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Assessing the Transfer of Risk: An Actuarial Perspective

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Risk transfer can be a difficult subject to define and describe. At the same time, demonstrating that risk has been transferred in an insurance or reinsurance arrangement is critical to both the applicable tax and accounting treatment. For actuaries, the challenge is to develop an analytical framework under which the presence of insurance risk can be identified and assessed.

Risk arises when there is uncertainty about the occurrence of a loss. Uncertainty includes both *process risk*, which arises from the random nature of a probability distribution, and *parameter risk*, which arises from the selection of the wrong distribution, or from changes in the expected distribution over time. That is, the uncertainty associated with a probabilistic model of the distribution of possible outcomes has two distinct sources: the inherent variability of the phenomenon, and incomplete knowledge and/or inaccurate representation of the probabilities of alternative sets of outcomes. Put differently, process risk is the risk of getting the outcomes distribution right, but being unlucky, while parameter risk is the risk of getting the outcomes distribution wrong.

Accounting Standards

Accounting standards are one source of definitional guidance related to risk transfer. Financial Accounting Standards Board Statement (FAS) 113 ("Accounting and Reporting for Reinsurance of Short-Duration and Long Duration Contracts") was implemented in 1993 in an effort to prevent, among other things, abuses in GAAP accounting for contracts that have the formal appearance of reinsurance but do not transfer significant insurance risk and, thus, should not be eligible for reinsurance accounting. FAS 113 amplified an earlier requirement of FAS 60 ("Accounting and Reporting by Insurance Enterprises") that reinsurance accounting only applies to contracts that transfer insurance risk.

In order for an arrangement to qualify for reinsurance accounting treatment (as opposed to deposit accounting treatment) in accordance with FAS 113, it must transfer insurance risk from an insurer to a reinsurer. To meet the risk transfer requirement, a reinsurance treaty must satisfy one of two conditions:

1. It must be evident that "the reinsurer has assumed substantially all of the insurance risk relating to the reinsured portion of the underlying insurance contracts" (paragraph 1.1), or
2. The reinsurer must "assume *significant* insurance risk under the reinsured portion of the underlying insurance contracts" (paragraph 9a) and it must be *"reasonably possible* that the reinsurer may realize a *significant* loss from the transaction" (paragraph 9b). (Emphasis added.)

Similarly, under statutory accounting, a ceding company is permitted to effectively remove the reserve for reinsured liabilities from its balance sheet in recognition of the fact that the underlying risks have been transferred to the reinsurer. The principles of FAS 113 are incorporated into statutory annual statement accounting through the National Association of Insurance Commissioners' (NAIC) Statement of Statutory Accounting Principles (SSAP) Nos. 61 (Life, Deposit-Type and Accident and Health Reinsurance) and 62 (Property and Casualty Reinsurance), which provide almost exactly the same guidance as FAS 113. However, neither FAS 113 nor SSAP 61 or 62 provide guidance on the precise meaning of the terms "reasonably possible" and "significant loss."

Outside the United States, the accounting definition of insurance contracts—including the issue of risk transfer—is governed by the International Accounting Standards Board (IASB), which promulgates international accounting standards. International Financial Reporting Standard (IFRS) No. 4 ("Insurance Contracts"), dealing with accounting for insurance contracts was issued in March 2004, effective for accounting periods beginning on July 1, 2005. Under IFRS 4,

the definition of insurance risk refers to risk that the insurer accepts from the policyholder and the definition of an insurance contract refers to an adverse effect on the policyholder. In other words, insurance risk is a pre-existing risk transferred from the policyholder to the insurer. Appendix B of IFRS 4 also discusses assessment of whether insurance risk is significant. That is, *"insurance risk is significant if, and only if, an insured event could cause an insurer to pay significant additional benefits in any scenario, excluding scenarios that lack commercial substance (*i.e.*, have no discernible effect on the economics of the transaction)."* (Emphasis added.) If an insurance contract is unbundled into a deposit component and an insurance component, the significance of insurance risk transfer is assessed by reference to the insurance component.

Federal Income Tax Definition

Beginning in the early 1940s an actuarial or economic definition of insurance was applied for federal tax purposes, focusing on the shifting and distribution of risk. The landmark case of *Helvering v. Le Gierse,*[1] (and similar cases) presented the courts with a choice of continuing the contract-based definition for commercial insurance policies or applying an actuarial or economic analysis. Ultimately, in the *Le Gierse* case, the Supreme Court chose to apply the economic approach, ruling the simultaneous purchase of a single premium life insurance policy and a nonrefund life annuity contract had eliminated any meaningful risk undertaking on the part of the insurer and thus the policy under the arrangement was not eligible for tax treatment as life insurance.[2] *Le Gierse* established the principle that although a contract (or a combination of contracts) is in the form of a standard commercial life insurance contract, it is not treated as an insurance contract for purposes of federal tax law unless it provides for risk-shifting and risk-distributing (or pooling). Essentially, the court took these as descriptive of the essential characteristics of insurance. One court explained the concept as follows:

> Risk shifting emphasizes the individual aspect of insurance: the effecting of a contract between the insurer and the insured each of whom gamble on the time the latter will die. Risk distribution, on the other hand, emphasizes the broader, social aspect of insurance as a method of dispelling the danger of the potential loss by spreading its cost throughout the group.[3]

However, in requiring the presence of risk-shifting and risk-distribution, the Supreme Court in *LeGierse* left open the question of how much is enough for an insurance contract to qualify under the Code.[4]

From an analytical perspective, in Revenue Ruling 89-96 (the "MGM Grand" ruling), the Internal Revenue Service (IRS) applied an economic analysis to hold that a retroactive insurance arrangement was not insurance for federal income tax purposes. As described in a 2007 Non-Docketed Service Advice Review (NSAR):

> The Service contends that in essence, Revenue Ruling 89-96 equates the tax savings received, when booked as an underwriting loss, to an additional premium which the taxpayer can invest to cover expected claims. Therefore, to evaluate the economics of the transaction, this tax savings along with the actual premium is compared to the net present value (NPV) of the anticipated losses. If the NPV of the anticipated losses do not materially exceed the premium plus the tax savings, the transaction does not transfer insurance risk for federal income tax purposes.[5]

The same NSAR also noted that "The annual statement and SSAP 62 are not controlling for federal income tax purposes. While an arrangement that fails the risk transfer requirements of SSAP 62 is almost certain to fail the risk transfer requirements for federal income tax purposes, satisfying SSAP 62 is no guarantee of success for federal income tax purposes."

Actuarial Analyses

The accounting requirements discussed above have resulted in an emerging literature in the actuarial field that attempts to analyze and implement the accounting standards with respect to risk transfer in the context of reinsurance agreements. In that regard, although FAS 113, SSAP 61 and SSAP 62 establish certain standards in terms of risk transfer that a reinsurance agreement must meet, they do not provide a definition or a test by means of which risk transfer can be assessed in such contexts. Instead, the accounting guidance speaks only in the largely undefined terms of a transfer of substantially all existing risk, or a transfer of "significant risk." The emerging actuarial literature attempts to identify specific tests or standards that can be used to measure and evaluate the level of risk transfer in reinsurance arrangements such that the rather vague standards in the accounting literature can be met.

In 2002, the Valuation, Finance, and Investments Committee (VFI Committee) of the Casualty Actuarial Society (CAS) authored a study entitled "Accounting Rule Guidance Statement of Financial Accounting

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Standards No. 113 – Considerations in Risk Transfer Testing" (2002 CAS Paper). With regard to risk transfer testing methodologies, the 2002 CAS Paper notes that the phrases "reasonable possibility" and "significant loss" are clearly the key considerations in the analysis of risk transfer under FAS 113. Thus, the paper observes that the explicit reference in FAS 113 to probability and significance gives rise to viewing risk in two parts—frequency and severity. In addition, the 2002 CAS Paper notes that, because these two concepts are intertwined in FAS 113, they should be considered in tandem, rather than considered independently; for example, the standard for "reasonable possibility" should be stricter in circumstances where "significant loss" is being construed more liberally, and *vice versa.*

In 2005 the CAS Research Working Party on Risk Transfer Testing authored a report entitled "Risk Transfer Testing of Reinsurance Contracts: Analysis and Recommendations" (2005 CAS Paper). The 2005 CAS Paper was prepared in response to a call from the American Academy of Actuaries' (the Academy) Committee on Property and Liability Financial Reporting (COPLFR), in which COPLFR requested ideas about how to define and test for risk transfer in short duration reinsurance contracts as required by FAS 113 and SSAP 62. In responding to that request, the 2005 CAS Paper notes that "[t]here is very little published actuarial literature on the subject,"[6] and refers to the 2002 CAS Paper as "the only significant paper" on the subject.

The financial consequence of a loss serves as the basis for quantifying risk.

A third paper is a 2005 report authored by the Academy's COPLFR, entitled "Risk Transfer in P&C Reinsurance: Report to the Casualty Actuarial Task Force of the National Association of Insurance Commissioners" (2005 Academy Paper). The 2005 Academy Paper contains a survey of current industry practices regarding risk transfer and alternative approaches to evaluating risk transfer.

In 2007, the Canadian Institute of Actuaries (CIA) Task Force on the Appropriate Treatment of Reinsurance issued a report that addressed risk transfer. In their report, the CIA Task Force identified four key principles of risk transfer:

1. There are several approaches that can be used to assess the existence of risk transfer.
2. Professional judgment will be required when assessing the existence of risk transfer.
3. The entire agreement consisting of the reinsurance contract and all written and verbal agreements and correspondence must be considered in assessing the existence of risk transfer.
4. The existence of risk transfer must be assessed at inception of the contract and every time a change to the contract that significantly alters the expected future cash flows of that contract is made.

Risk Metrics

From an analytical perspective, risk can be said to be transferred if there are plausible scenarios under which a loss to the insurer can occur. The financial consequence of a loss serves as the basis for quantifying risk. However, as noted above, there is no single actuarial method, test or rule that can be applied to definitively assess the existence of risk transfer. As a result, there are several approaches that can be applied in evaluating whether a particular insurance contract has transferred risk. However, these can generally be characterized in two broad categories: qualitative assessment and quantitative testing. A qualitative assessment may conclude that risk transfer is "reasonably self-evident" or that risk is transferred under a given accounting or tax standard. A low frequency, high severity risk (*e.g.*, a catastrophic risk) is an example of a reasonably self-evident risk. Quantitative testing involves the application of a risk metric to measure the existence of risk transfer. A risk metric is a single number or index value that quantifies the exposure to risk in a way that risks can be measured or compared. As such, risk metrics are useful in measuring both the existence and extent of risk transfer. However, every risk metric in itself contains an implicit definition of "risk." Further, quantitative testing generally addresses process risk, as it measures the effects of statistical variations assuming that the underlying loss distribution is known.[7]

VaR, CTE and TVaR

Value-at-risk (*VaR*) defines risk by a percentile of the tail of a loss distribution, such as the 95th percentile of annual loss. It is statistical, rather than economic, in nature. Conceptually, *VaR* represents the amount a firm could lose with a specified probability, given a distribution of possible losses. The concept has become very popular in the banking and investment banking communities, where it has become the standard risk

measure used to evaluate exposure to risk. Typically, *VaR* is used by banks and other financial institutions to measure risk over a short (less than one month) time frame. In solvency terms, the *VaR* is the capital required to ensure, with a high degree of certainty, that the enterprise doesn't become technically insolvent. However, the degree of certainty chosen is arbitrary.

Tail value-at-risk *(TVaR)*, also known as conditional tail expectation *(CTE)*, is the probability-weighted average severity of the worst outcomes. A *CTE* analysis at a given level is the basis for the stochastic element of principle-based reserves (including VACARVM as described in Actuarial Guideline 43). Like *VaR*, the *TVaR* or *CTE* measure uses a percentile (the average outcome in the worst 10 percent of cases would be called "*TVaR* (90)" or "*CTE* (90)"). Unlike *VaR,* however, *CTE* captures the entire tail of a loss distribution beyond the specified percentile rather than one point. One definition of *CTE* is that it is the average of all *VaR* values for probabilities above a specified level. The *CTE* measure captures both the probability and magnitude of large losses, as a *CTE* calculation includes the impact of all losses above the specified percentile of the loss distribution. In contrast, a *VaR* measure will only reflect losses occurring at the percentage chosen for the *VaR* measure. *CTE* is becoming the standard for insurance company risk measurement, particularly regarding risk-based capital requirements. From a solvency viewpoint, *CTE* can be used to measure the average capital that would be consumed by an unusual, adverse event, with the percentile chosen defining what is considered "unusual."

As described above, FAS 113 provides guidance on the question of risk transfer in the context of GAAP accounting for reinsurance. With less than precise guidance on this question from FAS 113 a "10-10" benchmark arose within the accounting and actuarial communities as an informal method for testing whether a reinsurance contract transferred sufficient risk of loss to be accounted for as reinsurance and not a deposit. The "10-10" test refers to a 10 percent chance of a 10 percent loss to the reinsurer, and is equivalent to a value-at-risk in the 90th percentile. It is usually interpreted to mean that, under at least 10 percent of modeled outcomes (*i.e.*, the 90th percentile of the distribution), there is a loss of at least 110 percent of the risk premium received by the reinsurer. Thus, the 10-10 test assumes that "significant" loss means a loss of at least 10 percent of premium and that "reasonably possible" means at least a 10 percent chance.

These percentages are not reflective of any particular guidance on what might be considered "significant" or "reasonably possible." Rather, they reflect a common interpretation of those terms within the accounting and actuarial fields as it pertains to reinsurance, although in practice other critical values are commonly used based on the judgment of the practitioner.

The 10-10 test was not originally intended to be applied to traditional reinsurance contracts, but rather was intended to be used in testing for risk transfer in highly structured reinsurance contracts that appeared to limit risk to the reinsurer.[8] Through its use in that context, however, it became the *de facto* standard for reinsurance risk transfer testing. Although it is simple and has a certain amount of intuitive appeal, as a standard, application of the 10-10 test can produce results that are analytically unsound. Notably, the 2002 CAS Paper criticized the 10-10 test as an inadequate risk transfer test for a number of reasons, including the fact that the test looks at risk at only one point on the distribution of possible outcomes (namely, the 90th percentile). The 2005 CAS Paper echoes the same criticisms of that test that were expressed in the 2002 CAS Paper, but notes that the prior paper was "fairly muted in its criticism of '10-10,' and it did not strongly advocate replacing it with an alternative."[9] In contrast, the 2005 CAS Paper advances a clear and convincing case for the abandonment of the 10-10 test, stating that "the time has come to be explicit about the shortcomings of the '10-10' test that has come into common use and to advocate its replacement with a better framework."[10]

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The Insolvency Put Option and EPD

The degree to which a policyholder is at risk for an insurer's insolvency is described in some literature as the "insolvency put option" or the "expected policyholder deficit" (EDP). When customers purchase insurance from a particular company, they implicitly give this option to the company.[11] The insolvency put option is the expected loss to policyholders due to the possibility that the firm will default. From a quantitative viewpoint, a positive expected value for the insolvency put option is a measure of the risk that has been transferred.

The option can be illustrated using a one-period, two-date model in which an insurer issues policies at time 0 and claims occur at time 1. If the insurer's assets exceed liabilities at time 1, the firm pays the losses. However, if assets are less than liabilities, the insurer defaults and the policyholders receive the assets. The payoff to policyholders at time 1 is thus equal to:

Claim Payment = L - Max [L-A,0]

where L = losses, A = assets, and Max[L-A,0] is the payoff on the insolvency put. If the insolvency put is not "in the money" the full claim is paid. In this context, the expected policyholder deficit is the average, or expected, deficit over all values where a deficit exists. In the table below, although both loss distributions have the same expected value, the EPD is $20 in the first case and $1,000 in the second, indicating that the policyholders in the second instance have granted the insurer a greater insolvency put option. This implies that the insurer in the first example would need surplus equal to 0.2 percent of premium to offset the insolvency put, while the second insurer would require surplus of 10 percent of premium.

Two Insurers with Same Balance Sheet but Different Unpaid Loss Distributions, Bustic Table 1

	Asset Amount	Loss Amount	Capital Amount	Probability	Weighted Loss	Claim Payment	Deficit
Insurer A							
Scenario 1	13,000	6,900		20%	1,380	6,900	0
Scenario 2	13,000	10,000		60%	6,000	10,000	0
Scenario 3	13,000	13,100		20%	2,620	13,000	-100
Expectation	13,000	10,000	3,000		10,000	9,980	20
EPD % Premium							0.20%
Insurer B							
Scenario 1	13,000	2,000		20%	400	2,000	0
Scenario 2	13,000	10,000		60%	6,000	10,000	0
Scenario 3	13,000	18,000		20%	3,600	13,000	-5,000
Expectation	13,000	10,000	3,000		10,000	9,000	1,000
EPD % Premium							10.00%

Bustic defined the concept of *EPD* as a risk measure for solvency analysis.[12] The solvency of an insurer is linked to the condition of its balance sheet and insolvency occurs when obligations to policyholders exceed assets. The concept of the insolvency put option, which is also referred to as EPD, Expected Underwriter Deficit (EUD) or Expected Reinsurer Deficit (ERD), can also be applied as a measure of risk. As a threshold value, the presence or absence of an insolvency put option can serve as a quantitative measure of risk transfer.

As a measure of risk, *EPD* is more informative than *VaR* because it considers the expected amount of loss that will occur with a specified probability rather than just the amount of loss that will be exceeded with a specified probability. *EPD* is closely related to *CTE* or *TVaR*, as it is simply the *CTE* of all loss scenarios. Where *CTE* considers all scenarios, whether gain or loss, in the chosen percentile of the distribution, *EPD* is the average of scenarios in which there is a loss.

The 2002 CAS Paper notes that the *ERD* test "has some appeal in that it is well grounded in actuarial theory concerning the measurement of risk,"[13] and that it overcomes the weakness of the 10-10 test (and that of *TVaR* test) by looking across the entire spectrum of profit and loss, rather than at a singular point or range, to define risk transfer. However, the 2002 CAS Paper does not attempt to identify what critical value of *ERD* would need to be detected in order for there to be a showing of a significant or meaningful risk transfer. In that regard, the paper concludes that "[r]egardless of the model employed or the risk metric used, judgment is still required as to where to establish the threshold or critical values for what constitutes risk transfer and what does not." [14]

The solvency of an insurer is linked to the condition of its balance sheet and insolvency occurs when obligations to policyholders exceed assets.

The 2005 CAS Paper concludes that the *ERD* test is a better alternative to the 10-10 test. In reaching this conclusion, the 2005 CAS Paper states that the *ERD* test overcomes the primary shortcomings of the 10-10 test, in that it (1) does not ignore the information in the portion of the distribution tail beyond the 90th percentile, and (2) replaces the separate frequency and severity requirements of the 10-10 test with a single, self-adjusting, and integrated measure that treats low-frequency/high-severity, high-frequency/low-severity, and moderate-frequency/moderate-severity contracts in the same way.

Like the 2002 CAS Paper, the 2005 CAS Paper does not attempt to identify what critical value of *ERD* would need to be detected in order for there to be a showing of a significant or meaningful risk transfer. As described above, the authors of the 2002 CAS Paper stated that "judgment is still required as to where to establish the threshold or critical values for what constitutes risk transfer and what does not." The 2005 CAS Paper attempts to identify tests that can be used to satisfy both of the general standards in the accounting literature described above, *i.e.*, that an arrangement either (1) transfers "substantially all" of the insurance risk, or (2) transfers a "significant" insurance risk that is "reasonably possible" to result in a "significant" loss to the carrier. However, the main focus of the 2005 CAS Paper is on testing for "significant" risk transfer, which corresponds to the latter standard in the accounting principles discussed above.

In the 2005 CAS Paper, the authors illustrate the application of the *ERD* test with a threshold value of 1 percent (determined by multiplying the separate 10 percent frequency and severity requirements of the 10-10 test together), because "it has the merit of a certain amount of continuity with the '10-10' test." Thus, the 2005 CAS Paper does not cite any particular guidance in interpreting "significant" loss or "reasonably possible," but rather adopts the common interpretation of those terms within the actuarial field as it pertains to reinsurance by following the 10 percent thresholds reflected in the 10-10 test. As described above, in practice other critical values are commonly used based on the judgment of the practitioner.

Based on the foregoing parameters of the *ERD* test, the 2005 CAS Paper reaches the following specific conclusions:

- The *ERD* methodology, with a 1 percent threshold for significant risk transfer, is numerically comparable to the 10-10 benchmark;
- The *ERD* test is qualitatively superior to that benchmark; and
- It would be a "significant improvement" if the 1 percent *ERD* test were adopted as a *de facto* standard in place of the 10-10 test.

One quality of the *ERD* test is that any contract that passes the 10-10 test will necessarily pass the *ERD* test. As described above, one criticism of the 10-10 test is that contracts might be "carefully engineered to allow for exactly a 10 percent probability of a 10 percent loss and little or no possibility of a loss greater than 10 percent." Because a contract that passes the 10-10 test also will pass the *ERD* test, this criticism could be made of the *ERD* test as well. In order to address this potential criticism, the 2005 CAS Paper suggests that it might be appropriate to consider a supplemental requirement that there be the potential for a loss of some minimum threshold, say, 15 percent or 20 percent of premiums.

Conclusions

As described at the outset, the issue is whether, using valid actuarial or statistical methods, an insurance arrangement can be shown to transfer a demonstrable, meaningful and significant level of insurance risk from the purchaser to the insurer. In that regard, any analysis must begin by first recognizing that there is no definition in actuarial science of the term "meaningful" or "significant" insurance risk. At the same time, actuarial tests can be used to provide quantitative measures of risk, although there are no threshold values at which sufficient risk can be said to be transferred to meet a particular tax or accounting standard. In fact, many of the tax methods themselves are qualitative. There is no one analytical standard that must be met for risk to be transferred. However, the presence or absence of an insolvency "put" option may be the best of the analytical tests. Even so, the definition of "how much" remains unsettled.[15] However, as discussed above, there is guidance from the financial and statutory accounting fields that discusses the accounting treatment of insurance arrangements that evidence a "significant" transfer of risk. Despite that, whether risk has been transferred in an insurance arrangement remains a matter of judgment. A qualitative assessment may conclude that risk transfer is "reasonably self-evident" or that risk is transferred under a given accounting or tax standard. A low

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frequency, high severity risk *(e.g.*, a catastrophic risk) is an example of a reasonably self-evident risk. Moreover, failure to meet a quantitative standard may not rule out an insurance arrangement from transferring risk, as it may still qualify under a "reasonably self-evident" standard. Thus, while risk metrics can provide a quantitative measure of risk transfer, the question of how much is enough will still remain unsettled and will continue to be a facts and circumstances analysis that will challenge both taxpayers and tax authorities in attempting to characterize a particular transaction as insurance. ◂

End Notes

1. 312 U.S. 531 (1941).
2. *See Commissioner Of Internal Revenue v. Keller's Estate et al*. (3rd Cir., 1940), 113 F.2d 833 in which the Court Of Appeals for the Third Circuit observed, "a single premium on a whole life insurance of $1 (payable at the instant of death) combined with a single premium on a complete annuity (apportioned in the year of death) of the interest (i) on $1 will always equal $1. …. The mortality factors a_x and A_x cancel out no matter what age is used."
3. *Commissioner of Internal Revenue v. Treganowan* (2nd Cir, 1950), 183 F.2d 288 at 291; Cert Den., 340 U.S. 853.
4. For a detailed discussion of federal income tax issues and risk transfer, *see* F. Gelfond, *Fortuity, or Not Fortuity? … That Is the Question, TAXING TIMES* SUPPLEMENT, September 2008.
5. IRS NSAR 20072502F.
6. 2005 CAS Paper, at 2.
7. It is possible to estimate parameter risk in an analytical process by using alternative loss distributions from those applied in the baseline analysis. For example, for a life insurance or annuity product, parameter error in expected mortality could be estimated by applying a factor to the underlying table.
8. Anecdotally, the 10 percent chance of a 10 percent loss was arbitrarily derived from the observed underwriting experience in the Property & Casualty insurance industry in 2003. The underwriting experience demonstrated a lognormal distribution with a mean loss ratio of 74.6 percent and a standard deviation of 11.4 percent. The experience showed a 10 percent overall loss occurs at a nominal loss ratio of 89.6 percent, which occurs at the 90th percentile (the 10 percent chance point for the 10 percent loss).
9. 2005 CAS Paper, at 278.
10. *Id.*
11. A put option gives the purchaser the right to sell an asset at a fixed price while the actual market price of the asset could decline. A put option could be thought of as providing downside protection and protection against market losses. Put options are available on individual stocks and broader market indexes such as the S&P 500. If an underlying asset declines in value, a put will increase in value and provide protection against the loss.
12. Robert P. Butsic, *Solvency Measurement for Property-Liability Risk-Based Capital Applications,* THE JOURNAL OF RISK AND INSURANCE, 1994 VOL. 61, NO. 4, 656-690.
13. 2002 CAS Paper, at 327.
14. 2002 CAS Paper, at 308.
15. One aspect of *Dow Chemical v. United States* involved whether the corporate-owned life insurance contracts owned by Dow were "mortality neutral." While risk transfer was not directly at issue in the case, the trial court did find sufficient mortality risk. *See Dow Chem. Co. v. United States* (Dow I), 250 F. Supp. 2d 748 (E.D. Mich. 2003); *Dow Chem. Co. v. United States* (Dow II), 278 F. Supp. 2d 844 (E.D. Mich. 2003). However, the case was overturned on appeal to the 6th Circuit. 435 F.3d 594 (6th Cir. 2006), cert. denied 127 S. Ct. 1251 (2007). In their opinion, the Sixth Circuit commented, "This review of the cases demonstrates that a "100% retrospective adjustment mechanism" requirement simply cannot be discerned from the past COLI-plan cases. In fact, a rule that permitted a COLI plan to be deemed mortality neutral only upon proof that "every dime of mortality profit" is eliminated would outright conflict with the facts of two of the three cases. Therefore, the district court erred by imposing such a high hurdle as a prerequisite to finding that Dow's plans were designed to neutralize mortality gains." While the Dow decision was in the context of the deduction of policy loan interest, it illustrates that even a demonstrable amount of risk transfer may not be enough to meet a given tax or accounting standard.