

# **Risk Management for Life Insurance with High Investment Component**

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Presented at the 12<sup>th</sup> Annual Assembly of ASSAL

November 6, 2001

## **Introduction**

Regulation of life insurance with a high investment component depends on the objectives of the regulator and the range of products offered. Risk management for these products may involve the use of sophisticated financial instruments, but the use of these instruments can create risk as well. Regulation is necessary to correct market imperfections, and the degree of necessary regulation depends on the sophistication of the market. Regulators must balance the need for simplicity of regulation against the need to permit product innovation. This paper discusses issues related to solvency risk management for a range of high savings life insurance products.

## **Regulatory Objectives**

Evidence shows that a competitive free market allocates scarce resources efficiently, enhances the value of products brought to market, and enhances consumer choice. For example, a recent thesis by Dr. T. Boonyasai at Georgia State University contrasted the insurance markets in Korea and the Philippines, which recently undertook modest deregulation efforts, with those of Taiwan and Thailand, which had virtually no deregulation during the period. Dr. Boonyasai found that liberalization and deregulation in Korea and the Philippines seem to have increased productivity there compared with Taiwan and Thailand. This rigorous research confirms the results of economic theory, that a competitive market increases productivity.

What, then, is the proper role of insurance regulation? A perfect market might be able to operate effectively with no regulation, but insurance markets tend to have imperfections that must be corrected by regulation. The proper role of regulation is to compensate for these imperfections with the minimum interference with the functioning of the market. The most important imperfections in the insurance market are information asymmetry, market power, and systematic financial risks.

A central assumption of the economic model of competition is that both buyers and sellers are well informed. We know that this is generally not the case in the insurance industry, and the situation for high savings life insurance is worse than for the industry in general. Asymmetric information problems arise when one party to a transaction has relevant information that the other party does not have. The asymmetry of information is the insurance industry's most important market imperfection.

The classic example of information asymmetry in life insurance arises as adverse selection, when an applicant is aware of adverse risk information that the insurance company is not aware of. While this is a common potential problem, companies usually handle it effectively in their underwriting process. The more pertinent problems for this discussion involve information that companies have that their customers do not have. This information includes company financial strength, the risk profiles of investment products, and comparative value of products. These imperfections bring about the need for regulation of solvency and consumer product disclosure.

A further imperfection in the insurance market results from market power. This arises when companies are able to limit competition. Market power can arise from regulatory involvement. For example, complex regulations can create a barrier to entry, which can keep competitors out of the market. Taxes, such as premium taxes, can create barriers to entry if the cost for foreign companies is higher than that of domestic companies. Some sources of market power, such as product differentiation, or maintaining a good reputation, can be beneficial to consumers.

Systematic financial risks exist when the failure of one financial institution leads to the failure of others. This has occurred in the United States when the failure of a reinsurer after a major hurricane caused the failure of several primary insurers. A second type of systematic financial risk is the possibility of a “run” where the simultaneous cash demands of many policyholders overwhelm the ability of a company to liquidate its assets at a fair price. High savings life insurance is vulnerable to both types of systematic risk.

Having outlined the principal imperfections that are likely to exist in the market for high savings life insurance, the need to foster market entry and innovation lead us to a limit the role of regulation. As stated by Skipper [2000]:

“Government’s role in crafting insurance regulation should be limited to rectifying imperfections that can cause significant harm. A pro-competitive approach, therefore, would witness governmental regulation of insurance only with respect to matters that meet three conditions:

- an actual or potential market imperfection exists
- the market imperfection causes or can reasonably be believed to cause meaningful consumer or public harm
- government action can ameliorate the harm.

Conversely, if any one of the three conditions is not met, no government intervention is warranted.”

This dictum would support solvency regulation, where the potential for harm to the public is clear, the information that customers need to protect themselves is difficult for them to obtain, and where government has demonstrated an ability to monitor and promote solvency. It would also support disclosure regulation to the extent that the transparency and sophistication of the market, and the complexity of products, make it difficult for customers to obtain the information they need for their decisions. It would not support long-term barriers to entry, perhaps erected to protect a domestic industry from international competition. As the market increases in transparency and sophistication, it is possible to reduce the degree of regulation.

As markets are deregulated, there is, paradoxically, a need for more skill on the part of regulators. Deregulation involves a shift of the focus of regulation away from prescribing industry actions toward protecting from adverse results. This shift requires an increased level of expertise on the part of the regulators. Markets in which products and prices are controlled by regulation may not need sophisticated solvency regulation. For example, in the Japanese life insurance market the regulation of prices kept prices at a high level and thereby minimized the risk of default. As controls are eliminated and as companies compete on price, regulators must give more attention to solvency, and the challenge of evaluating solvency increases. Similarly, if products are constrained to follow regulatory models,

product risks are well known. When innovative products are permitted, regulators will need a high level of expertise to evaluate the risk elements of these products.

## **Product Designs**

Traditional whole life policies have a savings element consisting of the increase in the present value of the future benefits in excess of the future premiums. When these products include a predetermined surrender value, significant cash-flow risks are created. Modern products with a high savings element introduce a much greater variety and degree of risks than exist for traditional life insurance, and challenge the ability of both companies and regulators to protect consumers from the risk of default. There are many product designs that have already been brought to market, and new designs depend only on the creativity of companies and the needs of the market. A challenge to regulators is to protect consumers without stifling product innovation.

### Risk Elements

Policy designs can be classified in relation to several elements that create risk. These risk elements include the existence of predetermined policy values, guaranteed or indexed account value increases, policyholder options to change investment options, premium flexibility, and guaranteed contingent benefit amounts, such as death benefits. Presented below are some actual examples of policy designs that have been brought to market, as well as a classification scheme for identification of risk elements of a particular policy design.

### Examples of Policy Designs with Associated Risk Elements

Here are some examples of actual product designs, and some comments on their risk elements.

**Universal Life Insurance:** A typical universal life insurance policy in the United States has an identified accumulation account value, and a minimum guaranteed interest rate. These policies also provide a surrender benefit that can be withdrawn by policyholders at will. The experience has been that there is a positive correlation between withdrawals and interest rates. This creates the potential of negative cash flow at the time that the market value of the assets is low. A few companies hedge this risk with interest rate options, but most assume that it is provided for by their overall capital.

**Variable Life Insurance:** A variable life insurance design has an identified account value that is valued on the basis of a specific stock index. Surrender values are based on the market value of the index, but the death benefit is guaranteed to be not less than the basic benefit amount stated in the policy. This product has no cash-flow risk on surrender, because liquid investments are available to match the index value. There is a risk caused by the possibility that the market value of the account will be depressed at the time that the company must pay a death benefit. The fact that the benefit guarantee is available only at death permits companies to assume an absence of correlation between benefit cash flow requirements and equity market level. This policy design requires payment of periodic level premiums. With a mature product portfolio the account value includes the effect of market changes that occur over a number of years.

Variable Annuity: A deferred annuity has an identified accumulation account value and a policyholder option to transfer the account between various investments, such as equity mutual funds, bond funds, and a real estate fund. In this case there is a risk that policyholder actions will produce worse results than any single investment type, causing guarantees to be even more costly than would be the case with a single investment type. The particular example has no guarantees regarding the value in the stock or real estate funds. The bond fund has an interest-rate guarantee over a relatively short future period. Annuity values can be received only as a life annuity, or as a cash payout in equal installments over ten years. This limits potential liquidity risk.

Stock Linked Savings Account: A major bank offers a savings account that provides asset appreciation equal to the greater of a fixed interest rate, or a percentage (such as 50%) of the appreciation of a published equity index. The guaranteed interest rate is a below-market rate. The margin below market is sufficient to fund the purchase of equity index options that fund the alternative appreciation rate in case of good equity performance. Potentially, the entire asset risk of this product can be transferred to the options market.

The following table identifies product features that can cause risk, or limit its effects. This table is not intended to be a complete listing, as new policy designs may introduce risks not previously contemplated. The necessary approach is to carefully review policy features to identify the risk elements of each policy.

### **Table of Policy Features Creating or Controlling Risk**

#### Account Value

Predetermined values

Minimum interest rate guarantee

Indexed to equity market average (such as Standard and Poor 500 Stock Index)

Greater of minimum interest rate or portion (such as 50%) of equity market average

Indexing to foreign currency, such as the U.S. dollar

#### Policyholder Options

Flexible premium options (premiums within some predetermined range)

Option to change investment basis, such as a change from equity to debt investments

Surrender-value guarantees

#### Events Effecting Guarantees

Death benefit amount guarantee

Cash-out option at predetermined age or duration

Guaranteed value in case of other contingent events, such as disability

Guaranteed minimum surrender value

Acceleration of death benefits for AIDS and other terminal illnesses

#### Protective Features

Deferral of cash payment on withdrawal of account value -- for example, under U.S. law companies must provide for a deferral of up to six months at the option of the company at the time of withdrawal.

Limitation of the maximum and minimum amount of premiums  
Limitation of the frequency of changes in the account value investment option

### Company Risk Elements

In addition to the risk elements that can be directly related to product design, there are elements that are related to company systems and personnel. Executives who are well-able to manage a traditional life insurance business may not have the special skills to manage products that involve more complex investment risks. The traditional accounting system can omit consideration of certain elements of a company's product or investment portfolio that have a zero current value, but have a possibility of creating future negative cash flow. Such off-balance-sheet risks require reporting scheme that goes beyond traditional accounting rules. Regulators need to rely on a more comprehensive reporting system to become aware of these off-balance-sheet risks while it is still possible to control them. Companies selling products that create off-balance-sheet risks may need to create a reporting system to allow them to manage these risks, and to demonstrate to regulators that the risks are under control.

### Relationship to Pure Investment Products

Regulators may need to consider the relationship between life insurance products and other investment products available in the market. Tax or other regulatory considerations may cause companies to "package" investment products as life insurance, while including little or no mortality protection. This is not necessarily a problem, but it can be confusing to consumers, and may be a way for companies to evade taxes or other regulations that were intended to apply to all similar products.

An example of this phenomenon may be observed with unit-linked life insurance policies in the United Kingdom. Some policies are designed with relatively low mortality protection, but with a savings element designed to fund the repayment of a home mortgage. The design of these policies appears to be driven primarily by a tax advantage given to life insurance premiums.

This issue causes special concern where banking, securities, and insurance regulation are separated. Communication between insurance regulators and the regulators of the securities and banking industries are necessary to avoid "regulatory arbitrage" where regulation of similar products is quite different depending on the type of company offering the product. It is clear that lack of communication can cause products to be offered by the least-regulated segment of the financial services industries, increasing the risk to consumers.

### **Company Risk Management**

Regulation of company solvency risk should be built on a foundation of company procedures to control risk. Without a control process within the company, no regulatory efforts can be successful. Too many things can go wrong between regulatory reviews, and company procedures are needed to prevent them. The need for an effective system of internal control is basic. This discussion of risk management for high savings life insurance products is intended to consider only their unique risk elements, so the existence of the basic system of internal control is assumed.

The need to manage cash-flow risk for innovative products, and the need to demonstrate to regulators the effectiveness of this risk management follow from the need for company solvency. The costs associated with this risk management function are inherent in offering these products, and are

appropriately included in the cost structure of the companies that wish to offer them. Regulators need to define clearly the information needed to monitor risk management, and companies should be obligated to supply this information on a timely basis. The information needed will, of course, vary by product, but there are common elements.

Companies need to maintain information that will allow regulators to evaluate the companies' risk profile as of any prior date. This information is needed to monitor the effectiveness of the companies' control systems. Specifically, all investment transactions, including transactions in financial derivatives, need to be recorded, and a process must exist to record or reconstruct each company's portfolio as of any past date. For instruments that do not have an active market it will be necessary to have software that will allow these assets to be valued. This may be done through the use of relationships to benchmarks with market prices, or through simulation analysis.

### Role of Professionals

Company executives, and professionals such as accountants and actuaries have a role in assuring the proper functioning of companies. Company officers can be required to take responsibility for the system of internal control, and existence and compliance with an asset risk management system. In addition, company officers can be required to confirm compliance of policy forms with applicable regulations. These responsibilities can be enforced by requiring officers to make a formal, legally binding statement that the required systems exist and are being applied, and that policy forms comply with regulations.

The use of professionals to facilitate the regulatory process is, of course, common. Independent audits are an example. Professionals can be used much more extensively by regulators to go beyond the basic financial reporting functions. For example, actuaries are relied on in the United Kingdom, Canada, and the United States to monitor the company's asset/liability management system. This is accomplished either by requiring the consideration of a fixed set of investment scenarios, or by requiring a simulation certified by the actuary. The cultural differences in the implementation of these schemes are interesting when one considers applying this approach in other countries. In the United Kingdom actuaries have a direct responsibility to the regulatory authorities, and have some protection from adverse actions by the companies that employ them. In the United States such protections are absent or very weak. This could be a result of differences in legislation between the two countries, but sorting out cause versus effect is not easy. The lack of full reliance on actuaries in the United States may be the reason for the U.S. legislation, rather than its result. The status of the professions in each country must be considered in determining the amount of reliance that can be placed on them.

### Use of Complex Financial Instruments

Companies with complex account value guarantees frequently use complex financial instruments to control risk, as well as to provide profit to the company. Many of these techniques are proprietary to the companies involved, so it is not possible to give specific company examples. It is possible, however, to discuss the general techniques used by companies in relation to various types of guarantees.

Complex financial instruments can be used to control the risk of guarantees that cannot be replicated with direct investments. For example, a product mentioned above is offered by a large bank

in which an account value floor is based on a combination of an equity index and a minimum interest rate. The account value at the end of a guarantee period, such as one year, is the greater of the result of accumulation at a portion of the increase in an equity index, such as 50% of the appreciation of the Standard and Poor 500 Stock Index or accumulation at an interest rate, such as 3%. Of course a direct investment by the bank in an equity and debt portfolio would not be able to replicate the values in this account. To control risk on this product the bank invests in debt instruments, and purchases options on the value of the equity index. This is a U.S. product, and the option market is efficient enough to make the cost of providing this product reasonable and predictable, and to make the risk of default on the equity options negligible.

A second example is a large insurance company that has special expertise in variable interest rate lending, but liabilities that involve fixed interest rates. The company usually finds that its returns are increased if it lends at a variable rate, and engages in swaps for fixed returns, as compared to its potential returns on fixed-rate debt. Of course this approach also creates a need to manage the counterparty default risk.

Managing risks related to complex financial instruments is different in several ways from managing more traditional investment risks. One important difference is that, because of leverage, their values can be much more volatile than the values of corporate bonds. This volatility requires more frequent monitoring to control risk. A company that uses complex financial instruments might be able to demonstrate a “clean” balance sheet at annual or quarterly intervals, but could have very high risk at interim dates. Controlling these risks requires a system that monitors risk at least daily, and creates a log that can be used for supervisory review. A second difference is the difficulty of identifying all of the risk elements of complex financial instruments. The description of such instruments must have enough detail to allow all of the risk elements to be identified. This level of detail may not fit in to existing asset data systems.

As a number of highly-publicized examples demonstrate, control of the hedging function and elimination of speculation are difficult to achieve at the company level. Clearly the task is even more difficult for regulators who have limited information and time. The fact that speculative problems can arise quickly means that traditional year-end reporting is not adequate to control this risk. A better approach is a “systems” solution that requires companies to demonstrate the existence of a system to control speculative risk, and to further demonstrate that this control system is being applied effectively. Appendix B is an excerpt of the State of Georgia banking regulations, showing how financial derivatives are considered in banking regulations in one state. U.S. federal banking regulations are similar.

One answer to the problem of regulating the use of complex financial instruments is to simply prohibit the use of instruments that could create a risk of speculation. This solution, however, deprives companies of a powerful and legitimate risk-management tool. Regulators need to exercise care in restricting the use of derivative instruments, as derivatives can be the most effective and least costly solution to managing certain types of risks. A solution that simply limits the use of derivatives, while easy to implement, may actually increase risk in some situations, and will certainly limit the ability of companies to find creative risk-management solutions.

Many of the notable recent examples of problems with financial derivatives involved a failure to adhere to basic principles of internal control. For example, in one case involving a loss of about \$100

million by a subsidiary of a large company, the parent company did not confirm bank statements directly with the bank, but allowed the president of the subsidiary to report on his company's financial status. His reports included as assets some holdings that had actually been sold to cover trading losses. This example demonstrates the need to follow standard auditing procedures, such as confirming transactions with the unrelated counterparty.

### Currency exchange rate risk

The popularity of U.S. dollar denominated life insurance products in a number of Latin American countries makes currency exchange rate risk an important regulatory concern for the countries involved. Public policy may cause regulators to prefer investments in local currency, but regulations preventing or limiting overseas investments create a need for hedging that may be impossible in times of crisis, and may be difficult to control on a real-time basis even in normal times. This problem is certainly not unique to insurance, so the regulatory controls developed for banking can generally be applied in the insurance context.

### Computer System Requirements

Record-keeping for traditional life insurance can be as simple as recording the policy form, issue date, date of birth, benefit amount, underwriting classification, and premium "paid to" date. The introduction of flexible premiums and varying asset appreciation rates can require the policy record to include a complete transaction history. The size of the policy record is greatly increased, and needs to be flexible for each policyholder. This parallels the increased complexity of asset records as a company moves from traditional investments into more complex instruments. Database software that is adequate for traditional policy types and investments may be completely inadequate for flexible products. In addition, the demands on the database software increase geometrically over time, creating a risk that the operation of a system can degrade, and cause an adequately functioning system to become inadequate simply as a result of growth and the passage of time, without any change in policy types.

Seemingly routine hardware and software upgrades can create a higher level of financial control risk for companies whose products place high demands on their computer systems. There are actual examples of companies that were virtually unable to process transactions on systems that had previously functioned adequately, but were overwhelmed by an increased volume of data over time. The ability of software packages to handle transactions, as measured by transaction response time, can be highly dependent on hardware choices and on the volume of transactions. It is not possible to completely determine the suitability of a software choice for a given company solely on the basis of its success in other companies. A complete assessment requires consideration of the specific hardware choice and the specific volume and nature of the transactions required.

### **Existing Solutions**

A practical and effective approach to regulation of high investment life insurance products involves a combination of product classification, simple safe-harbor capital requirements, and company obligations to create a risk management framework for innovative products. A product-classification scheme can be created on the basis of the risk elements identified above. An existing example of this



type of scheme is the annuity classification system under the U.S. Standard Valuation Law as it is applied to annuities.

### Annuity Product Definitions under the U. S. Standard Valuation Law

The Standard Valuation Law developed in the United States by the National Association of Insurance Commissioners includes a classification scheme for annuities in terms of the risk created by specific types of policy features. This classification scheme illustrates a practical approach to regulation of these products that provides some flexibility to companies, while providing a level of certainty to companies about the reserve levels that will be required for various types of products. This regulation covers policy features that involve interest rate guarantees, premium flexibility, and the timing of cash benefits. As a result of the classification of an annuity policy the interest rate used for valuation is selected from alternatives constrained by the classification. The classification system is described in Appendix A, which is an excerpt of the N.A.I.C. Standard Valuation Law.

Under the N.A.I.C. classification scheme annuities fall into one of three product types, designated A, B, and C. Product Type A includes only annuities that have a market value adjustment in the surrender value, or restrict the cash payout to be made over five years or more. Product Type C can allow a lump-sum payout without any market value adjustment. Plan Type B is intermediate between these. The valuation interest rates are highest for Type A plans, and lowest for Type C plans.

### Product Classification in General

In general a product classification scheme should have a small number of classes, taking into consideration that the risk profile of products within a particular class should be similar. The classification of a particular product design should be as clear as possible. Much of the challenge of this approach is the wording of the classification scheme to avoid manipulation by companies through relatively insignificant design changes. A key element is to limit the characteristics used for classification to elements that are directly and substantively related to risk. This type of safe harbor regulation can allow complete flexibility of innovation for companies that are able to comply with reporting requirements to will allow regulators to confirm that the risks of their products are adequately managed. This approach also allows the smaller, less sophisticated companies to participate in the market without taking on undue risk, while the larger and more sophisticated companies are free to create innovative products to meet market needs more effectively.

The valuation requirements for various products may be fixed at issue, or may change dynamically over time. Requirements that are fixed at issue have the advantage of being simple to apply, and predictable. This type of valuation approach is effective only for a limited set of relatively simple products. Requirements that change over time in response to capital market conditions can be effective for a much wider range of products, but require constant monitoring, and create additional expenses for companies. In addition, care must be taken to avoid an adverse effect of regulations on solvency when regulations increase capital requirements at the same time that capital market conditions reduce the ability of companies to provide needed capital.

### Risk-Based Capital Requirements

Risk-based capital is a standard that has been successfully implemented in a number of jurisdictions for both banks and insurance companies. It provides a relatively effective, low-cost benchmark with which to compare company capitalization. As implemented for life insurance companies in the United States, risk-based capital is calculated on the basis of mathematical formulas that take into account various risk elements within a company. Components of risk-based capital arising from various types of risk are combined in a way that depends on the assumed relationship that they have to each other. For example, components arising from investment risks of insurance companies are added together, but the combination of investment components and insurance underwriting components involves a “covariance adjustment” in which the total is computed as the square root of the sum of the squares of the two components.

The operation of the various formulas involved can be demonstrated with the provision for asset valuation risk. The basic components are amounts that are calculated by multiplying the value of each particular asset by a factor that takes account of the perceived risk of the asset. For bonds this involves a factor that is based on the bond’s quality rating from a recognized rating agency. The range of factors is from 0.003 for the highest quality bonds to 0.09 for the most risky bonds, requiring 30-times as much capital for the riskiest bonds as for the safest. Similar factors are multiplied by the values of equities, mortgages, real estate, and other assets. These amounts are then added together, but further adjusted by a factor that reflects the degree of diversification of the company’s portfolio. There is also a concentration adjustment that applies to any of the company’s ten largest asset holdings, if these are of lower quality than the highest investment classification. Other risks are taken into account in separate calculations, and also involve a process of multiplying certain values by factors that vary on the basis of risk.

Companies that are involved in certain types of activities can be required to provide additional risk-based capital in relation to them. This could be as simple as requiring a multiple of the base-level capital when certain product risk characteristics are present.

## **Conclusion**

The introduction of new life insurance products with a high savings element challenges both companies and regulators to protect against insolvency while continuing to promote product innovation. The popularity of these products where they have been offered shows that they fill an important perceived need of consumers. A prescriptive regulatory system may not give companies the flexibility they need to develop these products. Regulation is necessary to correct market imperfections, but should intrude as little as possible into the functioning of the competitive market. A regulatory framework that combines safe-harbor regulations for predefined products with a systems approach for innovative products can allow companies at various levels of sophistication to function in the market, and can provide adequate consumer protection with relative market freedom for companies. Countries that are now starting the process of regulating these products can learn from the experiences of others, bypass their mistakes, and build on their successes.

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## Appendix A

National Association of Insurance  
Commissioners  
Model Valuation Regulation  
Excerpt on Annuity Valuation

Note: This is not the complete valuation regulation, and should not be relied upon for purposes of insurance company valuation. For such purposes please refer to the complete regulation as distributed by the N.A.I.C.

Weighting factors for other annuities and for guaranteed interest contracts, except as stated in Subparagraph (b) above, shall be as specified in Items (i), (ii) and (iii) below, according to the rules and definitions in Items (iv), (v) and (vi) below:

(i) For annuities and guaranteed interest contracts valued on an issue year basis:

Guarantee Duration	Weighting Factor for Plan Type (Years)	Plan Type		
		A	B	C
	5 or less:	.80	.60	.50
	More than 5, but not more than 10:	.75	.60	.50
	More than 10, but not more than 20:	.65	.50	.45
	More than 20:	.45	.35	.35

(ii)	For annuities and guaranteed interest contracts valued on a change in fund basis, the factors shown in Item (i) above increased by:	Plan Type		
		A	B	C
		.15	.25	.05

(iii) For annuities and guaranteed interest contracts valued on an issue year basis (other than those with no cash settlement options) that do not guarantee interest on considerations received more than one year after issue or purchase and for annuities and guaranteed interest contracts valued on a change in fund basis that do not guarantee interest rates on considerations

A      B      Plan Type  
C

received more than twelve (12) months beyond the valuation date, the factors shown in Item (i) or derived in Item (ii) increased by:

.05 .05 .05

(iv) For other annuities with cash settlement options and guaranteed interest contracts with cash settlement options, the guarantee duration is the number of years for which the contract guarantees interest rates in excess of the calendar year statutory valuation interest rate for life insurance policies with guarantee duration in excess of twenty (20) years. For other annuities with no cash settlement options and for guaranteed interest contracts with no cash settlement options, the guaranteed duration is the number of years from the date of issue or date of purchase to the date annuity benefits are scheduled to commence.

(v) Plan type as used in the above tables is defined as follows:

Plan Type A: At any time policyholder may withdraw funds only (1) with an adjustment to reflect changes in interest rates or asset values since receipt of the funds by the insurance company, or (2) without an adjustment but installments over five years or more, or (3) as an immediate life annuity, or (4) no withdrawal permitted.

Plan Type B: Before expiration of the interest rate guarantee, policyholder may withdraw funds only (1) with an adjustment to reflect changes in interest rates or asset values since receipt of the funds by the insurance company, or (2) without an adjustment but in installments over five years or more, or (3) no withdrawal permitted. At the end of interest rate guarantee, funds may be withdrawn without an adjustment in a single sum or installments over less than five years.

Plan Type C: Policyholder may withdraw funds before expiration of interest rate guarantee in a single sum or installments over less than five years either (1) without adjustment to reflect changes in interest rates or asset values since receipt of the funds by the insurance company, or (2) subject only to a fixed surrender charge stipulated in the contract as a percentage of the fund.

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## Appendix B

### Excerpt of Georgia Insurance Code

33-11-56 G

\*\*\* CODE SECTION \*\*\* 08/27/01

33-11-56.

(a) An insurer may, directly or indirectly through an investment subsidiary, engage in derivative transactions under this article under the following conditions:

(1) An insurer may use derivative instruments under this Code section to engage in **hedging** transactions which manage risk and certain income generation transactions, as these terms may be further defined in regulation promulgated by the Commissioner;

(2) An insurer shall be able to demonstrate to the Commissioner the intended **hedging** characteristics and the ongoing effectiveness of the derivative transaction or combination of the transactions through cash flow testing or other appropriate analyses;

(3) An insurer may enter into **hedging** transactions under this Code section if, as a result of and after giving effect to the transaction:

(A) The aggregate statement value of options, caps, floors, and warrants not attached to another financial instrument purchased and used in **hedging** transactions does not exceed 7.5 percent of its admitted assets;

(B) The aggregate statement value of options, caps, and floors written in **hedging** transactions does not exceed 3 percent of its admitted assets; and

(C) The aggregate potential exposure of collars, swaps, forwards, and futures used in **hedging** transactions does not exceed 6.5 percent of its admitted assets;

(4) An insurer may only enter into the types of income generation transactions described in subparagraphs (A) through (D) of this paragraph if, as a result of and after giving effect to the transactions, the aggregate statement value of the fixed income assets that are subject to call or that generate the cash flows for payments under the caps or floors, plus the face value of fixed income securities underlying a derivative instrument subject to call, plus the amount of the purchase obligations under the puts, does not exceed 10 percent of its admitted assets:

(A) Sales of covered call options on noncallable fixed income securities, callable fixed income securities if the option expires by its terms prior to the end of the noncallable period, or derivative instruments based on fixed income securities;

(B) Sales of covered call options on equity securities, if the

insurer holds in its portfolio, or can immediately acquire through the exercise of options, warrants, or conversion rights already owned, the equity securities subject to call during the complete term of the call option sold;

(C) Sales of covered puts on investments that the insurer is permitted to acquire under this article, if the insurer has escrowed, or entered into a custodian agreement segregating, cash or cash equivalents with a market value equal to the amount of its purchase obligations under the put during the complete term of the put option sold; or

(D) Sales of covered caps or floors, if the insurer holds in its portfolio the investments generating the cash flow to make the required payments under the caps or floors during the complete term that the cap or floor is outstanding; and

(5) An insurer shall include all counterparty exposure amounts in determining compliance with the limitations of this article.

(b) The Commissioner may approve additional transactions involving the use of derivative instruments in excess of the limits of this Code section or for other risk management purposes under regulations promulgated by the Commissioner.