

6. Actuarial Assumptions

Modeling assumptions are developed during the course of the actuarial appraisal in close coordination with the company's actuaries and other company officials. The external actuary must balance the goals of the company with a realistic assessment of the chances of achieving them, uncovering hidden value while scaling back on aggressive targets to achieve a balanced, defensible end product with buy-in from the seller's team. However, no matter what rationale or techniques are used, assumptions should ultimately be validated by dynamic validation testing, which compares cash flows generated by the model to historic experience.

6.1 Sources of Data

The assumptions used in the model are developed based upon the recent history of the company, current market conditions and the company's future business plans, given the current form and structure of the company. Pricing and budget assumptions based on company experience serve as the best place to start developing best estimate appraisal assumptions. If these are not available, assumptions are based on the external actuaries' experience in the market supplemented with their insight into the company and overall market trends.

Obtaining reliable policy and claims data that is both at the level of detail needed and internally consistent with the company's financials is always a challenge. Considerable effort is required to obtain data of sufficient quality to perform the valuation. More often than not, the process is iterative and information is rarely available in a format immediately useful for the work at hand. Thus, data gathering and the process of developing assumptions takes time and attention from all parties in order to become comfortable that the resulting model will stand up to outside scrutiny.

As soon as the process starts, the external actuary sends a formal data request to the company's project coordinator. The company's actuarial department is typically hardest hit by the data request as pricing information, technical notes, policy forms, underwriting information, experience studies, reinsurance contracts, dividend philosophy, illustration systems, in-force extracts and associated validating information are all required to start the external actuary's modeling and review process. The accounting and financial areas are not immune as financial statements, budgets, expense breakdowns, asset listings,

tax and minimum capital calculations are also required. Finally, a close review of the distribution channel(s) is important in order for the external actuary to understand the drivers of production.

The most reliance is typically placed on the seller's audited financial statements for the previous three to five years. A balance needs to be reached between obtaining enough information to spot trends versus relying on information that is outdated due to changes in corporate operations or swings in economic conditions. As the financials are the most reliable information available, static and dynamic validations are measured against these documents.

6.2 Premium Production

New business premium production is usually the most important driver of value. For companies with established books of business, the value of new business can be two or more times the value of existing business. For young, fast growing companies, new business can be 10 times the value of existing business or even more.

It is sometimes forgotten in actuarial reports that it is the distribution channels that drive premium production. Premiums are often estimated without understanding how the distribution process drives sales, the mentality of the customers buying it or how either party may perceive the proposed sale and thus affect future production. This sort of actuarial "ivory tower" mentality leaves the report vulnerable upon review. The external actuary must work in close cooperation with the sales and marketing areas to produce well-reasoned, internally consistent premium estimates.

However, the requirements for an actuarial appraisal are often quite different from what sales executives are used to. Premium projections for an appraisal might be needed for five years, 10 years or even more, while the sales executives may be used to thinking only one year down the road. Company budget projections may be focused only on top-line growth, whereas an actuarial appraisal needs estimates of new business production, as premiums generated by existing business are generated "automatically" within the existing business model based on the actuarial assumptions.

In order to get production information in the format needed, the external actuaries enter into a close dialogue with their partners in the marketing department to develop a sales scenario that is reasonable and justifiable.

Measures that help to determine the reasonableness of the projected premiums and the fit of the model include:

- top line premium growth
- first year premium growth
- average premium per policy
- ratio of first year to total premium
- estimated increase in policies in force

On the sell side, it is particularly important to be realistic in the assessment of the potential for new business production. A premium growth assumption that is overly aggressive may inflate sellers' expectations and prove to be contentious in negotiations with buyers.

6.3 Expenses

Expenses can be modeled in any number of ways; however, it can be difficult to establish appropriate expenses at even the line of business level because the practice of expense allocation is not common in many developing markets and accurate expense studies are even less common. The challenge is to find measures that are appropriate with which the company is comfortable.

The best way to start is with pricing expenses; however, often there is very little pricing information, or if there is, it does not validate to actual expense levels. Worse still, in some jurisdictions, pricing assumptions are mandated by the regulatory authorities and have little or no relation to actual costs, nor has management made it a priority to understand their cost structure. It is often up to the external actuaries with their analytic tools to devise methodology that is appropriate both at time zero and going forward.

Measures that help to determine the reasonableness of the expense assumptions and the fit of the model include:

- total expenses as a percent of premium or reserves
- maintenance expenses as a percent of claims (health/P&C)
- maintenance expenses per policy in force (life)
- acquisition expenses per policy or as a percent of issued premium
- overhead expenses as a percentage of direct expenses

6.3.1 Overhead Expenses

Modeling overhead expense is often problematic. Once direct expenses have been established, there may still be a gap between the expenses generated by the model and total company expenses. The company may expect to close the gap in the years to come as production increases and economies of scale are reached. It is important for the external actuary to consider perceptions on both sides of the transaction in developing a model assumption for overhead.

6.3.2 Financial Groups

In some transactions, the insurance company is part of a larger corporate structure or financial group. In such instances, reported expenses may have little relation to actual expenses, as both corporate overhead and operating expenses may be allocated in a manner that has little bearing to actual costs. In such instances, the external actuary may be forced to rely on local market or international standards to develop reasonable expense assumptions.

6.3.3 Buy Side Expense Plays

From a bidder's perspective, expenses may present an opportunity to find extra value to improve the deal from their side. The bidder may be looking for the transaction to create economies of scale with existing operations, or they may perceive an opportunity to add value and/or effect cost reductions through technology and skills transfer. Such "expense plays" are risky, as additional layers of expenses are typically added to support the management and reporting needs of the acquiring company, often with little offsetting expense reduction on the side of the acquired company.

6.4 Commissions

Commissions are generally easier to model than expenses, as commission levels are closely monitored and systems are usually in place to track agent productivity. However, base and override commission levels described in product technical notes may tell only part of the story. A third layer of acquisition costs that is often material comes in the form of bonuses and convention expenses based on qualification standards. These costs typically have less structure and are not as well controlled as the base commissions. As such, they can be harder to model, but by analyzing historic experience and having discussions with sales executives, future levels of bonus payments can be

estimated based on management's intention to maintain, increase or decrease current funding levels. Ultimately, commissions are simpler to validate as they are usually expressed as a percentage of premium.

6.5 Life Mortality

Mortality is often not a driving factor in individual life profitability in developing countries. While there are numerous factors behind this, in some markets the amount of value returned to the policyholder in terms of death benefits can be as low as 10 percent of the expected value of future premium. Thus, a 10 percent fluctuation in the mortality estimation is often less troublesome than a 10 percent fluctuation in the commission or expense assumption. As such, mortality experience studies can be hard to come by, as many companies do not regularly monitor their mortality experience.

If historic claims and exposure data can be assembled and the block of business is large enough (10,000 life years is a rule of thumb used on group life cases for assuming full credibility of aggregate mortality experience), factors can be developed to be applied to existing market tables. If historic data is not available, some combination of market tables and factors derived based on the actuary's experience in the market are typically used, taking into consideration the company's market niche(s).

After dynamically validating in the first period it can be difficult to show that the mortality assumptions provide a good fit going forward. At a minimum, the progression of the average mortality rate for the book of business needs to be examined for reasonableness, given the mix of business and the average attained age of the block.

6.6 Annuity Mortality

In some markets, particularly Latin America, annuity mortality is an important consideration. Unfortunately, even in the most developed markets, the amount of information available on annuitant mortality is far less than on life. A large block of annuity business might consist of 30,000+ policies, while the entire Chilean market contains less than 500,000 policies issued to date.

Annuities associated with privatized Social Security schemes are multiple life and often have certain periods, such that the impact of the mortality assumption in the first ten years is often minimal and discrepancies between

actual to expected (A/E) do not have a material impact on results. However, assumptions for the 70+ age brackets are critical. The force of mortality is greatest here, as is the potential impact of improvements in mortality. A 10 percent variation in A/E at these ages has a much greater impact on ultimate profitability of an annuity block than a 10 percent variation does at the younger ages. Unfortunately, assumptions at the older ages are the hardest to refine due to lack of experience to date. However, there are reinsurers that specialize in the laying off of this long-tail risk.

6.7 Lapses

Lapse rates in developing markets can be an important driver of value. Early-year lapse rates are often very high by developed market standards. Some products are lapse supported without local management clearly understanding the risks of these designs. Lapse studies are often more readily available than expense or mortality studies, although it is simple enough to generate rough estimates of persistency for durations greater than one using year-end policy extracts. Universal life (UL) or fund accumulation products have the additional complication of partial withdrawals as well as the need to differentiate between full surrenders and lapse due to the exhaustion of fund value.

Another important consideration is non-forfeiture options. For traditional products, automatic premium loan, extended-term and reduced paid-up are all possibilities. If the technical basis upon which extended-term and reduced paid-up are calculated is more conservative than that of the base policy, these non-forfeiture options can be significant generators of value. It is important for the external actuary to capture this value not just by modeling existing non-forfeiture blocks, but by discriminating between full surrenders and premium lapses in the course of the projection.

Lapse rates have many implications on cash flows, so there are numerous moving parts to consider in validating lapse rates including:

- premium and policies remaining in force at the end of each period
- partial withdrawals and full surrenders on UL
- transition to non-forfeiture options on traditional blocks

Finally, the possible impact of the sale on short-term lapse behavior needs to be taken into consideration as well.

6.8 Statutory Reserves

Calculating statutory reserves for fund-accumulation products is a relatively straightforward task, although variations from market to market must be accounted for. For traditional life products, statutory reserves are calculated using factors provided by the company wherever possible, as reproducing factor reserve calculations can be costly and time consuming without adding value to the process.

The relative strength of the statutory reserving basis will determine the timing at which profits emerge. In instances where the statutory basis is deemed insufficient, a time-zero adjustment must be calculated and presented as a negative adjustment to statutory book value (see Actuarial Appraisal Value section below).

6.9 Dividends

Participating or with-profits business is typically not as great a consideration in developing markets as in developed markets. Dividend practices vary widely between markets, as do corporate practices within markets. Dividends may be determined by a factor-type formula or declared at management discretion. The legal challenges surrounding participating business in developed markets have typically not been advanced to date in developing markets. In modeling participating business, the external actuary must carefully consider contractual obligations as well as policyholder expectations in the context of historic corporate and market practices.

6.10 Options and Guarantees

The external actuary needs to be on alert for contract language providing for policyholder options and guarantees. Experienced professionals living and working in the markets may not be able to recognize the true nature or potential cost of these benefits. It is incumbent on the external actuary to carefully read material contracts both for existing blocks and new sales to identify and evaluate possible contingent liabilities.

6.11 Reinsurance

Reinsurance may or may not be a material factor in determining value. If reinsurance contracts are limited to catastrophe coverage, it may be ignored as

immaterial or modeled as a percent of premium expense. Coinsurance or yearly renewable term contracts that materially impact the profit signature of a product or block of business need to be incorporated into the projections. This can be effectively accomplished by modeling on either a net basis or on a direct basis.

6.12 Cost of Capital

A certain level of capital in addition to statutory reserves is required in order to support existing business and to issue new business. Companies domiciled in different jurisdictions have widely varying minimum capital requirements. Assuming this capital is released into earnings at the end of the projection, the cost of capital is the present value of the difference between the yield earned on the capital held in the model in each period and the discount rate used to calculate present values.

Typically, actuarial appraisals on the sell side are performed assuming domestic minimum capital requirements. This allows each potential investor to factor in their own capital considerations. Because capital considerations vary so widely between investors, there are no simple rules to translate the capital requirements of local jurisdictions to a single international standard.

The cost of capital for a particular investor is ultimately dependent on:

- the perceived adequacy of the statutory minimum reserves
- the level of capital necessary given the inherent risks of the company's portfolio
- the level of capital needed to satisfy regulator and rating agency requirements in an investor's home jurisdiction
- the difference between the potential investor's rate of return on capital and their desired rate of return for the acquisition

6.13 Taxation

Domestic taxation of insurance companies is often complex and most actuaries are not tax experts. Tax and investment strategies can vary greatly between potential investors. For example, new entrants to a market and companies with established local subsidiaries may have materially different tax positions causing them to value loss carry forwards deriving from the same potential acquisition differently. For each bidder, the decision to repatriate

versus retain earnings must be weighed against tax treaties currently in place and the risk that they might change, for better or worse, going forward.

Thus, while it may be possible for the external actuary to accurately calculate taxes on a local basis, in a complicated multi-national transaction it may be appropriate for the external actuary to present pre-tax earnings. This approach allows potential investor's the opportunity to assess the full economic consequences of the transaction from their unique perspective with their own tax team.