



Reinsurance Underwriting: Delineating the Core Differences of Various Lines of Business

By Michael Adams

As described by a colleague teaching new interns about the nature of our business at a reinsurance company: “If any underwriter here tells you they’re not gambling, they’re lying through their teeth.”

Reinsurers are, by the definition of their industry function, gambling. Risk exists in every insurance transaction and insurance companies must draw a line in the sand between their tolerated risk-level and that which they must cede in order to maintain order on their balance sheet. That ceded risk can be highly volatile and someone, somewhere, must make a judgment call about how it will turn out, put a price on it, and place their balance sheet at risk.

But proper assessment of different lines of business requires different skill sets to produce the optimal outcome of profitability. In order to delineate these differences, we can attempt to plot various lines of business on two correlated, but unmarried, axes: quantifiability and volatility.

QUANTIFIABILITY

The high end of this spectrum is dominated by actuaries. Risks at the top of this spectrum are highly measurable, and often driven primarily by modeling with sold rates deviating only minimally from those determined by the model. Data is readily available that can be used to hone in on appropriate parameters. Resources are poured into analytics as profitability is directly correlated to robustness of modeling. This is evident by the high ratio of actuaries at reinsurers that specialize in life and health reinsurance transactions, which are relatively high on the quantifiability scale.

In contrast, major property and casualty writers often opt to more heavily utilize talent of the MBA-type. As these risks can



be less quantifiable, confidence in profitability relies more on relationships and sage assessment of qualitative risks. Reinsurers prosper when their underwriters can produce business, negotiate well on behalf of the company, and draw on nontechnical indicators of good business.

VOLATILITY

More intuitive than the quantifiability scale, the volatility scale ranges from low to high. On the very low end, we see quota share deals on first-dollar insurance business. Under these arrangements, the reinsurer is on the hook for some percentage of all claims paid, while receiving their proportional share of premiums, net of an allowance for the direct writer’s expenses. Volatility is about as low as it gets in the industry, matching the risk profile of the underlying insurance block of business. When the block performs well, the reinsurer sees profits. If all goes as planned the reinsurer will earn low, but steady profits year over

year. Commonly these transactions are driven more by capital needs than risk management needs.

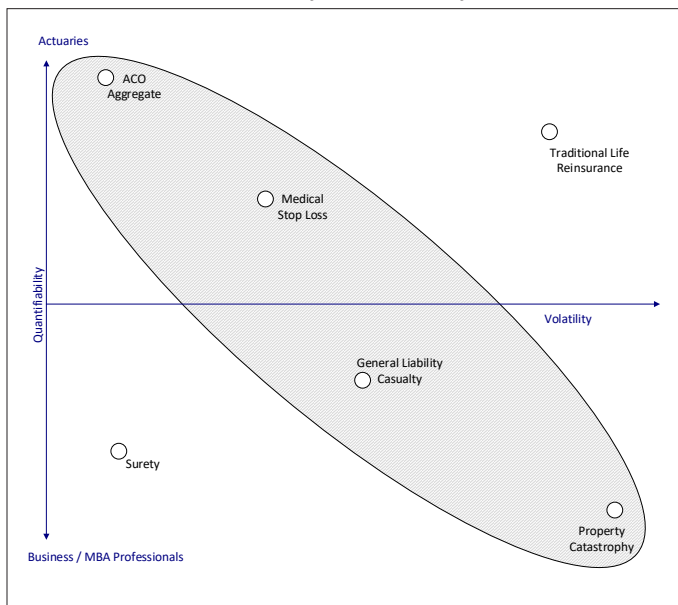
Higher volatility transactions typically deal with catastrophe claims: those only supposed to occur once every 10, 20 or 100 years. As opposed to the low and steady profits that are expected in a working layer as described previously, these transactions are designed to yield a moderate profit to the reinsurer in years where a claim does not occur, then dig deep into the red when it does, drawing from the reinsurer's vast capital base.

As it can take several years—or even decades—to determine if a reinsurer's premium rate for these high-volatility covers is adequate, market and capital-availability forces come into play much more heavily in these marketplaces. Rates and resulting profitability are much more sensitive to hard and soft markets, describing temporary market climates where insurance capital is scarce and abundant, respectively. It's not uncommon for management to issue directives to their front-line underwriters to "hold firm" with their rates and not cave to competitive pressure in an attempt to effect a hard market. Logically, if only one or a few market participants exercise this discipline, it can result in reduced market share for those participants.

As previously noted, there is a correlation between quantifiability and volatility. Lower volatility risks tend to be more quantifiable and vice versa. Thus, we see reinsurance lines of business tending to lie somewhere in the shaded range of Figure 1.

We'll walk through six examples and discuss where they lie on the two spectrums and why, based on their unique characteristics.

Figure 1
Correlation of Quantifiability and Volatility



Note that while the tendency is for a given line of business to fall in the shaded area, there are notable outliers due to the unique qualities of the underlying business or reinsurance coverage structure.

ACCOUNTABLE CARE ORGANIZATION (ACO) AGGREGATE COVERS

Quantifiability: High

Volatility: Low

Plotted at the top-left of the chart we have ACO aggregate covers. With the recent introduction of ACOs to the medical insurance industry and their ability to take two-sided risk, a need has arisen for reinsurance coverage that limits the potential losses that an ACO could sustain should the cost of care for their attributed membership increase.

Prominent underwriting methodology for this line of business involves a deep analysis into the performance and operational readiness of the ACO to (1) determine the adequacy of the benchmark expenditures with respect to the expected medical costs and utilization, and (2) ensuring that the organization has the right competencies to be successful under a risk-bearing contract, which includes governance structure, investment in data analytics, and strategic partnerships. Understanding the inherent volatility of these expected claims and gaps in competencies is paramount as minor miscalculations in claims or missing competencies can translate to large losses for the ACO and ultimately the reinsurer.

An actuary is best-suited for this job as they are the de facto authority on measuring claims volatility, assessing cost containment measures, and projecting insurance performance. This relationship is symbiotic in that the ACO not only gains downside protection, but also actuarial insight into the performance of their organization in containing costs.

MEDICAL STOP LOSS

Quantifiability: Moderate to high

Volatility: Low to moderate

Sitting farther down the spectrum is medical stop loss. This line of reinsurance cover pays when an exceptionally large health insurance claim occurs. A notoriously expensive medical claim is that for a hemophiliac, which can climb as high as \$5–10M throughout the year. A medical stop loss cover may cover claims, for example, for any covered member that exceeds \$1M in claims in a treaty year. While this is unlikely to occur on a case-by-case basis, the volume of health care claims and ubiquity of health coverage provides for the risk to be fairly quantifiable. Typically, a ceding insurer will have at least a few of these high claims in their experience. If not, there are reliable industry benchmark-

ing models based on broader datasets upon which underwriters can rely.

The major risk component reinsured here is process risk, as opposed to parameter risk. While some predictable claims occur, such as those for hemophilia, others are unforeseeable and seemingly random, like premature births. For the latter type, prevalence of large claims seems to follow a random selection process from a cost curve probability density function. As these cost curve PDFs are widely available in the market from vendors and re/insurers' own internal records, and a ceding insurer will typically have some of these high claims in their experience, there is opportunity for actuaries to measure expected costs with a reasonable degree of certainty over the course of a few treaty years.

GENERAL LIABILITY CASUALTY

Quantifiability: Low to moderate
Volatility: Moderate to high

There is a great degree of variability within the casualty line of business, and uncertainty emerges partly due to the wide variety of potential underlying risks. In contrast to those for the medical stop-loss line of business, underlying risks from program to program are often unrelated, ranging from high-end automobile accidents, to faulty breast implants, to class-action lawsuits. As a result, pertinent and reliable experience for a given type of risk is not so ubiquitous, which limits the actuary's effectiveness in assessing and projecting claims costs.

Needed expertise ranges by type of product and the nuances of each program. It would be unrealistic for a reinsurer to have the full extent of all of this expertise available on-hand, so casualty underwriters are often a jack of all trades, reasonably understanding the various associated risks and making a gamble. These gambles, also called "picks," can be substantiated or unsubstantiated by the picks from reinsurers competing to be on the same program.

This market interplay lends to decision-making based on competitive and market conditions. The underwriter can use an actuarially-derived pick as a grounding, while understanding that said pick is moderately uncertain, and inferring more information from how the rest of the market responds.

PROPERTY CATASTROPHE

Quantifiability: Low
Volatility: High

Perhaps the pinnacle of volatility in mainstream reinsurance, property catastrophe covers are on the bottom-right of the chart. These covers pay out to the insurer when an extraordinary event occurs that impacts a property writer's book in a substantial way. A straight-forward example is if a hurricane hits Florida and in-

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flicts billions of dollars in damage to residential and commercial properties. If the towers of risk held by reinsurers is breached, a syndicate of reinsurers will pay out at their respective shares.

These losses have historically occurred about once every 10 years. There are vendors in the industry that use sophisticated methods to model the potential damages sustained by any given property insurer in the event of a catastrophe, but the frequency of these occurrences is heavily debated, especially in the light of global warming. Some reinsurers will have the mindset that frequency is increasing due to effects of climate change, while others dismiss it as pseudo-science, sometimes at the highest level within a reinsurance company. The possibility of a real increase in catastrophic events further muddies a reinsurer's ability to be confident in their picks.

Ultimately, the same competitive and market pressures prevail as various reinsurers compete for share of these risks, necessitating the need in an underwriter for good relationships with brokers and strong negotiation skills. Reinsurers will strategically opt out of programs that they feel confident are underpriced and try to capitalize on those they think are well-priced with a larger share of participation. They will make modest profits each year that they can avoid a major loss—but when one does occur, the underwriters will be glued to the TV watching their profit-tied bonuses diminish as events unfold.

TRADITIONAL LIFE REINSURANCE

Quantifiability: High
Volatility: High

As exception number one, long-term mortality covers fall outside of our shaded area because they are highly quantifiable with respect to data availability and are best-assessed by actuaries with a deep knowledge of life insurance pricing, but ultimately not without notable risks, particularly parameter risk. In the case of traditional life reinsurance, which can span 10, 20 or 30+ years, process risk diminishes and parameter risk is magnified as coverage duration increases. A model parameter that is off by a

small margin could cause a long stream of unexpected losses or gains.

Unlike in prior examples, profitability can sometimes resemble an upward or downward slope, as priced parameters deviate from actual and project into the future. This long-term gamble requires the scrutiny and projection prowess of actuaries but also some business analysis from MBAs and the like to assess a company's strategic initiatives and block management techniques.

SURETY

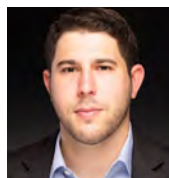
Quantifiability: Low

Volatility: Low

The underwriting of surety bonds is notably distinct from the aforementioned lines of business in that a significant share of the underlying risk is that of creditworthiness, although the ability to analyze and evaluate a contractor's ability to perform the bonded work is also very important. Traditional surety bonds are paid out if, for example, a contractor becomes insolvent and does not fulfill their obligation to a customer.

Simplistically, underwriting entails assessment of the ceding company's ability to appropriately identify risky insureds, whether it be due to their less-than-stellar financial shape, perceived inability to execute the work they have taken on, or both. Fraud, in its manifold forms, is often a cause of surety loss as well, and is notoriously difficult to underwrite by nature.

With proper expertise and underwriting the volatility of the block should be relatively low, especially considering the reinsurer's ability to opt in and out of programs according to their assessment. Generally speaking, underwriters will seek not to bond contractors they do not believe will perform, or those with which they are not comfortable from the perspective of credit, character or capacity. Because of the unique ability in surety to recover losses by pulling from the insured's remaining capital, the target loss ratio is, in theory, 0 percent. ■



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