A Practical Primer on Takaful From A Reinsurer's Perspective

By Tze Leong Chan

Editor's note: In this article, Tze Leong introduces the subject of Takaful (Islamic insurance) to a worldwide audience based on his experiences and observations in Malaysia and its surrounding region. Through this, he shares some reflections that we could apply to the conventional insurance market.

Understanding Takaful (Islamic insurance) is not always an easy or straightforward endeavor. Some Islamic terms and concepts underlying Takaful challenge even a seasoned insurance practitioner.

As a reinsurer, distributing knowledge to our colleagues in the industry and their practical applications is one of our roles that I am proud to play. If you were always curious about Takaful from a business perspective, you came to the right place. I spent much of my career in Malaysia and will explain Takaful as I see it and share my thoughts about what you could learn from this, even if it is not a common product in your market. While I will focus on the context of life insurance, similar considerations would apply in non-life insurance.

I am far from a scholar of this topic and this article is not aimed to be a definitive voice on this topic. Furthermore, the application of Takaful can be different across markets and practitioners as interpretation of the fundamental concepts can differ. If you are interested in delving deeper after this launching pad, feel free to let me know. There are many respected experts in the industry from whom you can seek further knowledge.

INTRODUCTORY TERMINOLOGY

Most newcomers to Takaful may feel overwhelmed by the introduction of new Islamic terminology. I will minimize using these for ease of reading. However, there are a few naming conventions that I will use throughout this article and it is therefore clearer to define them in this section for your ease:

Takaful: An Islamic term referring to Islamic insurance.

Conventional Insurance: I will use this term when referring to non-Takaful insurance products that are common across the world.

Participant: This is equivalent to "policyholder" in conventional insurance.

Contributions: This is equivalent in meaning to "office premiums" in conventional insurance.

Takaful Operator: In this article, this is used to refer to the organizational structure of an "insurance company" in conventional insurance.

Tabarru': An Islamic term meaning "donation." The purpose of the Tabarru' is to provide assistance to fellow participants. It is, subject to some caveats, equivalent in meaning to "risk premium" in conventional insurance.

Family Takaful: While not specifically used in this article, this is a term that is used as a substitute for "life insurance" in Takaful, and which comprises policies that cover risks associated with human life, e.g., death, disability and illness.

THE ROLE OF TAKAFUL

The need for Takaful in the modern world arises from three main principles within the Sharia (Islamic law) which are incompatible with conventional insurance[1]:

1. **Prohibition of Gambling (maysir):** Conventional insurance introduces an element of gambling as the policyholder pays a relatively small premium in exchange for a large payout if the insured event occurs.

2. **Prohibition of Excessive Uncertainty (gharar):** Is a broad concept that refers to the lack of transparency or certainty in a conventional insurance contract on the returns to the policyholder.

3. **Prohibition of Interest (riba):** Fixed or guaranteed interest is forbidden. This means that conventional insurance products that offer an interest guarantee (such as an endowment) would be forbidden. In addition, this principle also applies to the assets backing the conventional insurance fund, many of which (such as bonds) will violate this principle.

Strict compliance to these principles means that Muslims would be excluded from the financial protection offered by the conventional insurance market. Takaful therefore emerged as a solution to this. It is further supported by the development of Islamic finance and Sharia-compliant financial instruments, which both provided access to suitable assets and awareness to the Muslim community.

The fundamental distinction of Takaful is the basis of "risk sharing" as opposed to "risk transfer" (of biometric and interest risks) which is practiced in stockholding insurance companies. Whereas we have seen a trend of de-mutualization in many countries, the Takaful concept basically reverts back to the mutual concept under consideration of the above mentioned three Islamic principles.

THE TAKAFUL BUSINESS MODEL

There are several methods to structure a Takaful business model based on the Sharia-compliant principles. These are readily available in various publications (along with flow diagrams). I shall not delve into each of these in this section but will provide the highlights and their contrast compared to conventional insurance.

The usage of the term "Takaful operator" as the provider of retail Takaful products hints at the business model. Imagine a community of individuals who wish to form a fund that pools their respective risks against their death. Each **participant** can make a **tabarru**' into the fund based on their respective risk and desired insurance benefit amount. For efficiency and objectivity, they may then appoint an agent to administer and manage the fund, namely the Takaful operator. In exchange for this service, the Takaful operator would be given an administration fee, which each participant pays in addition to their tabarru'. In the spirit of risk sharing, surplus from the fund (tabarru' less claims) would be distributed to the participants based on a pre-determined formula. In certain arrangements, the surplus could also be shared with the Takaful operator either as payment for the administration service or as an incentive to properly manage the fund.

In a modern context, the reality is somewhat the reverse of this scenario: shareholders set up a Takaful operator. The Takaful operator subsequently sets up a risk pool and designs Takaful products, including the **contributions** to be paid by interested participants. This is analogous to how a conventional insurance company develops, distributes and manages its products. The management of the surplus sharing mechanism is akin to a conventional participating insurance product in a mutual company—the determination of surplus and its allocation between the participants and Takaful operator follow analogous principles.

A further unique role played by the Takaful operator arises in the scenario that the risk pool enters a deficit. One common approach is that the Takaful operator will make an interest-free loan ("qard") to the risk pool that is only recoverable from future surpluses if they emerge. This results in a potential financial risk for the Takaful operator, which needs to be accounted in its financial risk and capital management.

Takaful in modern times are a hybrid of concepts familiar to practitioners of conventional insurance, such as mutual and participating insurance.

APPROACHES TO CORPORATE STRUCTURE

Corporate structures are generally dependent on the prevailing laws and regulations in the market that the Takaful operators are licensed in. This may vary between countries like Malaysia, Indonesia and those in the Middle East.

In Malaysia, Takaful operators are legally licensed to market only Takaful insurance. It is therefore not uncommon to see multinational insurance companies with separate entities for a conventional insurance company and Takaful operator in the market.

In contrast, insurers in Indonesia are allowed to operate on a "window" approach until 2024[2] when separation of licenses will be required. The window approach means that a single entity markets and manages both conventional insurance and Takaful products. The management of Takaful business may be run by a dedicated sub-division within the entity.

While we will not discuss these in detail, both the above structures would elicit different approaches and implications on each of the following items, especially for a multinational insurer operating in both markets:

1. Ownership and governance (a Takaful operator typically requires a Sharia council of Islamic scholars to ensure that its activities are Sharia-compliant).
2. Capital requirements.
3. Backing assets.
4. Separation of funds or pools.
5. Human resource requirements.
6. Compliance (or perceived compliance) with Sharia principles.

RETAKAFUL OPERATIONS

The Retakaful market is arguably less developed or regulated compared to the primary Retakaful market. Retakaful operators use approaches that largely mirror that of conventional reinsurance while adopting similar practices to those described above for Takaful operators.

The practice of surplus sharing in Retakaful is also analogous to a practice that is already familiar to reinsurance companies—offering profit commission. There is one interesting distinction in this practice as compared to both a conventional reinsurer and a Takaful operator. A Takaful operator's risk pool consists solely of its own participants who are the end consumers of Takaful products. In contrast, the participants of a Retakaful operator's risk pool are technically its Takaful operator clients. This means that each Takaful operator clients' receipt of surplus is dependent on the experience of other Takaful operator clients' portfolios within the same risk pool.

In terms of corporate structure, Retakaful operators are faced with the same business and legal considerations. Some global reinsurers have set up dedicated local Retakaful entities that solely write Retakaful business, while others operate on a window approach. In South East Asia, Retakaful business can be written through a window set up in Labuan (an offshore financial center of Malaysia) while actual operations are carried out by a division in the reinsurance company. In 2019, the total Retakaful contributions written through Labuan was USD100.6 million, which is almost double the volume written in 2015 of USD55.3 million.[3]

MARKET ANALYSIS AND LESSONS

Takaful operations in South East Asia are mainly found in Indonesia and Malaysia:

- Indonesia has the world's largest population of Muslims, with close to 230 million Muslims which is almost 90 percent of their population.[4] Despite this, conventional insurance premium is still the dominant insurance solution. According to estimates, Takaful contributions are less than 10 percent of the total life insurance premiums.[5]
- Malaysia has a population of about 32 million and more than 50 percent are Muslim. Takaful contributions have emerged as a significant portion of the insurance sector, making up approximately 30 percent of new business premiums in 2019.[6]

> The need for Takaful in the modern world arises from three main principles within the Sharia (Islamic law) which are incompatible with conventional insurance.

There are a myriad of explanations and observations that could explain why Takaful has not seen wider popularity as a solution for the Muslim community and that could provide lessons to anyone looking to expand into new market segments.

Necessity and Preferences

Assuming all features and financial requirements are equal, a Takaful product would be costlier than an equivalent conventional insurance product. The surplus sharing and qard elements introduce additional risk to the Takaful operator that needs to be priced.

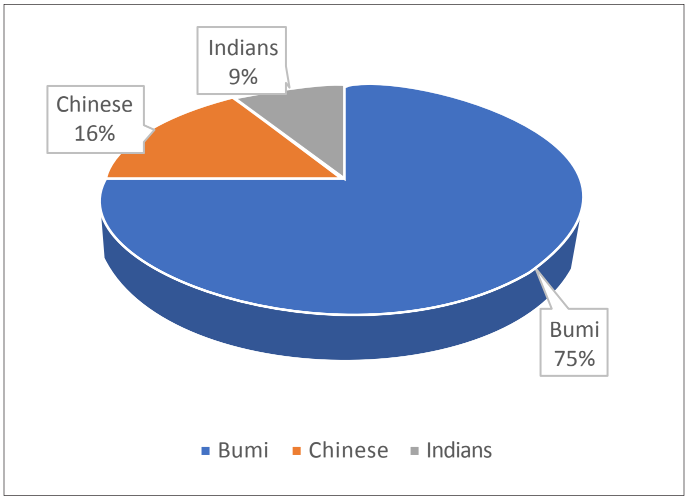
It appears that the Muslim community in these countries are not necessarily opposed to being policyholders of conventional insurance. A contributing factor could be the access to Takaful products, whether for benefits or at a price that is appropriate, which may not be available.

It is interesting to note that Takaful products are not exclusive to the Muslim community—in fact, non-Muslims do find some attraction in Takaful products and they are not forbidden from taking up these products. The surplus sharing concept offers an upside that could be attractive as this mitigates overpayment of risk premium if the overall claims experience improves.

Socioeconomic Situation, Distribution and Access

Both Malaysia and Indonesia are countries with disparate wealth inequality across the population and geographic regions. In Malaysia, at least, Muslims are disproportionately represented in the lower end of the income. Figure 1[7] shows that 75 percent of the bottom 50 percent of the income segment are of the Bumi ethnic group, which is predominantly Muslim.

Figure 1
Population Share in 2014 of Ethnic Groups in Bottom 50 Percent (Pre-tax National Income)



In the lower income segment, access to insurance solutions is more limited:

- The lower income community disproportionately reside in rural areas (geographically harder to access), therefore access to products that are traditionally sold by agents or banks is restricted.
- The inability to afford insurance premiums mean that they are less attractive prospects for products where distributor remuneration is based on premium size.

The introduction of Takaful solutions does hence not necessarily fulfill the needs of the lower income Muslim population, unless they are tailored in the same style of microinsurance. This could explain the disparity between the representation of Muslims in the population and the proportion of the Takaful in the insurance industry.

Modern technology will certainly help in this aspect, for example, microtakaful schemes that can be distributed through mobile phones. It remains to be seen whether these are commercially viable to Takaful operators to successfully launch.

In Malaysia, the mySalam scheme[8] was launched in 2019 as a free national health protection scheme for those at the bottom 40 percent of the income distribution. This scheme was designed as a Takaful for a number of reasons: it gained acceptance from the Muslim community, ensured a higher penetration rate, and allowed a generous profit-sharing scheme. The mySalam scheme can be seen as a hybrid of a microtakaful scheme and social security protection.

CONCLUSION

I hope that this provides a basic overview of what Takaful means and its role in the insurance industry. It is certainly a relevant case study for any entrepreneur who is interested in entering into a new market segment. ■

Tze Leong Chan heads the Strategy and Business Development function for Gen Re Life/Health's Indonesia market. He can be contacted at *Tzeleong.chan@genre.com.*

ENDNOTES

1 Gönülal, Serap O., ed. 2012. *Takaful and mutual insurance: alternative approaches to managing risks.* The World Bank.

2 Ferguson, Nick. 2019. "Fixing Indonesia's takaful sector." *Insurance Asia News. https://insuranceasianews.com/fixing-indonesias-takaful-sector/*

3 Labuan International Business and Financial Centre. 2019. *Market Report 2019. https://www.labuanibfc.com/clients/Labuan_IBFC_78C2FF81-703A-4CAA-8926-A348A3C91057/contentms/img/resource_centre/publication/download/2020/Market%20Report%202019_FinalV_27052020. pdf?1595823216*

4 *https://worldpopulationreview.com/countries/muslim-population-by-country/*, Accessed May 31, 2020

5 Own calculations from: *https://www.idnfinancials.com/news/30715/life-insurance-industry-performance-grows-q* and *https://www.meinsurancereview.com/News/View-NewsLetter-Article/id/49729/type/MiddleEast/Indonesia-Shariah-insurance-body-upbeat-about-takaful-market*

6 Statistics acquired from Bank Negara Malaysia (BNM) website on May 31, 2020: *www.bnm.gov.my.*

7 Abdul Khalid, Muhammed and Li Yang. 2019. "Income inequality among different ethnic groups: the case of Malaysia." *LSE Business Review.* London School of Economics and Political Science. *https://blogs.lse.ac.uk/businessreview/2019/09/11/income-inequality-among-different-ethnic-groups-the-case-of-malaysia/*

8 *https://www.mysalam.com.my/b40/info/?url=intro_EN*

Enterprise Risk Management for a Captive Audience

By Jason Alvarez and Mark Troutman

This article first appeared in the May/June issue of Contingencies. *It is reprinted here with permission.*

Health care insurance programs require capital to support the risk assumed by the health plan. Those who require capital include policyholders, rating agencies and regulators. The focus of this article is on the regulator's risk-based capital (or RBC) standards applicable to health plans.

Health reform has brought many health plans opportunities for growth. As a result, many health plans have legitimate concerns about meeting RBC requirements. This presentation explains how captives and reinsurance can help health plans with growth opportunities meet RBC requirements and other company enterprise risk management needs.

With many health systems and Accountable Care Organizations (ACOs) forming or acquiring their own health plans, assuming more population health management risk from payers via ACO contracts, and even directly contracting with employers in a narrow network strategy, population health management and protection from catastrophic medical claims becomes imperative for operational and financial success. If a health plan or hospital has an affiliated captive insurance company, it has an effective risk management tool at hand.

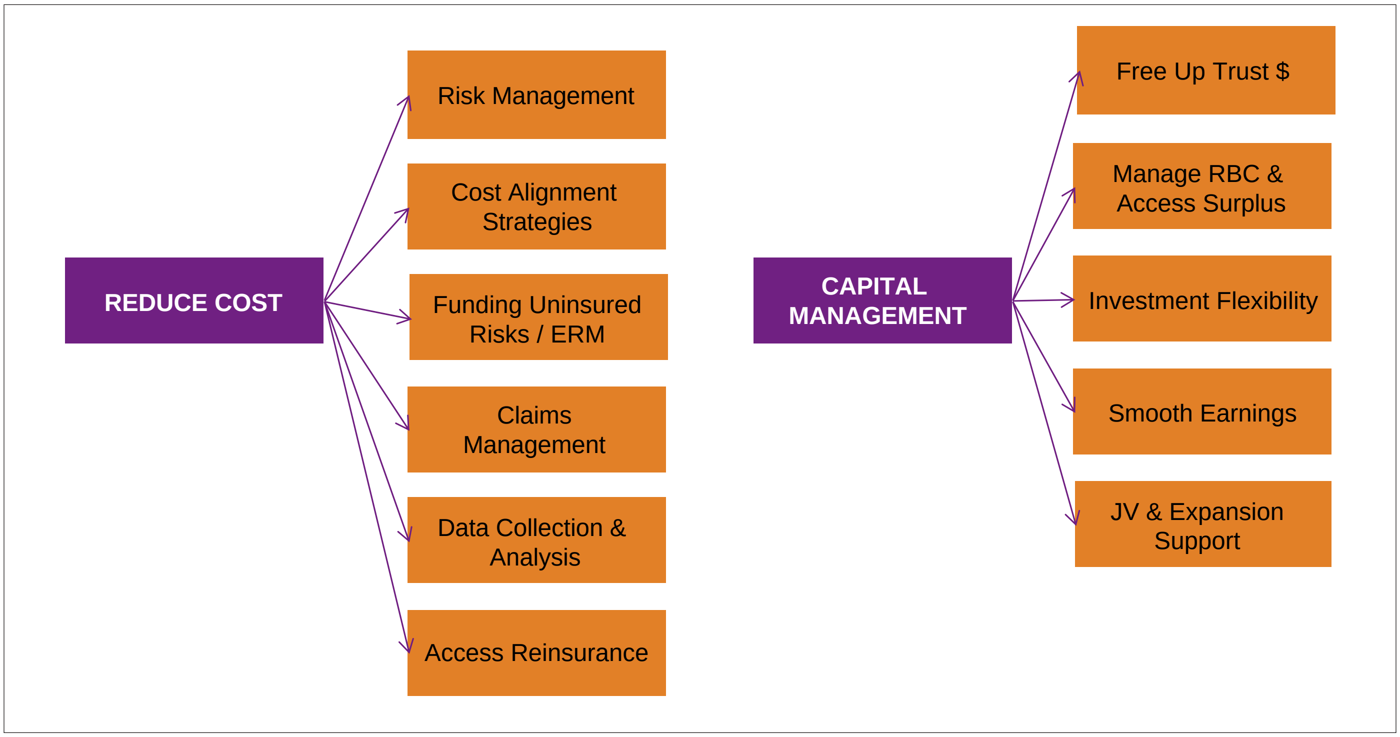
KEY DRIVERS OF THE INCREASED USE OF HEALTH CAPTIVES

The following industry trends have contributed to an increase in health captives with insurance or reinsurance protection:

- A growing number of health care entrants (e.g., providers, property and casualty insurance carriers, and venture capital investors).
- An abundance of low-cost capital has made reinsurance a cost-effective option for capital planning and management and catastrophic risk protection.
- New health programs requiring protection in early years (e.g., Next Generation ACOs) and unlimited maximum risk.
- A desire to draft custom insurance policy or reinsurance treaty terms and conditions.
- A desire to better understand fundamental risks and exposures and to access strategic partners to help manage risk.
- A desire for analytics to provide customers with insights and confidence to vary reinsurance buying patterns to mitigate and diversify risk.

Captive utilization offers several ways to reduce costs and improve capital management. Enhanced captive strategies are shown in Figure 1.

Figure 1
Enhanced Captive Strategies



There is increased utilization of cell captives in particular for several additional reasons:

- Additional cells can be added to the system's captive if/when needed.
- Cell assets and liabilities are segregated.
- Each cell can make their own tax elections (e.g., Internal Revenue Code Section 953(d) election for U.S. taxpayer.)
- Cells can be structured to fail the IRS tests as an insurer for tax-exempt entities to avoid unrelated business taxable income and federal excise tax.
- Cells can have separate governance.

Although an existing health plan or provider captive may have been formed to accept medical malpractice or professional liability or other property and casualty coverages, it may have excess capital or access to capital that would allow it to assume additional types of risk. The captive insurance company may be well-suited to accommodate various levels of medical excess, provider excess, and/or employer stop loss risk. Utilizing a captive to expand risk protection has numerous potential advantages and disadvantages to consider.

Potential advantages:

- Less risk and profits charges are ceded to an external organization.
- There is potential for lower expense and risk charges for the layer of risk retained in the captive as well.
- There is ability to buy higher deductible reinsurance while providing appropriate volatility protection in line with risk tolerance and enterprise risk management objectives.
- This is more flexibility on how to handle "lasers" placed by an insurer or reinsurer.
- Risk portfolio diversification within the captive lowers overall capital requirements due to covariance adjustments.
- There is ability to customize services provided.

Potential disadvantages:

- Additional risk is assumed.
- Additional captive accounting is required.
- There are limited markets that can handle the administration for the captive. The captive may contract with a managing underwriter to handle various services.
- Additional insurance/reinsurance agreements are needed if such coverage is purchased.
- Solvency requirements may increase and would need to be evaluated if the captive retains quota share or excess of loss risk. However, various forms of capital substitutes may be employed (e.g., letter of credit).
- There may be premium tax and federal excise tax depending on where the captive is domiciled.

Financing multiple lines results in an RBC diversification discount due to risk covariance credits. Table 1 illustrates an example with RBC savings of $1,258,750 (46 percent of total) when the risks are modeled as a portfolio versus on a stand-alone basis.

Table 1
RBC Savings Example

Line of Business	Deductible/ Retained Layer	Expected Loss Funding	Required Funding to Achieve 75% Confidence Level	
			%	$
Medical Stop Loss	$2M xs $3M	$5,000,000	25%	$1,250,000
Workers Compensation	$500,000	$2,500,000	40%	$1,000,000
MCO Errors & Omissions	$1,000,000	$225,000	85%	$191,250
Directors & Officers	$1,000,000	$200,000	65%	$130,000
Employment Practices	$500,000	$125,000	50%	$62,500
Network Privacy & Security	$500,000	$200,000	55%	$110,000
All Lines—Modeled in Isolation		**$8,250,000**	33%	**$2,743,750**
All Lines—Modeled as a Portfolio		**$8,250,000**	**18%**	**$1,485,000**

Quota share reinsurance in particular is a capital management tool. Although it does not provide actual capital (i.e., increase the numerator in an RBC calculation), it does reduce the required capital (i.e., decrease the denominator in an RBC calculation). Quota share benefits to a health plan are many:

- Reduce the plan's required capital and/or improve its RBC ratio through a transaction that can be executed quickly.
- Provide a temporary funding of risk capital during a period of premium growth without a dilution of the equity in the company.
- Reduce financial exposure to adverse claim fluctuations resulting in underwriting losses.
- Continue to participate in underwriting gains, although such gains will be diluted based upon the reinsurance terms.
- Access to outside expertise via underwriting, actuarial analysis, claims and care management services.

Excess of loss reinsurance is less effective as a capital management tool (versus a moderate to large quota share percentage) because the typical excess of loss premium is only 5 percent to 10 percent of total premium. A health plan must cede more premium to receive more RBC relief (e.g., a 50 percent quota share would provide close to 50 percent RBC relief). Excess of loss protection is still important to cover catastrophic claims even when a quota share reinsurance treaty also exists. An excess of loss reinsurance treaty provides protection to the variability of the quota share reinsurance treaty results.

A captive provides maximum flexibility to offer alternative reinsurance structures protecting against claim volatility. Many health plans utilize a "one-size-fits-all" strategy in developing their reinsurance programs. For example, they may have the same deductible across all blocks of business, in spite of the varying claims profile of each line, simply due to historical practices. Customized solutions hedge health plans against the unique volatility of each block of business they write. (See Figure 2, page 8)

Figure 2
One-Size-Fits-All Reinsurance Strategy

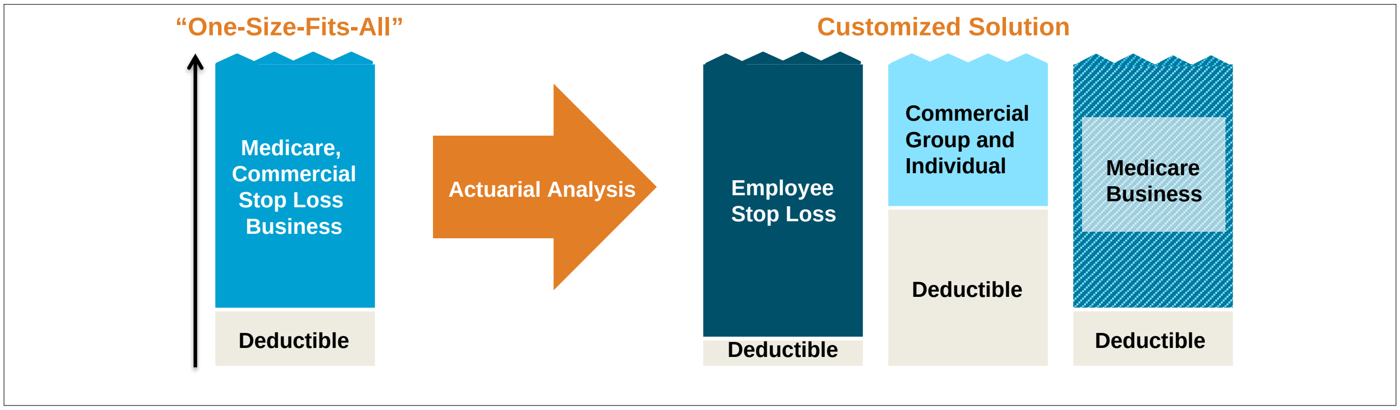
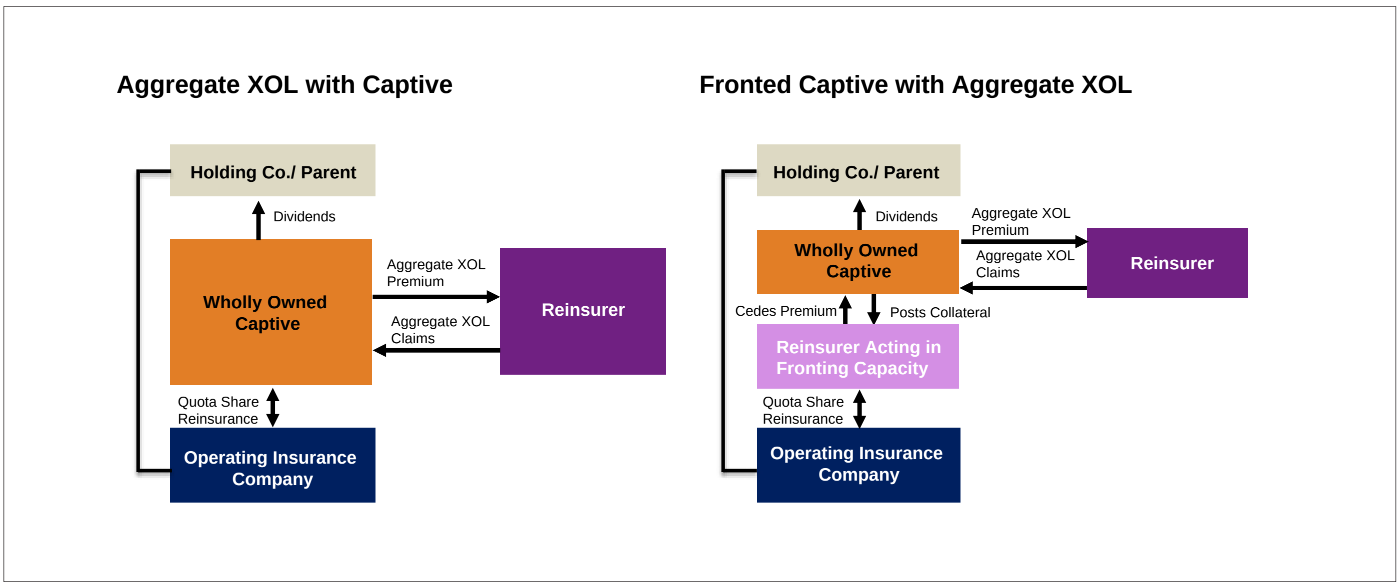


Figure 3
Primary Options for Captive Reinsurance



CUSTOMIZED SERVICE

A captive can also subcontract for various risk management services. Unbundled risk management services for captives include the following:

- Providing fronting services that allow a risk-bearing entity to cede risk to the captive via insurance policy or reinsurance treaty.
- Appropriately pricing and underwriting stop loss coverage on medical risks placed into the captive.
- Evaluating the actuarial adequacy of pricing of stop loss coverage provided through ACO contracts.
- Providing medical case management support for excess medical risk on large claims inside or that leak outside a health plan's contracted provider network.
- Calculating premiums and executing billing function for various lines of business.
- Adjudicating claims.
- Obtaining quota share and/or excess of loss insurance or reinsurance for non-retained risk.

One health plan CFO began utilizing their existing property and casualty captive for health reinsurance protection in 2019. He stated, "Utilizing our captive for our risk protection allowed us to customize our reinsurance program to our specific needs.

This includes not only the coverages provided to each subsidiary line of business, but also the services to be performed for our own net retained layer. Once we determined our risk tolerance, we worked with our reinsurer to customize our risk program. We are still able to access their managed care resources to mitigate claim severity and frequency to the benefit of all."

GIVE (REINSURANCE) CREDIT WHERE CREDIT IS DUE

There are two primary options for captive reinsurance, with and without a "front" company. (See Figure 3, page 8)

A cedant will need to obtain some form of security for the reserve credit and credit risk it takes when it cedes risk to a captive reinsurer. There are several ways to accomplish this:

- **Funds withheld**—Cede the premium and reserves to the reinsurer in the form of an account receivable. Since cedant retains the funds, they are secured.
- **Assets in trust**—Cede the premium and reserves to the reinsurer which puts them in a trust with cedant as beneficiary. Assets are not commingled in the general funds of the reinsurer. It is like an escrow account.
- **Licensed and approved reinsurer**—Cede the risk to a "domestic" reinsurer licensed and approved to do business in cedant domiciliary state (i.e., not an unauthorized or alien reinsurer). The state regulates them as well so the cedant is allowed to take proper reserve credit. This reinsurer will then "front" the business to the captive.
- **Letter of credit for alien or unauthorized reinsurer**—Cede to an alien or unauthorized reinsurer which uses a letter of credit to guarantee its reserve credit obligations to the cedant. The letter is evergreen (drawable at any time) on a qualified bank so it is as good as cash to the cedant.
- **Parental guaranty**—As a form of general security, but not necessarily reserve credit, the captive reinsurer's parent provides a guarantee to the cedant to pay claims that the captive reinsurer fails to pay. Alternatively, it agrees to maintain a specified capital level (dollar or percent) as surplus in the captive.

CONCLUSION

A captive utilizing reinsurance tools and related services can play an important role in successfully managing risks assumed by health plans and providers as risk contractors and as employers in their own self-funded employee benefits program. ■

Jason Alvarez is leader—Health Plan Practice at Willis Towers Watson. He can be reached at *Jason.alvarez@willistowerswatson.com.*

Mark Troutman is former president of Summit Reinsurance Services, Inc. He can be reached at *markrtroutman@gmail.com.*

The Bulletin Board

Updates on important events related to the Reinsurance Section

NEW SECTION LEADERSHIP

A new section leadership has been elected in July 2020: Xueli Zhang will be the next council chair (*xzhang@rgare.com*) and Sean Kim (*Seankim@munichre.com*) will be the next vice chair. Stay tuned for news from the section leadership in the next newsletter on the transition to the new SOA community structure.

REINSURANCE SECTION RESEARCH UPDATE

by Ronora Stryker

Did you know each year the Reinsurance Section Council (RSC) allocates a significant amount of Section revenue on research for its members? In fact, the RSC has assembled a dedicated group of volunteers to form a research team to oversee the process to ensure relevant and quality studies are produced. Currently the team is further developing research project ideas in topic areas such as reinsurance and principle-based reserving, predictive modeling in underwriting and managing and measuring extreme event risk. Here is an update, as of July 2020, on the Reinsurance Section's sponsored research in process and studies recently completed.

CURRENTLY IN PROCESS

"Mortality by Socioeconomic Category in the United States." The objective of this project is to construct a set of detailed U.S. life tables by socioeconomic category to allow year-over-year changes in mortality to be determined, giving insights into mortality improvement trends. These mortality improvement trends can then be fed into actuarial mortality improvement models to identify current and future mortality assumptions for insured cohorts. Work is underway and is in the mid-stage of the project.

"2020 Living to 100 Symposium." In January of this year, thought leaders from around the globe gathered in Orlando to share ideas and knowledge on high-age mortality and morbidity and the challenges and opportunities associated with the increasing number of retirees. Over 20 research papers on such topics as aging measurement and mortality modeling, advanced-age mortality patterns and mortality trends were presented. They are currently being edited for publication in an online monograph. Session recordings of the presentations are now available and can be found at: *https://www.soa.org/resources/essays-monographs/2020-living-to-100/.*

"Mortality Improvement Trend Analysis." To help actuaries develop and set mortality improvement assumptions, the focus of this project is on better understanding the key drivers of mortality improvement and how they vary. Work has yet to begin on the project as the Reinsurance Section is in negotiations with a researcher to perform the study.

"Life Reinsurance Treaty Recapture Provisions." In today's environment, recapture provisions are an important industry topic. In this study, recapture provisions from reinsurance treaties are compiled and analyzed, highlighting the reasons the specific provisions are of particular importance to direct-writing companies and/or to reinsurers, and how current practice has differed from the past. Additionally, the researcher(s) will identify the underlying objective each party to the transaction is aiming to achieve with the recapture provision, what obstacles have been encountered and what solutions have been found. Work is in the late stages as the research report is being prepared for publication.

RECENT PUBLICATIONS

"Company Practice Survey of Individual Life Insurance Accelerated Underwriting." This study summarizes the results of a direct writer and a reinsurer company practice survey on accelerated underwriting. Among the areas addressed are the structure of accelerated underwriting programs, how programs are monitored, how accelerated underwritten business is performing relative to expectations and how companies are considering accelerated underwriting cohorts in the context of VM-20 assumption setting. *https://www.soa.org/resources/research-reports/2019/accelerated-underwriting-survey/*

"A Machine Learning Approach to Incorporating Industry Mortality Table Features in Mortality Analysis." This research applies a machine learning approach that would enable a practicing actuary to incorporate key industry mortality table features into insured mortality analysis. *https://www.soa.org/resources/research-reports/2019/2019-machine-learning-approach/*

"Consideration for Predictive Modeling in Insurance Applications." This study examines how best to implement predictive modeling into relevant areas of actuarial practice. *https://www.soa.org/resources/research-reports/2019/considerations-predictions-insurance-applications/*

"Earnings Emergence Insurance Accounting Under Multiple Financial Reporting Bases." This expands a 2015 research report on earnings emergence under multiple financial reporting bases. The original report looked at deferred annuities and term life insurance under U.S. SAP, U.S. GAAP, IFRS, CALM and market-consistent balance sheet approaches. This expanded report adds universal life and makes updates for principle-based U.S. statutory reserves, targeted changes to U.S. GAAP, and the new IFRS for insurance products. *https://www.soa.org/resources/research-reports/2018/earnings-emergence/*

"Mortality Analysis for 1898–1902 Birth Cohorts." This report examines the old-age mortality trajectories for the five extinct (or nearly extinct) U.S. cohorts. *https://www.soa.org/resources/research-reports/2018/birth-cohort/*

"The Impact of Genetic Testing on Life Insurance Mortality." This study develops a tool for insurers to examine the potential impact of a ban on using genetic testing in life insurance underwriting. *https://www.soa.org/resources/research-reports/2018/impact-genetic-testing/*

REQUEST FOR RESEARCH IDEAS

Do you have an idea for a research topic you would like to see the Reinsurance Section consider for funding? If so, we want to hear from you! For more information, please contact Jean-Marc Fix, chair of the Reinsurance Section's research team, or Ronora Stryker. ■

Ronora Stryker, ASA, MAAA, is a senior practice research actuary for the Society of Actuaries. She can be reached at *rstryker@soa.org*.