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# MORTALITY CATASTROPHE BONDS AS A RISK MITIGATION TOOL

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**S**ecuritization is defined as: *The process of aggregating similar instruments, such as loans or mortgages, into a negotiable security.* Although relatively new to the life insurance industry, securitizations are certainly the most talked about topic by far. For most people unfamiliar with securitizations, they are usually all lumped into one bucket. However, there are many different types of securitizations serving different purposes.

In general, there are three types of securitizations that have been completed in the life insurance arena. The first type releases embedded value from a grouping of policies. The main purposes of this type of deal is to release capital to reinvest into core businesses, to prove to regulators and ratings agencies that the present value of future profit from a block of business is a liquid asset and to increase the return on equity for the underlying business. Swiss Re completed an embedded value securitization in early 2005 named Queensgate. Although Queensgate was the first securitization of its kind, one should expect more of these embedded-value type securitizations in the near future.

The second type of securitization, and one that is gaining much popularity amongst life insurers, is one that transfers large statutory reserves to the capital markets. These reserves, mandated by the regulation known in the industry as Regulation XXX, are believed by most experts to be highly redundant. By using the underlying business as collateral, the

company issues securities to the capital markets. The investor trades principal for a better than a market return. The ceding company then gets to use the principal invested to set up the large statutory reserve thereby receiving a large tax deduction. This type of securitization also relieves the ceding company of the anxiety present in other types of Regulation XXX solutions. The investor's principal is returned as the profits on the underlying business emerge. Companies that have successfully completed this type of securitization include Genworth, Scottish Re, Banner Life and Prudential. Please note that while generally these four transactions fall into the same bucket, these deals are constructed quite differently.

The final type of securitization is one more commonly found in the non-life insurance arena. The purpose of this type of transaction is to transfer extreme risk into the capital markets as a risk mitigation tool. Catastrophe bonds such as earthquake bonds and windstorm bonds have been available in the market for years. The life insurance industry completed its first Mortality Catastrophe Bond in late 2003 under the name of Vita Capital, Ltd. Swiss Re completed this deal and decided to offer a similar bond in 2005 dubbed Vita II. It is this type of bond that will be the focus of this article.

There are many ways in which a company can mitigate extreme mortality risk. The simplest method is to self-insure this risk. A company may choose to set aside a portion of profit each year until it builds a meaningful contingency reserve with which to offset an extreme mortality event. The benefits to this approach are that it is the most cost efficient method, there is flexibility in how much to save each year, and when the reserve can be deployed, and it matches up perfectly with the losses. The problems of this approach are the length of time it takes to build a meaningful reserve, that the reserve will most likely be a drag to return on equity, and that future management will have access to this reserve.



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Another approach is to purchase a simple high-limit stop-loss cover. This tool also has the benefit of matching actual losses with reimbursements. In addition, it is very simple to negotiate a deal and to administer. The drawbacks to this tool are it is relatively expensive, it usually has exclusions (such as terrorism, nuclear, biological) and the ceding company is exposed to the credit risk of the reinsurance company. The last of these drawbacks is extremely disconcerting in that losses large enough to trigger this cover will probably damage the reinsurer enough to make payment suspect.

The final method is a Mortality Catastrophe Bond. This tool is much more complicated than the prior two. It involves external investors who may not be insurance savvy. Therefore rating agencies must be engaged. In addition, external parties must review each component of the bond so that the investors are comfortable with any calculations. Also, don't forget the lawyers. These deals usually involve off-shore companies set up as special purpose vehicles (companies set up with the sole purpose of issuing this bond) and lawyers must be involved to set up these SPVs. Finally, one must pay the investment bankers to underwrite these bonds. This sums up one of the major drawbacks of a mortality bond—cost. In fact, the fixed and variable expenses are so large that a minimum bond issue of \$250–\$300 million is usually deemed as the minimum worthwhile and cost efficient enough to issue a bond.

Here is how the bond works. Investors “buy” bonds and receive a return on their investment. If an “event” does not occur, investors receive their principal back at the end of the term (three to five years). If the event does occur, the investors will lose part or all of their investment, which is paid to the insurance company to offset some or all of its loss. The bond issuer must set the underlying mortality used, the trigger point for an event, the grading from a partial payment to a total loss of investment and the rate of return paid to investors.

An underlying mortality index is set as the base mortality or expected mortality. Although this mortality could theoretically be the company's own expected mortality, the capital markets will have a difficult time understanding and trusting these

numbers. That is why a standardized table is most often used. This is called a parametric bond. The parameter here could be population mortality weighted by country, age and gender to generally replicate the underlying insured-life business.

## MORTALITY CATASTROPHE BONDS ARE AN EFFECTIVE METHOD TO MITIGATE MORTALITY RISK TO A LIFE INSURANCE ORGANIZATION.

Once the base mortality is set, the bond issuer must determine a trigger point. The trigger point is usually set at 100 percent + X of expected mortality. The larger X is, the lower the chance of an event and, therefore, the investor can expect a lower return. At some point 100 percent + Y, there is a total loss to the investor. Between 100 percent + X and 100 percent + Y, there will be a grading of loss to the investor (See Figure 1 on page 22). Depending upon the rating of the bond and the current market climate, the return is set by the bond issuer. Just to complicate things a bit, a bond issuer may issue different levels of risk to reach investors with different risk appetites. The capital markets people call these tranches, because they need to have a language that regular people don't understand. Tranches closer to the expected mortality will generate higher returns and tranches further from the expected mortality will generate lower returns.

The benefits of this type of approach to risk mitigation are that there is absolutely no credit risk, the bond issuer may be able to release some risk capital and all events are covered. The drawbacks are cost, complication and the risk that insured-life mortality will be poor even though the population mortality index used will not generate an event. This is called basis risk for some odd reason that no capital markets person can explain. It is simply a mismatch risk and can work in either direction. So, for example, if there was an epidemic that effected lower income people aged 35 to 65, the population might have an event that would trigger a loss to investors but the bond issuing company might not have a serious mortality event. In this case, the

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*Mortality Catastrophe Bonds ... from page 21* covers. The best approach to risk mitigation is probably some combination of all three methods.

insurance company would get an unnecessary benefit. Basis risk must be well understood internally and well managed.

Mortality catastrophe bonds are an effective method to mitigate mortality risk to a life insurance organization. So are self-insurance and high-limit stop loss

While working on any type of a securitization is interesting and completing one is exciting, a company must be certain of its goals before moving down this path. For companies exposed to large amounts of mortality risk, willing to accept basis risk and fearful of additional credit risk, a mortality catastrophe bond could be a very viable solution. \*

**Figure 1: Mortality Risk Transfer—Payout**

