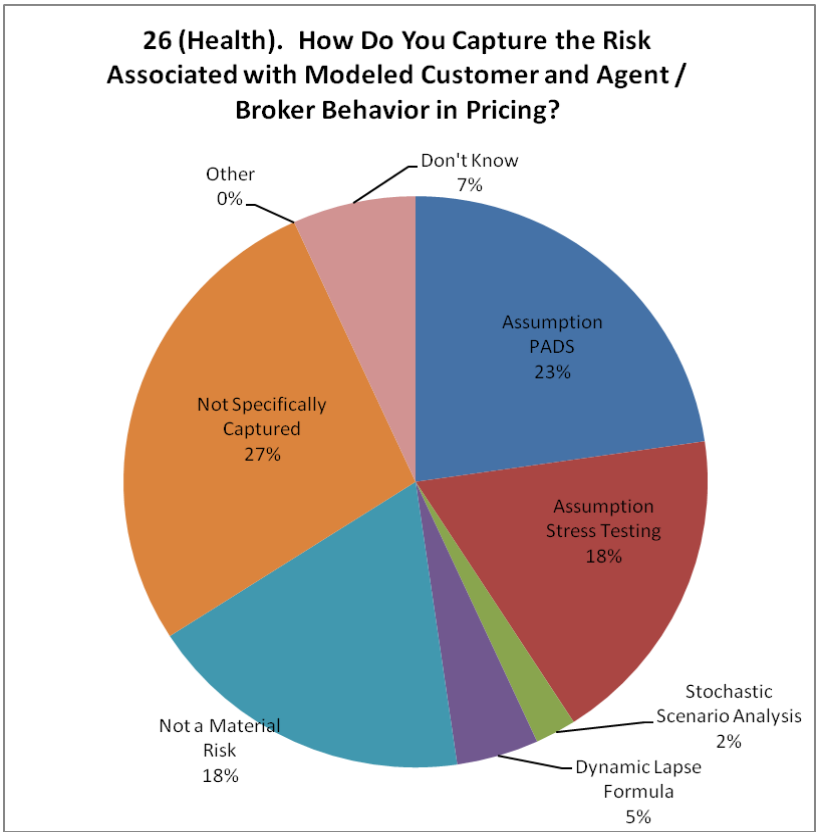
Question 25 – How do you capture risk associated with short-term claim fluctuations/frequency in pricing?

42% of health insurers use assumption PADs and 27% use assumption stress testing, while 15% do not specifically capture short-term fluctuations/frequency in pricing. Almost a quarter of the smallest and larger companies did not consider this risk material. A larger percentage of corporate/risk management actuaries use capital allocation for this risk.



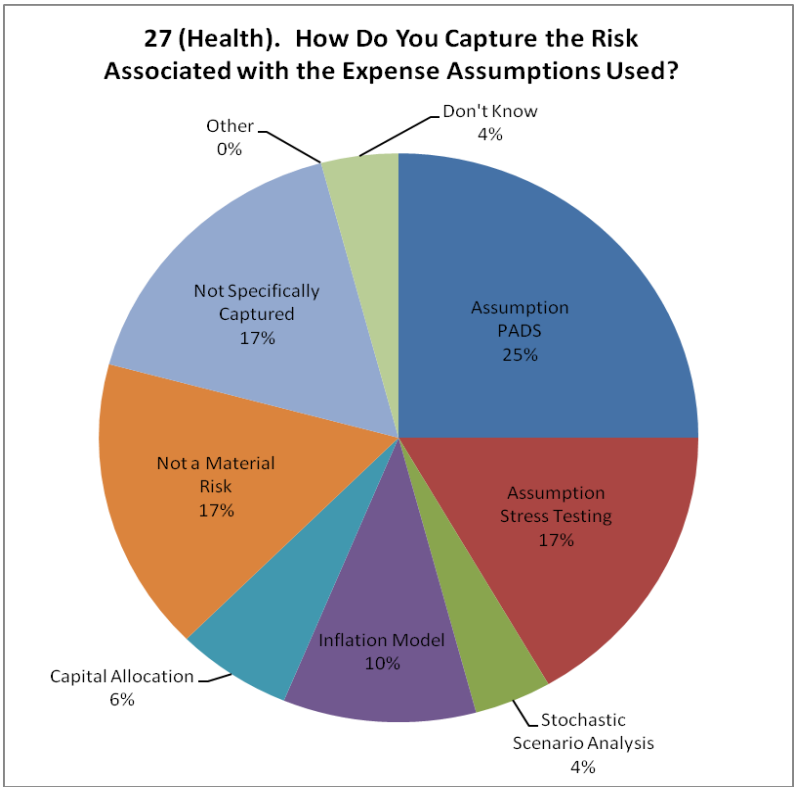
Question 26 – How do you capture the risk associated with modeled customer and agent/broker behavior in pricing?

Customer/agent/broker behavior is not captured by 27% of the reported respondents for health insurers. 23% use assumption PADs while 18% use assumption stress testing or do not consider this a material risk. The smallest of companies tend to not capture this risk specifically more so than other companies. The largest of companies report that dynamic lapse formula is used as often as assumption stress testing.



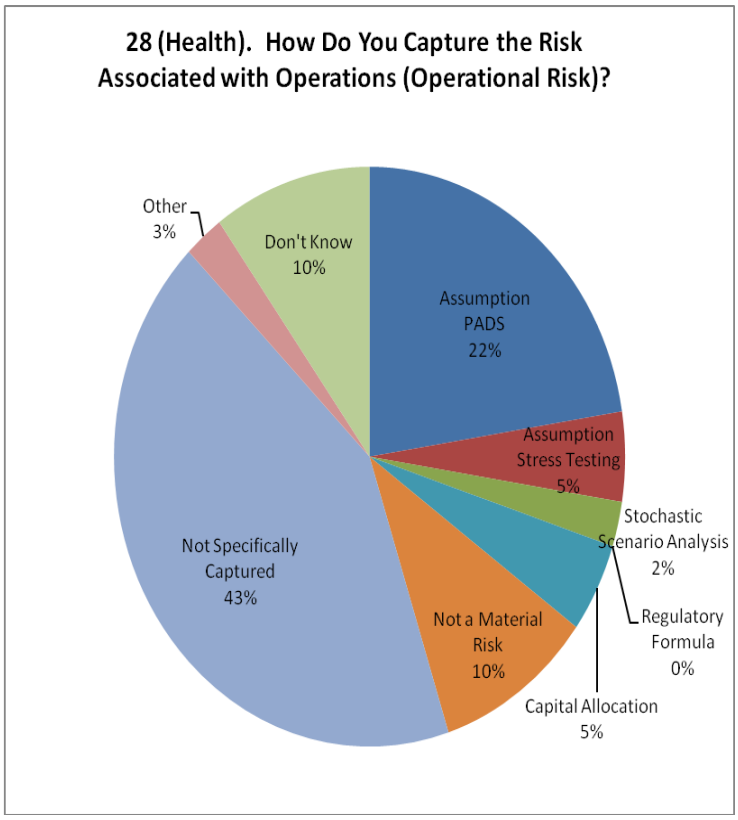
Question 27 – How do you capture the risk associated with the expense assumptions used?

25% of health insurers use assumption PADs and 17% use assumption stress testing. 34% (17% each) reported expense risk as not material or not specifically captured. Assumption stress testing gains popularity as the size of the company increases with the exception of the largest companies. The largest companies report the smallest use of assumption stress testing and the highest percentage of capital allocation for risk associated with expense assumptions.



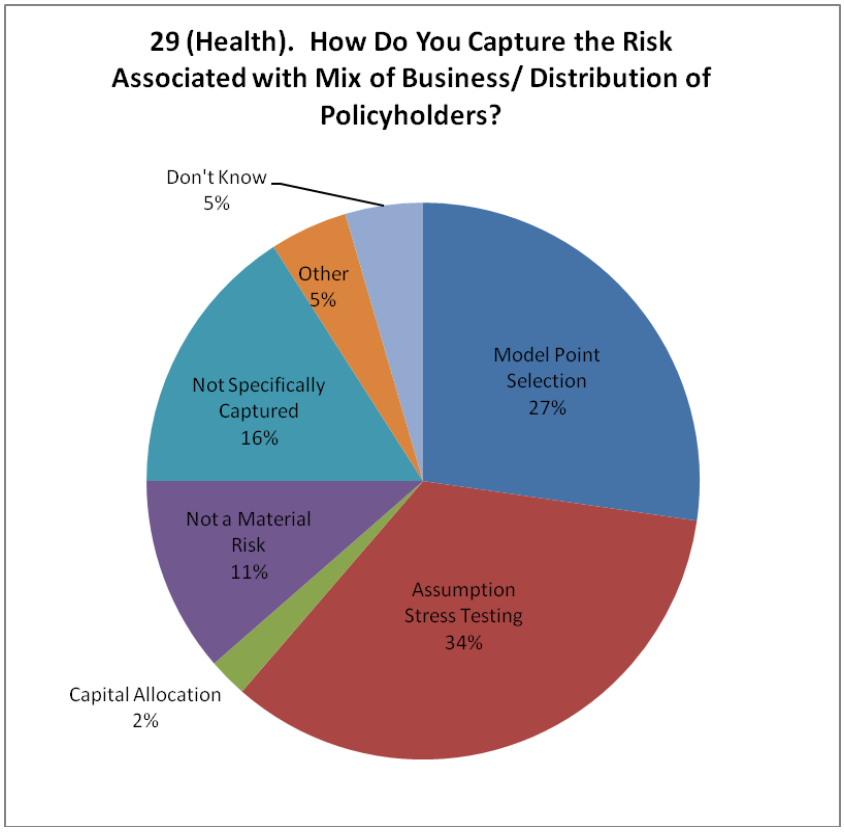
Question 28 – How do you capture the risk associated with operations (operational risk)?

43% of health insurers do not specifically capture operational risk, while 10% do not consider this a material risk. Those health insurers that do capture operational risk mainly use assumption PADs (22%). The largest companies report capital allocation as their most popular means of capturing operational risk. Other sized companies generally do not consider this risk specifically. Corporate/risk management actuaries use capital allocation to capture operational risk.



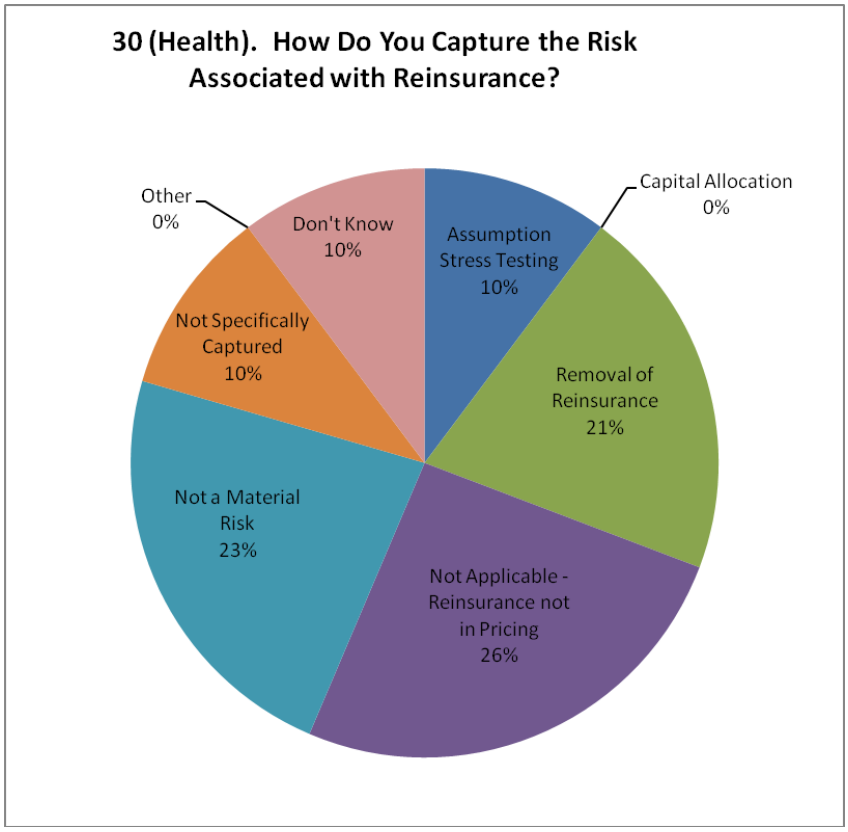
Question 29 – How do you capture the risk associated with mix of business/distribution of policyholders?

Distribution risk is captured through assumption stress testing (34%) and model point selection (27%). 16% do not specifically capture this risk and 11% do not consider distribution risk as material. Almost 30% of the smallest companies reported they do not specifically capture distribution risk.



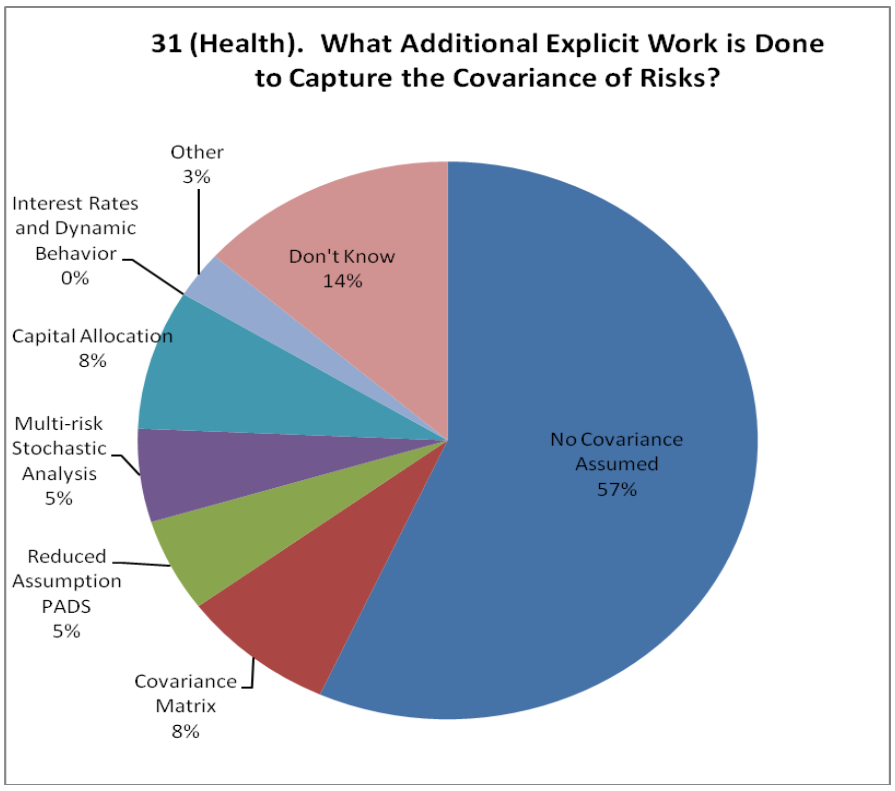
Question 30 – How do you capture the risk associated with reinsurance?

26% of health insurers report not using reinsurance, while others report reinsurance as not a material risk (23%) or not specifically captured (10%). 21% report removal of reinsurance as their way of capturing risk, and 10% use assumption stress testing. Reinsurance risk is captured and considered material in larger companies relative to smaller companies.



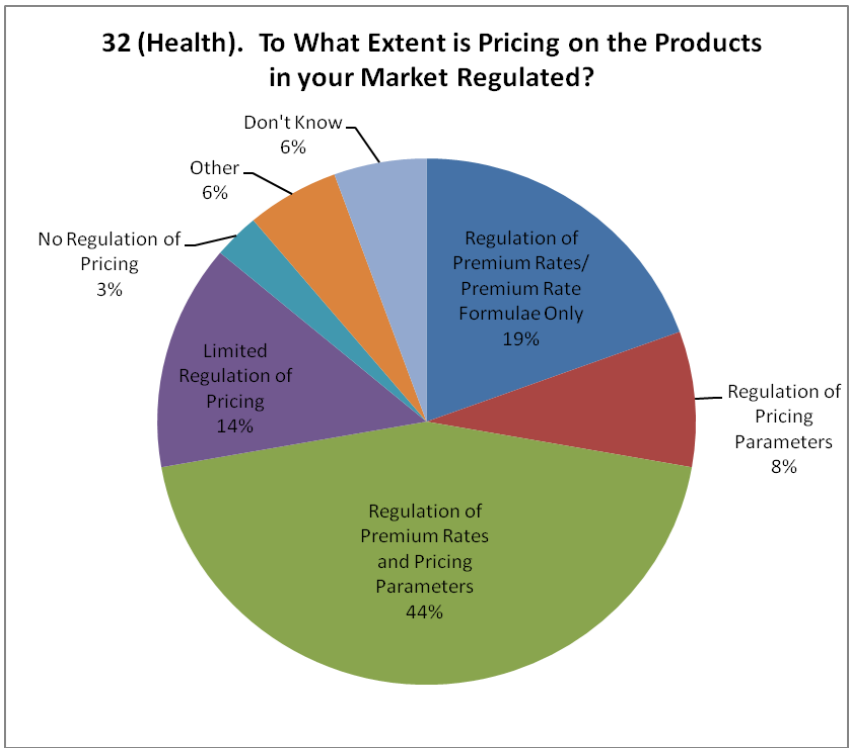
Question 31 – What additional explicit work is done to capture the covariance of risks?

Over half (57%) of health insurers do not capture covariance of risk. Those that do capture covariance of risk mainly use capital allocation (8%) or covariance matrix (8%). 60% of the smallest companies do not assume any covariance of risk.



Question 32 – To what extent is pricing on the products in your market regulated?

44% of health insurers report regulation of premium rates and pricing parameters. 19% report regulation of premium rates/formulae and 14% report limited regulation of pricing.



Property and Casualty

Question 1d – Which of the following profit measures do you use in pricing products.

Among Property and Casualty (P&C) responses, the leading profit measure for the personal line was ROE, then combined ratio, then expected loss ratio. Commercial lines of business ranked EV/EVA first, then ROE, then premium margin. The chart below shows the ranking of the profit measures by product line. Commercial pricing actuaries chose premium margin as the top measure. Personal corporate/risk management actuaries preferred risk adjusted return on capital to expected loss ratio.

Profit Measure Ranking	Personal	Commercial	Other	Total
Return on Investment	10	11	-	13
Return on Equity	**1**	**2**	**1**	**1**
Return on Liabilities	-	4	4	7
Risk Adjusted Return on Capital	4	8	**1**	5
Premium Margin	9	**3**	5	4
Embedded Value/Economic Value Added	6	**1**	**3**	**2**
Expected Loss Ratio	**3**	-	-	6
Combined Ratio	**2**	9	-	**3**
Break Even Year	11	-	-	14
Internal Rate of Return	8	5	5	8
Return on Assets	12	6	-	10
Return on Capital	5	10	-	9
Contribution to Surplus	7	-	-	12
Revenue Margin	-	-	-	-
Market Consistent Embedded Value	-	-	-	-
Other	-	7	-	11

"-" denotes that this profit measure was not indicated as used in any form for that product line.

Question 2 – If you use the following profit measure, how is risk assessed when using the profit measure?

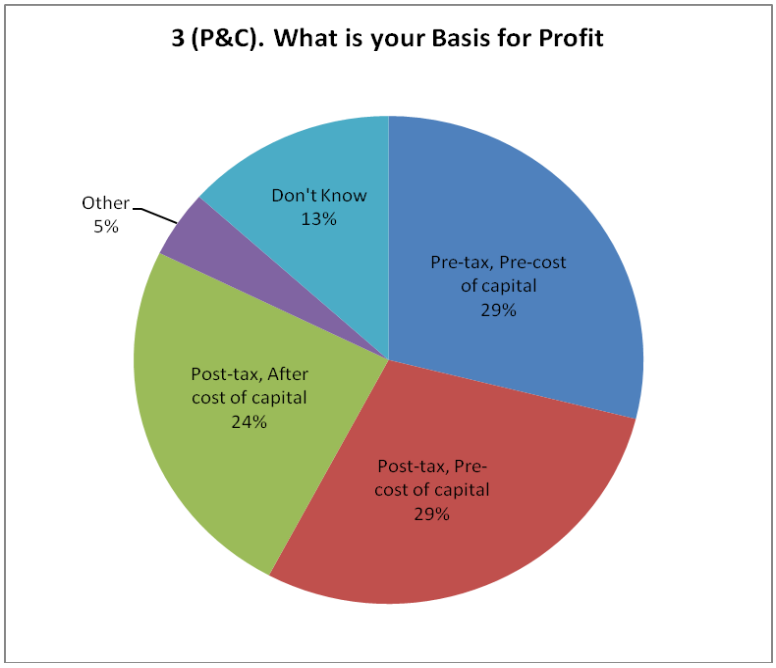
For companies using ROI, EV, Expected Loss Ratio, and contribution of surplus, stochastic scenario analysis is mainly used for risk assessment.

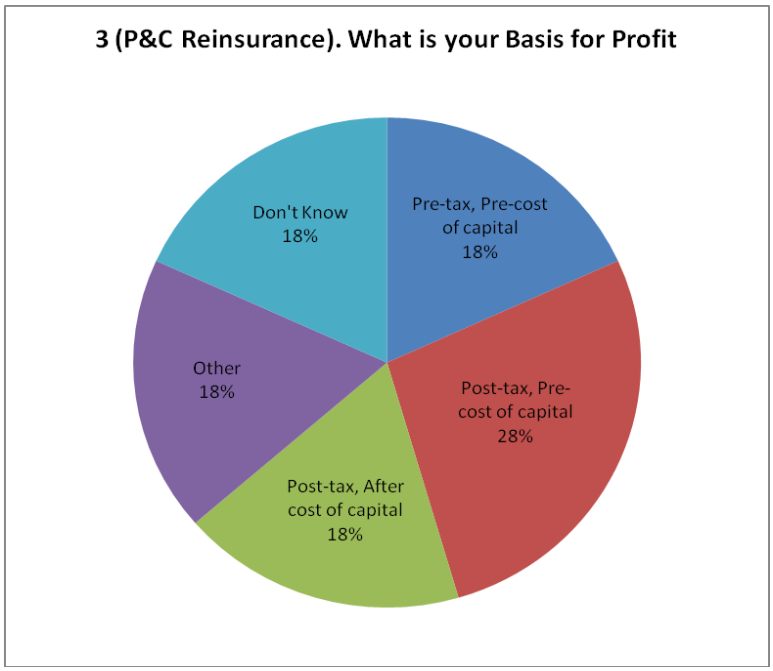
When ROE, Risk-adjusted Return on Capital, Combined Ratio, IRR and return on capital are the focus, capital allocation is the chief tool for risk assessment.

For Return on Liabilities, Premium Margin and Revenue Margin, companies mainly use risk-adjusted profit targets to assess risk.

The most commonly used measure for risk for P&C responses was capital allocation, followed by risk-adjusted profit targets and then stochastic scenario analysis. Assumption PADs is the least used method for P&C companies.

Question 3 – When defining your profit measure, what is the basis for profit?





Top choices for P&C writers include post-tax, pre-cost of capital (29%) and pre-tax, pre-cost of capital (29%). P&C reinsurers chose post-tax, pre-cost of capital (28%), then evenly split between the other methods.

Question 4 – What accounting basis is used for assessing your primary profit measure?

40% of P&C writers and 50% of P&C reinsurers reported using US GAAP as their primary profit measure accounting basis. 30% of P&C writers and 10% of P&C reinsurers reported using US Statutory as their primary profit measure accounting basis. For P&C direct companies, 7% indicated using Canadian GAAP, 8% reported "other" and 15% did not know. 40% of P&C reinsurers reported they did not know their accounting basis. No responses reported using IFRS or IAS.

Question 5 – Do you measure actual profitability against projected pricing profitability?

P&C writers responded "Yes, frequently" 45% of the time, "Occasionally" 40% of the time, and "No" 15% of the time to measuring actual to projected profitability. P&C reinsurers similarly reported 40%, 40%, and 20% for these same choices. Generally, as the size of the companies increase, the percentage of "yes" responses increased as well.

Question 6 – If you measure actual profitability versus projected profitability, is this information passed back into the pricing process for future pricing?

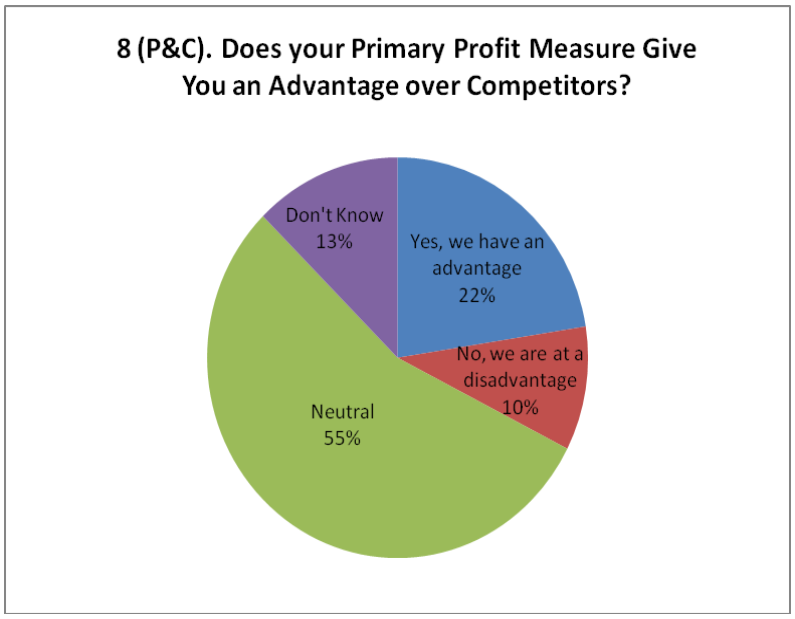
P&C writers responded 44% of the time with "Yes, frequently," 38% "Occasionally,", and 18% "No" to feeding actual to projected profitability back through the pricing process. P&C reinsurers reported 37% of the time "Yes, frequently," 63% "Occasionally,", and 0% "No" to feeding information back through the pricing process.

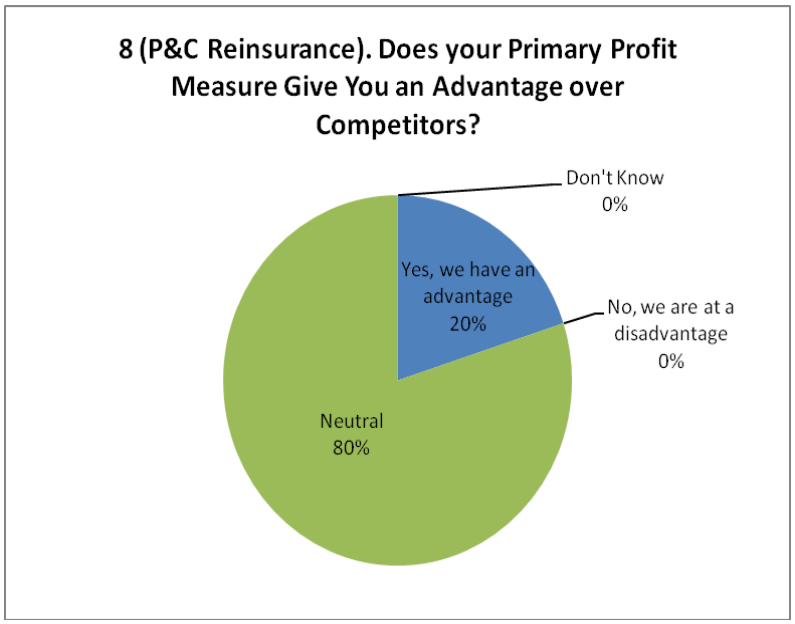
Question 7 – Do you feel your profit measures are substantially different from your competitors?

Most P&C companies do not feel they have a substantially different profit measure from their competitors – 53% of P&C direct, 80% of P&C reinsurers. P&C reinsurers were otherwise unsure of any difference. 27% of P&C direct writers felt they did have substantially different profit measures, while 20% were unsure of any difference. The largest and smallest companies reported the highest percentages (31% largest, 26% smallest) of believing their profit measure was substantially different than their competitors.

Question 8 – Do you feel your primary profit measures give you an advantage against your competitors?

22% of P&C direct writers and 20% of P&C reinsurers felt they did have an advantage using their primary profit measure. 10% of P&C direct writers felt they were at a disadvantage using their primary profit measure. Most P&C companies (55% direct and 80% of reinsurers) felt neutral in their use of their primary profit measure.

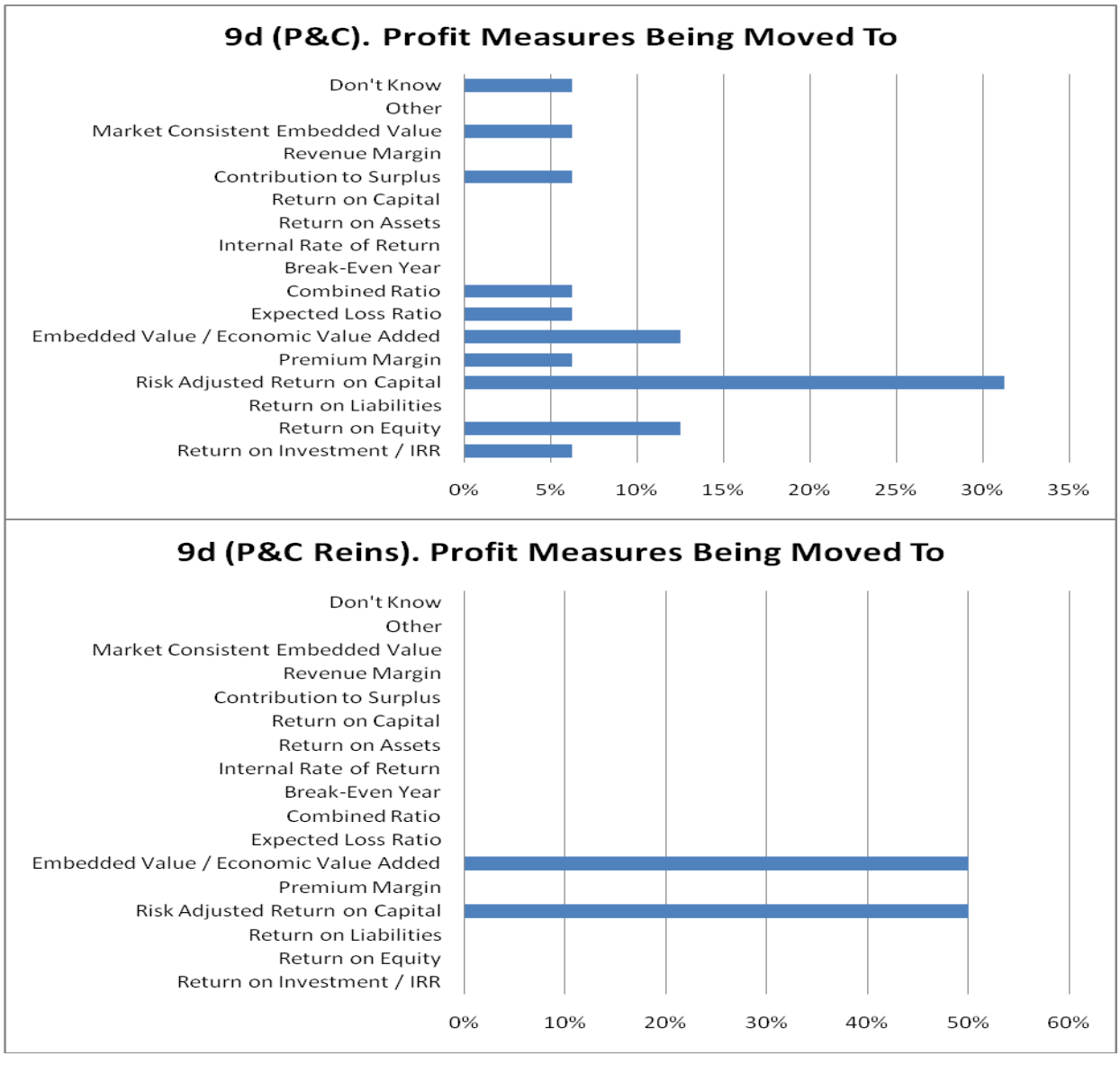




Question 9 – Have you changed your primary profit measure within the last 3 years? If so, what profit measure did you move away from? Which profit measure are you moving to?

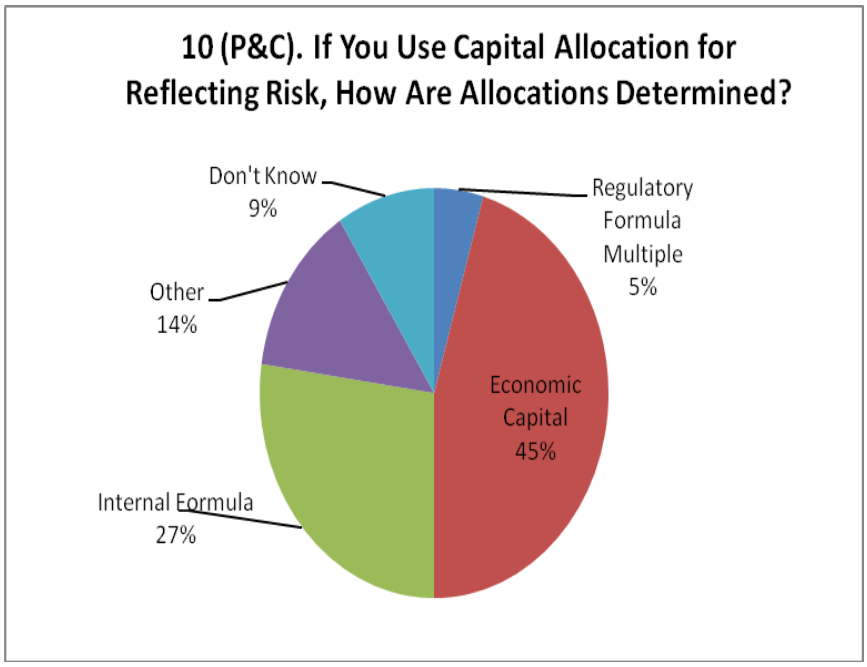
A large portion of the P&C responses report a change in their primary profit measure – 72% of direct and 80% of reinsurers – in the last 3 years. More smaller and mid-sized companies reported changing their profit measure recently than larger companies. It is not surprising given the number of companies reporting a change in the last 3 year that the response to "are you planning to change" came up primarily with "No" – 67% of direct and 70% of reinsurers. Those that do plan to change responded they will likely do so within 3 years.

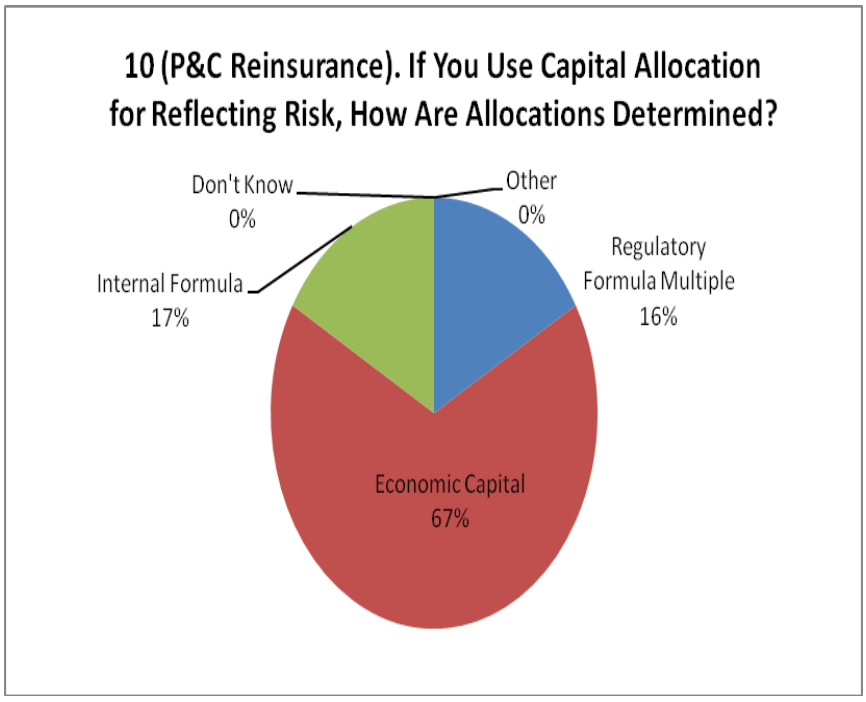
Companies that reported a change or desire to change primarily moved away from combined ratio and expected loss ratio to risk-adjusted return on capital, ROE and embedded value.



Question 10 – If you use capital allocation for reflecting risk, how are these allocations determined?

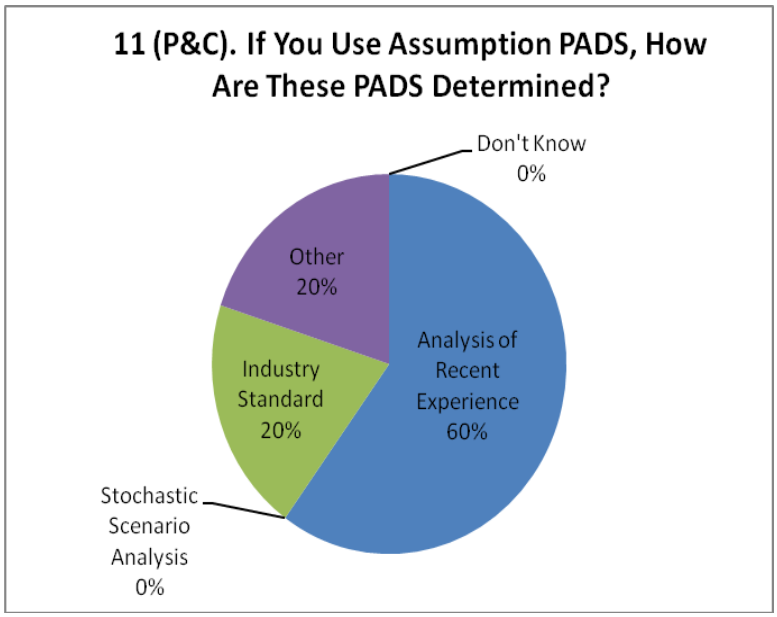
For those P&C companies who reported using capital allocation, 45% of direct writers and 67% of reinsurers use economic capital to determine that allocation. 27% of direct companies and 17% of reinsurers reported using an internal formula. Only 5% of direct insurers and 16% of reinsurers reported using a regulatory formula multiple for capital allocation. Smaller companies tend to use a regulatory formula multiple. Larger companies are using more economic capital for capital allocation.





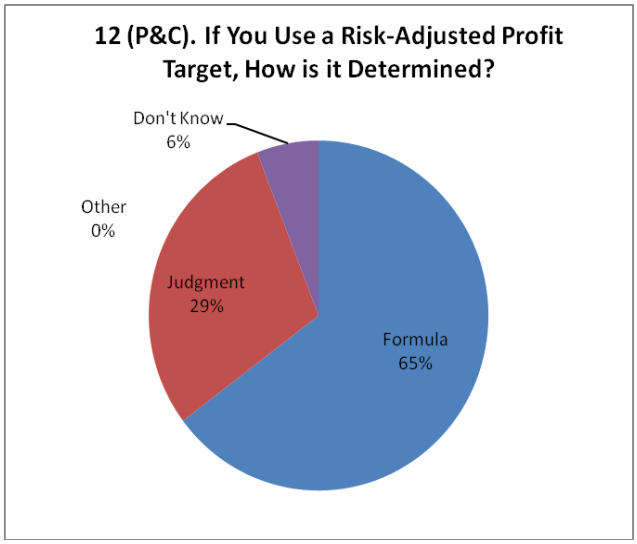
Question 11 – If you use Assumption PADS, how are these PADS determined?

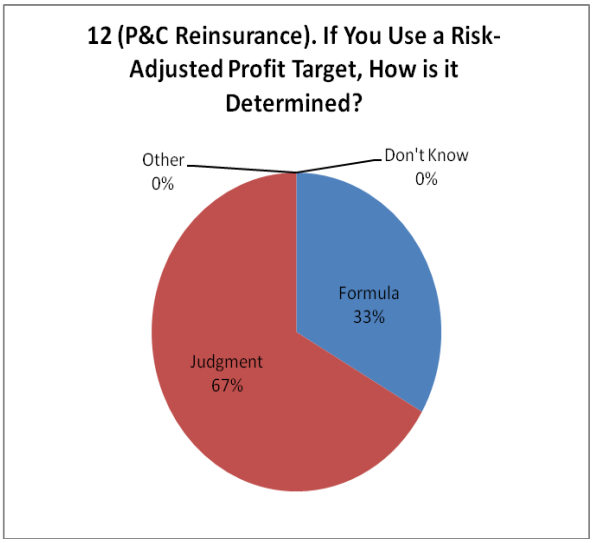
Analysis of actual experience is used 60% of the time for direct writers, with the remainder evenly split 20% each for industry standard and "Other" for determining PADs. No P&C reinsurer reported using PADs in the survey. Larger companies reported more use of stochastic analysis than smaller to mid-size companies when determining assumption PADs, although analysis of recent experience is still more used among all companies.



Question 12 – If you use a Risk-Adjusted Profit Target, how is it determined?

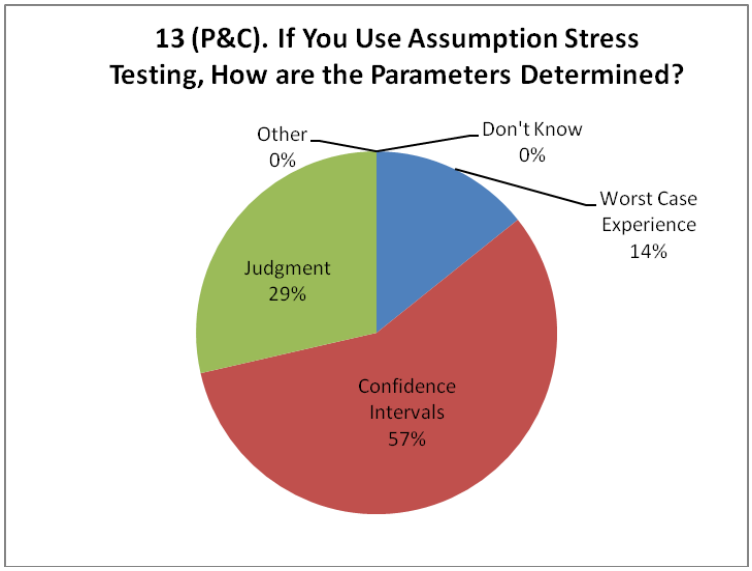
Risk-adjusted profit targets are determined by formula (65%) then judgment (29%) for P&C direct writers. Reinsurers use judgment (67%) then formula (33%). Mid-size and larger companies use more judgment for determining risk-adjusted profit measure. The largest companies were more formula driven.





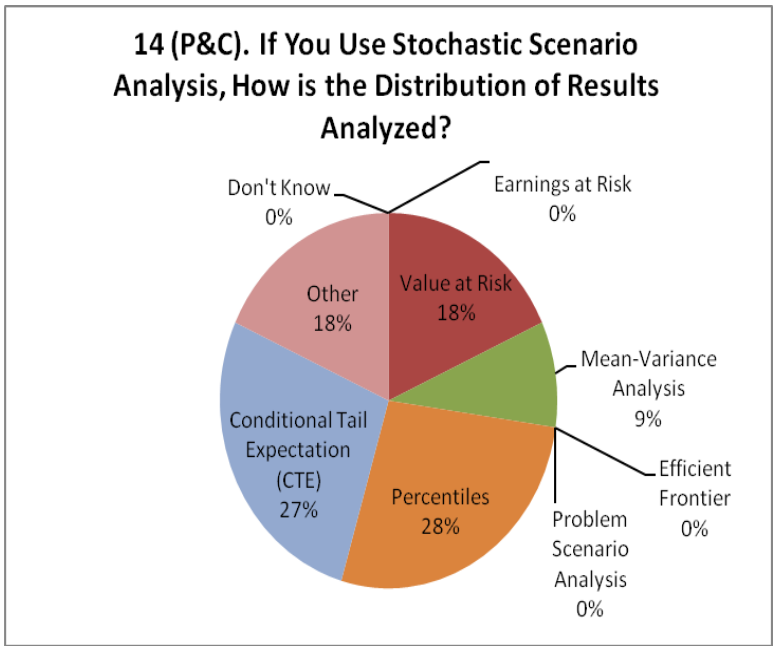
Question 13 – If you use Assumption Stress Testing, how are the parameters determined?

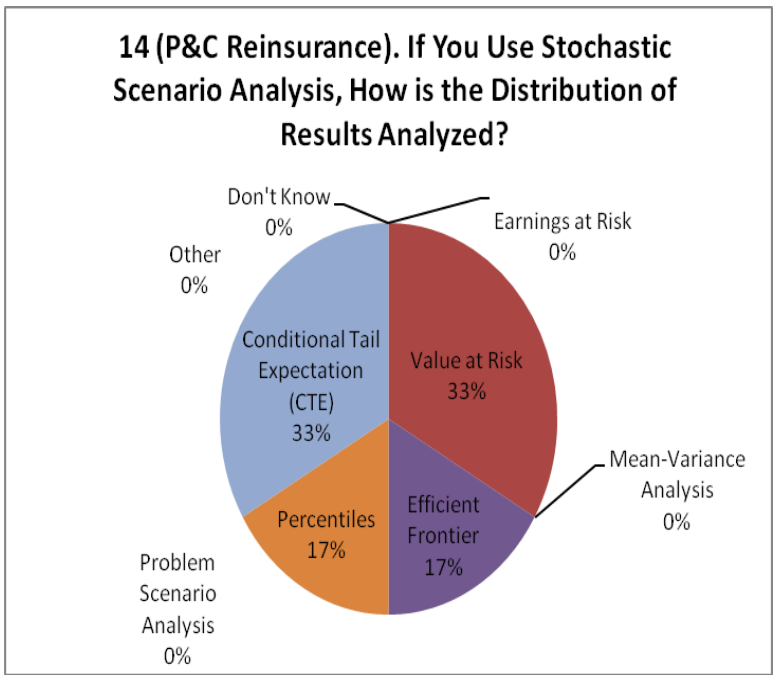
Of those who use assumption stress testing, 29% of P&C writers and 100% of P&C reinsurers use judgment. Confidence intervals are used by 57% of the P&C writers, followed by 14% using worst case. Larger companies reported using more confidence intervals relative to other sized companies, but judgment is still the primary method for determining parameters for assumption stress testing.



Question 14 – If you use Stochastic Scenario Analysis, how is the distribution of results analyzed?

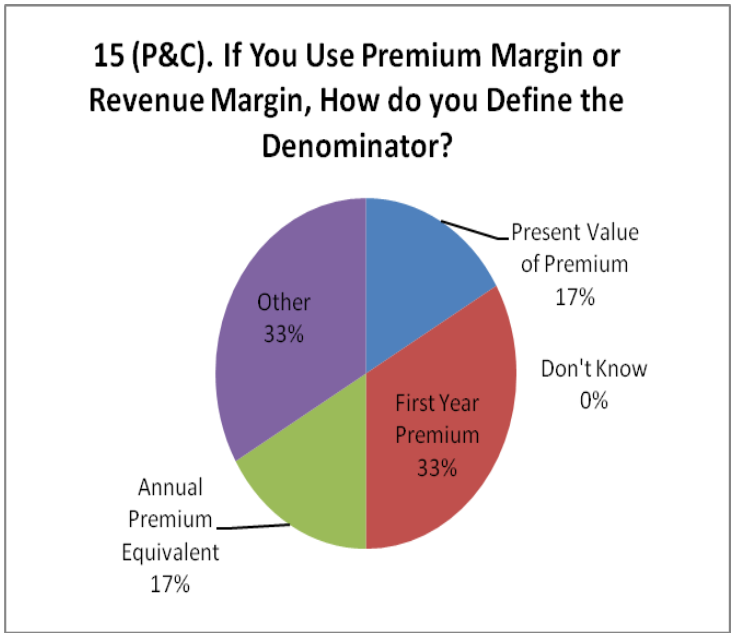
P&C writers mainly use percentiles (28%) and CTE (27%), closely followed by Value at Risk (18%) or some combination of the percentiles and CTE (18%) for distribution of results. P&C reinsurers use CTE (33%) and Value at Risk (33%), followed by efficient frontier (17%) and percentiles (17%). Smaller and the largest companies report using more percentiles than using CTEs when analyzing distribution results from stochastic scenario analysis.

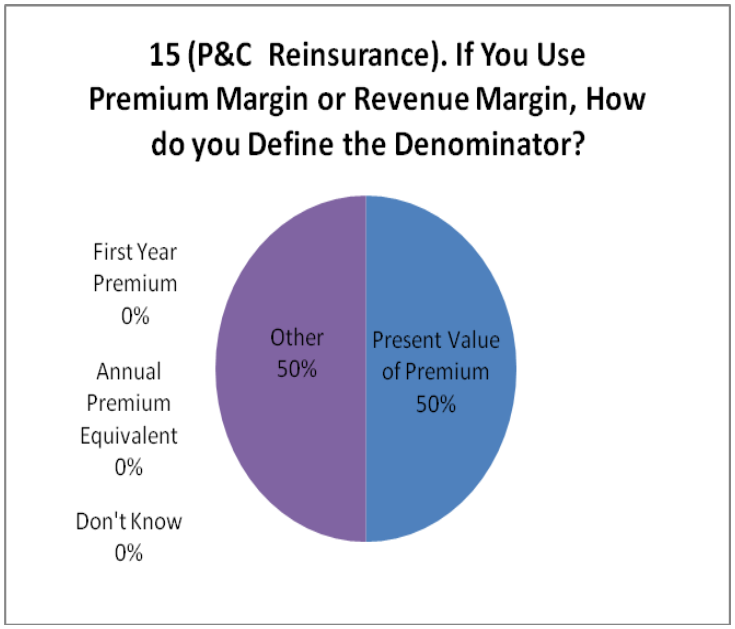




Question 15 – If you use Premium Margin or Revenue Margin, how do you define the denominator of the equation?

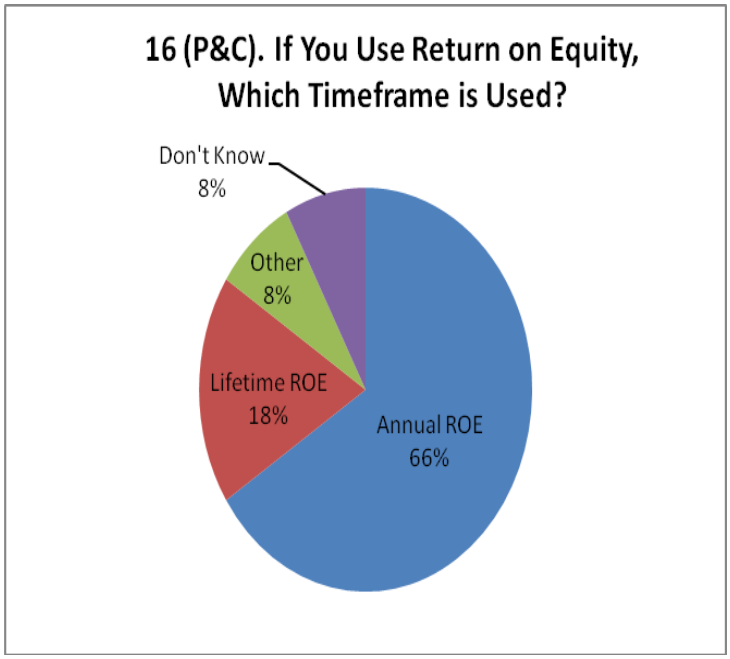
P&C writers use first year premium (33%), "Other" (33%), and present value of premium or annual premium equivalent (17% each) as the denominator in premium or revenue margin calculations. For P&C reinsurers, responses split 50%/50% for present value of premium and other.

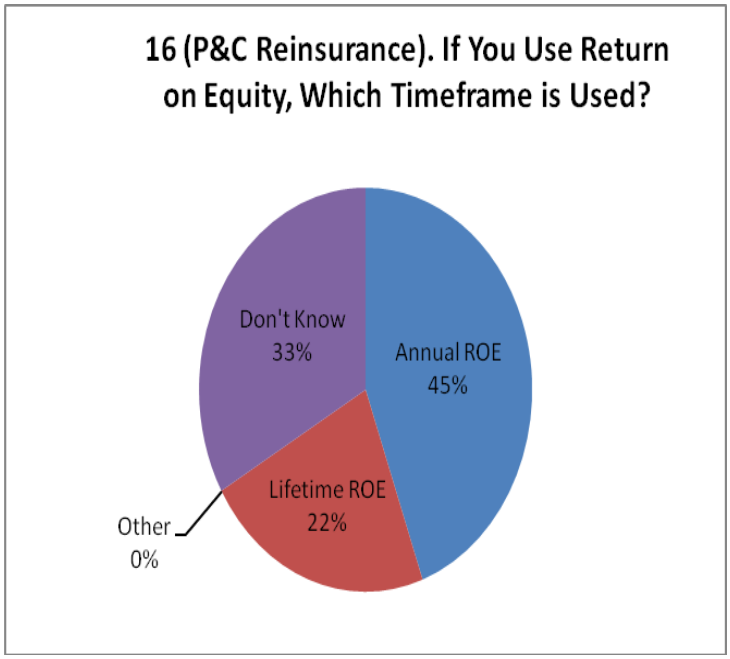




Question 16 – If you use ROE, which of the following timeframes is used?

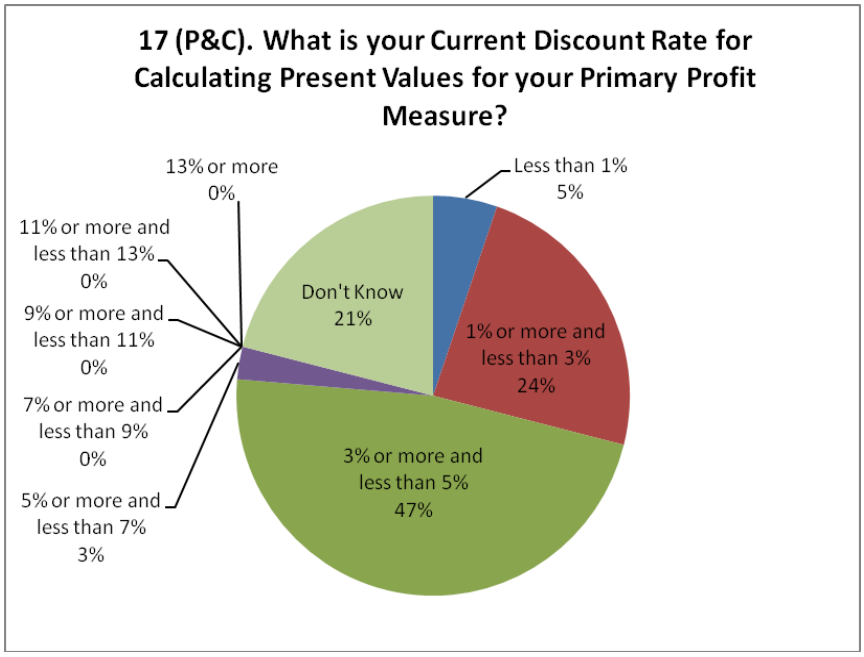
Annual ROE is the leading timeframe for P&C, specifically 66% for direct writers and 45% for reinsurers. Lifetime ROE is used by 18% of direct companies and 22% of reinsurers for P&C lines. Midsize to larger companies have a higher percentage of lifetime ROE (between 47%-49%). The smallest and largest companies were more evenly split between lifetime and annual ROE.

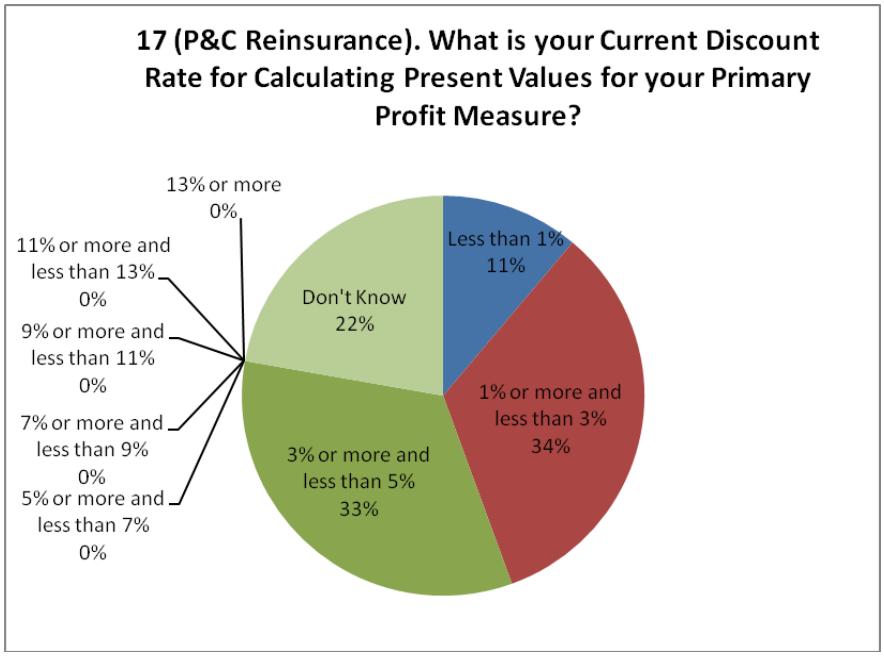




Question 17 – What is the level of your current discount rate when calculating present values for your primary profit measure?

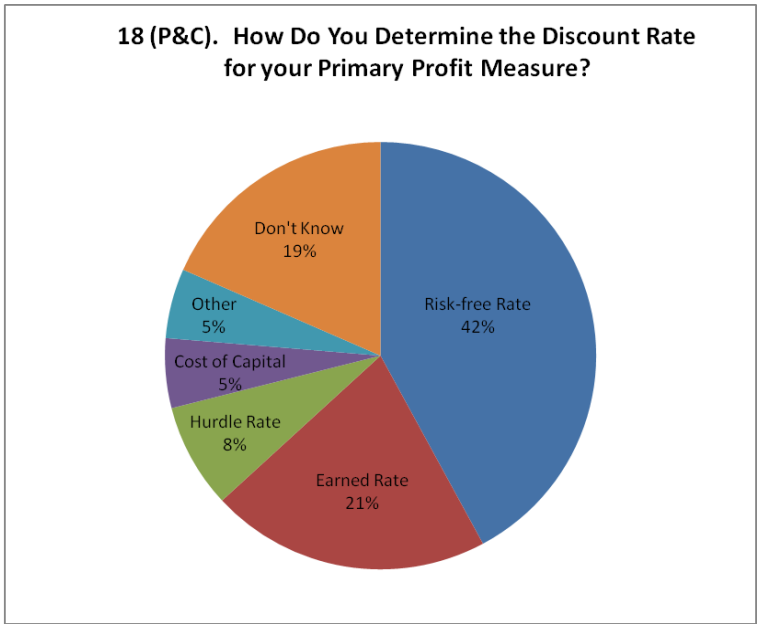
Current discount rates are generally between 1% and 5% for P&C companies. Very few direct P&C companies indicate use of a discount rate greater than 5%, while many were not able to answer. Companies that completed the size of the company question report heavier weighting in the 3%-5% rather than 5%-7%.

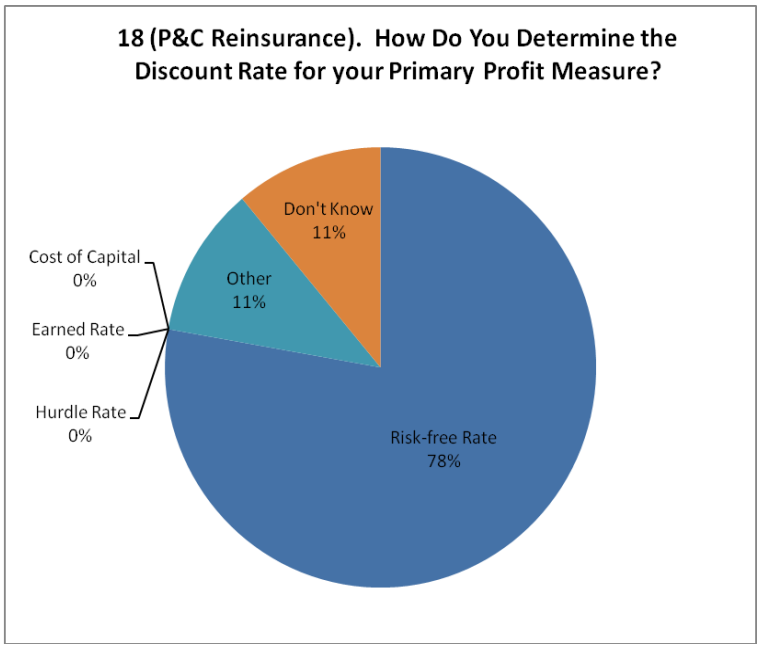




Question 18 – How do you determine the discount rate for your primary profit measure?

The leading source for discount rates is risk free rates, chosen by 42% of P&C direct companies and 78% of P&C reinsurers. P&C direct writers chose earned rates (21%), hurdle rate (8%) and cost of capital (5%). Earned rate is more popular among the smallest and mid-sized companies. Smaller and the largest companies favor risk free rates. Larger companies in the survey use hurdle rates more often.





Question 19 – Given the recent economic environment, has your company made changes to its risk assessment practices?

Most P&C companies have made no changes due to the recent economic environment. 50% of direct issuers and 56% of reinsurers made no changes. 29% of direct companies and 11% of reinsurers did indicate a change has been made due to the economy. Larger companies have made more changes based on the economic environment relative to smaller companies.

Question 20 – Do you employ an enterprise risk actuary or have an enterprise risk management area in your company?

66% of direct writers and 67% of reinsurers indicated they do employ an enterprise risk area or actuary in their companies. 18% of direct insurers and 22% of reinsurers do not employ and are not considering the addition of an enterprise risk area or actuary. Smaller companies are less likely to employ ERM areas/actuaries in their organizations, with only 32% responding "yes" and 43% not considering hiring ERM areas/actuaries.

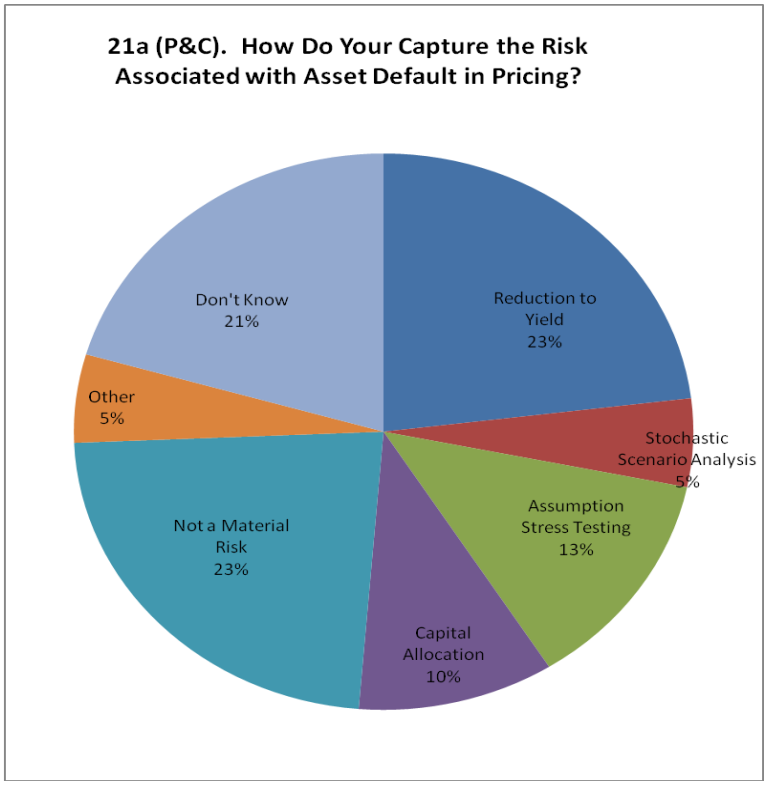
Question 21 – How do you capture risk associated with asset default in pricing? Who determines the parameter and magnitude of the asset default in pricing? How is the amount of the asset default adjustment determined?

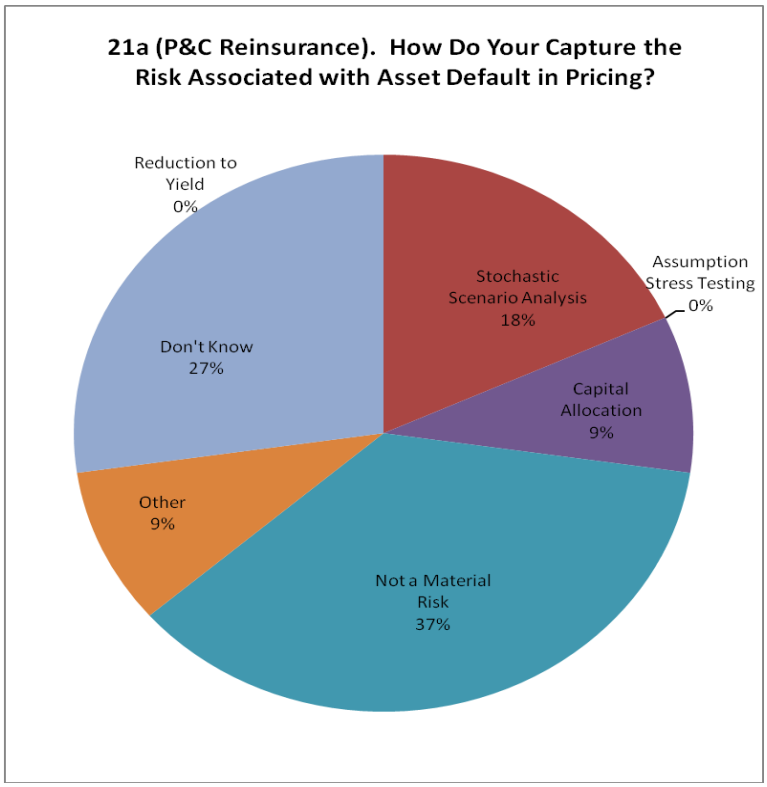
Asset default is not considered a material risk by 23% of direct and 37% of reinsurance P&C companies. Direct writers that do capture this risk use reduction to yield (23%) or assumption stress testing (13%). Reinsurers use stochastic scenario analysis (18%) and capital allocation (9%). Many responses did not know how this risk was captured.

For those capturing asset default risk, parameters and magnitude are determined by input from a combination of investment, actuarial, and enterprise risk management areas (20%). 23% of companies replied "not applicable" and 20% did not know who determined these elements.

The amount of asset default is determined by internal model (29%) and commercial software (9%) for direct P&C writers. P&C reinsurers use internal model (22%) or other (11%). Most responses were not applicable or did not know.

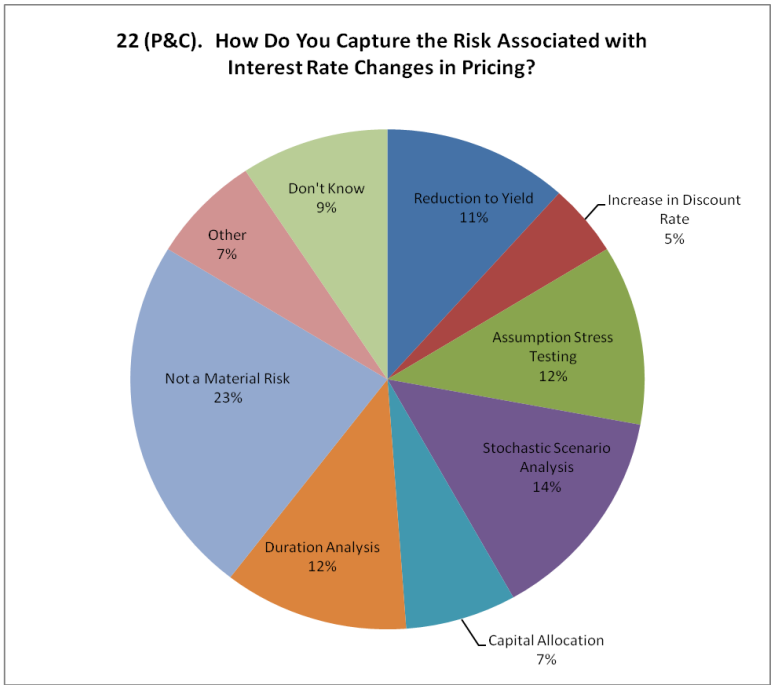
20% of the smallest companies did not consider default risk as material. The largest companies tend to use more tactics than reduction to yield for capturing asset default relative to other companies. Smaller companies tend to use only one area rather than a combination of areas to determine the parameters and magnitude of defaults. Internal models are the most popular method, but rating agency formulas are used by smaller companies more often than larger companies.

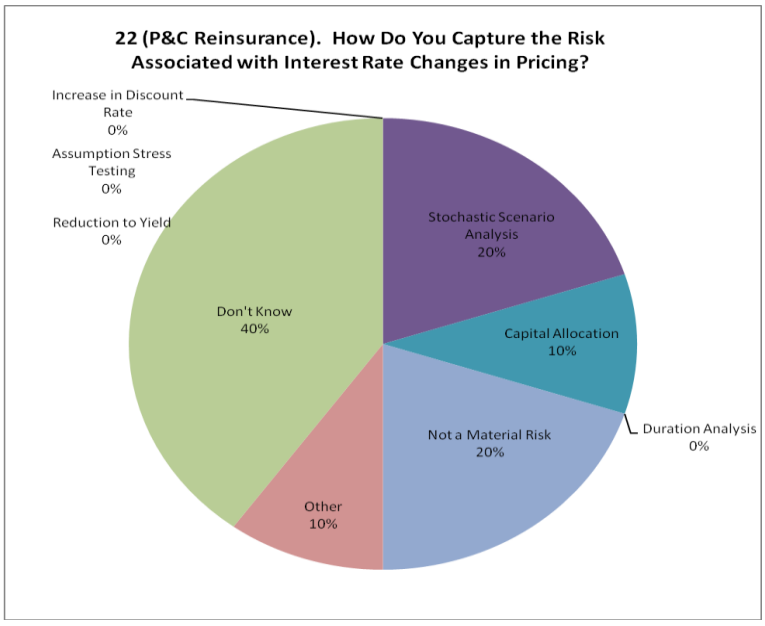




Question 22 – How do you capture risk associated with interest rate changes in pricing?

For P&C direct writers, there was no dominant means for determining interest rate risk. Responses ranged from stochastic scenario testing (14%), assumption stress testing (12%), duration analysis (12%), and reduction to yield (11%). 23% of respondents indicated this was not a material risk. For P&C reinsurers, 40% did not know how interest rate risk was captured. 20% each indicated using stochastic scenario analysis or that it was not a material risk. 10% used capital allocation and 10% use some other method to capture interest rate risk. Larger companies slightly favored stochastic scenario analysis to assumption stress testing.

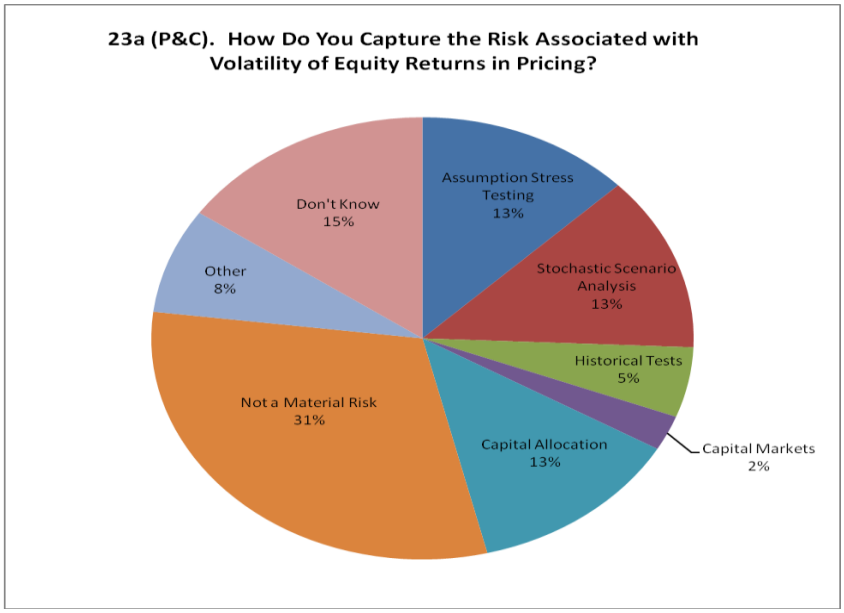


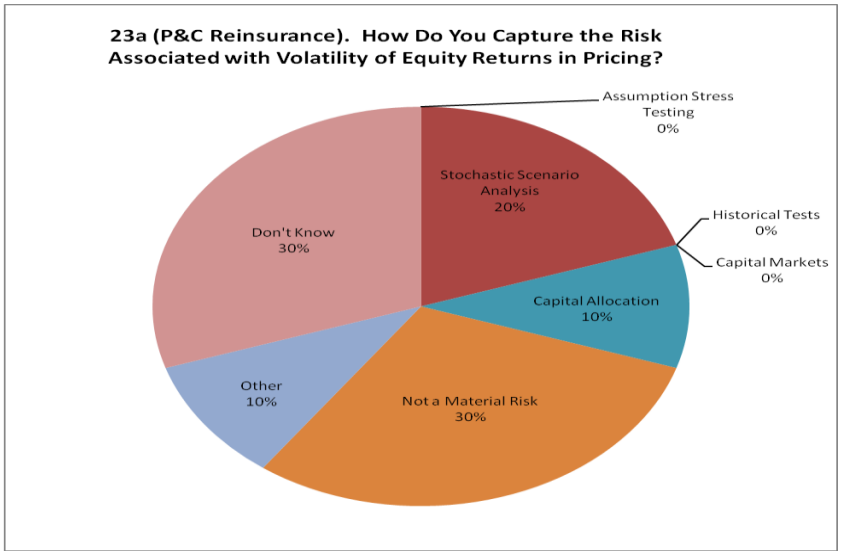


Question 23 – How do you capture the risk associated with the volatility of equity returns in pricing? If you use stochastic analysis, what areas do you look at for assumptions used in generating the scenarios?

31% of direct writers and 30% of reinsurers indicate equity volatility is not a material risk. For direct P&C writers, 13% each chose stochastic scenario analysis, assumption stress testing and capital allocation. For P&C reinsurers, 20% chose stochastic scenario analysis, while 10% each chose capital allocation or some other method to capture volatility risk.

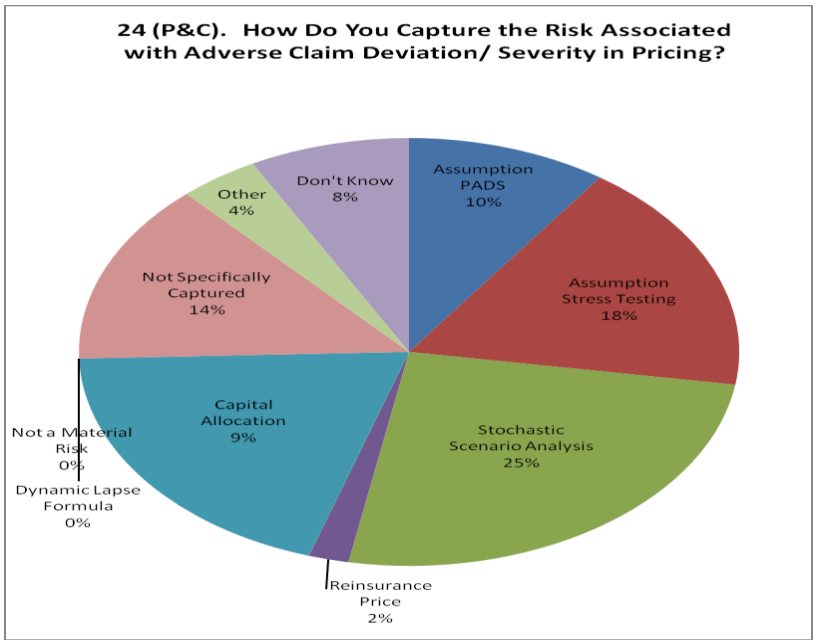
For direct P&C writers using stochastic scenario analysis, 43% use historical information, 33% use capital markets and 11% use mean reversion to generate scenarios. For P&C reinsurers, 33% use historical, 33% use capital markets, 17% use arbitrage free and 17% use risk neutral. Larger companies favor risk neutral while smaller companies utilize historical more often when building assumptions.

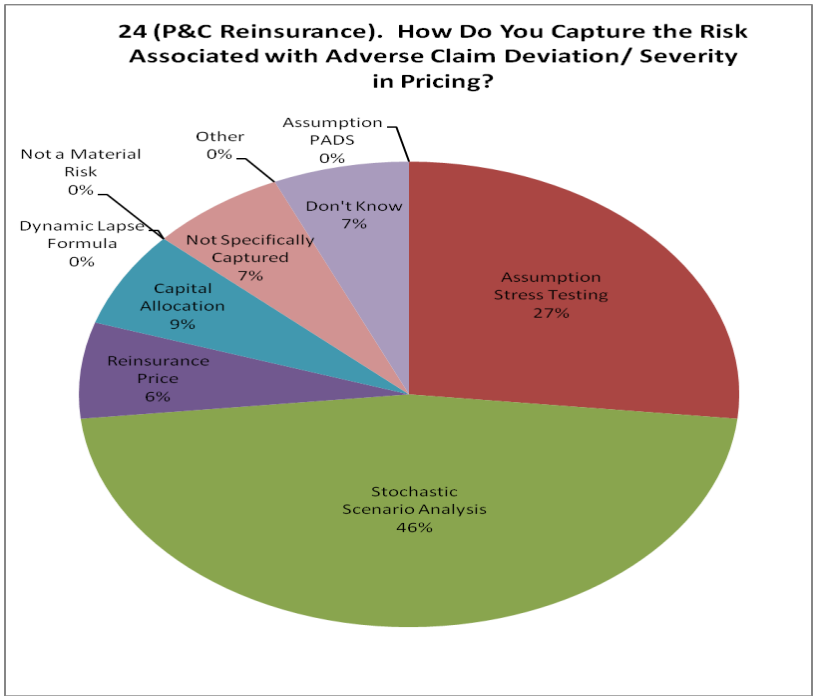




Question 24 – How do you capture the risk associated with adverse claim deviation/severity in pricing?

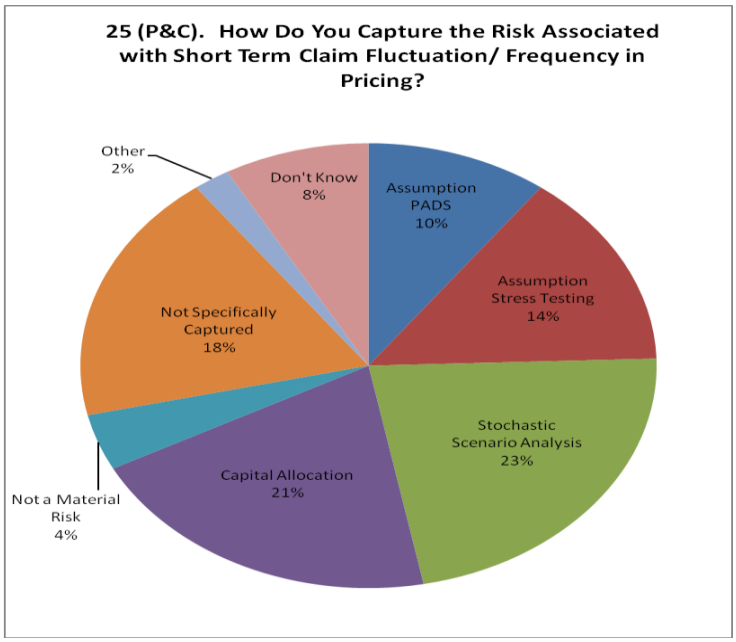
25% of P&C direct companies use stochastic scenario analysis and 18% use assumption stress testing, while 14% report claims deviation/severity as not specifically captured. P&C reinsurers use stochastic scenario analysis (46%) and assumption stress testing (27%). Assumption stress testing becomes less popular as the size of the company increases, when Assumption PADs slightly beat assumption stress testing in the largest of companies.

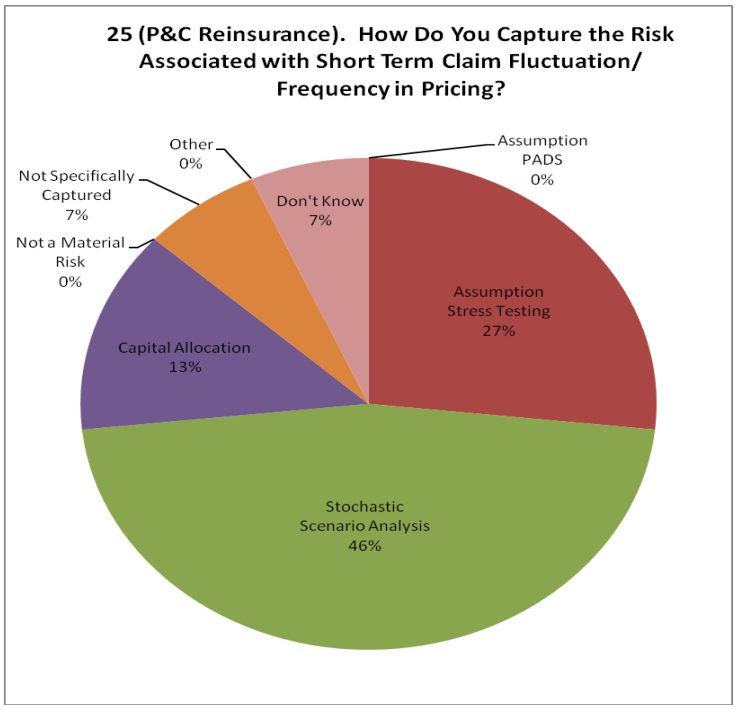




Question 25 – How do you capture risk associated with short-term claim fluctuations/frequency in pricing?

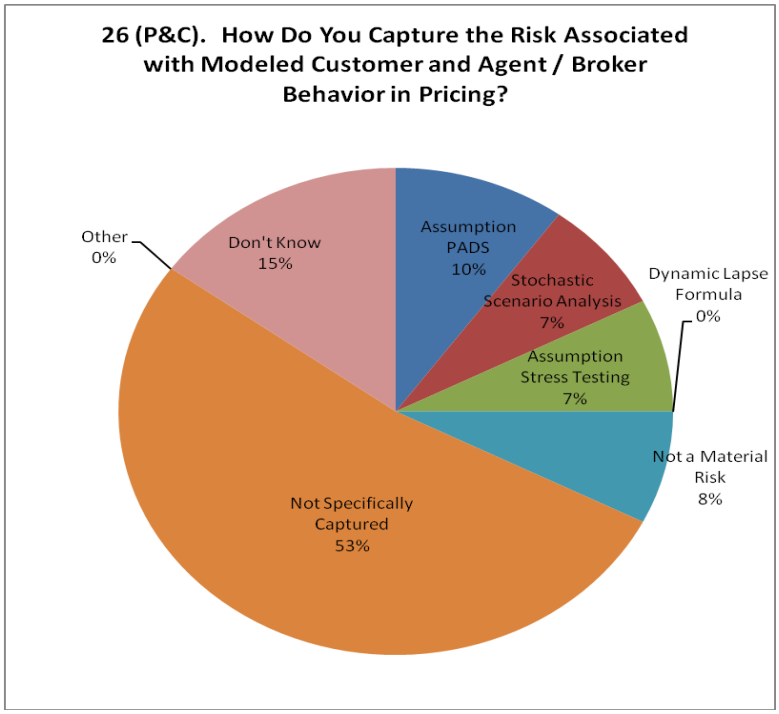
Direct P&C insurers use stochastic scenario analysis (46%) and capital allocation (21%), while 18% report claims fluctuation/frequency is not specifically captured. P&C reinsurers report using stochastic scenario analysis (46%) and assumption stress testing (27%). Almost a quarter of the smallest and larger companies did not consider this risk material. A larger percentage of corporate/risk management actuaries use capital allocation for this risk.

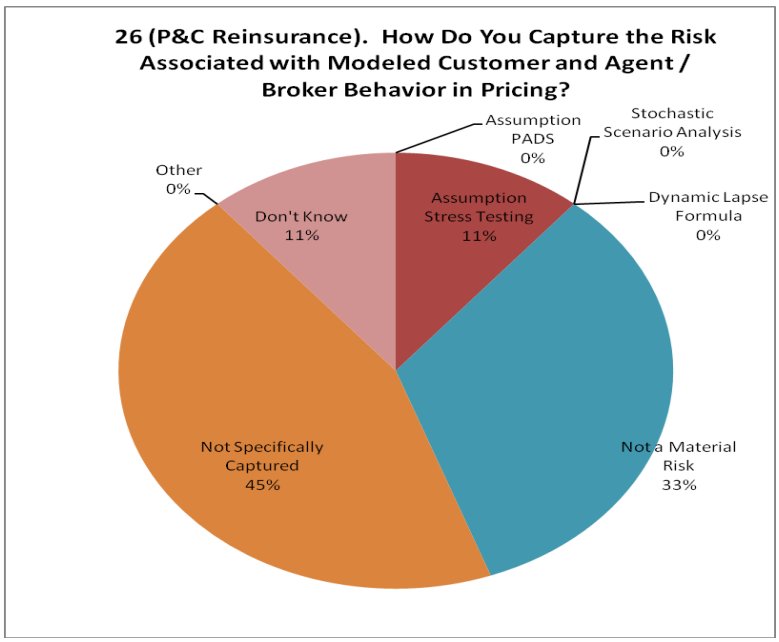




Question 26 – How do you capture the risk associated with modeled customer and agent/broker behavior in pricing?

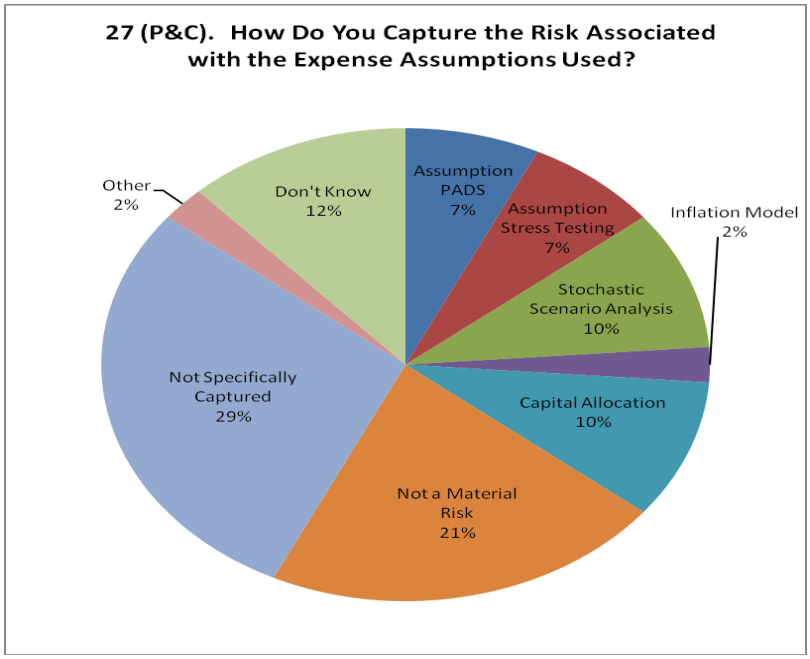
53% of P&C direct writers and 45% of P&C reinsurers do not specifically capture customer/agent/broker behavior. 33% of reinsurers do not view this as a material risk. The smallest of companies is more likely to not capture this risk specifically than other companies. The largest of companies reported that dynamic lapse formula is used as often as assumption stress testing.

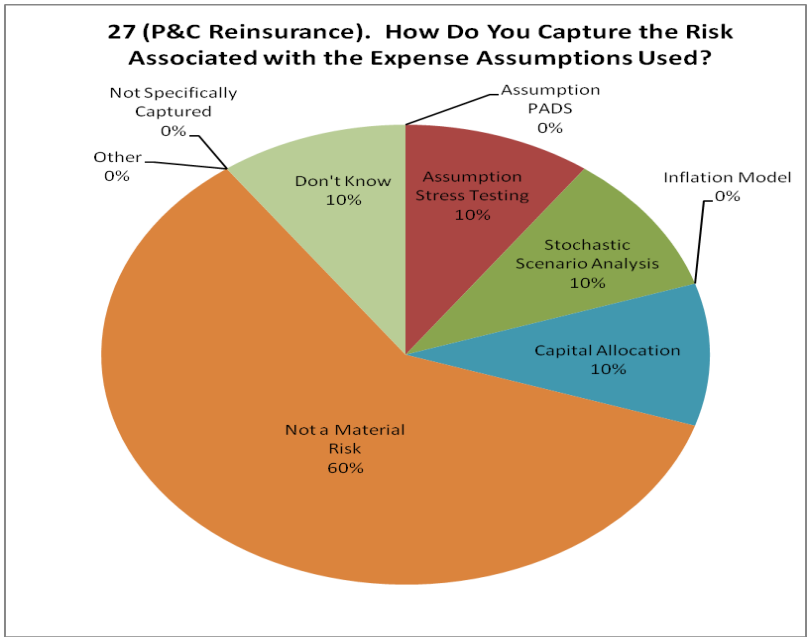




Question 27 – How do you capture the risk associated with the expense assumptions used?

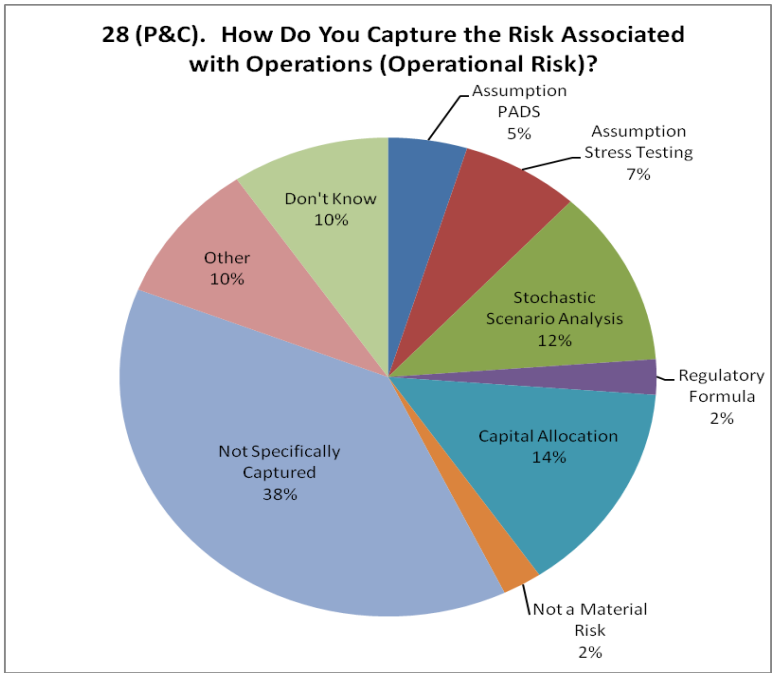
Half of P&C direct writers assume that expense assumption risk is either not material (21%) or not specifically captured (29%). 60% of P&C reinsurers assume expense risk is not material. In general, P&C companies that do capture expense risk use capital allocation (10%) or stochastic scenario analysis (10%). Assumption stress testing gains popularity as the size of the company increases with the exception of the largest companies. The largest companies report the smallest use of assumption stress testing and the highest percentage of capital allocation for capturing risk associated with expense assumptions.

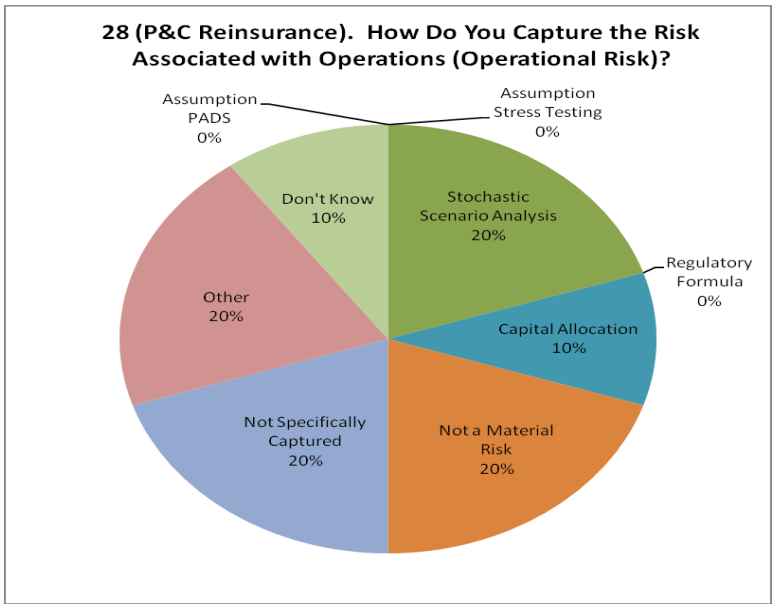




Question 28 – How do you capture the risk associated with operations (operational risk)?

For P&C direct writers, 38% do not specifically capture operational risk. Direct writers that capture operational risk mainly use capital allocation (14%) and stochastic scenario analysis (12%). P&C reinsurers reported not specifically capturing operational risk 20% of the time, while 20% reported it not material. 20% of P&C reinsurers use stochastic scenario analysis to capture the risk. The largest companies report capital allocation as their most popular means of capturing operational risk. Other sized companies generally do not consider this risk specifically. Corporate/risk management actuaries use capital allocation to capture operational risk.



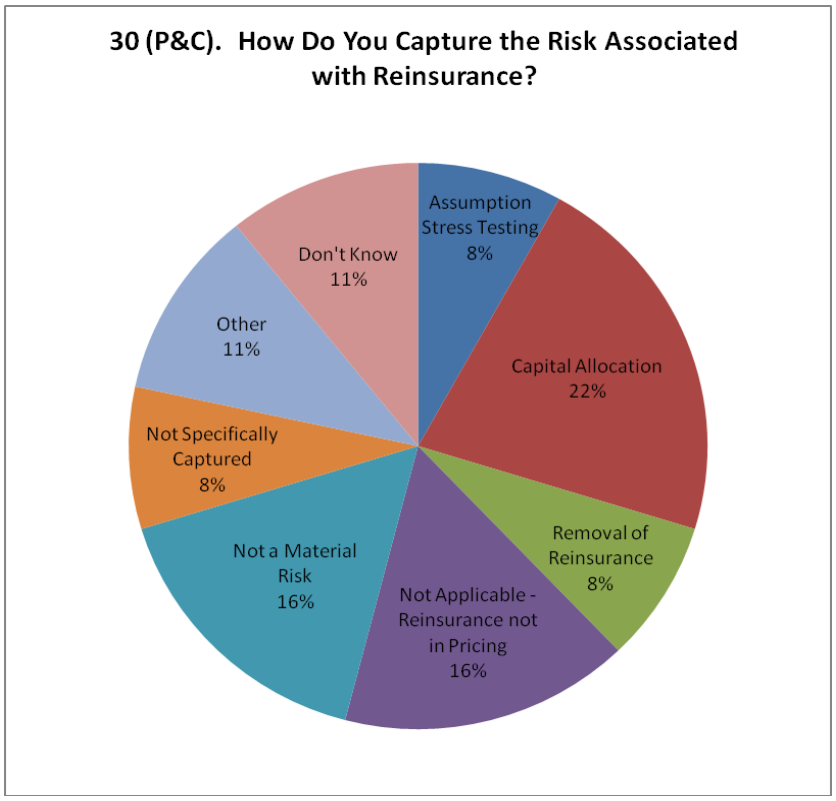


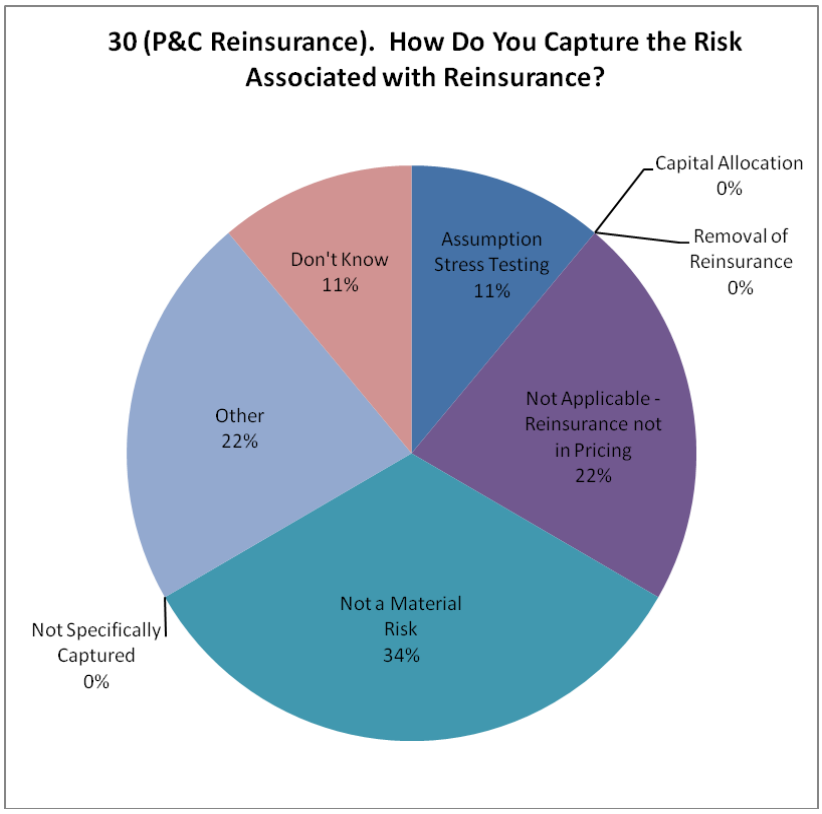
Question 29 – How do you capture the risk associated with mix of business/distribution of policyholders?

Half (50%) of P&C direct insurers report they do not specifically capture distribution risk in pricing, while 15% report it as not material. 12% of respondents use assumption stress testing and 8% use capital allocation. Almost half (45%) of P&C reinsurers do not consider this risk material, while 22% report not capturing distribution risk specifically. 11% of reinsurers use assumption stress testing and 11% use capital allocation. Almost 30% of the smallest companies reported they do not specifically capture distribution risk.

Question 30 – How do you capture the risk associated with reinsurance?

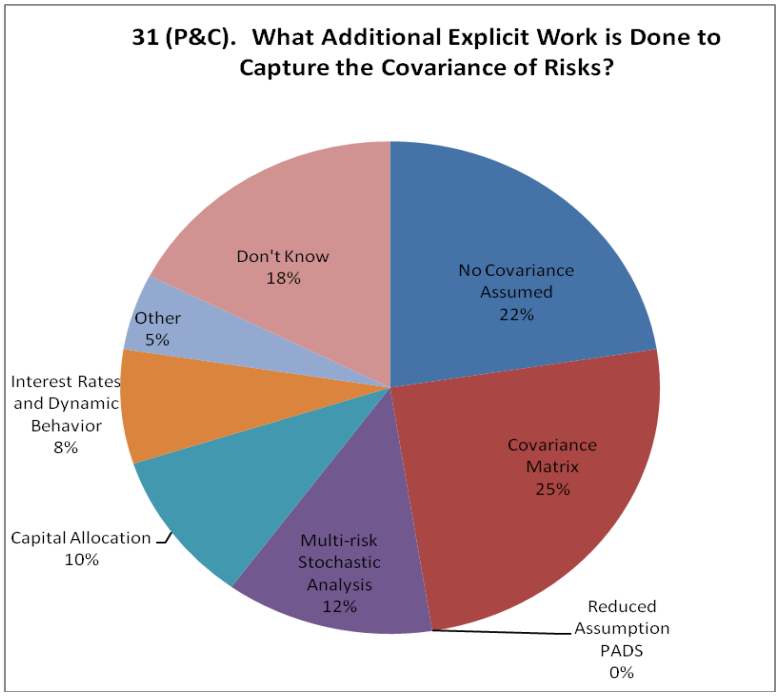
For P&C direct insurers, 22% assume capital allocation to cover reinsurance risk. 16% do not use reinsurance and 16% do not consider this risk as material. For P&C reinsurers, 34% view reinsurance as not a material risk, while 22% do not use reinsurance at all. Other responses included assumption PADs, judgment and stochastic scenario analysis. Reinsurance risk is captured and considered material in larger companies relative to smaller companies.

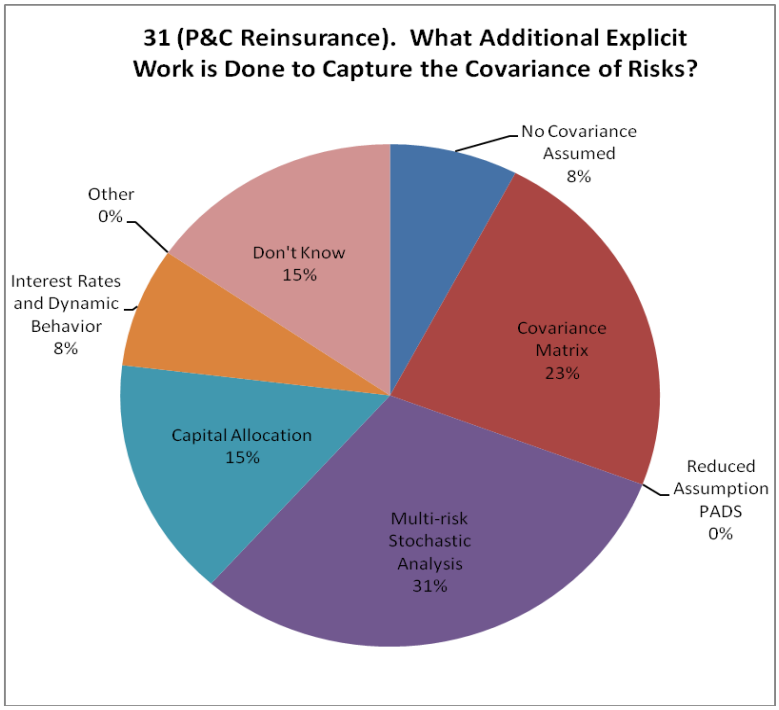




Question 31 – What additional explicit work is done to capture the covariance of risks?

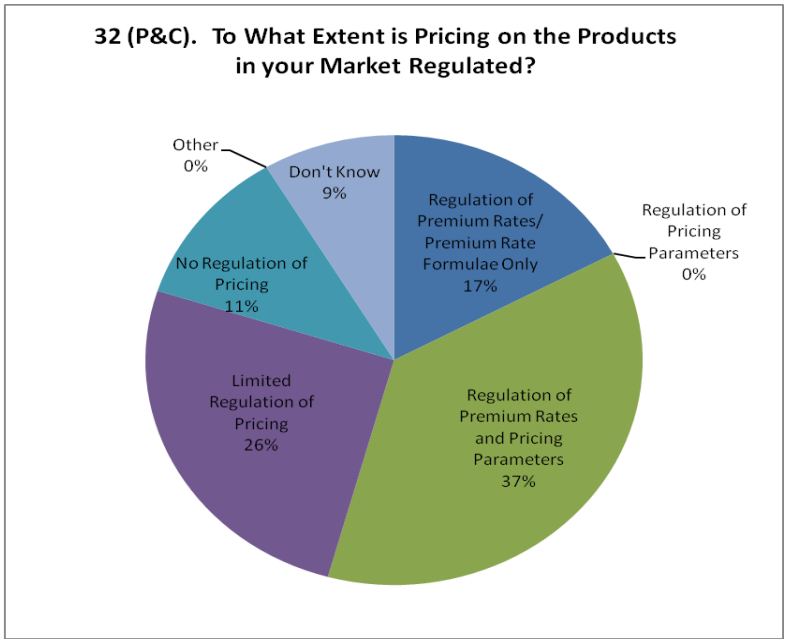
P&C direct companies use covariance matrix (25%) and multi-risk stochastic analysis (12%) to capture covariance of risk. 22% report no covariance of risk assumed. For P&C reinsurers, 31% use multi-risk stochastic analysis, 23% use covariance matrix, and 15% use capital allocation to capture covariance of risk. 60% of the smallest companies do not assume any covariance of risk.

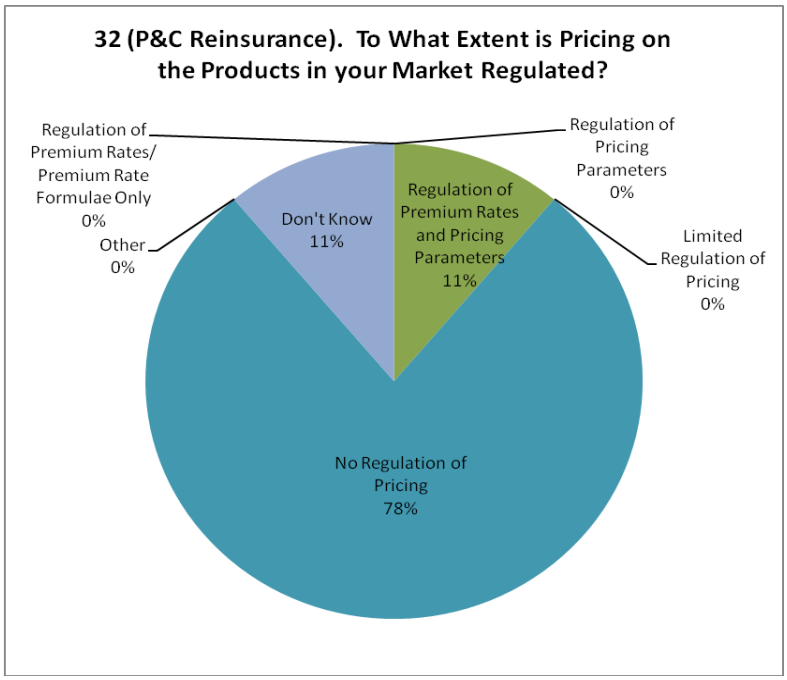




Question 32 – To what extent is pricing on the products in your market regulated?

37% of direct P&C companies report regulation of premium rates and pricing parameters, 26% report limited regulation of pricing and 17% report regulation of premium rates/formulae only. For P&C reinsurers, 78% responded with no regulation of pricing, and 11% reporting regulation of pricing and premium rates.





International

Limited responses were obtained from companies whose parent company is located outside of North America, Europe and Asia. Most companies reported targeting their business in North America or Asia. Only 3 companies reported targeting South America, along with 5 targeting Europe, 3 targeting Australia, and 0 targeting Africa. Due to the small sample size, results for these continents are not shown.

Question 1d – Which of the following profit measures do you use in pricing products.

Life and Annuity

North American companies writing life insurance primarily use IRR, premium margin, then break-even year. North American companies writing annuities primarily use IRR, premium margin then return on assets. The smallest North American companies writing life or annuity business prefer premium margin to IRR. The largest North American companies prefer EV/EVA to IRR. North American companies writing group life primarily use premium margin, then ROE, then IRR. North American companies writing group annuity business generally use IRR, ROE, and break-even year. The largest companies writing group insurance rank EV/EVA in their top 3 profit measures. Similar ranking were given by companies whose target market is North America.

North America -Profit Measure Ranking - Life	Whole Life	Endowment	Term Life	Universal Life	Variable life	Variable Universal Life	Total
Return on Investment	6	7	6	6	4	6	6
Return on Equity	5	5	4	4	5	**3**	4
Return on Liabilities	-	10	13	14	9	14	14
Risk Adjusted Return on Capital	11	9	8	8	7	10	8
Premium Margin	**1**	**2**	**1**	**2**	**2**	**2**	**2**
Embedded Value/Economic Value Added	4	4	5	5	6	5	5
Expected Loss Ratio	13	-	13	14	-	14	15
Combined Loss Ratio	15	-	-	-	-	-	-
Break Even Year	**3**	**3**	**3**	**3**	**3**	4	**3**
Internal Rate of Return	**2**	**1**	**2**	**1**	**1**	**1**	**1**
Return on Assets	14	-	-	13	-	12	13
Return on Capital	8	12	10	9	11	13	10
Contribution to Surplus	7	6	7	7	11	7	7
Revenue Margin	12	8	12	11	-	11	12
Market Consistent Embedded Value	9	11	9	10	9	8	9
Other	10	-	11	12	7	9	11

North America - Profit Measure Ranking – Annuities	Fixed Deferred Annuity	Variable Deferred Annuity	Fixed Immediate Annuity	Variable Immediate Annuity	Annuity Total
Return on Investment	7	11	6	9	7
Return on Equity	5	**3**	4	10	5
Return on Liabilities	12	12	12	-	12
Risk Adjusted Return on Capital	10	8	10	7	10
Premium Margin	**2**	4	**2**	5	**2**
Embedded Value/Economic Value Added	6	6	7	6	6
Expected Loss Ratio	-	-	-	-	-
Combined Loss Ratio	-	-	-	-	-
Break Even Year	**3**	5	5	4	4
Internal Rate of Return	**1**	**1**	**1**	**1**	**1**
Return on Assets	4	**2**	**3**	**3**	**3**
Return on Capital	8	7	9	**2**	8
Contribution to Surplus	9	10	8	8	9
Revenue Margin	-	-	-	-	-
Market Consistent Embedded Value	11	9	11	11	11
Other	-	-	-	-	-

North American - Profit Measure Ranking - Group/Other	Group Life	Group Annuity	Other
Return on Investment	7	9	-
Return on Equity	**3**	**2**	**3**
Return on Liabilities	12	10	-
Risk Adjusted Return on Capital	12	7	10
Premium Margin	**1**	6	**2**
Embedded Value/Economic Value Added	5	4	5
Expected Loss Ratio	4	-	6
Combined Loss Ratio	9	-	-
Break Even Year	6	**3**	4
Internal Rate of Return	**2**	**1**	**1**
Return on Assets	-	5	-
Return on Capital	10	13	-
Contribution to Surplus	8	8	8
Revenue Margin	11	11	11
Market Consistent Embedded Value	-	12	9
Other	-	-	7

European companies writing life insurance primarily use MCEV, then IRR, then EV/EVA. No companies writing annuities reported being a European company. The smallest European companies writing life business ranked premium margin and IRR above EV and MCEV. European companies writing group life use ROE and risk adjusted return on capital.

Europe -Profit Measure Ranking - Life	Whole Life	Endowment	Term Life	Universal Life	Variable life	Variable Universal Life	Total
Return on Investment	7	6	7	-	-	5	7
Return on Equity	4	6	4	**3**	-	-	6
Return on Liabilities	-	-	-	-	-	-	-
Risk Adjusted Return on Capital	**3**	**1**	**3**	-	-	**1**	**3**
Premium Margin	7	-	7	6	-	-	8
Embedded Value/Economic Value Added	**1**	**2**	**1**	**1**	-	**1**	**1**
Expected Loss Ratio	-	-	-	-	-	-	-
Combined Loss Ratio	-	-	-	-	-	-	-
Break Even Year	9	8	10	-	-	-	9
Internal Rate of Return	**2**	**2**	**1**	**2**	-	5	**2**
Return on Assets	-	-	-	-	-	-	-
Return on Capital	-	-	-	-	-	-	-
Contribution to Surplus	10	9	-	-	-	7	9
Revenue Margin	-	-	9	-	-	-	11
Market Consistent Embedded Value	5	4	4	**3**	-	**1**	4
Other	5	4	4	**3**	-	**1**	4

Europe - Profit Measure Ranking – Group/Other	Group Life	Group Annuity	Other
Return on Investment	-	-	-
Return on Equity	**1**	-	**1**
Return on Liabilities	-	-	-
Risk Adjusted Return on Capital	**1**	-	5
Premium Margin	**3**	-	**3**
Embedded Value/Economic Value Added	5	-	5
Expected Loss Ratio	-	-	**1**
Combined Loss Ratio	-	-	**3**
Break Even Year	-	-	-
Internal Rate of Return	7	-	7
Return on Assets	-	-	-

Return on Capital	-	-	-
Contribution to Surplus	5	-	-
Revenue Margin	**3**	-	-
Market Consistent Embedded Value	-	-	-
Other	-	-	-

Asian companies writing life or annuity insurance primarily use premium margin, then break-even year, then IRR. Asian companies writing group life primarily use premium margin, then break-even year, followed by expected loss ratio. Asian companies writing group annuity business use MCEV, then premium margin, EV/EVA, and break-even year. Companies writing life or annuity products targeting Asia generally rank premium margin first, then break-even year, followed by IRR. Companies writing group life targeting Asia use premium margin, then break-even year, followed by expected loss ratio. Companies writing group annuity targeting Asia primarily use MCEV over premium margin, break-even year or EV/EVA.

Asian - Profit Measure Ranking - Life	Whole Life	Endowment	Term Life	Universal Life	Variable life	Variable Universal Life	Total
Return on Investment	-	-	12	8	-	-	13
Return on Equity	8	8	8	15	11	11	10
Return on Liabilities	-	-	-	-	-	-	-
Risk Adjusted Return on Capital	7	7	7	14	8	7	7
Premium Margin	**1**	**1**	**1**	4	**1**	**2**	**1**
Embedded Value/Economic Value Added	4	4	4	**3**	**3**	4	4
Expected Loss Ratio	-	-	12	13	-	-	15
Combined Loss Ratio	-	-	14	11	-	-	14
Break Even Year	**2**	**2**	**2**	**1**	**2**	**1**	**2**
Internal Rate of Return	**3**	**3**	**3**	**1**	4	**3**	**3**
Return on Assets	12	11	11	7	7	6	8
Return on Capital	11	10	10	10	8	9	9
Contribution to Surplus	6	6	6	5	6	8	6
Revenue Margin	9	12	-	8	10	-	12
Market Consistent Embedded Value	5	5	5	6	5	5	5
Other	9	9	9	12	-	10	11

Asia - Profit Measure Ranking - Annuity	Fixed Deferred Annuity	Variable Deferred Annuity	Fixed Immediate Annuity	Variable Immediate Annuity	Annuity Total
Return on Investment	-	-	9	-	12
Return on Equity	10	9	12	10	11
Return on Liabilities	12	11	-	-	12
Risk Adjusted Return on Capital	8	7	11	9	9
Premium Margin	**1**	**2**	**1**	**2**	**1**
Embedded Value/Economic Value Added	4	**3**	**3**	4	4
Expected Loss Ratio	-	-	-	-	-
Combined Loss Ratio	-	-	-	-	-
Break Even Year	**2**	**1**	**2**	**1**	**2**
Internal Rate of Return	**3**	5	4	**2**	**3**
Return on Assets	6	6	10	8	7
Return on Capital	8	12	7	7	8
Contribution to Surplus	7	7	6	5	5
Revenue Margin	-	12	-	-	-
Market Consistent Embedded Value	5	4	5	-	6
Other	11	9	8	5	10

Asia - Profit Measure Ranking – Group/Other	Group Life	Group Annuity	Other
Return on Investment	-	-	-
Return on Equity	10	-	-
Return on Liabilities	-	-	-
Risk Adjusted Return on Capital	8	8	**1**
Premium Margin	**1**	**2**	**3**
Embedded Value/Economic Value Added	4	**2**	-
Expected Loss Ratio	**3**	6	6
Combined Loss Ratio	5	6	4
Break Even Year	**2**	**2**	**2**
Internal Rate of Return	7	5	7
Return on Assets	-	-	-
Return on Capital	-	-	8
Contribution to Surplus	8	-	-
Revenue Margin	-	-	-
Market Consistent Embedded Value	6	**1**	5
Other	-	-	-

Accident & Health

In total, North American health companies rank expected loss ratio first, then premium margin, and thirdly revenue margin. Largest health companies chose return on capital over revenue margin. Smaller companies chose IRR over revenue margin. However, companies that write LTC business listed break-even year and ROE above revenue margin. North American health companies writing critical illness use break-even year rather than revenue margin. There was no material difference between companies in North American and companies that target North America in ranking their primary profit measures.

North America - Profit Measure Ranking - Health	Individual A&H	Group A&H	Stop Loss	Critical Illness	LTC	Other	Total
Return on Investment	10	9	-	-	5	4	10
Return on Equity	9	5	-	4	**3**	-	7
Return on Liabilities	13	-	-	-	7	-	12
Risk Adjusted Return on Capital	11	-	-	6	-	6	11
Premium Margin	**2**	**1**	**1**	**2**	**2**	**1**	**2**
Embedded Value/Economic Value Added	-	-	-	-	7	-	15
Expected Loss Ratio	**1**	**2**	**1**	**1**	**1**	**2**	**1**
Combined Ratio	7	7	-	8	-	**3**	8
Break Even Year	8	-	-	8	**3**	8	9
Internal Rate of Return	5	8	-	**3**	5	4	5
Return on Assets	-	-	-	-	-	-	-
Return on Capital	4	4	4	4	-	7	4
Contribution to Surplus	6	5	**3**	-	9	-	6
Revenue Margin	**3**	**3**	4	7	-	-	**3**
Market Consistent Embedded Value	13	-	-	-	10	-	13
Other	11	-	-	-	-	-	14

European companies writing health insurance generally use revenue margin, EV/EVA, then expected loss ratio. European companies writing LTC use EV/EVA followed by expected loss ratio.

Europe - Profit Measure Ranking - Health	Individual A&H	Group A&H	Stop Loss	Critical Illness	LTC	Other	Total
Return on Investment	-	-	-	-	-	-	-
Return on Equity	-	-	-	-	-	-	-
Return on Liabilities	-	-	-	-	-	-	-
Risk Adjusted Return on Capital	-	-	-	-	-	-	-
Premium Margin	-	-	-	-	-	-	-
Embedded Value/Economic Value Added	**1**	**3**	**-**	**3**	**1**	**-**	**2**
Expected Loss Ratio	**3**	**2**	**-**	**2**	**2**	**-**	**3**
Combined Ratio	-	-	-	-	-	-	-
Break Even Year	-	-	-	-	-	-	-
Internal Rate of Return	-	-	-	-	-	-	-
Return on Assets	-	-	-	-	-	-	-
Return on Capital	-	-	-	-	-	-	-
Contribution to Surplus	-	-	-	-	-	-	-
Revenue Margin	**2**	**1**	**-**	**1**	**3**	**-**	**1**
Market Consistent Embedded Value	-	-	-	-	-	-	-
Other	-	-	-	-	-	-	-

No health companies reported targeting Europe.

No Asian companies reported writing health business or targeting the Asian health market.

P&C

North American P&C companies writing personal lines of business use combined ratio, ROE, then expected loss ratio. Commercial writing North America companies use EV/EVA, then ROE, then premium margin. Similar ranking were provided by companies targeting North America.

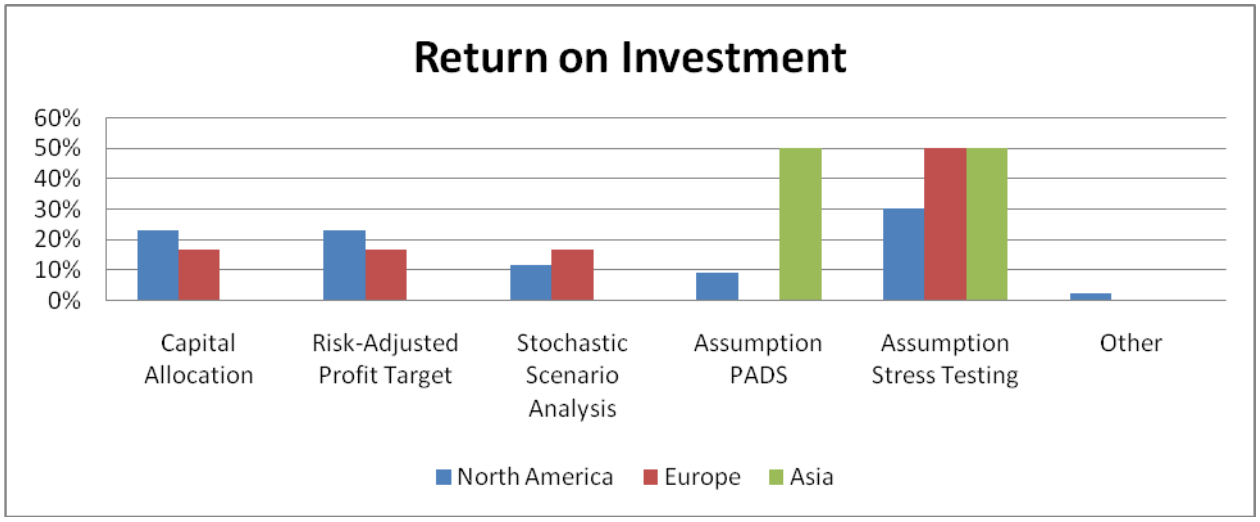
North America - Profit Measure Ranking – P&C	Personal	Commercial	Other	Total
Return on Investment	8	11	-	12
Return on Equity	**1**	**2**	-	1
Return on Liabilities	-	4	**1**	8
Risk Adjusted Return on Capital	4	8	**1**	5
Premium Margin	8	**3**	4	4
Embedded Value/Economic Value Added	8	**1**	**1**	**2**
Expected Loss Ratio	**3**	-	-	6
Combined Ratio	**1**	9	-	**3**
Break Even Year	-	-	-	-
Internal Rate of Return	6	5	-	7
Return on Assets	-	7	-	11
Return on Capital	5	10	-	9
Contribution to Surplus	7	-	-	13
Revenue Margin	-	-	-	-
Market Consistent Embedded Value	-	-	-	-
Other	-	6	-	10

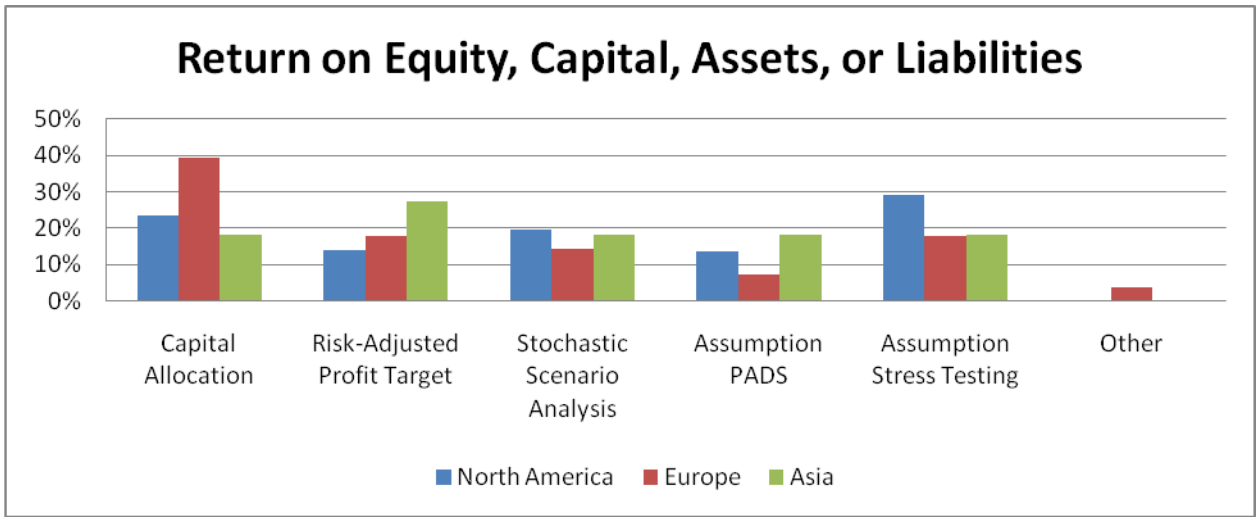
No European companies reported writing P&C coverage.

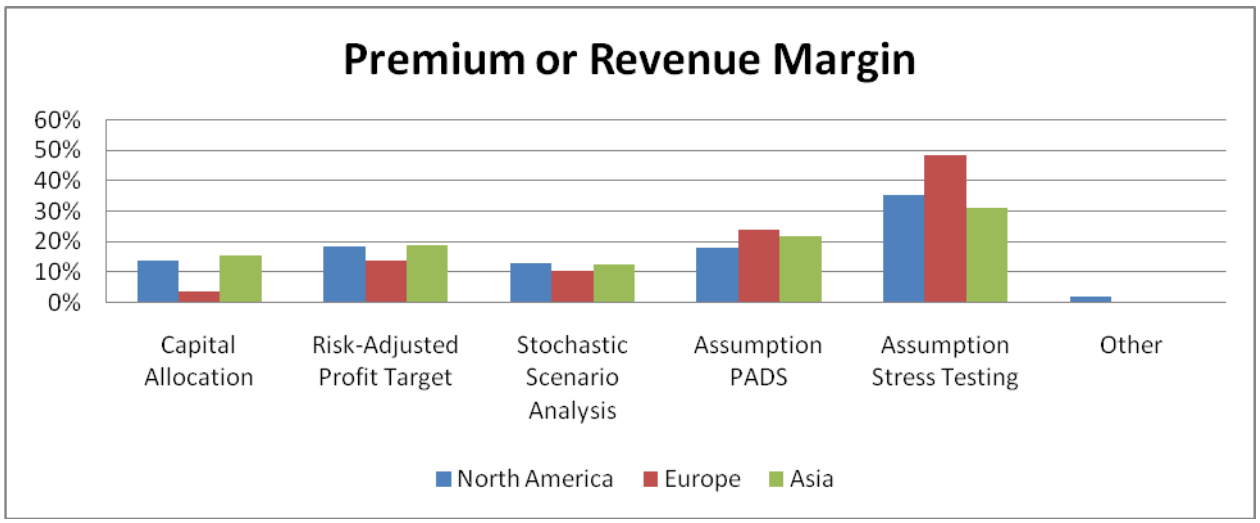
Asian P&C companies writing personal lines of business use premium margin, expected loss ratio and combined ratio. Asian companies writing commercial lines of business use return on liabilities, then premium margin, then EV/EVA. No companies writing P&C lines of business targeting Asia provided responses to the survey.

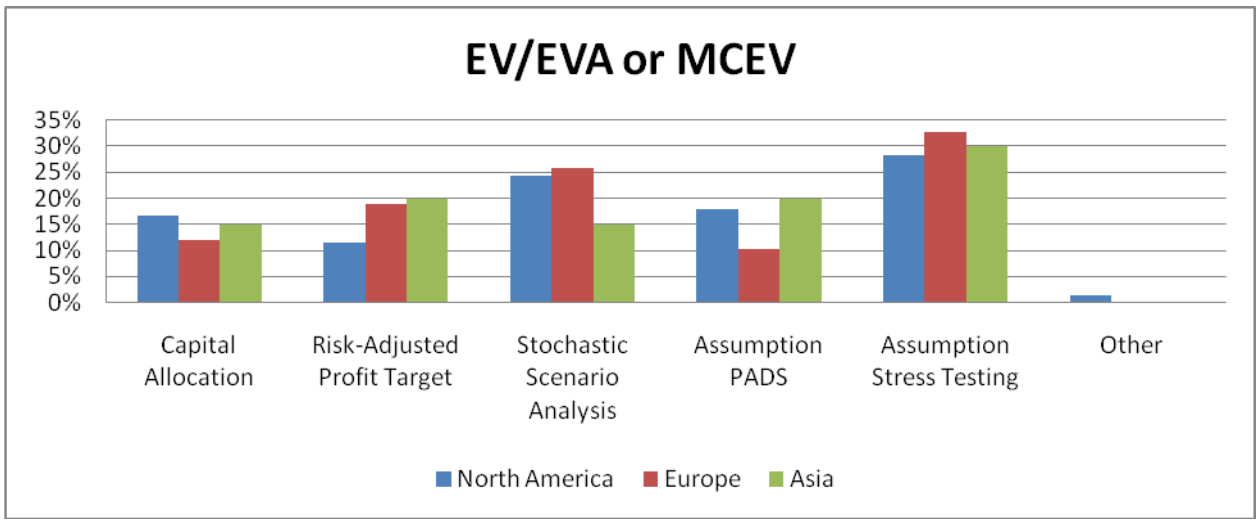
Asia - Profit Measure Ranking – P&C	Personal	Commercial	Other	Total
Return on Investment	-	-	-	-
Return on Equity	-	-	-	-
Return on Liabilities	-	**1**	-	**2**
Risk Adjusted Return on Capital	-	-	-	-
Premium Margin	**1**	**2**	-	**1**
Embedded Value/Economic Value Added	-	**3**	-	4
Expected Loss Ratio	**2**	-	-	**3**
Combined Ratio	**3**	-	-	4
Break Even Year	-	-	-	-
Internal Rate of Return	-	-	-	-
Return on Assets	-	4	-	6
Return on Capital	-	-	-	-
Contribution to Surplus	4	-	-	6
Revenue Margin	-	-	-	-
Market Consistent Embedded Value	-	-	-	-
Other	-	-	-	-

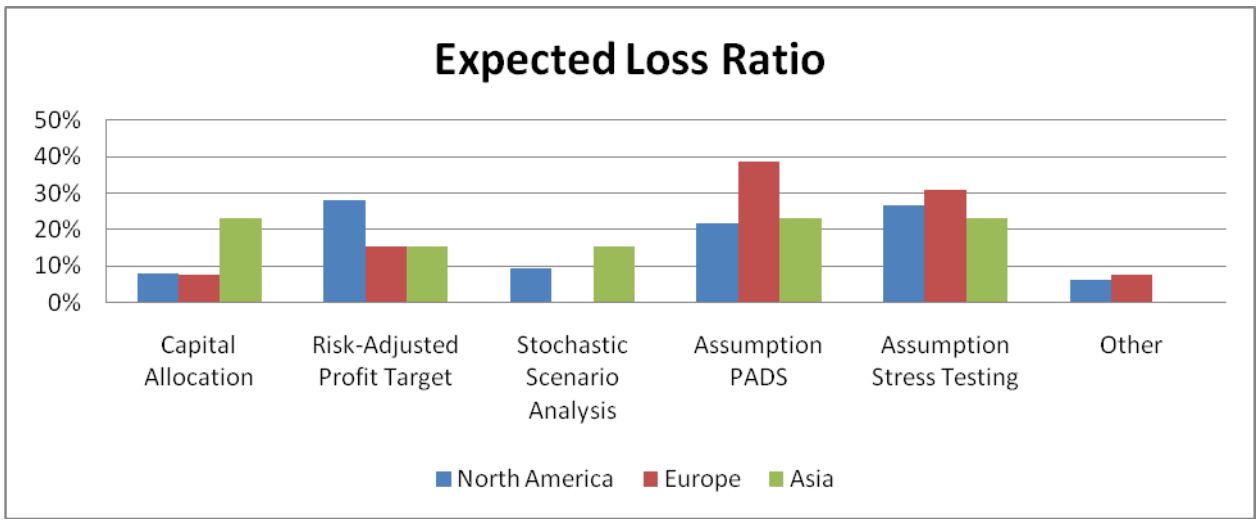
Question 2 – If you use the following profit measure, how is risk assessed when using the profit measure?

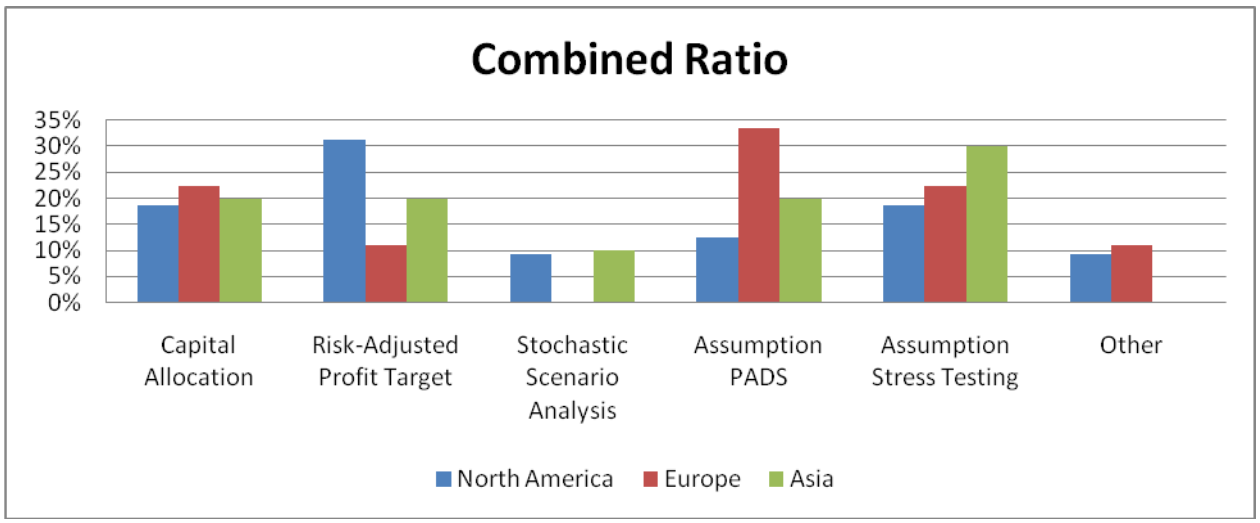


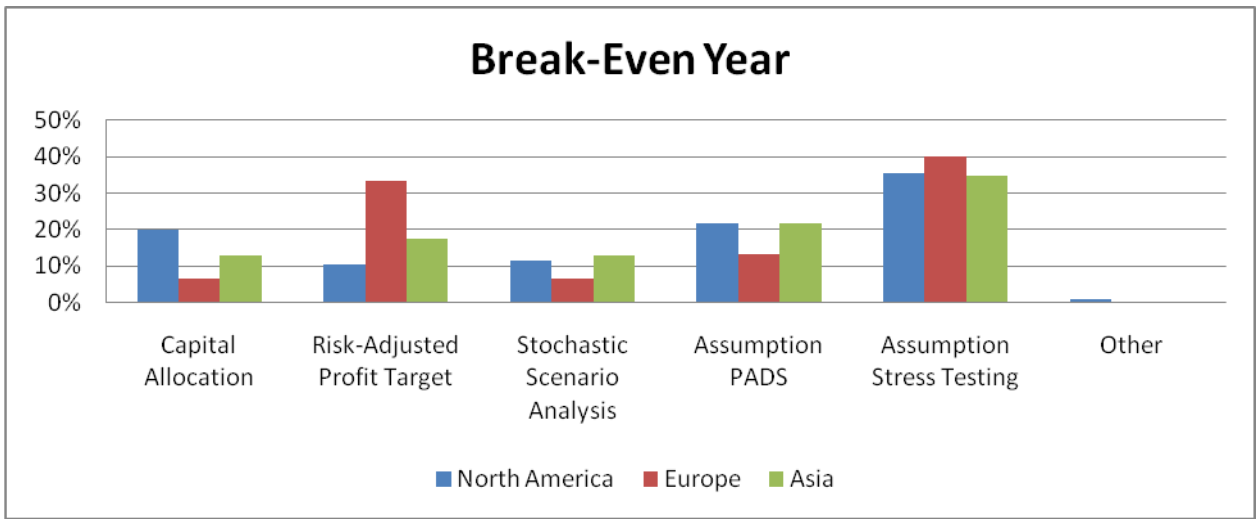


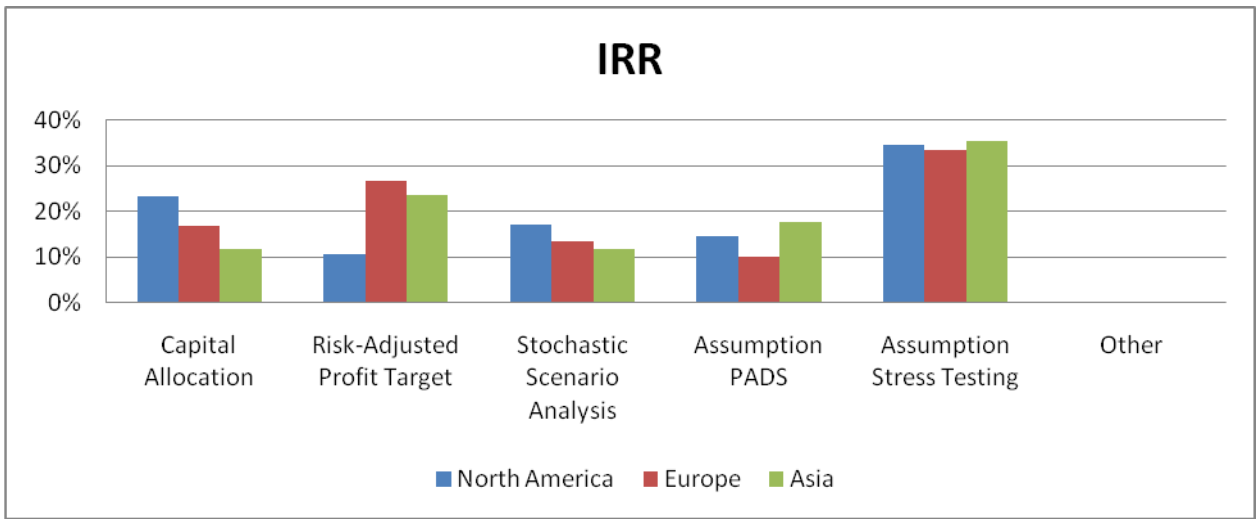


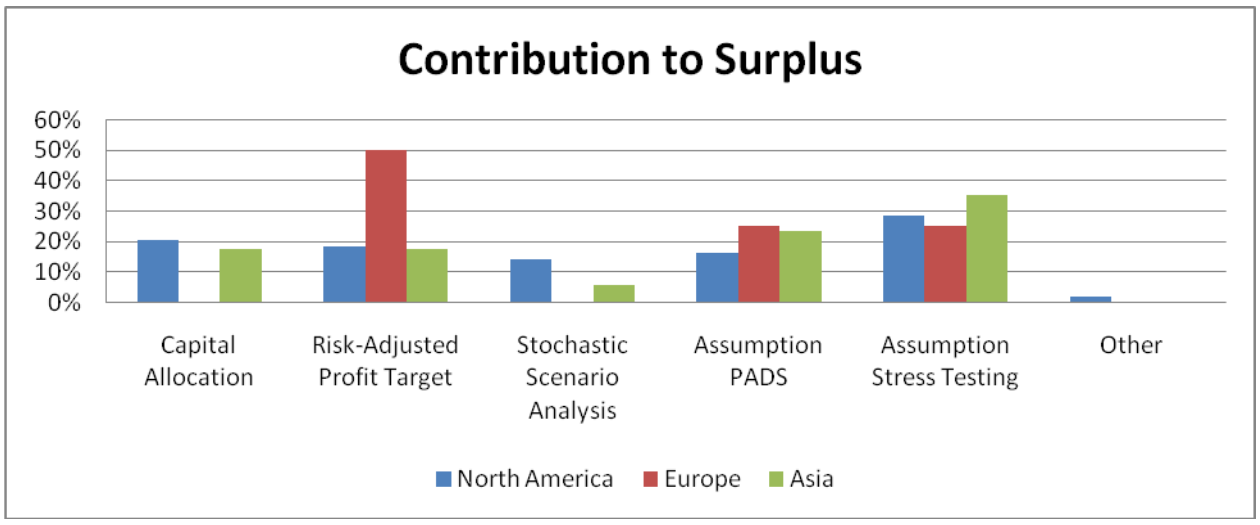












ROI - North American companies assess risk through assumption stress testing, capital allocation and risk-adjusted profit targets. European companies mainly use assumption stress testing. Asian companies use assumption PADs and assumption stress testing.

ROE -North American and European companies assess risk through assumption stress testing and capital allocation. Asian companies use assumption PADs, capital allocation, risk-adjusted profit targets and stochastic scenario analysis.

Return on Liabilities – North American companies usually assess risk through stochastic scenario analysis and capital allocation. No European or Asian companies reported using ROL.

Risk-adjusted Return on Capital – North American companies use capital allocation and stochastic scenario analysis. European and Asian companies tend to use capital allocation and risk-adjusted profit targets.

Premium Margin – North American companies use assumption stress testing, assumption PADs and risk-adjusted profit targets. European and Asian companies generally assess risk through assumption stress testing and assumption PADs.

EV/EVA – North American and Asian companies mainly assess risk through assumption stress testing and assumption PADs. European companies assess risk through assumption stress testing and risk-adjusted profit targets.

Expected Loss Ratio – North American companies use risk-adjusted profit targets and assumption stress testing. European and Asian companies use assumption PADs and assumption stress testing.

Combined Ratio – North American companies use risk-adjusted profit targets, capital allocation and assumption stress testing. European companies use assumption PADs, assumption stress testing, and capital allocation. Asian companies use assumption stress testing, capital allocation, risk-adjusted profit targets and assumption PADs.

Break-even Year – North American companies assess risk through assumption stress testing and assumption PADs. European companies use assumption stress testing and risk-adjusted profit targets. Asian companies use assumption stress testing and assumption PADs.

IRR – North American companies mainly use assumption stress testing and capital allocation. European and Asian companies mainly use assumption stress testing and risk-adjusted profit targets.

ROA – North American companies assess risk through assumption stress testing and stochastic scenario analysis. European companies use capital allocation, assumption stress testing and risk-adjusted profit targets. Asian companies mainly use assumption PADs.

Return on Capital – North American companies use assumption stress testing and capital allocation. European companies mainly use capital allocation. Asian companies use stochastic scenario analysis, risk-adjusted profit targets, and assumption stress testing.

Contribution to Surplus – North American companies use assumption stress testing and capital allocation. European companies mainly use risk-adjusted profit targets. Asian companies use assumption stress testing and assumption PADs.

Revenue Margin – North American companies use assumption stress testing and risk-adjusted profit targets. European companies use assumption stress testing and assumption PADs. Asian companies mainly use assumption PADs.

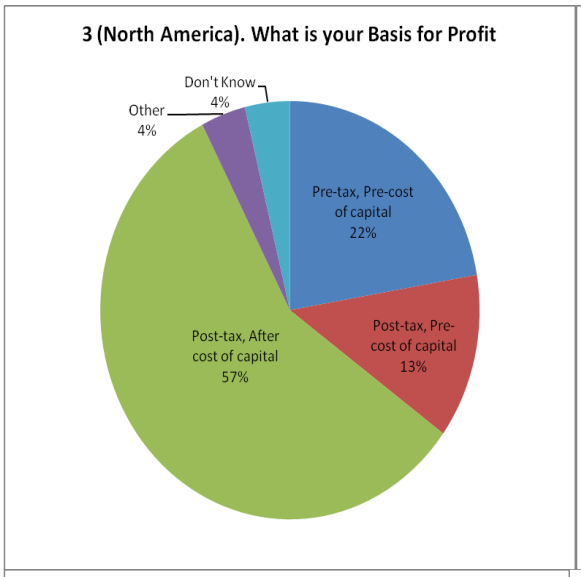
MCEV – North American and European companies assess risk through stochastic scenario analysis and assumption stress testing. Asian companies use stochastic scenario analysis and risk-adjusted profit targets.

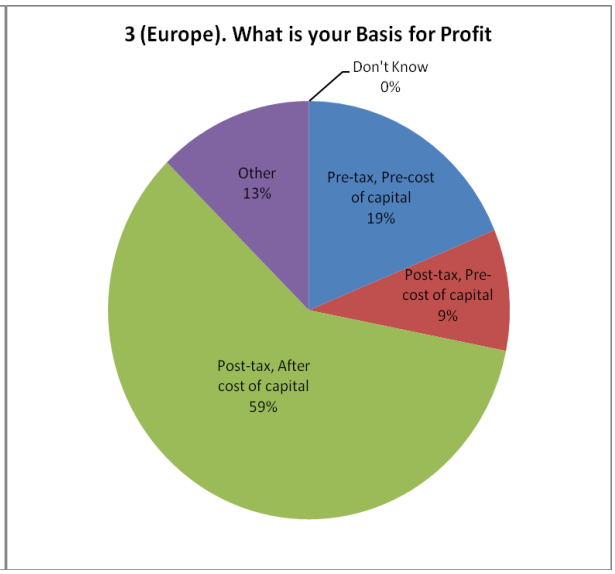
Generally, the leading ways to assess risk by company location were the same as those based on location of target market.

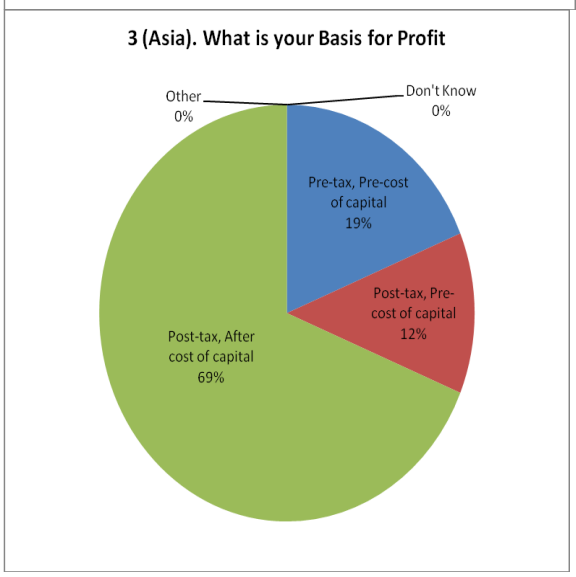
Question 3 – When defining your profit measure, what is the basis for profit?

Over half (58%) of companies reported using post-tax, after cost of capital for their profit basis – 57% of those in North America, 59% of companies domiciled in Europe, and 69% of companies in Asia. Next in popularity was 22% pre-tax, pre-cost of capital – 22% North American, 19% Europe, and 19% Asia.

Companies that target North America generally use post-tax, after cost of capital (60%), pre-tax pre-cost of capital (21%) and finally post tax, pre-cost of capital (12%). Companies that target Asia generally use post-tax, after cost of capital (56%), pre-tax pre-cost of capital (19%) and finally post tax, pre-cost of capital (12%).

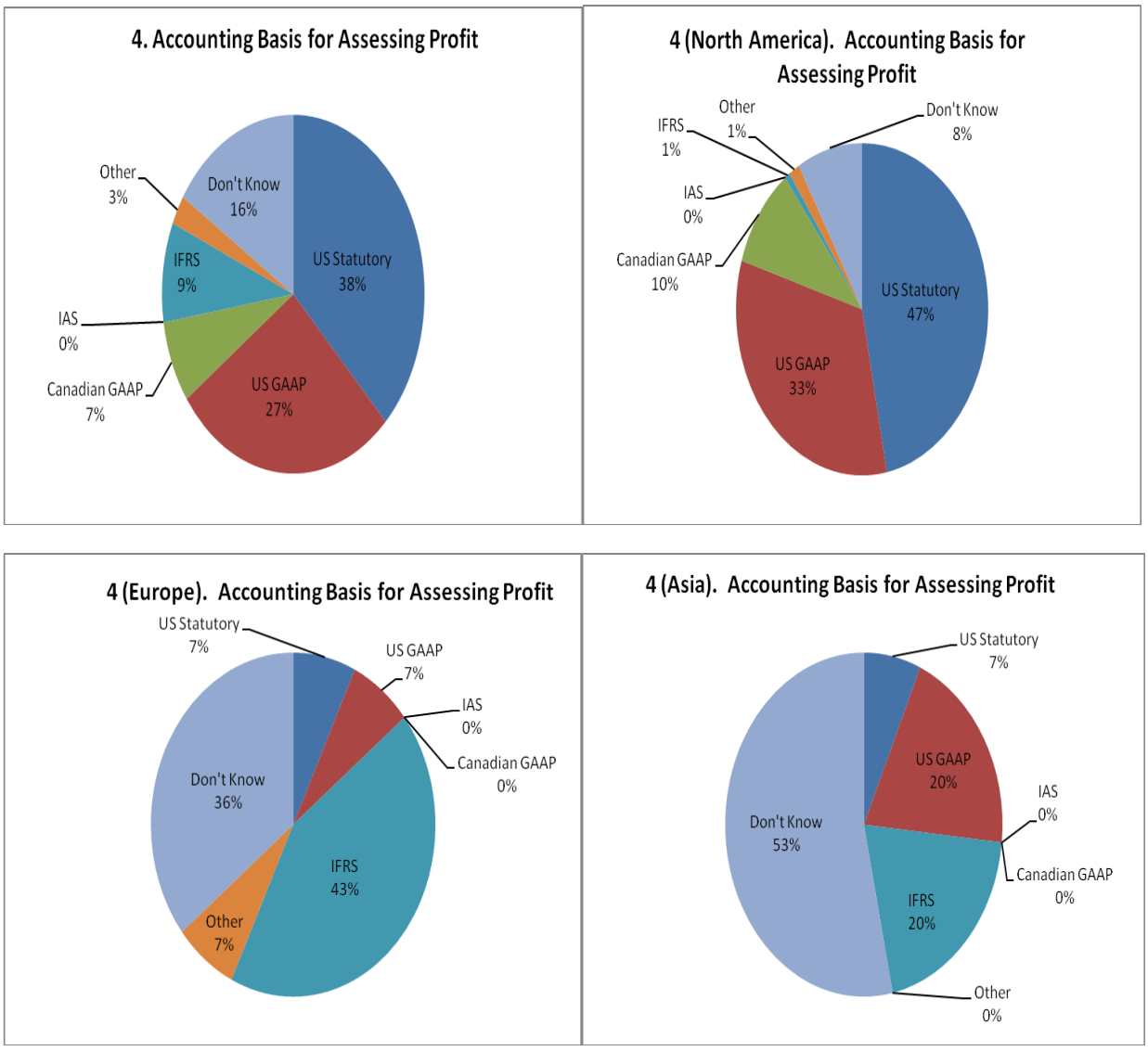






Question 4 – What accounting basis is used for assessing your primary profit measure?

The overall accounting basis used is US Statutory (38%)-- (47% North America, 7% Europe, and 7% Asia), and US GAAP (27%) - (33% in North America, 7% Europe, 20% Asia).



Companies that target North America use US Statutory (45%) or US GAAP (32%), with 9% using Canadian GAAP. Companies targeting Asia reporting using IFRS (25%) and US GAAP (7%), while most companies targeting Asia did not know the accounting basis.

Question 5 – Do you measure actual profitability against projected pricing profitability?

Generally companies do measure profitability against projected results in some way (45% frequently and 43% occasionally). "Yes, frequently" was reported by 45% of companies in North America, 50% in Europe, and 34% of issuers in Asia. "Occasionally" was reported for 42% of companies in North America, 39% in Europe and 53% in Asia.

Companies that target North America reported "Yes" (46%) and "Occasionally" (42%). Companies targeting Asia reported "Yes" (43%) and "Occasionally" (46%).

Question 6 – If you measure actual profitability versus projected profitability, is this information passed back into the pricing process for future pricing?

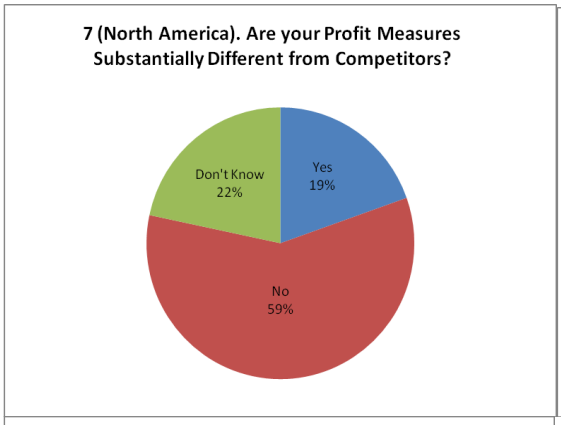
57% of companies reported they frequently pass information back through pricing – 56% in North America, 64% in Europe and 62% in Asia. 36% occasionally report information back to pricing – 36% in North America, 32% in Europe, and 38% in Asia.

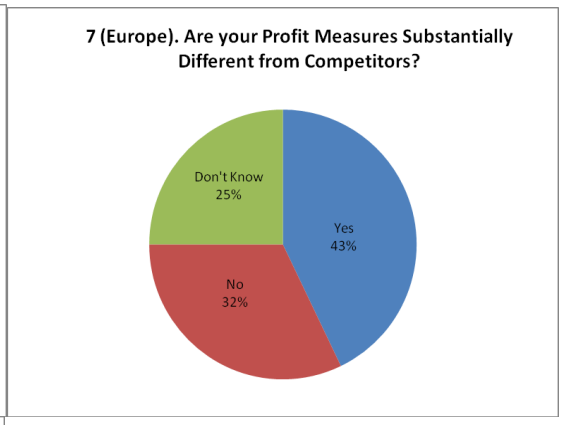
58% of companies targeting North America reported they frequently pass information back through the pricing process, where 34% reported they occasionally do. Companies targeting Asia reported "Yes frequently" (60%) and "Occasionally" (40%) passing information back through the pricing process.

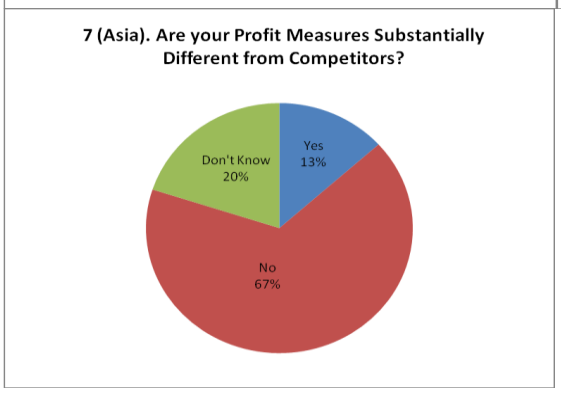
Question 7 – Do you feel your profit measures are substantially different from your competitors?

Companies generally feel their profit measure is not substantially different from their competitors – 59% in North America, 32% in Europe, and 67% in Asia. 43% of European companies do believe their profit measure is different from their companies, while 19% of North America and 13% of Asian companies believe it differs as well.

57% of companies targeting North America do not believe their profit measures are substantially different from their competitors while 22% believe they are different. Companies targeting Asia believe there is no substantial difference (50%), while 29% feel they are substantially different.



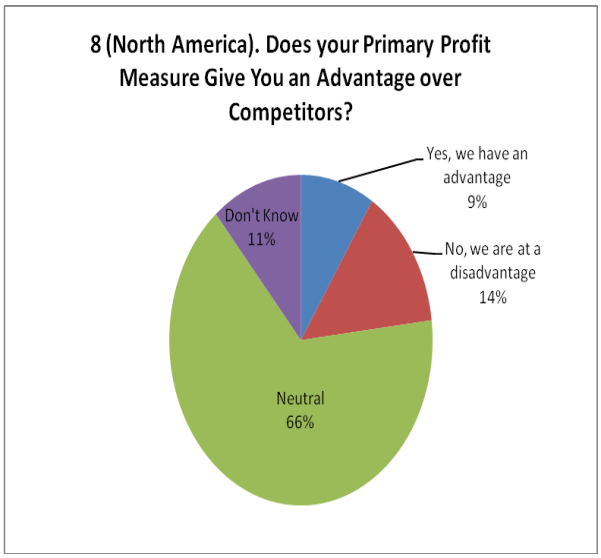


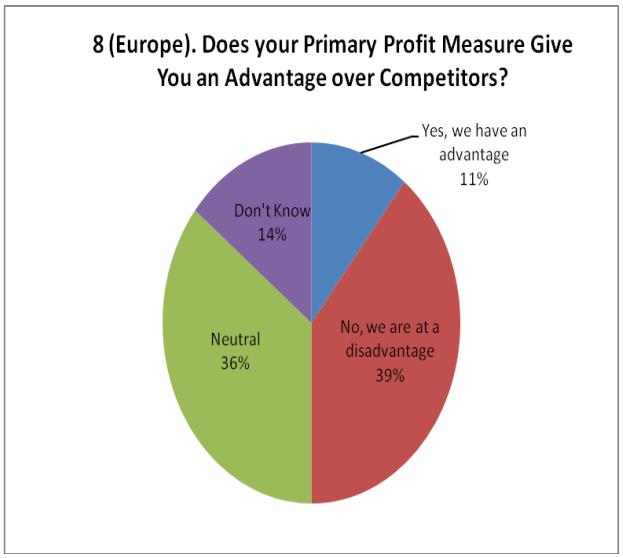


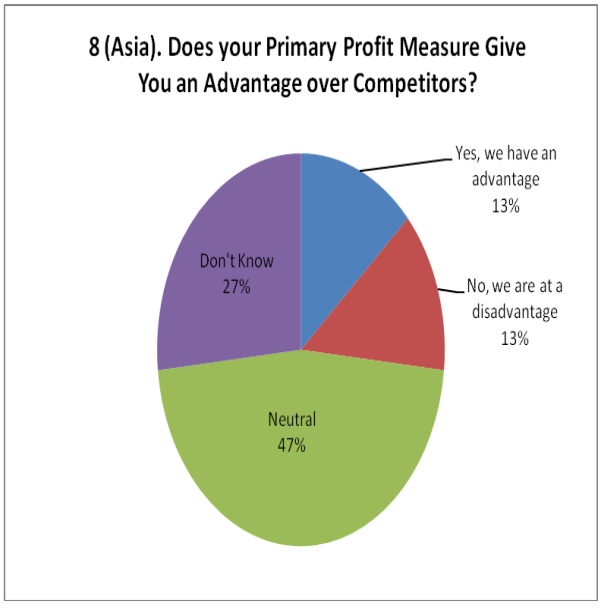
Question 8 – Do you feel your primary profit measures give you an advantage against your competitors?

Overall, 60% of companies are neutral relative to their profit measure advantage – 66% in North America, 36% in Europe, and 47% of Asia. Companies believing they are at a disadvantage include 14% of North America, 39% of Europe, and 13% of Asia. Companies believing they are at an advantage include 9% in North America, 11% in Europe, and 13% of Asia.

Companies targeting North America generally feel neutral (63%) about their profit measure relative to their competitors, while 18% feel they are disadvantaged and 9% believe they have an advantage. Companies targeting Asia feel neutral (50%) about their profit measure relative to their competitors, while 18% feel they are disadvantaged and 11% believe they have an advantage.



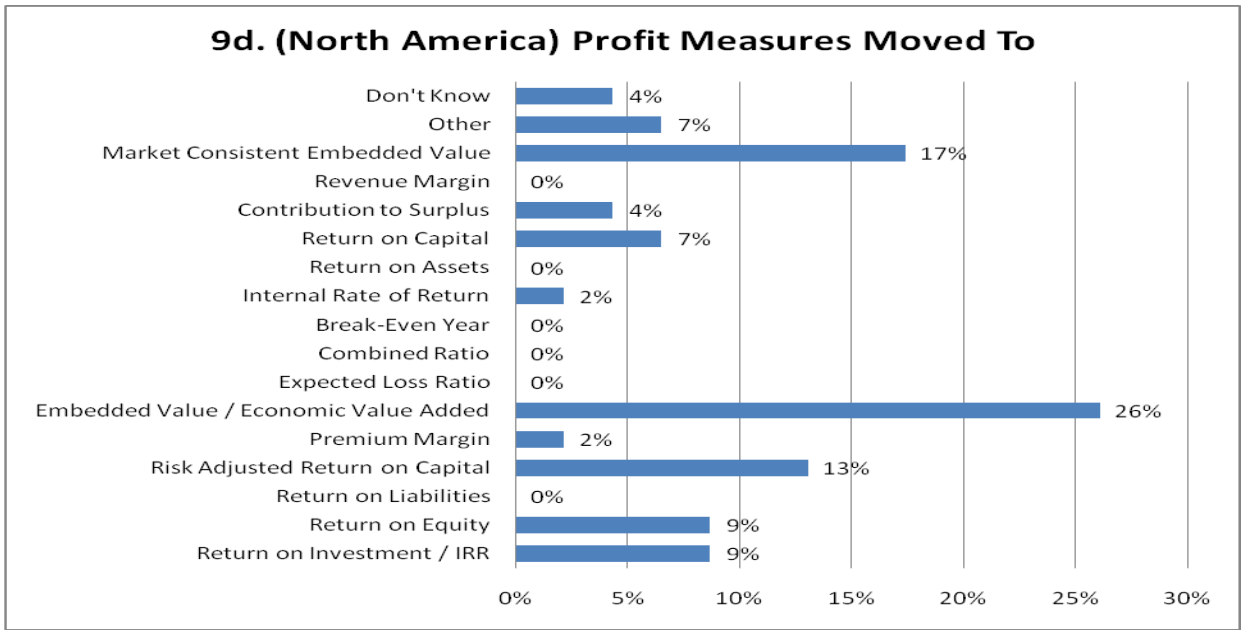




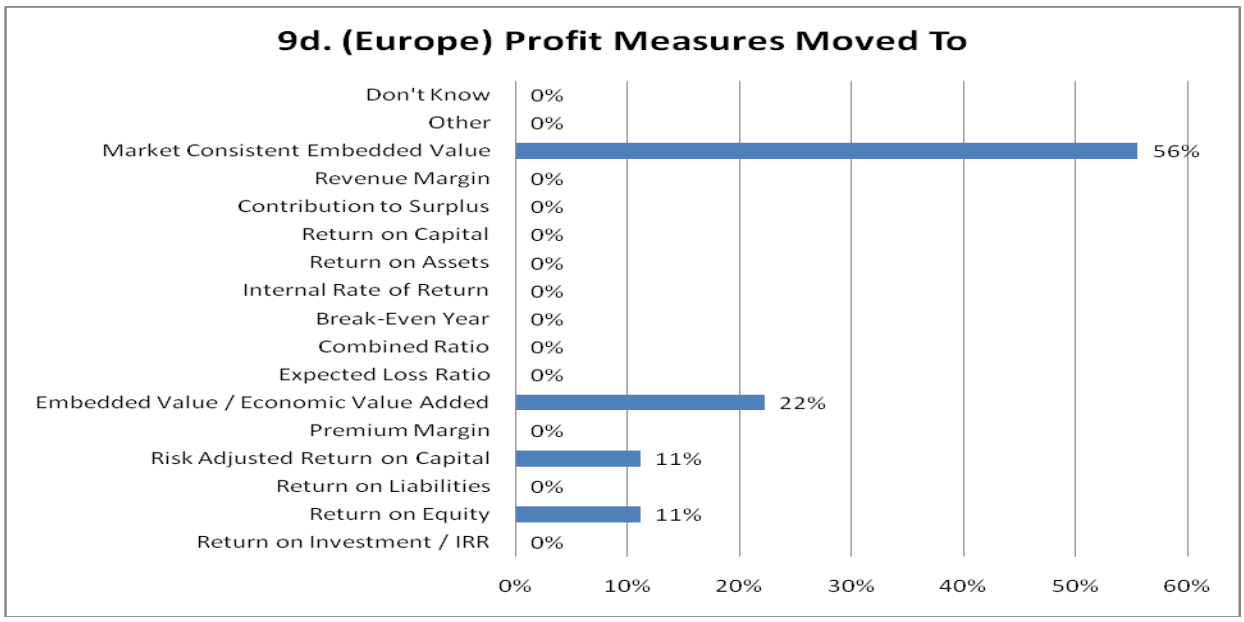
Question 9 – Have you changed your primary profit measure within the last 3 years? If so, what profit measure did you move away from? Which profit measure are you moving to?

Most companies have changed their profit measure in the last 3 years – 76% of North America, 39% of Europe, and 73% of Asia. No change was reported by 54% of European companies along with 20% of North American companies and 27% of Asian companies.

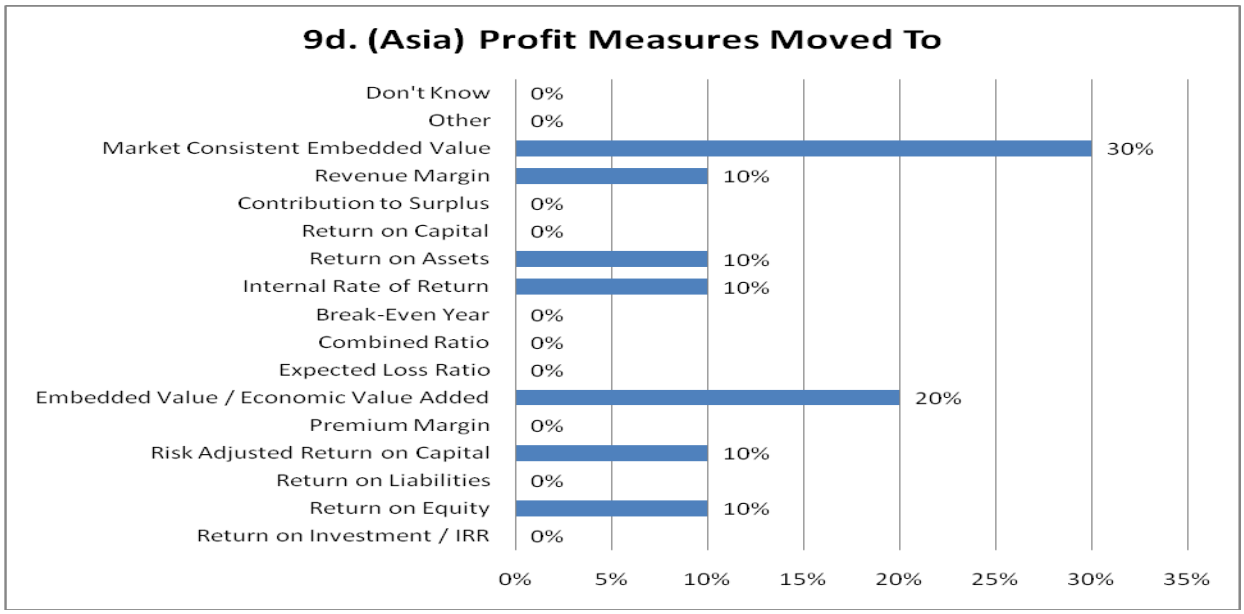
North American companies reported moving away from IRR and ROI as well as premium margin. Of the companies that have changed in the last 3 years and 18% of companies that anticipate a change in their profit measure within the next 5 years, most anticipate moving to embedded value or market consistent embedded value. 63% of North American companies do not plan to change their primary profit measure in the foreseeable future. Companies that target North America have also generally moved away from IRR (36%) and many plan to move to embedded value (26%) or market consistent embedded value (17%).



European companies have generally moved away from IRR, ROI and embedded value. 25% of companies anticipate a move within the next 3 years. Most companies (55%) anticipate moving or have moved to a market consistent embedded value profit measure.



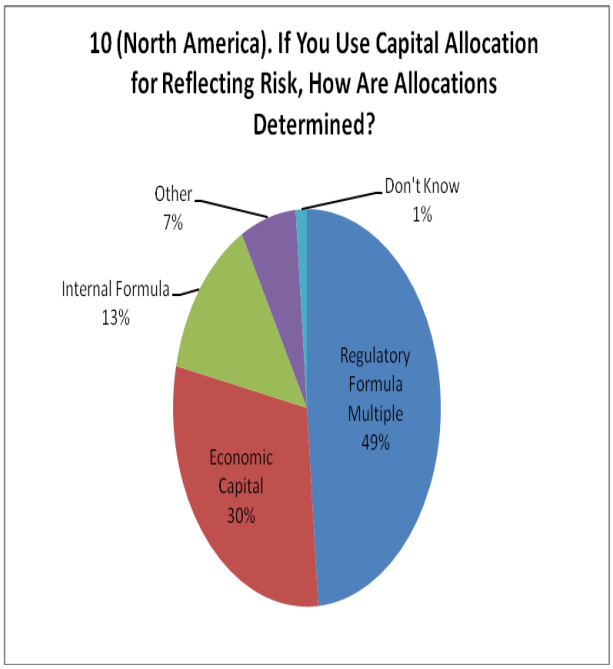
Asian companies have moved away from IRR, embedded value, return on capital and return on liabilities. 53% of companies do not anticipate a change in their profit measure. 20% of companies assume they will change their profit measure in 1-3 years, likely moving to market consistent embedded value or embedded value. Companies that target Asia have moved away from IRR (26%) or embedded value (20%), and are moving to market consistent embedded value (33%) and embedded value (25%).

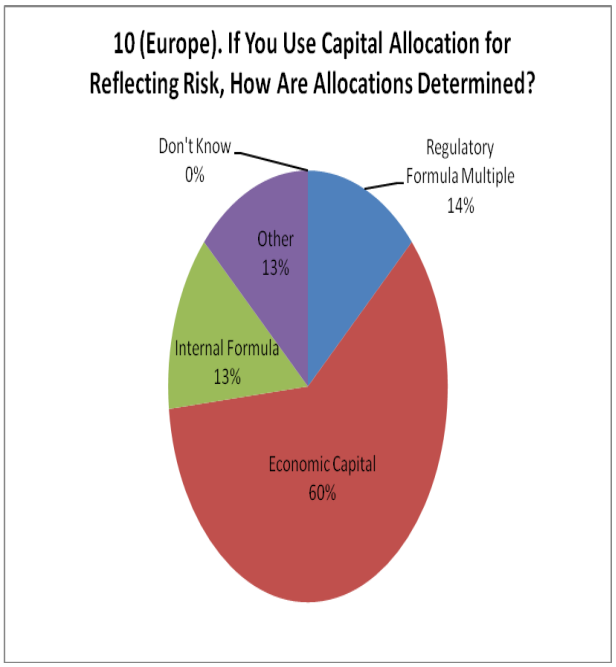


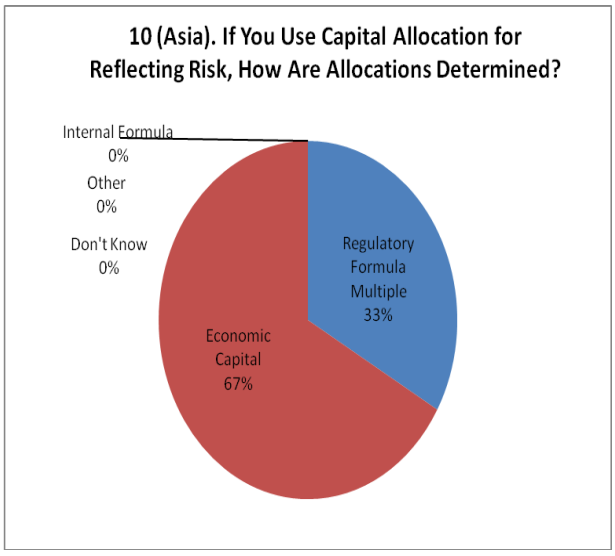
Question 10 – If you use Capital Allocation for reflecting risk, how are these allocations determined?

For North American companies, 49% report using a regulatory formula followed by 30% using economic capital to determine capital allocation to reflect risk. European companies use economic capital (60%), while 14% use a regulatory formula, and 13% each use an internal formula or some other means of allocating capital. Asian countries use economic capital (67%) or a regulatory formula (33%).

Companies targeting North America use a regulatory formula multiple (44%) and economic capital (32%), with a small number (13%) using an internal formula. Companies targeting Asia use economic capital (60%), regulatory formula (30%) and an internal formula (10%).



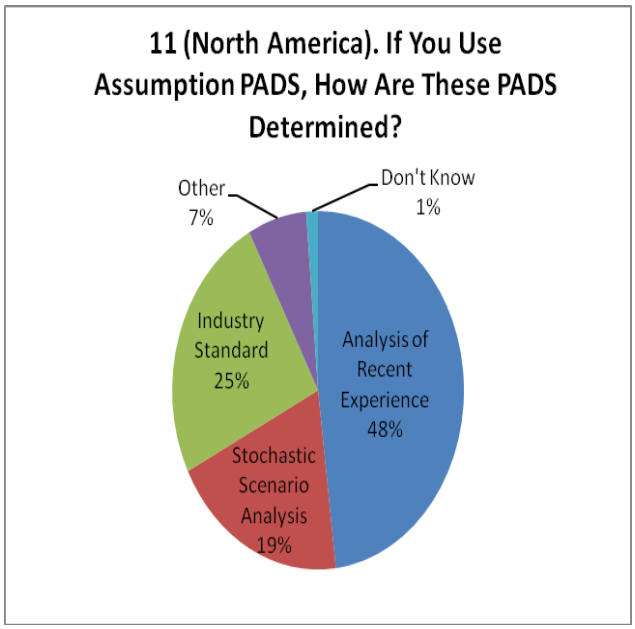


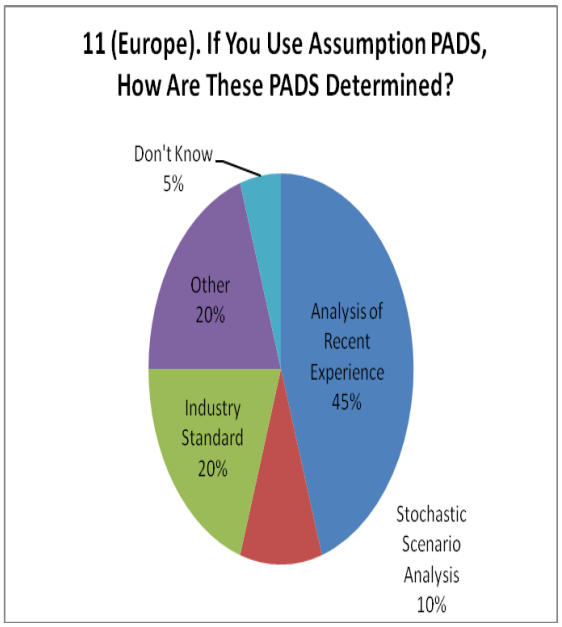


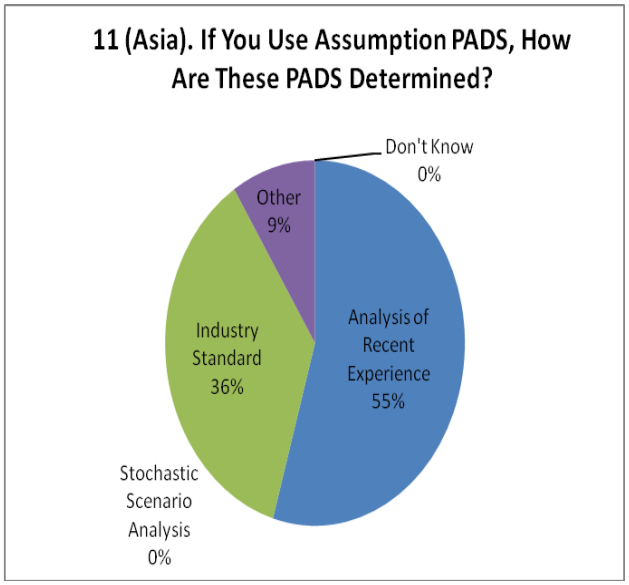
Question 11 – If you use Assumption PADS, how are these PADS determined?

North American companies determine PADs through analysis of experience (48%), industry standard (25%) and stochastic scenario analysis (19%). European companies determine PADs via analysis of experience (45%), industry standard (20%) and other means (20%). Asian companies use analysis of experience (55%), industry standard (36%) and other means (9%).

Companies targeting North America determine PADs by analysis of recent experience (48%), industry standard (23%) and stochastic scenario analysis (19%). Companies targeting Asia determine PADs through analysis of recent experience (50%), industry standard (33%) and through some other means (11%).







Question 12 – If you use a Risk-Adjusted Profit Target, how is it determined?

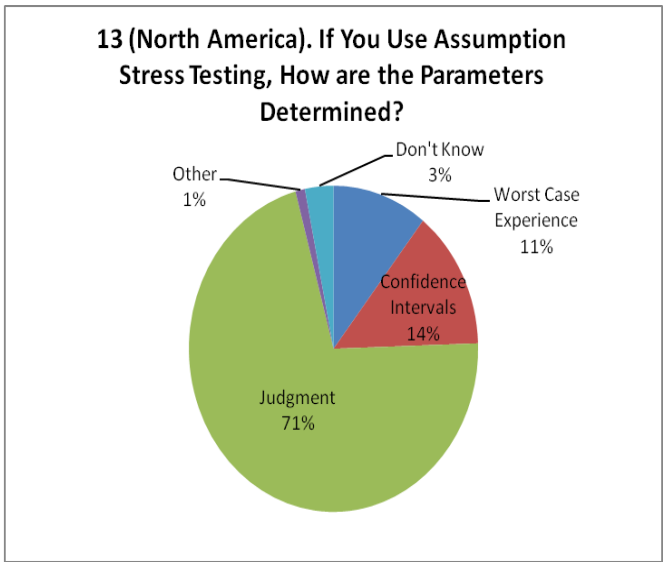
North American companies determine risk-adjusted profit targets through judgment (55%) or formula (35%). European companies use judgment (50%) and formula (43%). Asian companies use judgment (63%) and formula (37%).

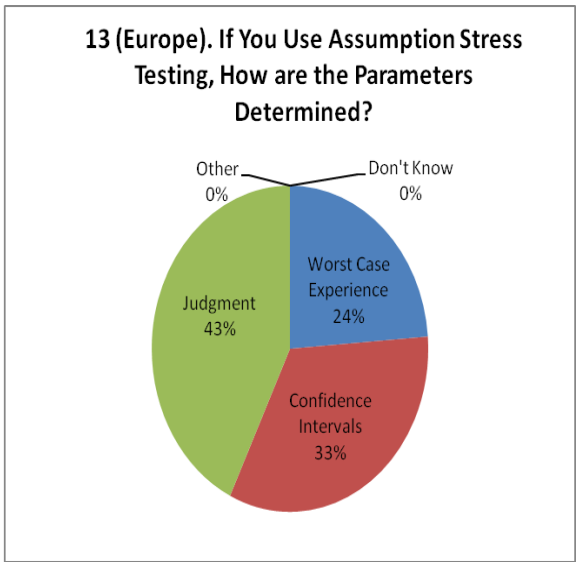
Companies targeting North America use judgment (57%) and formula (37%) to determine risk-adjusted profit targets. Companies targeting Asia use judgment (50%) and formula (44%).

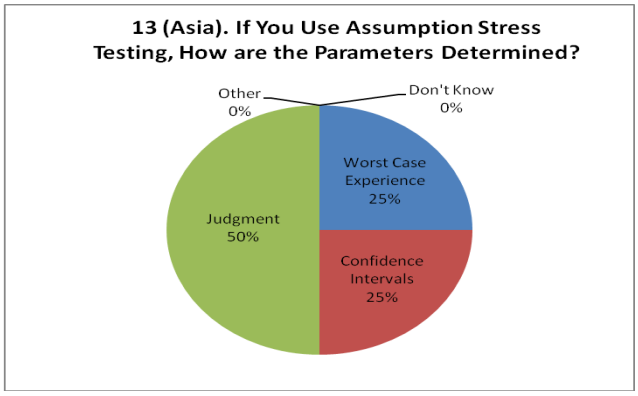
Question 13 – If you use Assumption Stress Testing, how are the parameters determined?

North American companies determine assumption stress testing parameters through judgment (71%), confidence intervals (14%), and worst case experience (11%). European countries use judgment 43%, confidence internals (33%) and worst case experience (24%). Asian countries use judgment (50%), confidence intervals (25%) and worst case experience (25%).

Companies targeting North America use judgment (67%), confidence internals (18%) and worst case experience (11%) to determine stress testing parameters. Companies targeting Asia use judgment (57%), worst case experience (26%) and confidence intervals (17%) to determine stress testing parameters.

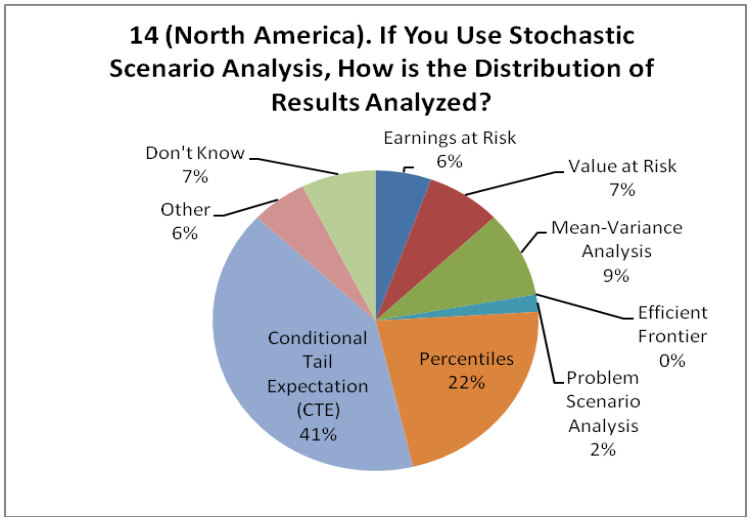


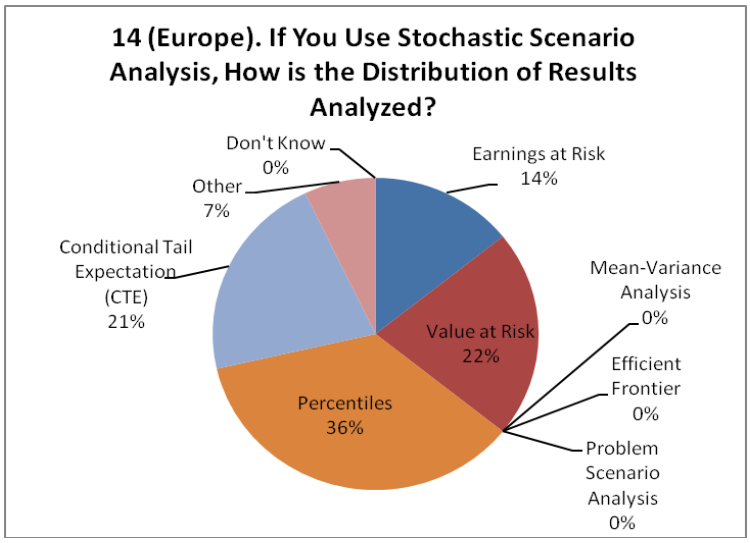


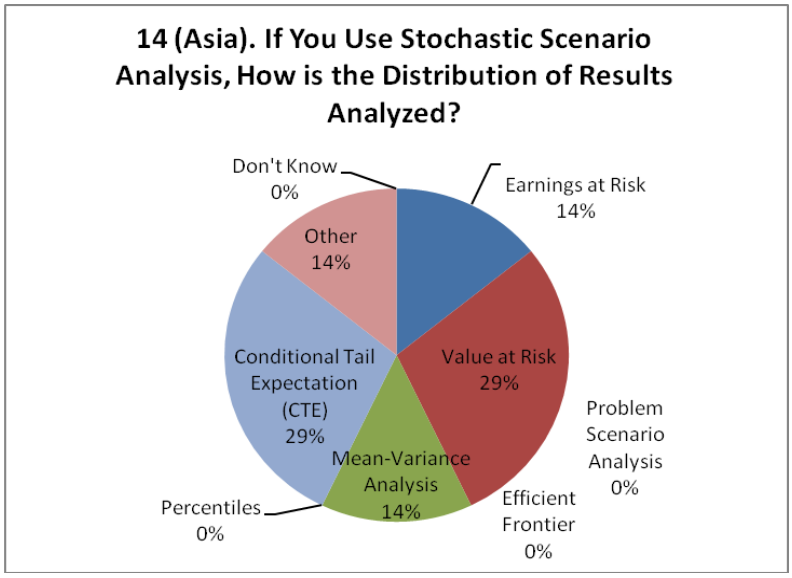


Question 14 – If you use Stochastic Scenario Analysis, how is the distribution of results analyzed?

North American companies that use stochastic scenario analysis analyze results through CTE (41%) and percentiles (22%). European companies use percentiles (36%), value at risk (22%), and CTE (21%). Asian companies use CTE (29%) and value at risk (29%).



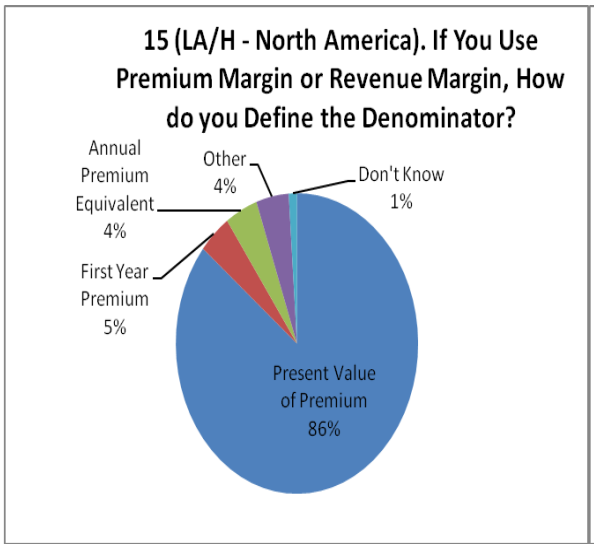


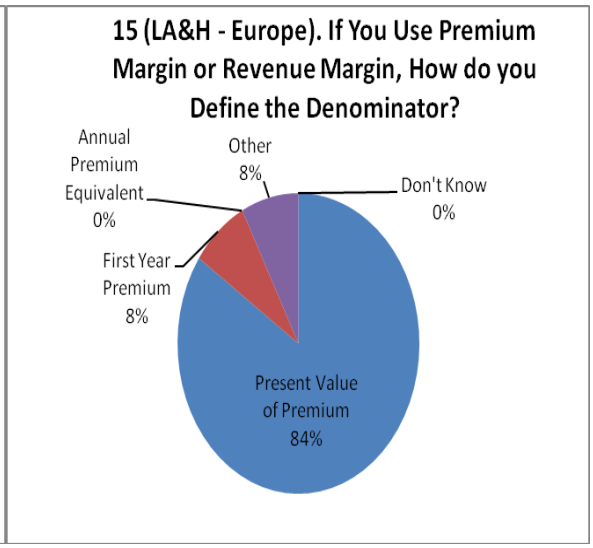


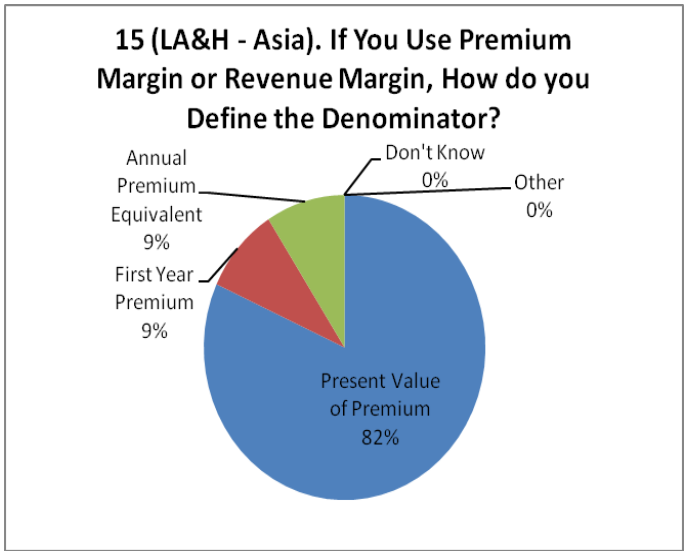
Companies targeting North America analyze stochastic results through CTE (42%), percentiles (20%) and value at risk (9%). Companies targeting Asia use percentiles (36%) and earnings at risk (15%), while 14% each use CTE or value at risk.

Question 15 – If you use Premium Margin or Revenue Margin, how do you define the denominator of the equation?

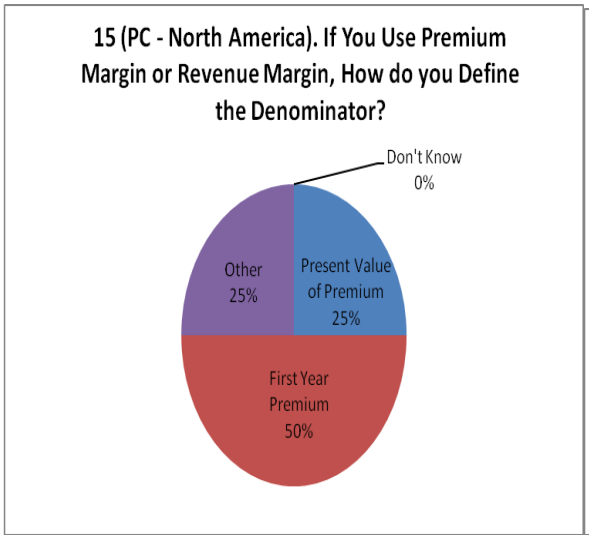
North American life and health companies use present value of premium (86%), first year premium (5%), and annual premium (4%) to define the denominator of premium or revenue margin. European life and health companies use present value of premium (84%), first year premium (8%), and some other measure (8%). Asian life and health companies use present value of premium (82%), first year premium (9%) and annual premium equivalent (9%).

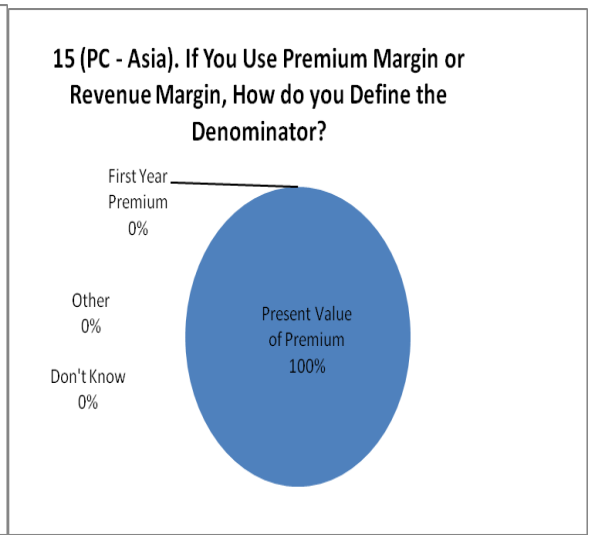






North American P&C companies use first year premium (50%), present value of premium (25%), and other measures (25%). Asian P&C companies use present value of premium (100%).



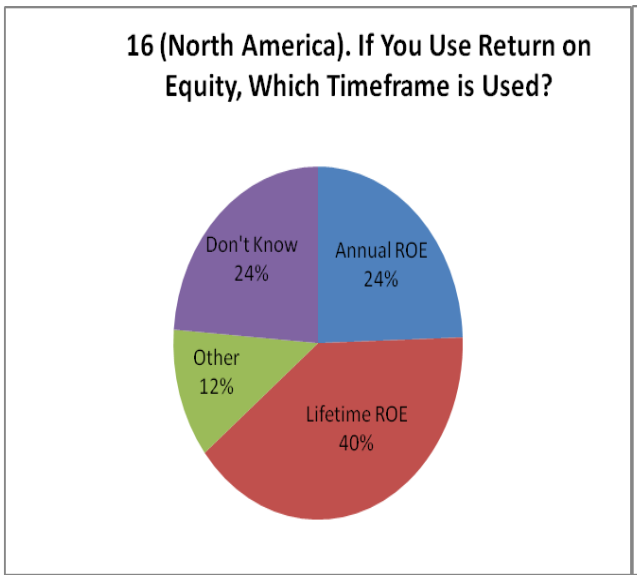


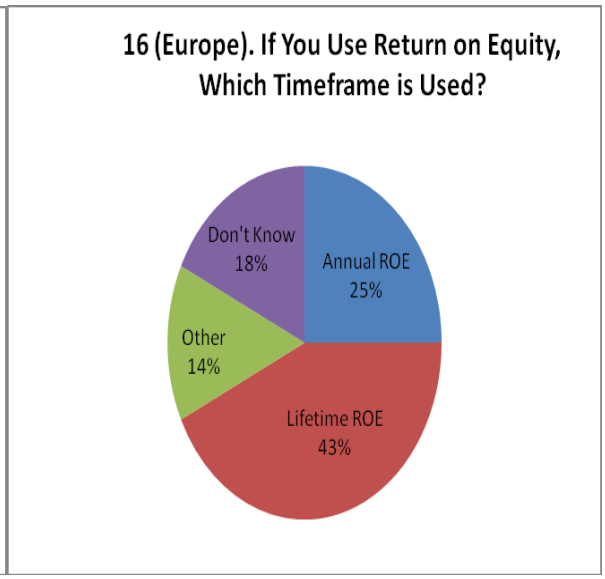
Life and health companies targeting North America use present value of premium (86%) to determine the denominator of premium or revenue margin. P&C companies targeting North America use present value of premium (40%) and first year premium (40%). Companies targeting Asia use present value of premium (90%), then annual premium equivalent (5%) and first year premium (5%).

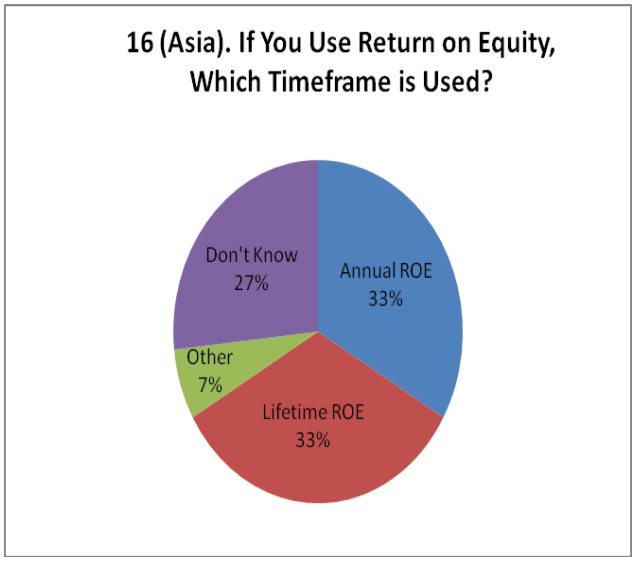
Question 16 – If you use ROE, which of the following timeframes is used?

North American companies using ROE have a timeframe of lifetime ROE (40%), Annual ROE (24%) and some "Other" measure (12%). European companies use lifetime ROE (43%), annual ROE (25%), and some "Other" measure (24%). Asian companies use lifetime ROE (33%), and annual ROE (33%), and "Other" (7%). "Other" responses include specific numbers of years or a mixture of methods.

Companies targeting North America use lifetime ROE (39%) and annual ROE (26%). Companies targeting Asia use lifetime ROE (43%) and annual ROE (25%).

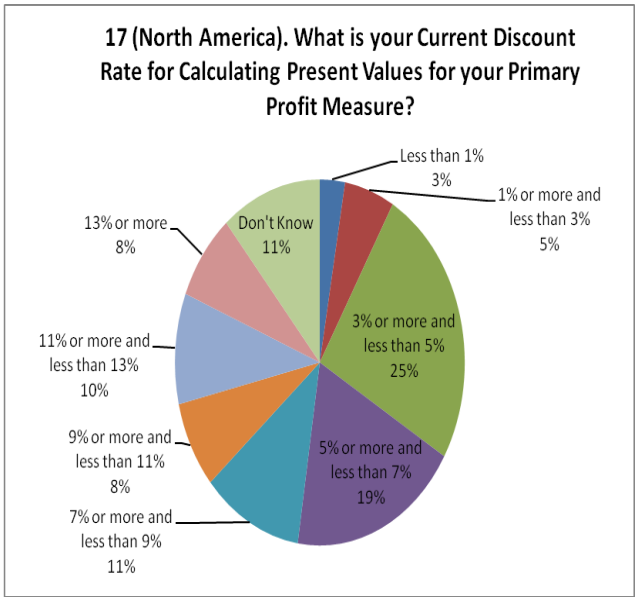


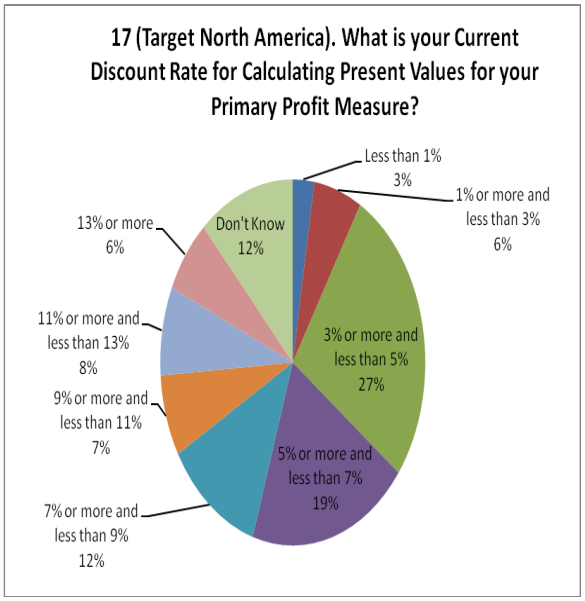




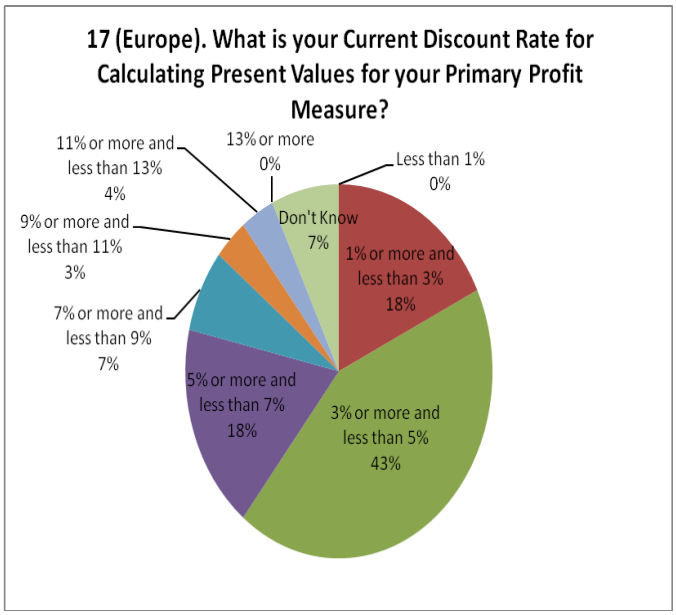
Question 17 – What is the level of your current discount rate when calculating present values for your primary profit measure?

One quarter (25%) of North American companies reported discount rates of 3%-5%, and 19% use 5% to 7%. Companies targeting North America have a similar distribution of discount rates.

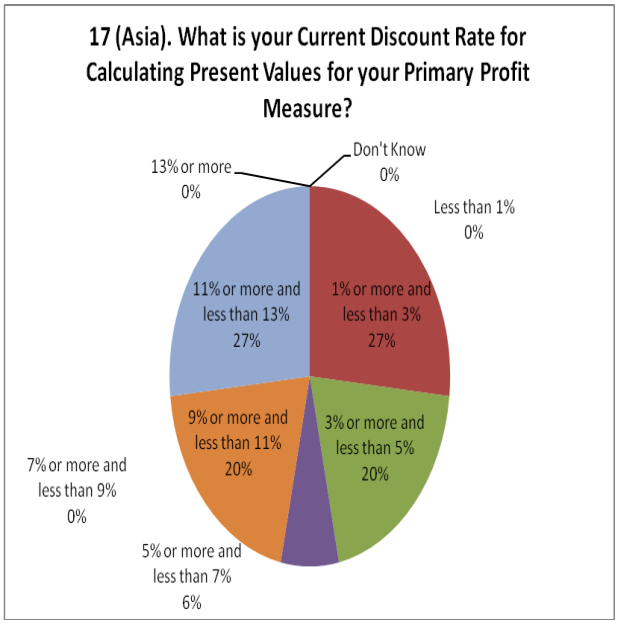


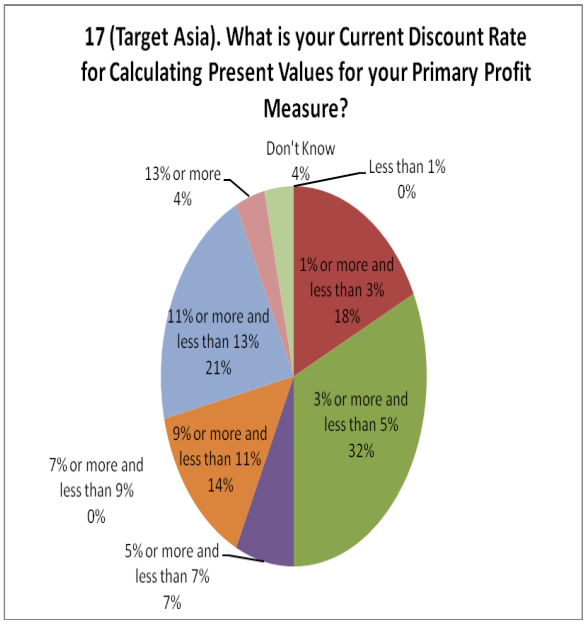


43% of European companies reported using 3%-5%, and 18% each report ranges from 1%-3% and 5%-7%.



27% of Asian companies reported 1% to 3% and 27% reported 11%-13%. Companies targeting Asia had a higher concentration in the 3% - 5% range than companies with parents in Asia.

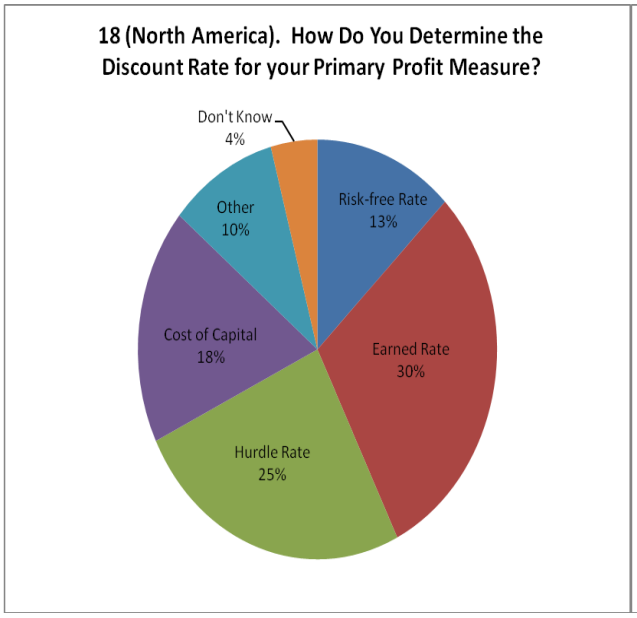


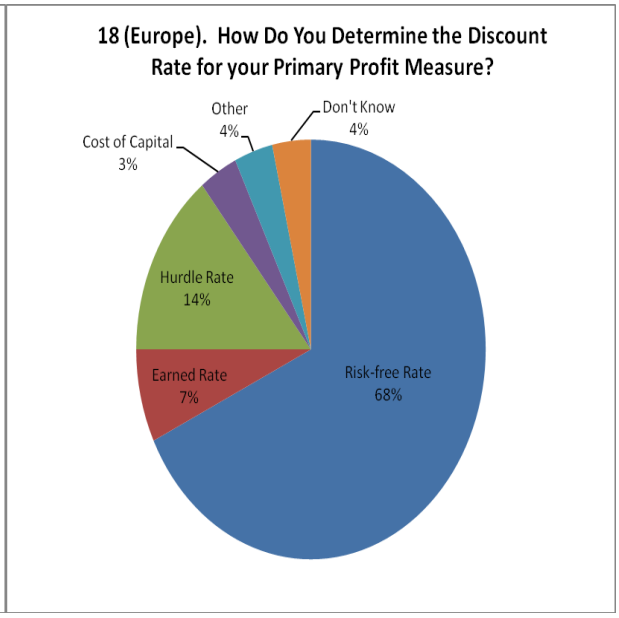


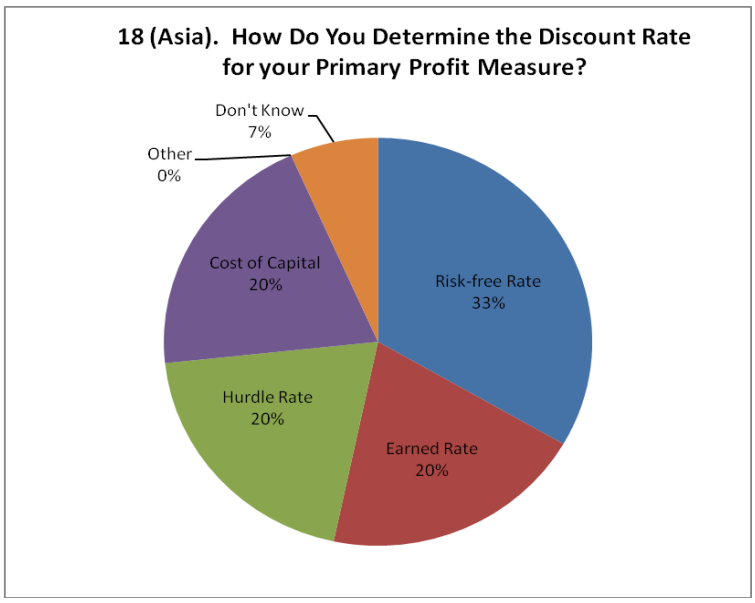
Question 18 – How do you determine the discount rate for your primary profit measure?

Discount rates for North American companies are determined through earned rates (30%), hurdle rates (25%), and cost of capital (18%). European companies generally use risk free rates (68%), hurdle rates (14%), and earned rates (7%). Asian companies use risk free rates 33% of the time, while 20% each use cost of capital, hurdle rates, and earned rates.

Companies targeting North America determine discount rates by using earned rates (29%), hurdle rates, (24%), and 16% each use cost of capital and the risk free rate. Companies targeting Asia use risk free rates (43%), hurdle rates (21%) and earned rates (18%).







Question 19 – Given the recent economic environment, has your company made changes to its risk assessment practices?

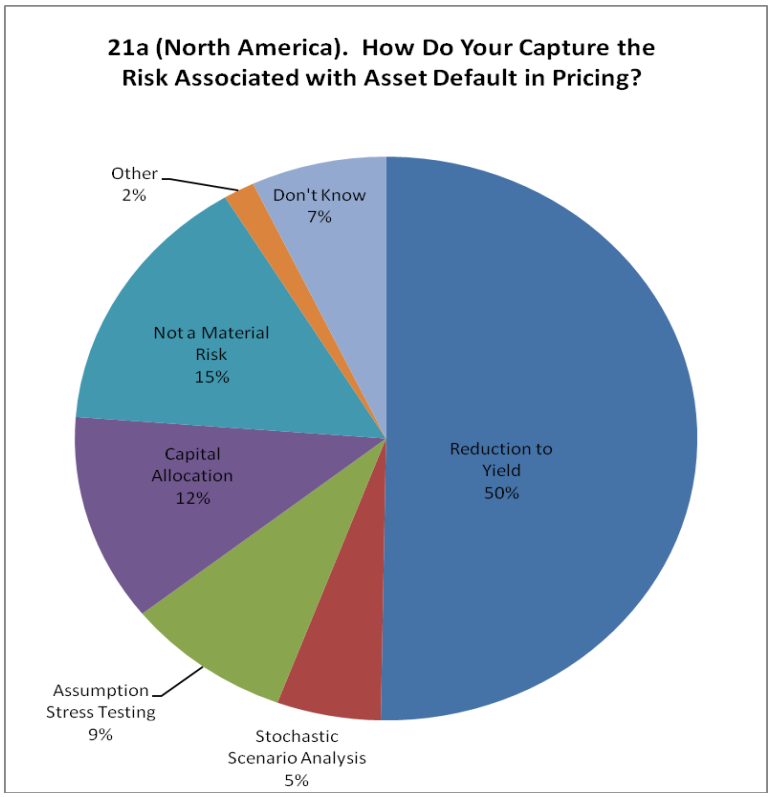
47% of North American companies report no change due to the recent economic environment while 43% reported "Yes" changes have been made. European companies reported "Yes" 43% of the time and 36% reported "No" to changes being made. Asian companies responded no change 47% of the time while 33% responded with "Yes," changes have been made. Similar distributions were provided by companies targeting North America and Asia.

Question 20 – Do you employ an enterprise risk actuary or have an enterprise risk management area in your company?

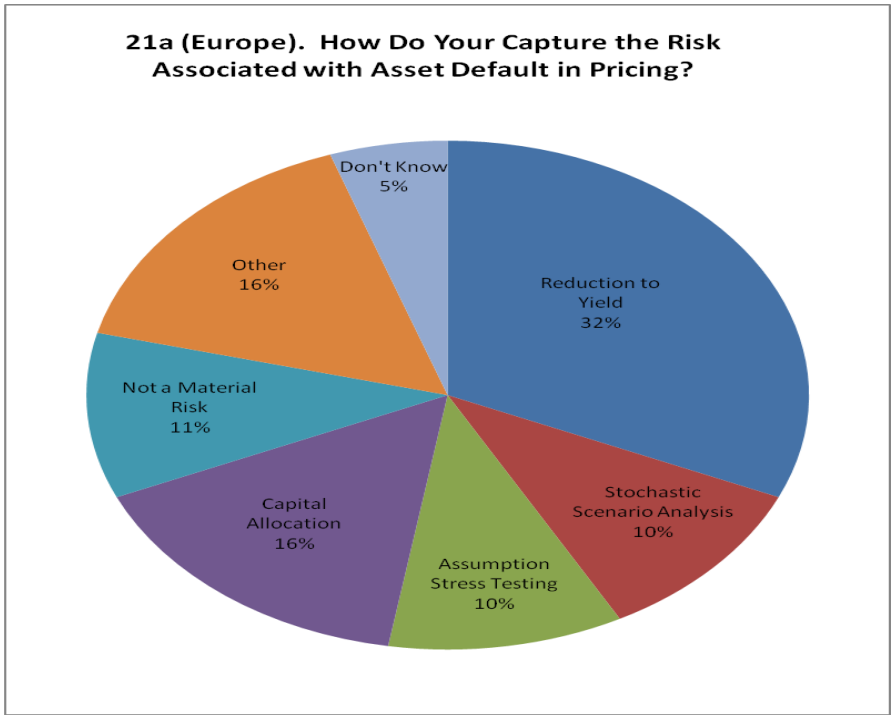
64% of North American companies reported employing an ERM actuary or area in their companies, as well as 68% of European companies and 60% of Asian companies. No intention of employing an ERM area or actuary was reported by 22% of North American companies, 7% of European companies, and 20% of Asian companies. Companies considering ERM areas or actuaries include 9% in North America, 7% in Europe and 13% in Asia. A similar distribution of answers was given by companies targeting North America. Companies targeting Asia had 54% employing ERM areas/actuaries, 18% considering the addition, and 14% stating no interest in adding ERM areas/actuaries.

Question 21 – How do you capture risk associated with asset default in pricing? Who determines the parameter and magnitude of the asset default in pricing? How is the amount of the asset default adjustment determined?

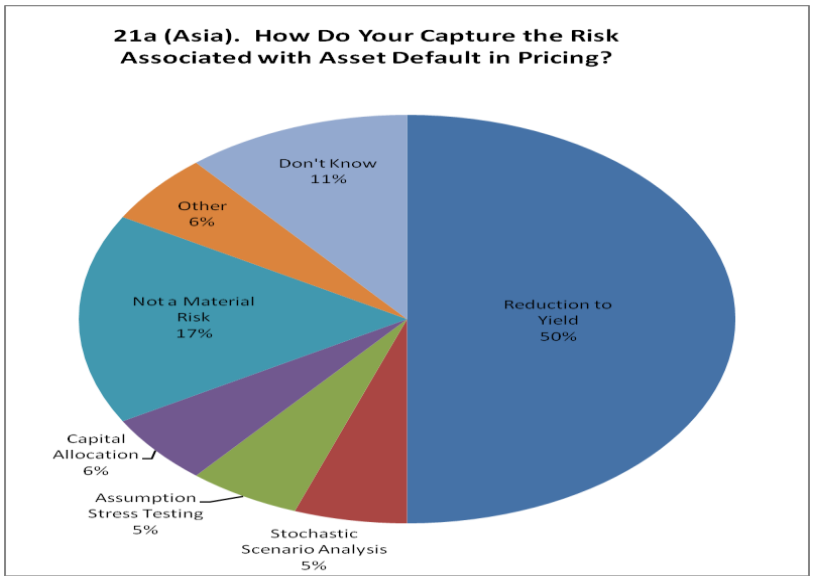
North American companies generally use reduction to yield (50%) to capture default risk. Determination of the amount of default comes from the investment area (32%), or a combination of areas (28%). The amount is determined through an internal model (42%) or rating agency formula (13%). A similar distribution of answers was provided by companies targeting North America.



European companies capture default risk through reduction to yield (32%) and capital allocation (16%). Parameters are determined by the investment area (25%) and a combination of areas (21%). The amount is determined through an internal model (47%) or some other method (7%).



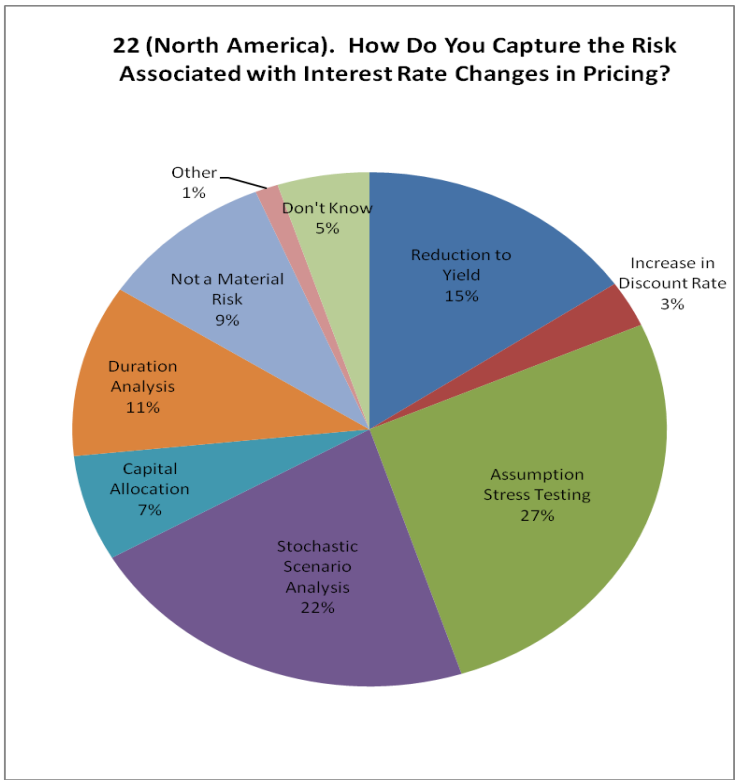
Asian companies capture defaults risk through reduction to yield (50%) and many do not consider it material (17%). The investment area (40%) or some combination of areas (20%) generally determine the parameters. Amounts are determined through an internal model (20%) or rating agency formula (13%). 20% of Asian companies replied "Not applicable" and 33% did not know how the amount was determined. A similar distribution of answers was supplied by companies targeting Asia.

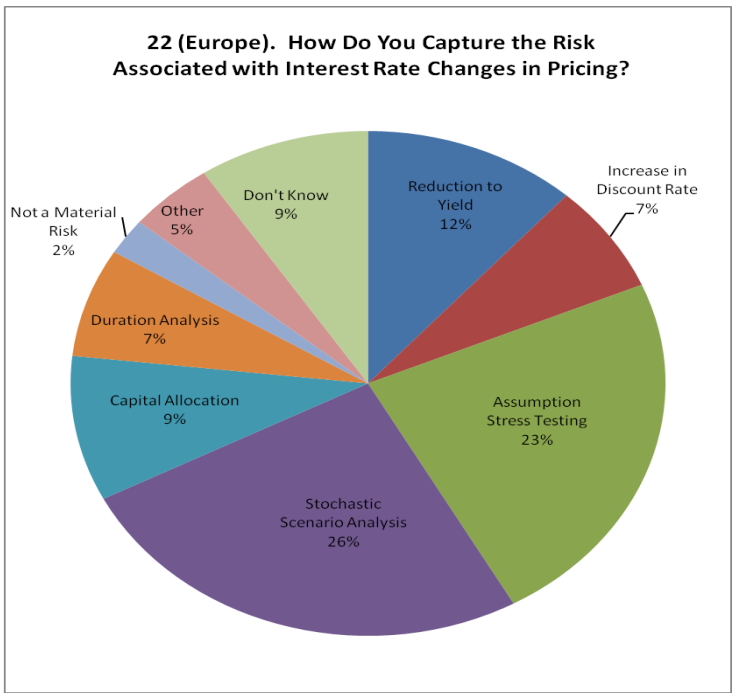


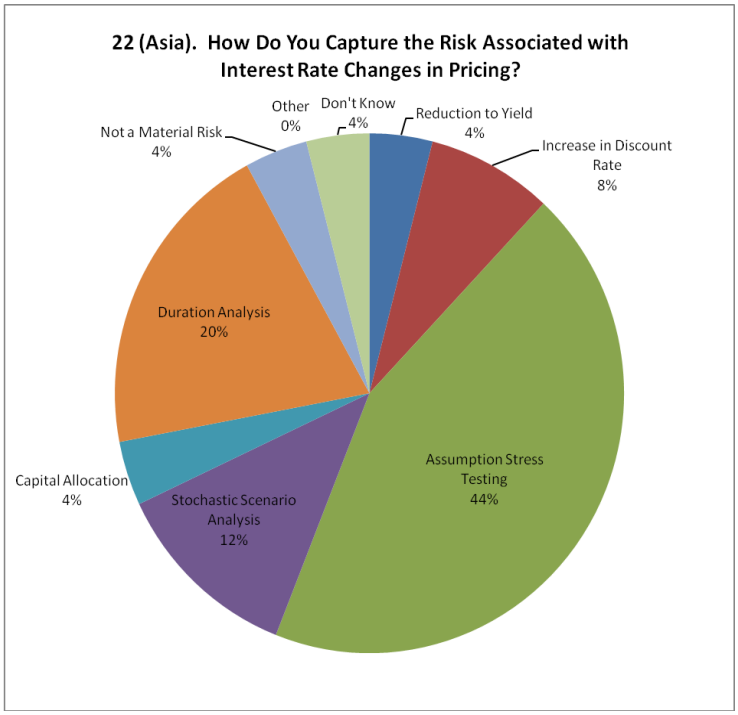
Question 22 – How do you capture risk associated with interest rate changes in pricing?

North American companies capture interest rate changes through assumption stress testing (27%) and stochastic scenario analysis (22%), followed by reduction to yield (15%). European companies use stochastic scenario analysis (26%), assumption stress testing (23%) and reduction to yield (12%). Asian companies use assumption stress testing (44%), duration analysis (20%) and reduction to yield (12%).

Companies targeting North America capture interest rate changes primarily through assumption stress testing (25%) and stochastic scenario analysis (22%), followed by reduction to yield (15%). Companies targeting Asia use assumption stress testing (41%), stochastic scenario analysis (19%) and duration analysis (17%).





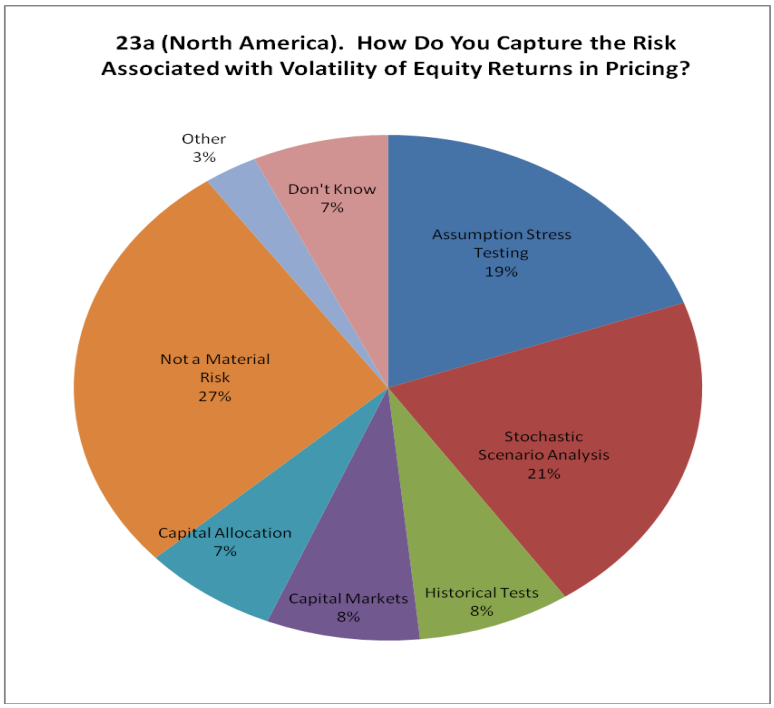


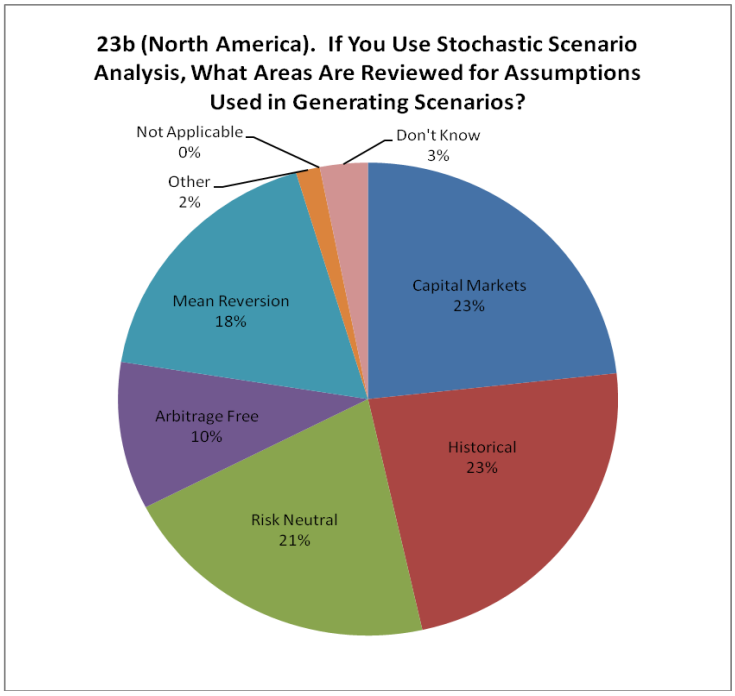
Question 23 – How do you capture the risk associated with the volatility of equity returns in pricing? If you use stochastic analysis, what areas do you look at for assumptions used in generating the scenarios?

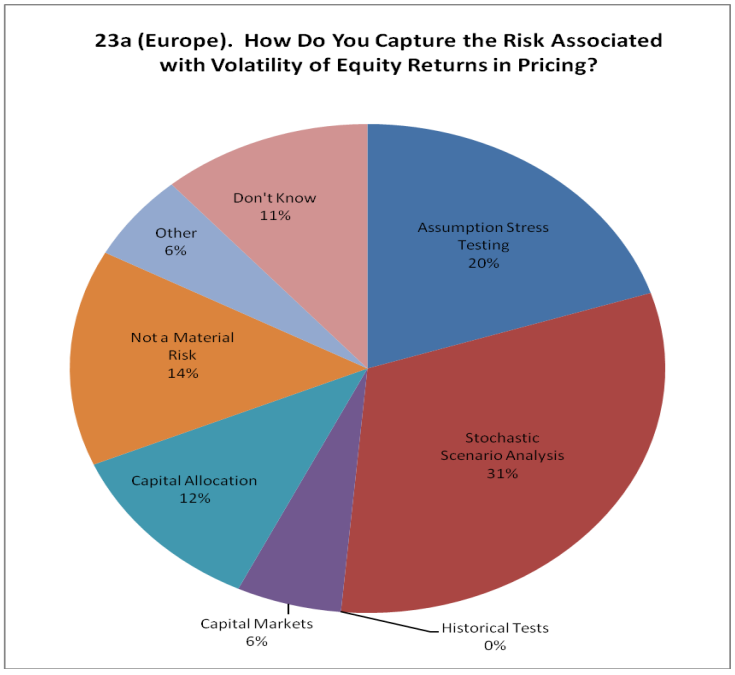
North American companies capture volatility risk through stochastic scenario analysis (21%) and assumption stress testing (19%), while 27% do not consider this risk as material. North American companies that use stochastic scenario analysis reported looking at capital markets (23%) and historical data (23%), risk neutral (21%) and mean reversion (18%). Similar answers were reported by companies targeting North America.

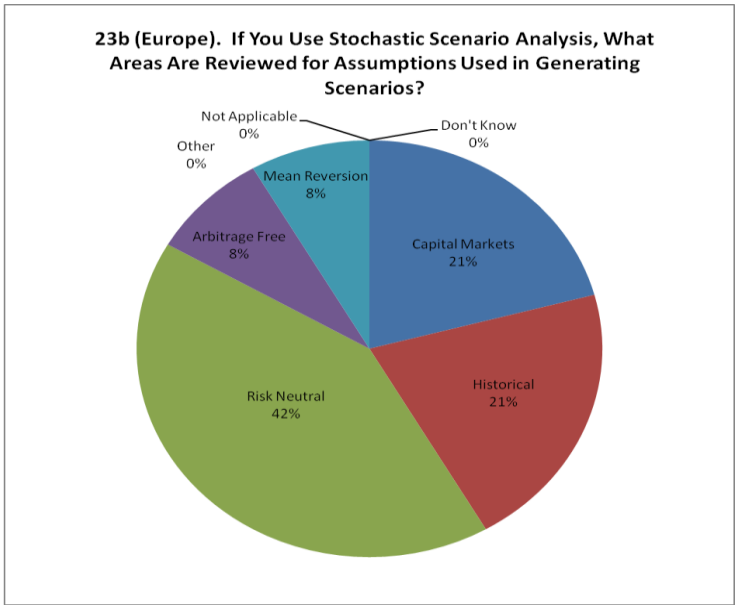
European companies use stochastic scenario analysis (31%) and assumption stress testing (20%), while 14% do not consider volatility a material risk. European companies using stochastic scenario analysis reported looking at risk neutral (42%), capital markets (21%), and historical data (21%).

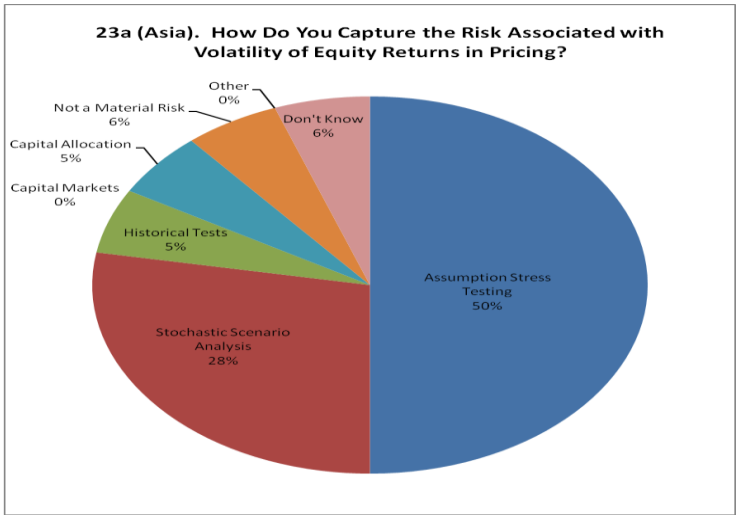
Asian companies generally use assumption stress testing (50%) and stochastic scenario analysis (28%) while only 6% do not consider volatility a material risk. Asian companies that use stochastic scenario analysis review risk neutral information (31%), historical data (31%) and capital markets data (23%). Companies targeting Asia use assumption stress testing (44%), stochastic scenario analysis (32%), while 6% do not consider volatility a material risk. Companies targeting Asia that use stochastic scenario analysis review regarding risk neutral data (41%), historical data (27%) and capital markets (18%).

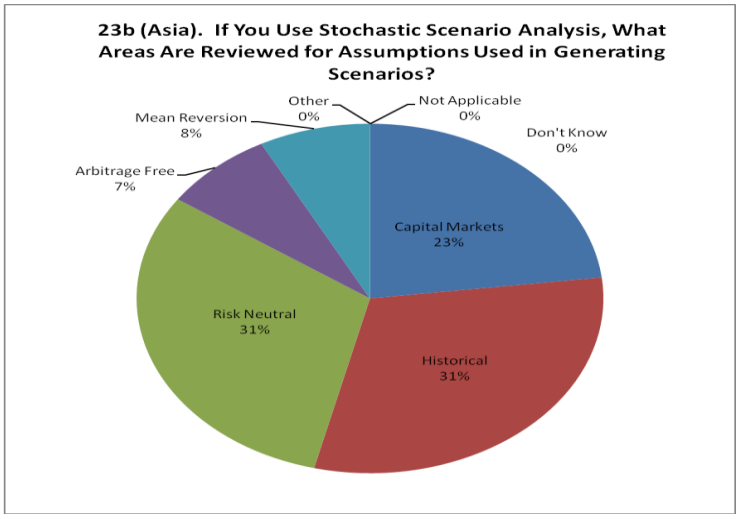








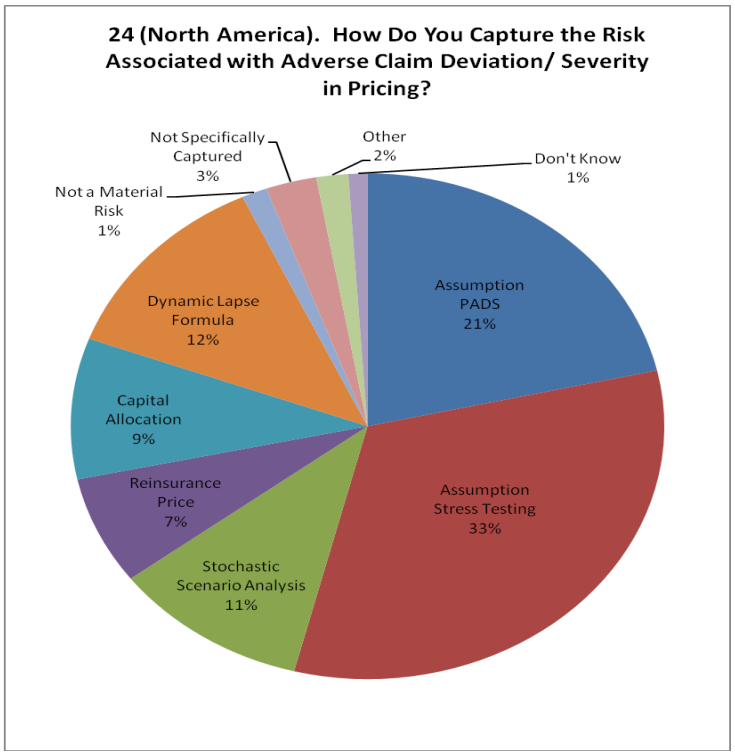


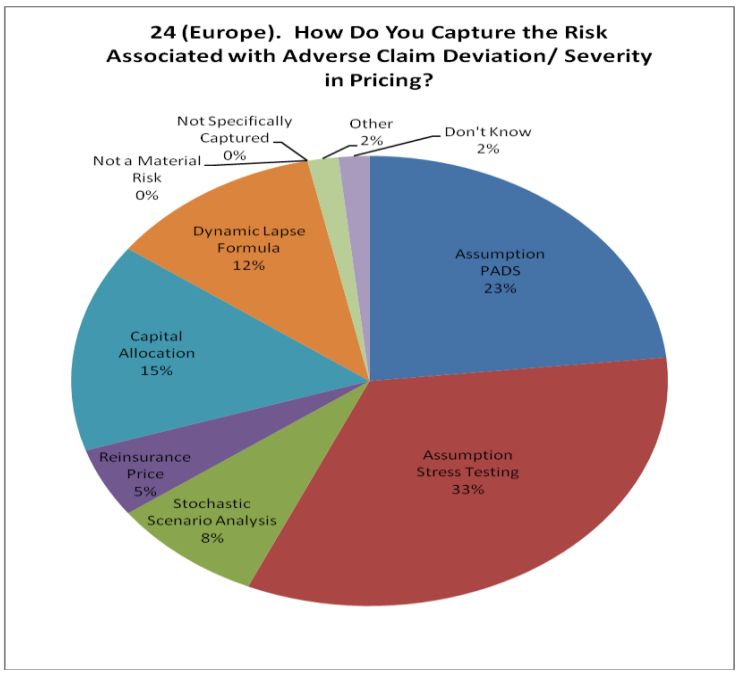


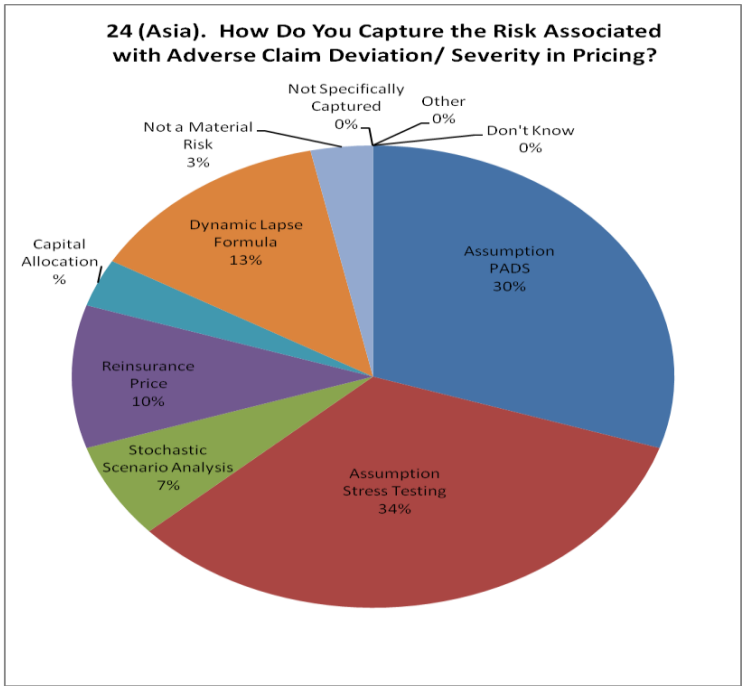
Question 24 – How do you capture the risk associated with adverse claim deviation/severity in pricing?

North American companies capture claim deviation/severity risk through assumption stress testing (33%), assumption PADs (21%), and dynamic lapse formula (12%). European companies generally use assumption stress testing (33%), assumption PADs (23%), and capital allocation (15%). Asian companies mainly use assumption stress testing (34%), assumption PADs (30%), and dynamic lapse formula (13%).

Companies targeting North America provided a similar distribution to companies located in North America. Companies targeting Asia reported mainly using assumption stress testing (40%), assumption PADs (26%), and dynamic lapse formula (12%).





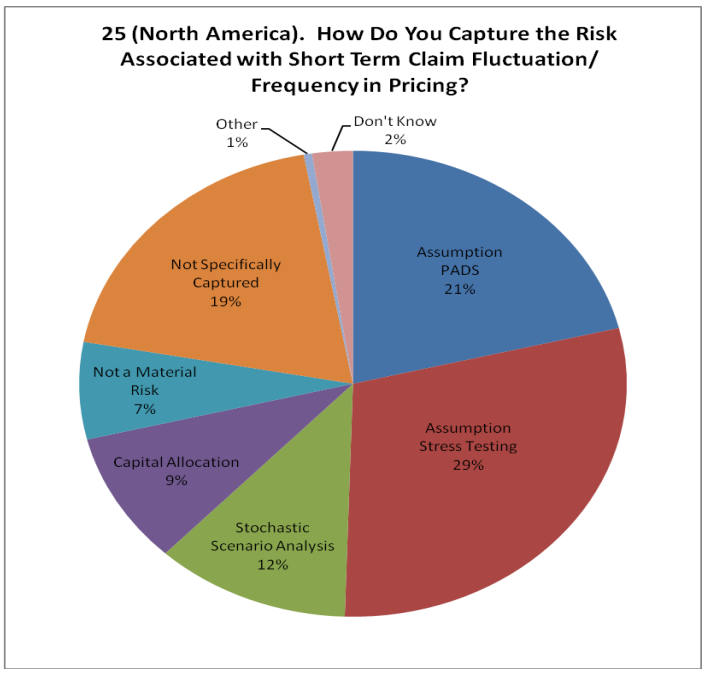


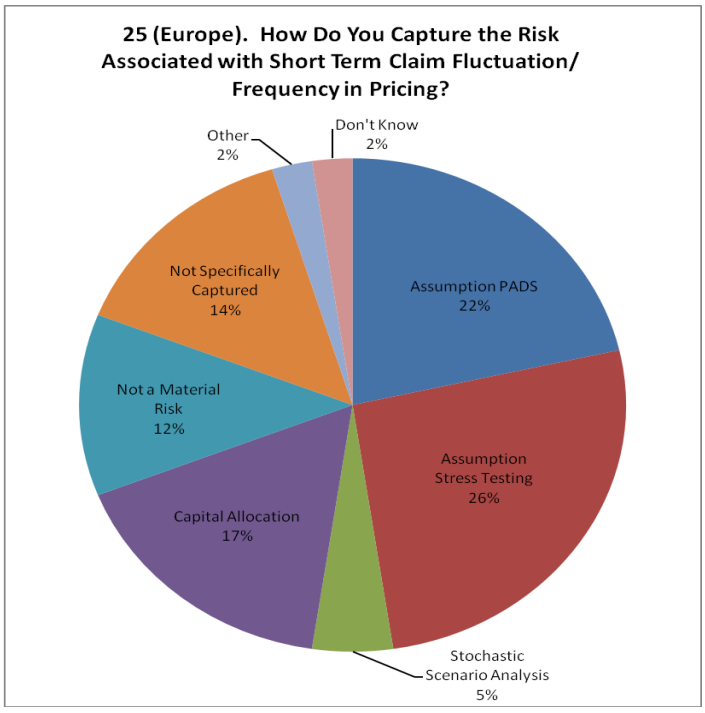
Question 25 – How do you capture risk associated with short-term claim fluctuations/frequency in pricing?

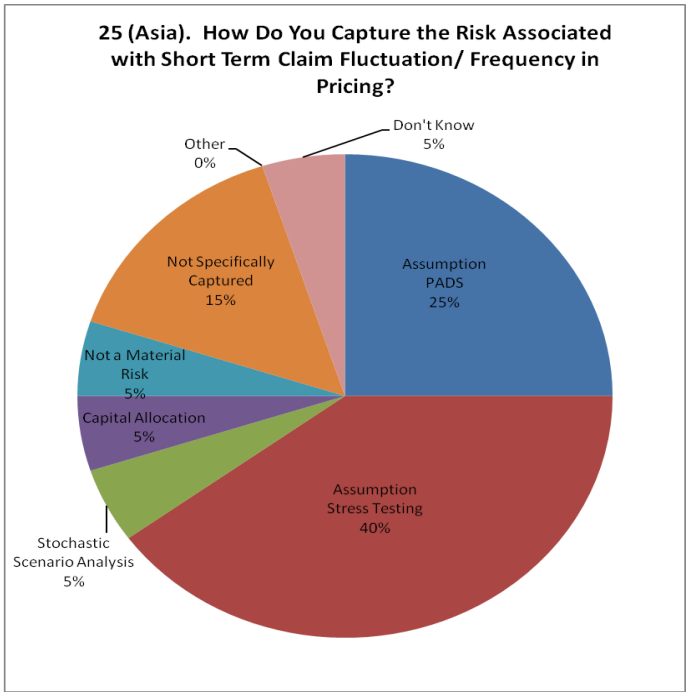
North American companies capture short-term claim fluctuation/frequency through assumption stress testing (29%) and assumption PADs (21%), while 19% do not specifically capture fluctuation/frequency risk. European companies favor using assumption stress testing (26%), assumption PADs (22%), and

capital allocation (17%). Asian companies use assumption stress testing (40%) and assumption PADs (25%), while 15% reported they do not specifically capture this risk.

A similar distribution of results was provided by companies targeting North America to companies located in North America, as well as those that target Asia and those located in Asia.



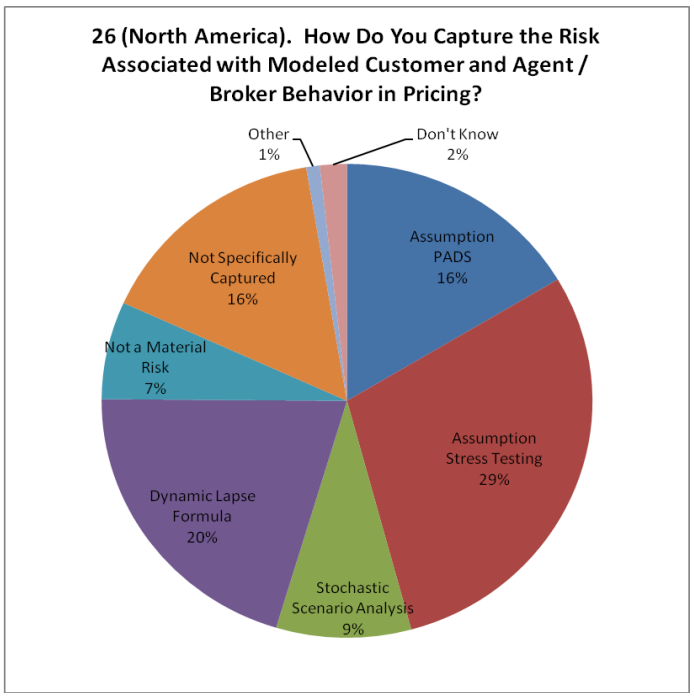


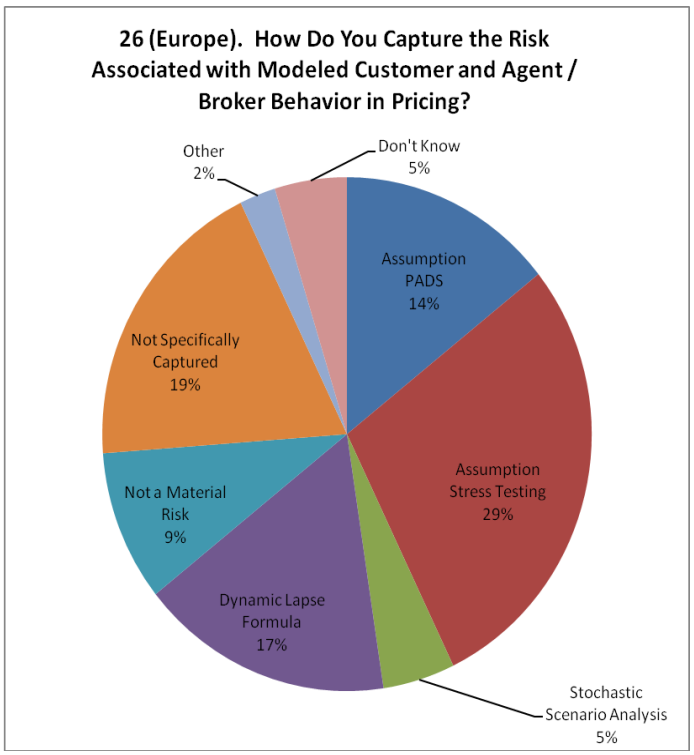


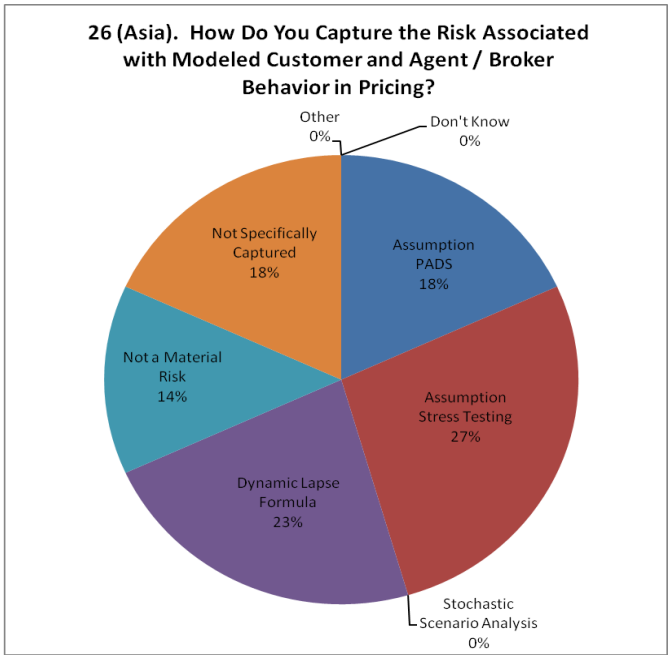
Question 26 – How do you capture the risk associated with modeled customer and agent/broker behavior in pricing?

North American companies use assumption stress testing (29%) and dynamic lapse assumption (20%), while 16% each reported assumption PADs or no specifically reflect customer/agent/broker behavior. European companies use assumption stress testing (29%) and dynamic lapse formula (17%), while 19% do not specifically capture risk associated with customer/agent/broker behavior. Asian companies use assumption stress testing (27%), dynamic lapse formula (23%), and 18% each use assumption PADs or do not specifically model customer/agent/broker behavior.

Companies targeting Asia use assumption stress testing (35%), dynamic lapse formula (19%), and 16% each use assumption PADs or do not specifically capture risk associated with customer/agent/broker behavior.



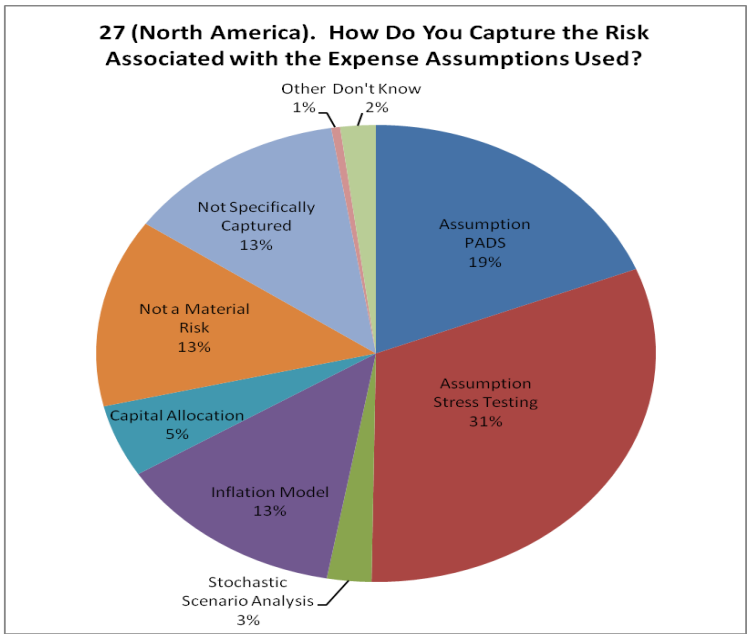


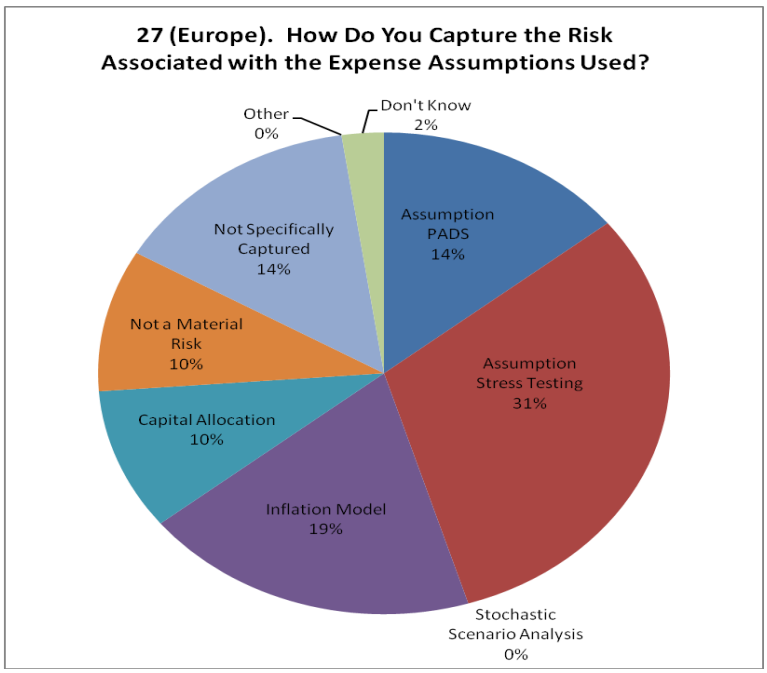


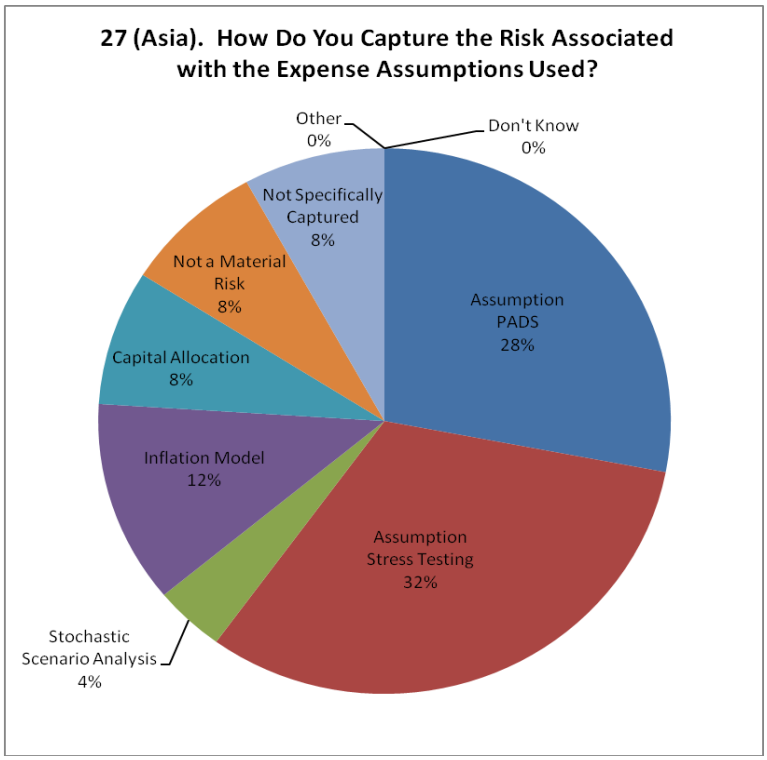
Question 27 – How do you capture the risk associated with the expense assumptions used?

North American companies capture expense risk through assumption stress testing (31%), assumption PADs (19%), and inflation models (13%). European companies use assumption stress testing (31%), inflation models (19%) and assumption PADs (14%). Asian companies use assumption stress testing (32%), assumption PADs (28%) and inflation model (12%).

Companies targeting Asia use assumption stress testing (36%), assumption PADs (21%) and inflation model (17%).



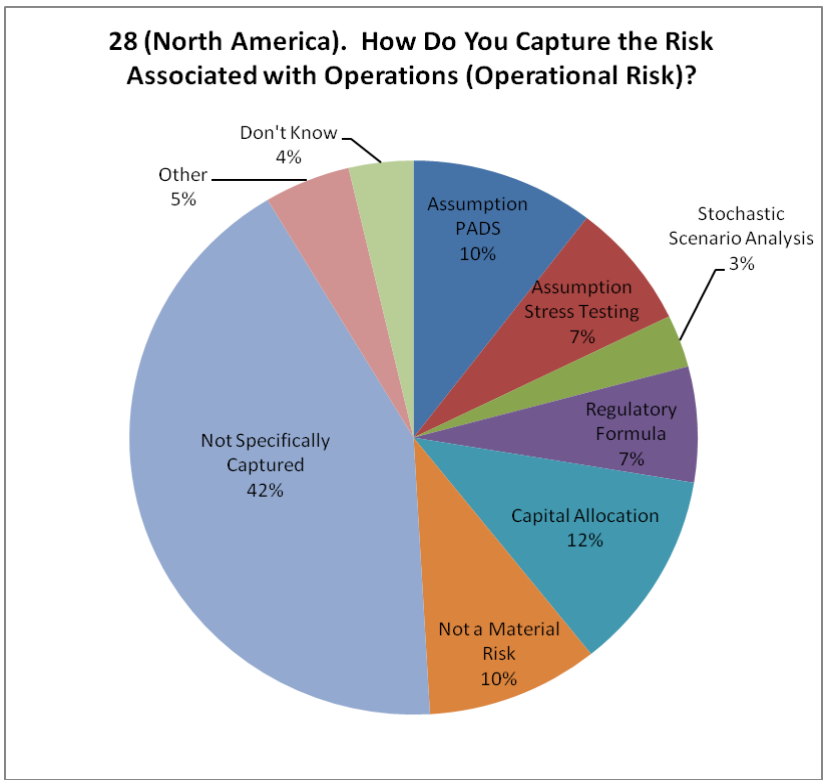


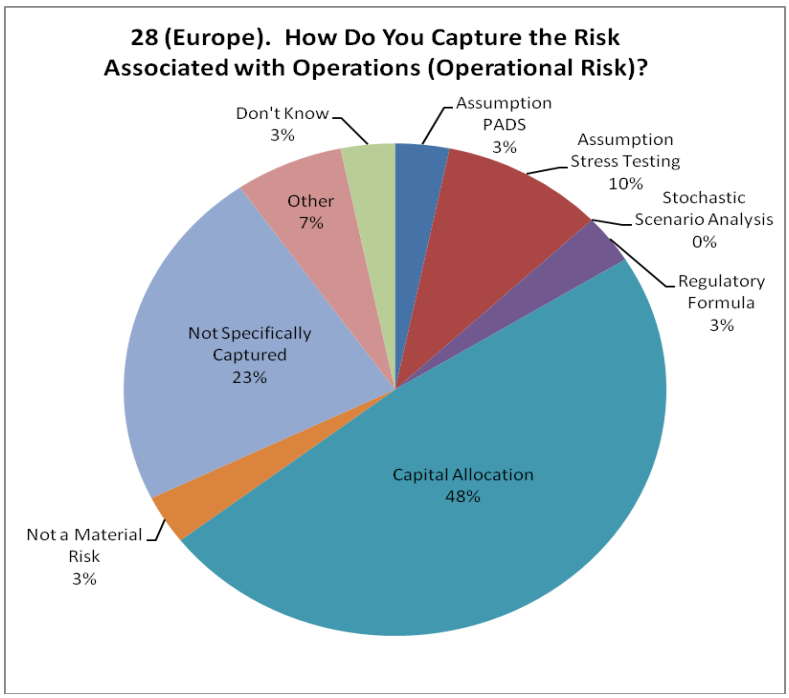


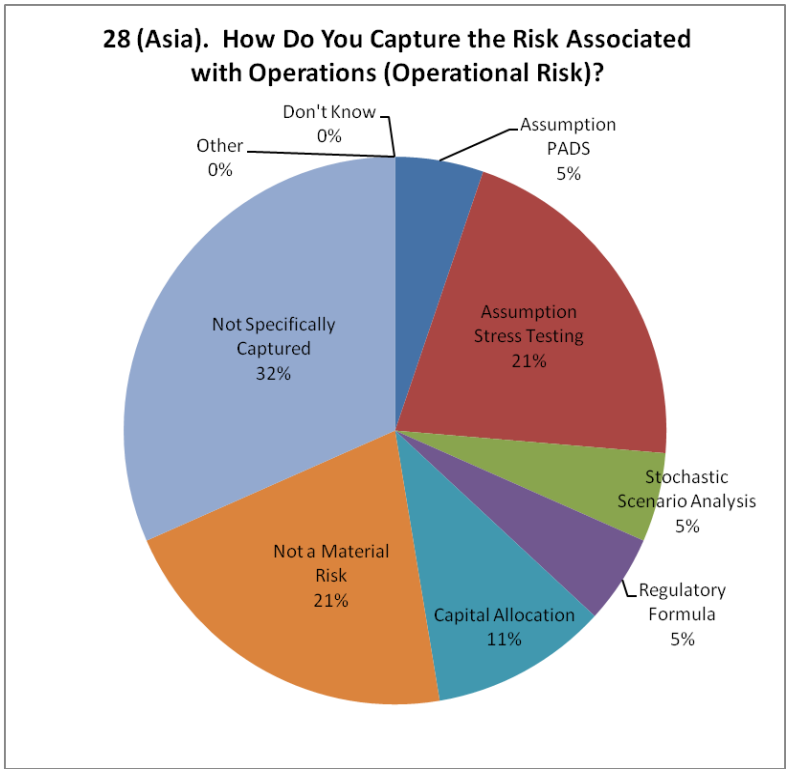
Question 28 – How do you capture the risk associated with operations (operational risk)?

42% of North American companies generally do not capture operational risk specifically and 10% do not consider operation risk as material. Those that do capture operational risk use capital allocation (12%) and assumption PADs (10%). European companies generally use capital allocation (48%) and assumption stress testing (10%), while 23% do not specifically capture operational risk. 32% of Asian companies do not specifically capture operational risk and 21% do not consider this risk as material. Asian companies that do capture operational risk use assumption stress testing (21%) and capital allocation (11%).

28% of companies targeting Asia do not specifically capture operational risk and 16% do not consider this risk as material. Companies targeting Asia that do capture operational risk use capital allocation (22%) and assumption stress testing (19%).



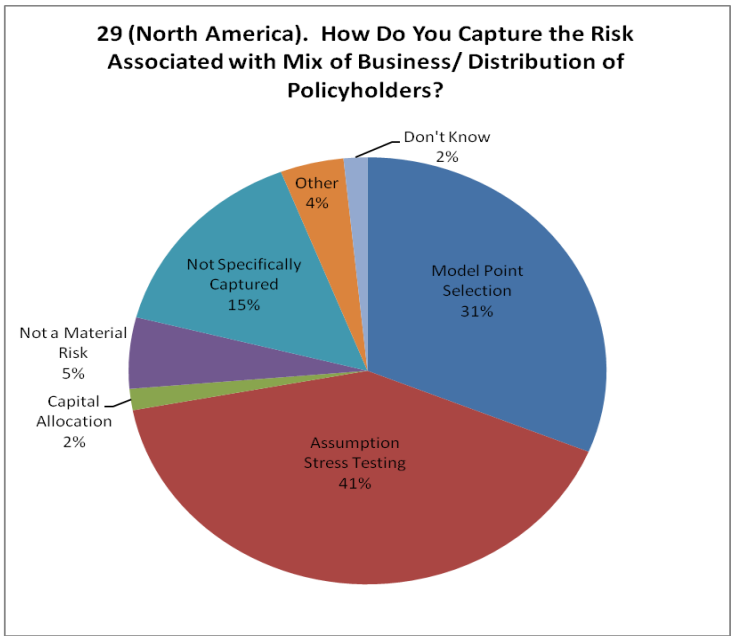


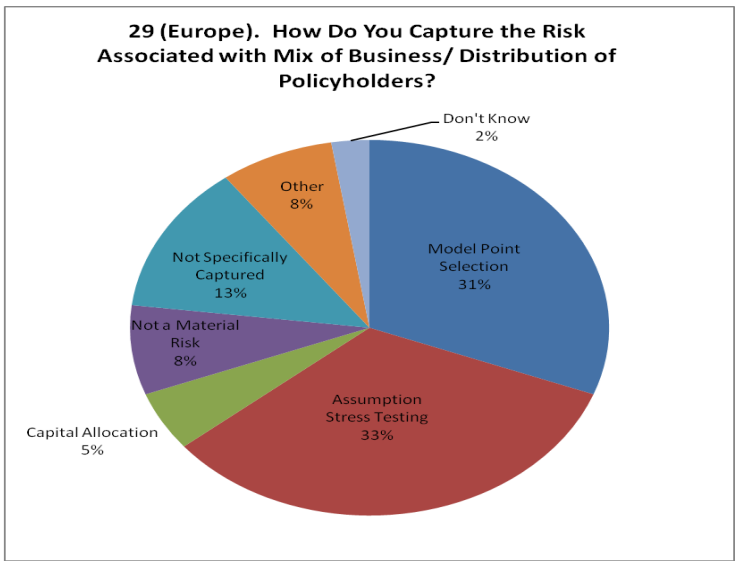


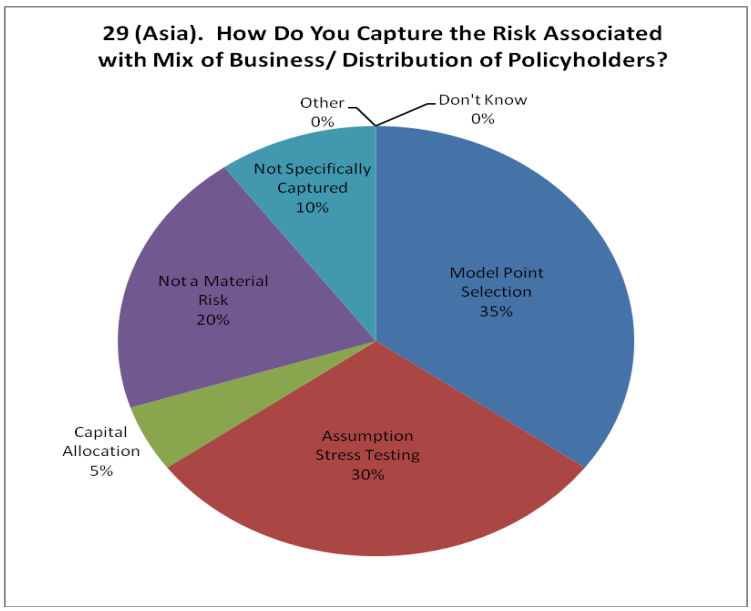
Question 29 – How do you capture the risk associated with mix of business/distribution of policyholders?

North American companies capture distribution risk through assumption stress testing (41%)\ and model point selection (31%), while 15% do not specifically capture this risk. European companies use assumption stress testing (33%) and model point selection (31%), while 13% do not specifically capture distribution risk. Asian companies use model point selection (35%) and assumption stress testing (30%), while 20% do not consider this a material risk.

Companies targeting Asia use model point selection (40%) and assumption stress testing (30%), while 13% do not consider this a material risk. Companies targeting North America capture distribution risk similar to companies located in North America.



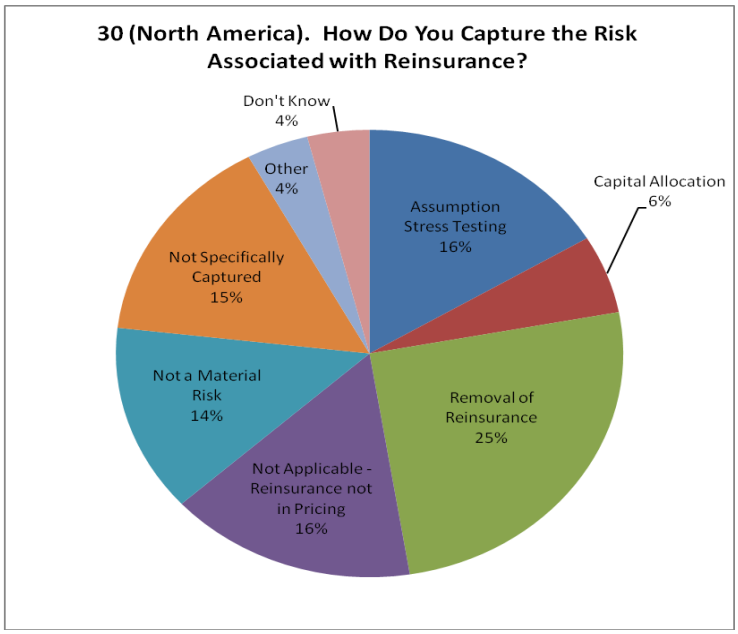


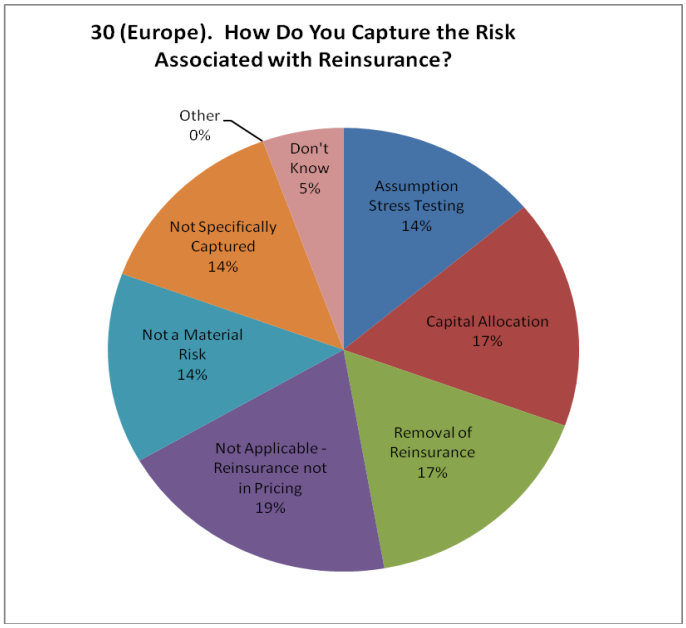


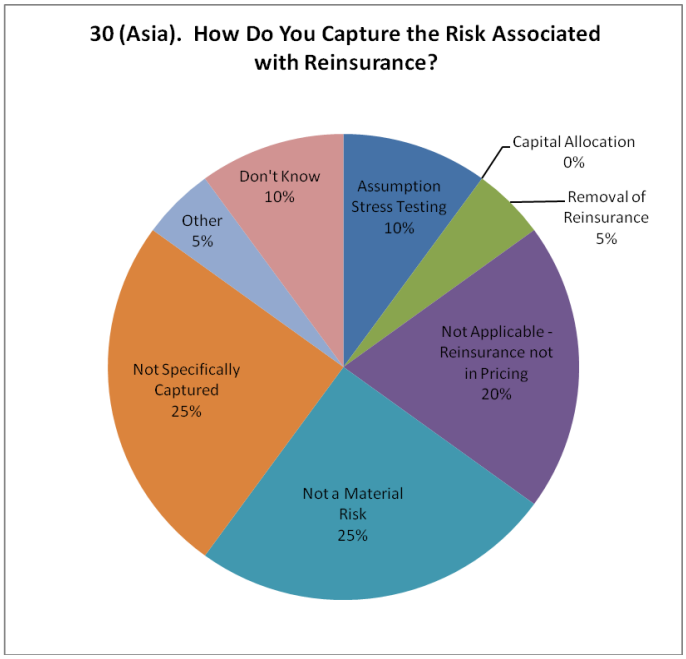
Question 30 – How do you capture the risk associated with reinsurance?

North American companies capture reinsurance risk through removal of reinsurance (25%) and assumption stress testing (16%), while 16% do not use reinsurance. European companies use capital allocation (17%) and removal of reinsurance (17%), while 19% do not use reinsurance. Asian companies reported reinsurance as not material (25%), not specifically captured (25%) or not used (20%).

Companies targeting Asia reported reinsurance as not material (22%), not specifically captured (27%) or not used (22%).



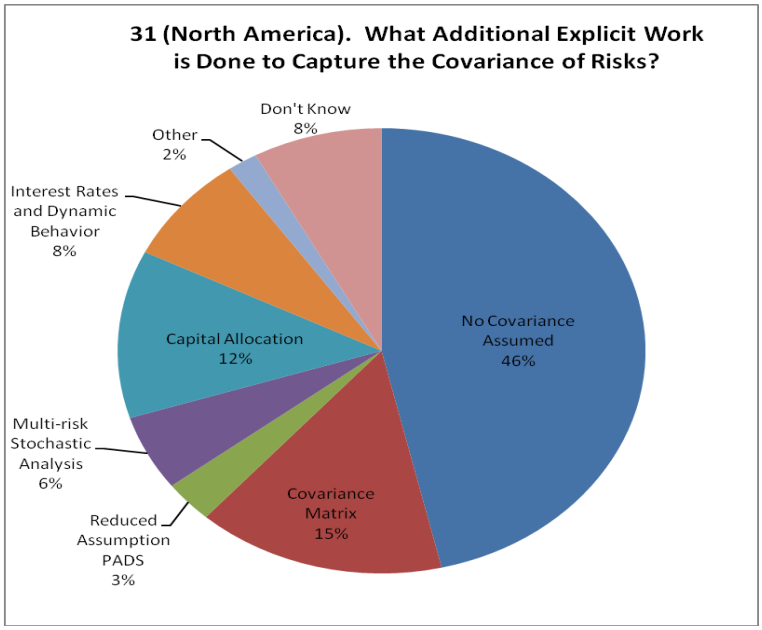


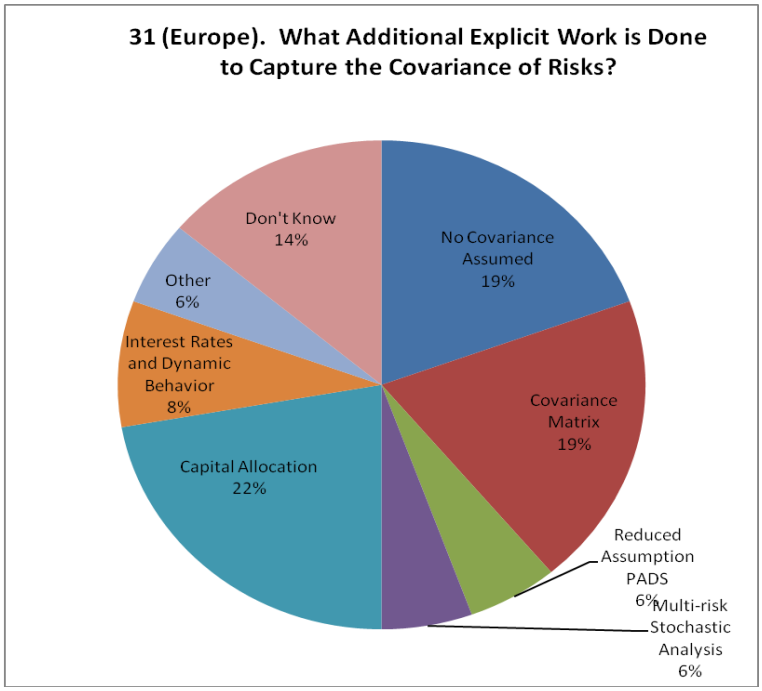


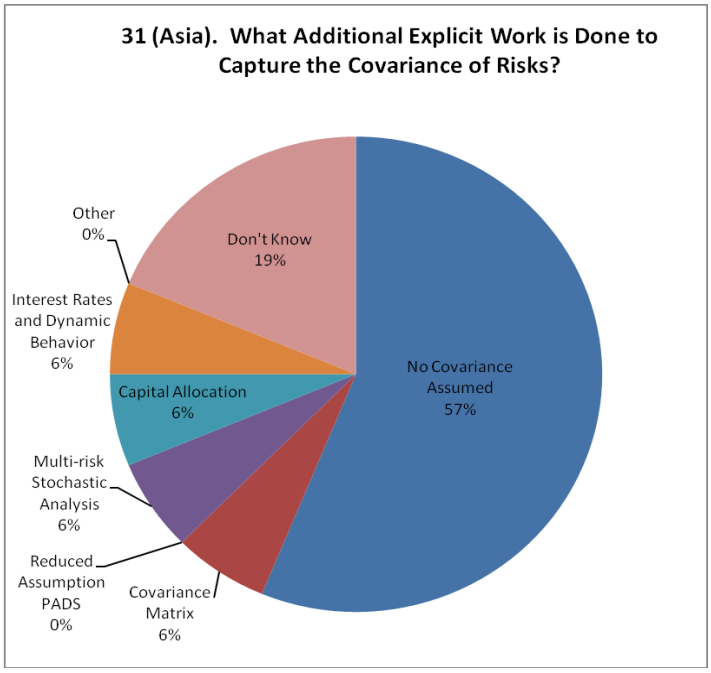
Question 31 – What additional explicit work is done to capture the covariance of risks?

46% of North American and 57% of Asian companies reported no covariance of risk is assumed. North American companies generally use covariance matrix (15%) and capital allocation (12%) to capture covariance. European companies reported using capital allocation (22%) and covariance matrix (19%), while 19% assumed no covariance of risk.

42% of companies targeting North America do not capture covariance of risk. Companies that do will use covariance matrix (15%), capital allocation (14%) and interest rate and dynamic behavior (8%). 47% of companies targeting Asia do not capture covariance of risk. Companies that do will use covariance matrix 13%, capital allocation (10%) and interest rate and dynamic behavior (7%).







Question 32 – To what extent is pricing on the products in your market regulated?

North American companies reported no regulation of pricing (33%), limited regulation of pricing (32%) and regulation of premium rates and pricing parameters (16%). European companies reported limited regulation of pricing (32%) and regulation of premium rates and pricing (21%), while 18% reported no regulation of pricing. Asian companies reported regulation of premium rates and pricing parameters (40%), limited regulation of pricing (20%) and regulation of pricing parameters (20%).

Companies targeting Asia reported regulation of premium rates and pricing parameters (32%), limited regulation of pricing (25%) and regulation of pricing parameters (18%). 14% reported regulation of premium rates/formula only, and 7% reported no regulation of pricing. Companies targeting North America reported similarly to companies located in North America.