

Actuarial Considerations in International Insurance M&A

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1. INTRODUCTION

The last decade has seen an explosion of cross-border mergers and acquisitions as companies in mature markets seek to increase their potential for growth through expansion into developing markets. This paper presents a broad overview of the actuarial considerations of insurance company transactions in developing countries, identifying both theoretical and practical issues that need be addressed when trying to assess the potential value of a multi-national insurance transaction.

There is very little published literature on the practical considerations of international insurance M&A. One very fine example of local standards, to which this paper owes a great debt, is Actuarial Standards Board *Actuarial Standard of Practice No. 19*, "Actuarial Appraisals". This document, while neither 100% necessary nor always sufficient when performing transactions outside of the United States, serves as an excellent guide to the practicing actuary. I would like to thank Dan McCarthy for his encouragement in taking up the task of codifying practices outside of the U.S.

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It is important to note that the opinions expressed in this paper are my own and do not necessarily reflect the views of my employer. Any errors, omissions or controversial statements are mine and mine alone.

2. EXECUTIVE SUMMARY

This is not a typical actuarial paper; there are no formulas or tables of numbers. Its goal is to present to an international audience an overview of the process unique to insurance M&A, and the role of the actuary in it. While much of this paper is written from the seller's perspective, it is equally applicable to an investor's point of view. In addition to being addressed to the practicing actuary, intended audiences include;

- executives at institutions considering purchasing or selling insurance operations;
- investment bankers involved in insurance transactions; and
- students of the profession.

The paper begins with a discussion of various types of actuarial analysis and the role of the external actuary. Some time is spent discussing the key elements of actuarial models, which are important tools developed to support actuarial analysis.

The next section deals with various considerations of the sale process from both the buyer's and the seller's perspective. The preparation of a company for sale, the bidding process and the rigors of due diligence are also discussed. The importance of teamwork throughout this process cannot be overemphasized.

After walking through the sale process, the development of economic and actuarial assumptions is examined in detail, including sources of data and various techniques for developing assumptions. Important considerations in specific markets are presented where appropriate. Methodology and modeling considerations for specific lines of business, including individual life, annuity and loss ratio lines, are then discussed.

Finally, we examine the three traditional elements of appraisal value: adjusted book value, value of existing business and value of new business. In determining the value of new business, we consider two distinct components: the value of new business from established lines of business produced by currently installed distribution capacity,

and the potential value of new business sold in new lines of business and/or alternative distribution channels. Together, this definition of new business captures the franchise or “brand” value of the company.

3. THE ROLE OF THE ACTUARY

Actuaries play many roles in the insurance industry. One of the most complicated tasks an actuary can perform is large scale corporate modeling in an attempt to shed light on the relationship between value, performance and risk. In specialized situations such as these, it may be appropriate to have external actuaries perform the work rather than attempt the task with internal resources.

3.1 *Types of Actuarial Analysis*

The term actuarial analysis is very broad and not at all limited to appraisals. Corporate level actuarial analysis is prepared for and used in many different situations, some of the most important of which are outlined below:

1. Actuarial analysis is an integral part of the process of the sale of an insurance company. A seller's appraisal outlining the analysis is generally provided to prospective bidders prior to the opening of the data room. The report typically develops discounted cash flows for the insurance company, along with projected income statements.
2. Likewise, actuarial analysis is a critical part of a potential investor's due diligence. The seller's appraisal is used as a starting point for the buyer's technical team. The cash flows underlying the analysis are adjusted to reflect the buyer's perception of best estimate assumptions. Often this means developing alternative macro-economic, expense and production assumptions vs. what was used as the basis for the seller's analysis. Armed with a revised set of cash flows and their own business plan, potential investors arrive at what they believe to be an appropriate purchase price.
3. Actuarial analysis is performed in order to assess the vulnerability of a company or book of business to fluctuations in actuarial assumptions (risk analysis), changing macro-economic conditions (cash flow testing), or both (enterprise risk

management). This form of analysis is the most sophisticated level of modeling, requiring powerful machines, specialized software and lots of time. However, the end results can be the most valuable as it provides management with clear information about potential vulnerabilities while at the same time analyzing strategies that can assist in mitigating the consequences.

4. Actuarial analysis in the form of an embedded value report can be prepared for the senior management of insurance companies. This analysis will give management a clear picture of value and reasons for changes in value of the company over a given time period. This analysis is also helpful to management in assessing the capital costs of different blocks of business, along with the capital generation/usage of the different blocks of business.
5. Actuarial analysis may be tailored specifically for lending institutions or rating agencies at the request of the insurance company. The company's business plan is reflected in the analysis, although the interested third party may specify certain sensitivity tests which then become part of the analysis. The third parties may rely upon the company's analysis or may retain their own external actuary to review the analysis.

In the remainder of this paper we will be focusing on actuarial appraisal reports, i.e. documents prepared in the context of a sale process.

3.2 Actuarial Models

Actuarial models are the backbone of actuarial analysis. A well constructed model calculates the emergence of earnings of a product, line of business or company such that in both early and late projection years and under various conditions the profit signature of the business is fairly represented.

Accurate models can be developed in sophisticated actuarial software, spreadsheets, or, more typically, a combination of the two. The decision as to which platform to chose

depends on many factors, including the types of questions that need to be answered by the model, the nature of the business, the timeframe to complete the analysis and the budget to complete the task.

An actuarial model is constructed to project the cashflows deriving from an enterprise under a defined set of assumptions and economic conditions. Models can be run on a policy by policy basis (seriatim) or grouped into model cells that map policies into representative products, ages, policy characteristics and issue years. The characteristics of each modeled product are carefully constructed to reproduce the expected cashflows and policy holder values arising from it.

3.2.1 Modeling Questions

Models are created to provide insight into the current and projected financial condition of the enterprise in a reasonable timeframe. As such, the model must be flexible and robust enough to answer a wide range of questions from various interested parties. In the case of an appraisal, the question is, *“What is a company potentially worth, given a certain set of assumptions?”* A well constructed appraisal model can later be used to answer budgeting questions, questions about the embedded value, or questions about the relative risks the company faces associated with fluctuations in actuarial assumptions and/or macro-economic conditions.

3.2.2 Model Validation

The degree of faithfulness or “fit” of the model is determined by two important tests: a “static” validation and a “dynamic” validation. The static validation confirms that the initial values for reserves, face and policy count in the model match company records as of the valuation date. A dynamic validation looks at the cashflows produced by the model in the first period(s) of the projection and compares them to historical periods. A dynamic valuation is a far more artful and subjective exercise because it must strike a balance between matching the results of previous periods while taking into account any

prospective changes in assumptions, production changes, and deviations in recent past experience.

3.3 The Importance of the External Actuary

Actuarial analysis is performed in all merger and acquisition transactions involving life insurers. Unlike other types of economic enterprises, the nature of insurance requires a long term perspective to realize value. Traditional measures such as price/earnings or price/book do not adequately capture insurance valuations. Internal actuaries generally do not have the experience or perspective to perform an unbiased appraisal that will withstand the scrutiny of an international audience. Because of this, investment bankers rely on external actuaries to develop an appraisal report in support of the transaction, which is often used as the primary indicator of value to both the potential investor and seller.

3.4 The Appraisal Report

An appraisal report goes far beyond the development of appraisal values. An actuarial appraisal provides a unique opportunity for a company to understand their operation at far greater depth and from a different perspective than they may have previously. It provides the seller with an exceptional opportunity to build modeling tools, experience studies, and communication links inside the organization as well as determine metrics to measure performance going forward, including embedded value and budget actual to expected.

From the perspective of a potential investor, an appraisal report can be intimidating, particularly to a non-actuary. Although the typical external actuary's report may appear to try to reduce a company into a series of discounted cash flows, a high quality actuarial report will present the analysis in the context of the market in which the company operates, making reference to how the company prices its products, how it distributes them and how it invests its assets. In the best case, the external actuary

partners with the client in a management consultant role, looking at the operations with a critical eye towards maximizing value and managing enterprise risk.

4. THE SALE PROCESS

The sale process is a team effort. On the sell side, the team usually consists of the seller, their investment banker, the external actuaries and a legal team. On the buy side, the team consists of accounting experts in addition to the previous disciplines. For a sale to be successful, the team on each side must be able to communicate the story of the company in a consistent, focused manner to their publics.

This paper focuses primarily on the actuarial responsibilities. There are a host of functions performed by the other members of the team that will not be well served if we were to try to describe them here. Although no two transactions are alike, in this paper we consider a “typical” situation with multiple bidders in a voluntary sale situation, although it is not uncommon for a single bidder to have an exclusive right to bid on a particular property for a period of time.

4.1 Buy vs. Sell

The objective of the seller is to maximize value; the objective of the potential investor is to optimize the transaction price while minimizing post-sale risk, particularly in the transfer of unidentified liabilities. As such, the process for the buy versus the sell side is very different. The sell side typically has three months or more and full access to the resources and data of the company to prepare their case, while the buy side generally has limited access to information and a limited time frame within which to submit a bid.

All things being equal, the seller is in a stronger position in transactions of this nature, as they have (theoretically) perfect access to information. This increases the risk to the potential investor’s, which inevitably decreases price. In order to maximize value, it is in the seller’s interest to make the transaction as transparent as possible. This is true to the point of identifying and making provisions for any possible reserve deficiencies, as the potential investor may discount them more heavily than necessary if the work to quantify them is not done by the seller. Finally, in order to encourage potential investors to maximize their bid, a post-bid review process known as “due diligence” is

entered into which allows the winning bidder the chance to make adjustments to their bid based on any problems that might be uncovered in the course of the review.

4.2 *Sell Side Preparation*

Takeovers are typically not hostile in the insurance industry. In the absence of distress, the transaction is a managed process, with the investment bankers taking care of legal, timing and other details of the sale.

Usually, the external actuary is brought in early in the process to perform the valuation. It is always necessary to visit the company to gather data, interview management and establish contacts. Depending on the preparedness of company, it may be important to spend significant time on site to develop experience assumptions, become comfortable with the operations, etc.

The investment of senior management time and resources is significant, so it is important to make efficient use of their time. A core group will tend to emerge from the company whose top priority is making sure the sale is a success. In addition to a full time project coordinator, significant commitments are needed from senior members of the actuarial, accounting, marketing, treasury, legal and information technology areas. Coordination of efforts with the investment bankers and other advisors is needed to minimize the duplication of efforts within the company.

In the normal course of preparing the appraisal report, the external actuary will often come across inconsistencies in data or processes across departments that are not always obvious to the company's management team. One of the important roles of the external actuary is to detect and correct such problems in preparation for due diligence. Nothing can damage a sale process more than to have significant issues arise during the due diligence process for which the sell team is unprepared.

Communication plays a critical role during the sale process. After a draft of the appraisal report is developed, it is usually distributed to the people who were closely involved in its development in order to ensure consistency with the management view and obtain buy in from the parties involved.

4.3 *The Bidding Process*

Potential investors are attracted by a “teaser” prepared and distributed by the investment bankers. Should a bidder wish to proceed, documents are filed with the proper authorities, and the interested parties are provided with an offering memorandum with general company and market information upon which to base an indicative bid. At some point in the process, the bidders are provided with the actuarial appraisal report. This is sometimes provided with the offering memorandum but more often it is provided after the offering memorandum but prior to the opening of the data room.

At this stage, the approved bidders are invited to spend time (generally a week) in the data room, reviewing information and interviewing senior management. The data room contains the basic information used to create the offering memorandum and the actuarial appraisal. Each potential investor provides a data request. There are few surprises in the kind of information that is asked for by potential investors; it is up to the seller to be prepared to provide it in an efficient and timely fashion. Likewise, senior management should be prepared in advance and made aware of the types of questions that they will be asked in the process. Depending on the number of bidders, the process of preliminary data room visits can take a month or more, which is an enormous time commitment on the part of management.

4.4 *Due Diligence*

At this point final bids are submitted. These bids may be binding or non-binding as established by the investment bankers. Typically, the winning bidder is given extended

access to the company records and personnel to follow up on issues identified in the initial visit, although in some instances more than one party may be invited back.

The potential investor may dispatch a team of 50 or more individuals for a period of up to two weeks on site, scouring the company for potential issues ranging from actuarial and accounting to legal and regulatory to IT and HR. Any material issues thus identified are then addressed either by adjusting the bid price or through the addition of specific clauses to the transaction document. There are many ways to resolve issues between willing buyers and sellers, including earnouts, straight price reductions, liability workout clauses, etc. The full range is limited only by the creativity of the lawyers and the willingness of the two parties.

While it is important to carefully probe for undisclosed current liabilities, during due diligence it is equally important to consider areas of possible future risk. Class action suits, while not common in developing markets, are a possibility in such familiar areas as sales practices in the U.S. and pension misselling in the U.K.

5. ECONOMIC ASSUMPTIONS

In developing the economic assumptions for use in the appraisal, a team approach must be used. The investment bankers, external actuaries and the company's financial area research current and historic economic conditions to develop an internally consistent base scenario. To be successful, all parties must be comfortable with this scenario and its implications on production, investment yields and, ultimately, distributable earnings.

5.1 Macro-economic Assumptions

In developing countries, fluctuations in asset values and inflation rates are a familiar part of the landscape. However, in order to perform an actuarial appraisal, long term economic assumptions are needed. Economic conditions are typically projected for several years and held constant for the remainder of the projection period, assuming a long term average is reached.

The external actuaries generally rely on other team members to develop the macro-economic data needed for the projection. Those data needs include expected GDP, local inflation, expected yields on local risk free assets, and any short term expected deviation from purchasing power parity between the local currency and any "reference" currency such as the U.S. dollar. Other items which are useful include expected yields and/or spreads on other asset types which might be included in the seller's investment portfolio.

5.2 Assets and Asset Valuation

Admitted assets in developing markets can be of a quite different nature than those in developed markets. Some of features that make assets difficult to value and project in developed markets (derivatives, asset backed securities, even simple put/call options) often are not found in developing markets; however, assets in each country have their own distinct character and risk profile.

Assets in inflation adjusted currencies or with yields linked to external indices are among the simplest to model. Although trading volumes can be thin, market values are usually available or can be derived from market data. However, volatility in inflation and currency trading ranges can create greater discontinuities than actuaries practicing in developed markets are used to considering.

Valuing assets for which the market is illiquid or does not exist at all poses much greater challenges. For example in Asia, a much greater percentage of insurance company assets are in illiquid real estate or corporate loans, some made within a corporate holding structure. Further complicating the issue, reserves may be held on an inadequate statutory basis. In situations such as this, the challenge is to determine the capital injection necessary to make an appropriate provision for existing liabilities, taking into account estimated asset values.

5.3 Projected Yields

There are many reasonable approaches to incorporating existing assets into an actuarial model. If time and budget allow, existing assets can be fully modeled in actuarial projection software and projected with the liabilities. In order to utilize this methodology, future investment strategies must be defined in addition to new money yields on those assets. All things being equal, this is the preferred approach, as it allows for modeling flexibility and precision that other techniques cannot match. Also, this approach facilitates scenario testing which can be valuable in developing markets.

The downside of this approach is that it is time consuming and expensive. Current international standards of practice do not require - and potential investors are typically not asking for - this type of sophisticated analysis. Thus, simpler methods are often used.

An alternative to the fully modeled approach is to take a seriatim listing of the inforce assets and run them off in a spreadsheet, taking a weighted average of coupon rates

and principal remaining at the midpoint of each projection period. The average rates thus calculated can be applied in different ways. One common approach is to allocate existing assets fully to existing business, making up any projected deficit in invested assets going forward by purchasing assets using new money rates. New business can then be projected assuming new money rates (generally a conservative assumption) or by calculating a portfolio rate from asset purchases going forward.

Another approach calculates a blended portfolio rate to be applied equally to existing and new business by allocating inforce assets across total projected liabilities. The blended portfolio rate is a weighted average of projected yields on existing assets and new money rates, based on the ratio of existing assets to total modeled reserves including required capital, IBNR and any other reserves.

Compared to the fully modeled approach, other methods are blunt instruments. However, given the duration of assets developing markets and the amount of variance inherent in other model assumptions, most investors appear satisfied with inforce asset yield estimates calculated in spreadsheets.

5.4 Risk Discount Rates

Appraisal values are generally presented in the actuarial report using a range of risk discount rate scenarios. These are provided to aid potential investors in assessing the effect on value of various risk discount rates based on different investor expectations and perceptions of risk.

In theory, the risk adjusted rate of return is the risk-free rate increased by a risk premium in order to compensate the investor for the risk that actual returns might vary negatively from those expected. This definition is consistent with that of economic value, whereby the value of an asset is equal to the present value of the income stream it generates.

In practice, discount rate assumptions will vary according to the user of the report based on strategic considerations for the use of capital. The actuarial report will provide a range which is intended to cover most reasonable risk discount scenarios, but ultimately each potential investor will determine their own risk discount rates based on long-term return expectations, cost of funds, internal hurdle rate, tax considerations, competitiveness of the bidding process, and their perception of country, market and overall transaction risk. A discount rate thus selected can be justified using Capital Asset Pricing theory, but discount rates tend to be plastic and are influenced by far more mundane considerations than an accurate calculation of the local risk free rate, country equity risk and industry beta.

5.5 Projection Currency

Appraisals are almost always performed on a nominal basis in the local currency. The main exception to this is in economies where the currency for financial transactions is inflation indexed, such as the *Unidades de Fomento* (UF) in Chile.

Performing projections in the local currency facilitates model development and reconciling the model to historic experience. However, present values will often be presented in a reference currency that bidders are expected to be comfortable with, such as U.S. dollars. Discounting assuming purchasing power parity (PPP) facilitates the conversion to the reference currency. Given local market inflation expectations and any short term expected deviations from PPP, converting the present value of nominal cash flows into a reference currency as of the valuation date is a straightforward matter.

5.6 Real vs. Nominal

Modeling on a real basis can have a negative impact on value if the model contains inflation indexed products that are adjusted once per year. The inflation adjustment typically accounts for the previous year's inflation, and appraisals performed on a real basis do not capture the income "notch" consisting of the difference between the

inflationary income for the current year and the current face amount, which is always lagging one year behind.

5.6.1 Discounting Cash Flows

In many instances, investor expectations in developing countries contemplate an improvement in future economic conditions. This often leads to the selection of a declining inflation scenario, coupled with declining real investment yields. This has a number of implications on the calculation of discount rates.

Investors in industrialized nations are often used to seeing results presented using nominal discount rates. This is appropriate if the economic environment, and in particular the inflation rate, is projected to be level. However, if economic conditions are projected to improve while inflation rates decline, a nominal rate appropriate for the first years of the projection may unduly penalize earnings in later years of the projection. Thus, in developing markets real discount rates are often used. When the real rate (selected using the strategies discussed previously) is multiplied by the inflation rate, the resulting nominal discount rates decline with the inflation scenario.

Taking this premise a step further, some economists contend that, if investor expectations are that the economy will improve in the future (thus reducing country risk), it would therefore be appropriate to reduce the *real* rate used to discount future earnings. Looking at this proposal from an embedded value standpoint, if the macro-economic projections which assume an improving economy are achieved, the discount rate for a future embedded value calculation would be reduced accordingly. If the financial performance of a bidder is measured to some degree by embedded value considerations, using this approach could give them an edge in the bidding process.

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. Ultimately, assumptions must 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 this is 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 which is both at the level of detail needed and internally consistent with the company's financials is always a challenge. More often than not the process is iterative, and the 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 for all parties 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, inforce 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 channels 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 ten times the value of existing business or even more.

It is sometimes forgotten in actuarial reports that it is the distribution channels which drive premium production. Premiums can be 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 experienced actuary works 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 than what a sales executive might be used to. Premium projections might be needed for five or even ten years, while the sales executive 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 to some extent “automatically” generated by the existing business model.

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; and
- estimated increase in policies in force.

6.3 Expenses

Expenses can be modeled in any number of ways. However, the practice of expense allocation is not common in many developing markets, so it can be difficult to establish appropriate expenses at even the line of business level. 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, they do not validate to actual expense levels. It is up to the external actuaries with their analytic tools to devise a system 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 per policy in force; and

- acquisition expenses per policy or as a percent of issued premium.

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 coming up with a model assumption for overhead.

6.3.2 Financial Groups

In some transactions, the insurance company is part of a larger corporate 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 such a way 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 a more reasonable expense assumption.

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 at the transaction to create economies of scale for 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 after analyzing historic experience and 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 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% of the expected value of future premium. Thus, a 10% fluctuation in the mortality estimation can be a lot less material than a 10% fluctuation in the commission or expense assumption. As such, mortality experience studies can be hard to come by as companies are not in the habit of monitoring 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 is 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.

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

6.6 *Annuity Mortality*

Annuities associated with privatized plans 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 during the 70+ age brackets are critical. The force of mortality is greatest here, as is the potential impact of improvements in mortality. A 10% variation in A/E at these ages has a much greater impact on ultimate profitability of an annuity block than does a 10% variation at the younger ages. Unfortunately, assumptions at the older ages are the hardest to refine due to lack of exposure and insured experience. 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 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 from 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 are 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, products with these non-forfeiture options can be significant generators of value. It is important for the external actuary's model to capture this value by discriminating between surrenders and premium lapses, rather than see potential profits leave the company in full surrenders.

Lapse rates have many implications on cashflows, 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; and
- transition to non-forfeiture options on traditional.

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

6.8 *Technical Reserves*

Calculating technical 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 technical 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 section 8.1 below).

6.9 *Dividends*

Participating or with-profits business is typically not as great a consideration in developing markets as in developed markets. 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 YRT contracts that materially impact the profit signature of a product or block of business need to be incorporated into the earnings pattern. This can be effectively accomplished by modeling on 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 run 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 an 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; and
- the difference between the potential investor's rate of return on capital and their desired rate of return for the acquisition.

6.13 Taxes

Domestic taxation of insurance companies is often complex, and most external actuaries are not tax experts. The tax status and long term investment strategies can vary greatly between potential investors. The tax status of companies with established local subsidiaries may materially impact their valuation of expected distributable earnings and/or loss carryforwards deriving from acquisitions in the same market. For each bidder, the decision to repatriate vs. retain earnings must be weighed against the tax treaties currently in place and the risk that they might change, for better or worse, going forward.

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

7. MODELING CONSIDERATIONS

Actuarial appraisals are performed using discounted cash flow models. The profit / loss from existing and new business is projected annually. The projected annual profit / loss is then assumed to be paid out / funded at the end of the year in the form of stockholder dividends / capital contributions. The net present value of these cash flows at the selected the risk discount rate(s) plus the adjusted book value is the appraisal value.

7.1 Valuation Date

The valuation date is chosen by the external actuaries and investment bankers and is usually the most recent quarterly reporting period. However, as interim reporting is often less rigorous than annual reporting and usually unaudited, year end valuation dates are usually preferable to other periods.

Sell-side appraisals may take anywhere from two to six months or more to complete. This extended timeframe may put the most recent reporting period well beyond the valuation date. In this case, there are two alternatives: change the valuation date and update the model or review the model to ensure goodness of fit vs. the most recent reporting period. There are valid reasons for either approach, but the decision typically comes down to time and budget. For a complicated model, it is generally easier keep the validation date the same and ensure that the cash flows coming out of the model reasonably track reported numbers. This approach has the added benefit of dynamic model validation on both a historic and prospective basis.

7.2 Years of New Business Production

The purpose of modeling new business is to estimate the value of the distribution channel. Various forces can affect the amount of money a willing buyer is willing to pay a willing seller for a distribution channel. Considerations include the age of the company, the stability of the market and the relative bullishness of local market sentiment. Typically, sensitivities are presented with different production periods to provide investors with a sense of both a range of potential value for the distribution

channel and the degree to which the profitability of new business is weighted towards the end of the projection period.

Another less common approach is to project one year of new business production and allow potential investors to make their own determination of value attributable to new business. While this allows bidders to craft their own projections, it provides less information about the seller's expectations. This approach may not be appropriate in situations where the macro-economic assumptions or product margins are expected to change materially over time.

7.3 Individual Life

Individual life is generally modeled in actuarial software using representative cells based on the inforce as of the valuation date. The valuation area passes a policy level extract to the external actuary to build the model. Cells are constructed to speed model run time and increase flexibility without materially changing the profit signature. Individual policies are mapped to representative products, issue ages, durations and policyholder characteristics (sex, face amount, rate class, etc) in such a manner that the size and run time of the model are reduced without compromising accuracy or robustness.

Representative cells must be validated at the policy level to ensure policy mechanics are properly replicated. For Universal Life policies, illustration systems are commonly used as the benchmark. For traditional policies, if reserves and non-forfeiture values are provided by the company (the preferred approach), validation is an administrative chore. If reserves and non-forfeiture values are instead being calculated by the actuarial software, the task is decidedly more challenging and involves more back and forth between the external actuaries and the company's actuaries to work out the details of the calculations.

In order to measure the value generated by a block of individual life business and associated new business production, a projection period of 10 – 20 years beyond the last date new business is assumed to be issued is generally appropriate.

7.4 Individual Life Riders

Riders and built in benefits can make up a significant proportion of premium in developing markets and an even greater percentage of profits. Riders may be sold on a package basis along with the base policy, often assuming that expenses are covered by the base policy. As such, riders generally have very wide margins. Thus, it is very important that the external actuary pay close attention to the riders to accurately capture the full profitability of the line.

Rider benefits run the gamut from lump sum benefits based on complicated eligibility criteria to disability income and hospital indemnity type benefits to waiver of premium benefits. Lump sum benefits are more easily modeled using time honored techniques of incidence rates times benefit amount. Income benefits may be modeled similarly if the external actuary can accurately estimate the single premium reserve needed to fund the future benefits. The single premium thus calculated can then be substituted for the benefit amount.

Unfortunately, although the profit contributed by riders is very high, the amount of management attention paid to them locally is often minimal (perhaps for that very reason⁰). Often, they are priced using outdated tables from the U.S. or other markets as a proxy. Experience data can be very hard to isolate due to minimal statutory and management reporting requirements. The external actuary must be both creative and disciplined to model rider profitability with the same degree of accuracy as the base policy.

If rider claims and premiums can be isolated, then it is generally appropriate to model them using loss ratio techniques either on a bulk basis in spreadsheets or in actuarial

software substituting age dependent incidence rates for an equivalent loss ratio. The latter approach is generally preferable, as the degree of accuracy generating future rider premiums for the base case and sensitivities can be compromised if the riders are run separately from the base model.

7.5 Annuities

Modeling annuity business in markets with privatized social security systems is hugely complex. Mexican annuities, for example, can have unlimited beneficiaries that must all be modeled going forward on a multiple life basis. The permutations of beneficiaries, ages and benefit levels is far greater for multiple life annuities than on a typical individual life portfolio, while the number of policies in even a large block of annuity business is far smaller than for a life portfolio with comparable reserves. Because of this, constructing a cellular annuity model that appropriately captures the profit signature of an annuity block of business going forward is *reductio ad absurdum*. For this reason, seriatim projections are generally used.

Likewise, it is not possible to capture the profit signature of a complex multiple life annuity using models constructed with only single or joint lives. While it is possible to solve for a joint life distribution that validates at time zero, future cashflows and reserves generated by such models will be materially inaccurate.

Validating the complex interactions of an annuity projection is a far more difficult task than validating an individual life model. There are no illustration systems comparable to an individual life fund accumulation product. An important start is replicating initial reserves but, as mentioned earlier, this is no guarantee of reasonableness going forward. Note that while an initial model discrepancy of .5% vs. published financials is excellent for individual life, due to the sheer size of annuity reserves and the potential impact on future profits, greater accuracy is required.

As of the date of this paper, there is no production software specifically geared towards projecting these types of annuity reserves and cash flows. Company projection models, if they exist at all, are custom built in spread sheets or C++ programs. There are many more decisions in calculating prospective reserves than calculating static time zero reserves. Hence, there are more possible discrepancies between the company's methodology and the external actuary's. The key is to develop a methodology that all parties feel comfortable with and can defend.

In order to measure the value generated by a block of annuity business and associated new business production, a projection period of 30 – 40 years beyond the last date new business is assumed to be issued may be required. Because there are no lapses on these types of products, the reserves remaining at the end of a 20 or even 30 year projection may still be material.

7.6 Other Lines

Companies in developing markets are often multi-line operations. The external actuary may be required to model various types of group, property and casualty (P&C), health or asset accumulation products. Sometimes a product or line of business may be unique to a market, and there may be little or no experience in modeling that line outside that market. In these instances the external actuary must again be both creative and disciplined to understand the line well enough to create suitable modeling techniques as well as determine appropriate assumptions for the key drivers of value in order to project the profit signature.

Spreadsheets may be appropriate for loss ratio lines and asset accumulation products, although modeling using actuarial software provides the advantages of consistency and flexibility when consolidating results and performing sensitivities. On the other hand, spreadsheet models can be perfectly adequate, and the dictates of time and budget may force one decision over the other. As it is difficult to separately identify new and existing on annual renewable business, the convention is to present them together.

The determination of loss ratios, commissions and expense levels is more of an art than a science, as P&C market cycles can drive profitability levels to a far greater extent than on life business. The degree to which reported experience can be relied on depends entirely on the accuracy of company data systems, which are often not up to the task. The goal is to model profit margins that are reasonable in the long term, taking into account the current and expected degree of competition in the market.

7.7 Reserve Review

Issues to be aware of in modeling loss ratio lines relate mostly to the appropriateness of starting balance sheet items such as unearned premium reserves, claim reserves and IBNR. Developing markets can have statutory requirements or company practices that differ widely from international standards.

It is in the best interest of the seller to have a P&C actuary review the sufficiency of these reserves. The analysis is almost always performed in a report separate from the actuarial appraisal. The determination of adjusted book value in the actuarial appraisal then relies on this assessment to adjust initial surplus up or down depending on whether the external actuary's assessment of appropriate reserve levels is lower or higher than the reserves held on the company's balance sheet.

From the standpoint of preparing the data alone this is an important exercise. Any potential investor will want an assessment of these types of reserves. It is advisable that the seller not be caught unable to produce the data required for this type of analysis, as this would have negative implications.

With these adjustments, the reserve runout in the model is assumed to be without profit or loss other than interest earnings. The calculation of the IBNR reserve provides the claim payout pattern for use in the projections, which drives IBNR levels going forward.

7.8 Sensitivities

The results obtained using the best estimate assumptions described in the actuarial report are referred to as the base case. While the base case scenario is developed in conformity with what the seller's team believes to be reasonable and defensible, actual experience will certainly vary from these assumptions.

A range of sensitivities is typically provided for each line of business to demonstrate the effect on value of variations in key assumptions. The sensitivities and their ranges are chosen to assist potential investors in evaluating the effect on results of deviations in future experience from that assumed in the base case. A well constructed set of sensitivities should provide a potential investor's team with enough information to develop a sound estimate of value based on their own perception of the company.

However, as investors become more familiar with the property, they are likely to have a view of future conditions which they would like to see presented in an individually tailored sensitivity run. While these types of requests are commonly fulfilled, it is important for the external actuary to assess the reasonableness and consistency between the changes requested, both actuarial and macro-economic. For example, a significant reduction in projected levels of inflation should not be analyzed in isolation from the implications on the discount rate or the margins of the products being sold.

In some markets, sensitivities may be performed on existing business only, under the theory that any deviation in assumptions will be reflected in future pricing such that margins remain the same. This same argument may be sound in any particular developing market, but it is up to the bidder to determine their own view. Thus, sensitivities are typically provided incorporating both existing and new business.

7.9 New Business Margins

Although implicit margin changes may be contained in prospective macro-economic assumptions or expense levels, new business pricing margins are usually not explicitly

assumed to change in the time horizon of the projection. The rationale behind this approach is that the market continues to operate in a way such that the company obtains profit margins in new business comparable to the margins obtained in the current portfolio.

This approach may not be appropriate where markets are undeveloped or uncompetitive. However, it is very difficult to anticipate the extent and timing of market adjustments, and even more difficult to incorporate these changes in the model going forward. The sensitivities provided in the appraisal report may assist a potential investor in assessing the potential impact on value of changes in future profit margins, or a particular bidder's view can be explored in an individually tailored sensitivity.

8. ACTUARIAL APPRAISAL VALUE

One of the primary functions of the actuarial appraisal is to provide enough information for potential investors to make an informed judgement as to the potential value of a company. The components of value typically presented in an actuarial appraisal include:

- the adjusted book value;
- the value of existing business; and
- the value of new business.

While these elements are important indicators of value (and seller's expectations), they do not necessarily represent the value of a transaction in the open market. Each of these elements is considered in more detail below.

8.1 *Adjusted Book Value*

The adjusted book value (ABV) is calculated to determine the value of a company's net assets at current market prices. The adjustments are intended to eliminate possible accounting differences that over or understate capital and surplus. Thus, the statutory book value is modified where appropriate for items such as:

- contingency reserves (reserves that are better characterized as allocations of surplus);
- case, IBNR and unearned premium reserve redundancies or shortfalls;
- any accrued and unfunded employee benefit liabilities;
- the realizable value of non-admitted assets; and
- the difference between the book versus market value of assets supporting the adjusted book value.

As presented in this paper, ABV includes the minimum capital stated in the opening model balance sheet. Depending on the structure of the company, it may or may not be appropriate to develop the ABV of the company in the appraisal report. Whether the presentation of ABV is appropriate depends also upon whether the appraisal is

completed for the entire company or just for selected lines of business. Barring significant disagreements in technical reserving levels and current asset values, the ABV is generally valued at one to one.

There are no hard and fast rules for presenting price/book. Typically, investment bankers rely on reported numbers. The extent to which the ABV adjustments impact price/book may therefore depend on the home jurisdiction of the acquiring company and possibly impact the relative competitiveness of different bidders. Changes in international accounting standards are sure to further impact the presentation of ABV and price/book.

8.2 Value of Existing Business

The value of existing business is the present value of distributable earnings deriving from business in force as of the valuation date projected for a defined period beyond the valuation date. The value is usually calculated and presented using a range of risk discount rates in order to demonstrate sensitivity to the discount rate. This allows potential investors the opportunity to estimate the value of the block given their perception of the risk inherent in the block's emergence of profits. This also provides a relative indication of the weighting of profits towards the beginning or the end of the projection period.

The value of existing business is comparable to embedded value, although discount rates used in M&A transactions are typically much higher than those used in calculating embedded values for financial reporting purposes. The main discrepancies between buyer and seller in placing a value on existing business will come from differences in opinion over actuarial assumptions (often captured in the risk discount rate), perception of transaction risk (also captured in the choice of risk discount rate) and any possible expense savings that a buyer might anticipate.

8.3 Value of New Business

The value of new business is designed to measure and make a provision for the company's ability to produce new business, as well as take into account any franchise or "brand" value. For the purpose of this paper, we make a distinction between new business sold in currently operating lines of business produced by currently installed distribution capacity, and new business sold in new lines of business and/or new distribution channels ("alternative distribution channels").

It is the perceived value of new business production that typically causes the widest variation between bids and separates buyer and seller expectations. Assuming technical competency in the seller's appraisal and an efficient market, negotiations generally revolve around the perceived value of new business.

8.3.1 Value of Installed Distribution Capacity

The value of new business for installed distribution capacity equals the present value of distributable earnings from new sales in existing lines of business projected for a defined period beyond the valuation date, based on existing marketing and distribution capabilities. This value is an indicator of the relative value of the distribution structure the company currently has in place.

8.3.2 Value of Alternative Distribution Channels

Actuaries and transaction specialists alike are starting to recognize the importance of analyzing new business lines and alternative distribution channels in assessing value. Combined with the value of new business from currently installed marketing and distribution capabilities, this captures the franchise value of the company.

Valuing the currently installed capacity of a company may not make full provision for the franchise value of a company in their market. A company may not have taken advantage of leveraging its name to enter new markets with new lines of business

and/or new distribution channels. The external actuarial advisor needs to be on the alert for these types of opportunities in developing markets.

However, determining the value of alternative distribution channels is a delicate balance. Presented well, it can unlock significant value on behalf of the seller. Done poorly, with inflated premium projections and/or over-optimistic margins, it can detract from the credibility of the appraisal report or even derail the entire sale process by creating a chasm between seller's expectations and bidder's perception of risk, opportunity, and relative contribution to value creation.

8.4 Actuarial Appraisal Value vs. Market Value

The range of values presented in an actuarial appraisal does not necessarily represent, and should not be utilized as, the absolute determination of value of an insurance company or portfolio in the open market. The appraisal provides for a range of values based on discounted projected distributable earnings. These earnings are generated from a carefully crafted, internally consistent set of assumptions designed to produce best estimate future cash flows from the seller's perspective. Different potential investors will typically come to their own conclusions as to what constitutes best estimate assumptions.

All things being equal, the relative value of a company or portfolio will be different for each bidder depending on their strategic goals, potential synergies, expense savings, competitive position in the market, tax position, cost of capital, risk tolerance, etc. The values derived from an actuarial analysis serve as a reference from which potential investors can evaluate their position and arrive at a value based on their unique situation.

9. CONCLUSIONS

This paper was intended to give a broad overview of the international M&A process and the role of the actuary in it. However, there is no “cookbook” approach to the M&A process; the dynamics of each transaction are unique. It is important for buyers and sellers alike to get the best advice possible to conclude a successful transaction. This usually consists of contracting a cross-disciplinary team to assist the internal project managers and technical staff.

There are many important topics that have not been fully treated in this paper, including post-transaction corporate form and structure. The different considerations of closed block purchases vs. acquisitions vs. joint ventures have a significant impact on negotiation complexity, expense considerations and price.

Finally, purchase GAAP accounting in the U.S. and developing international accounting standards drive the post-transaction financial reporting process and the reporting of earnings. Any unresolved discrepancies in reporting standards going forward may provide artificial advantages to companies domiciled in one jurisdiction vs. another in the ongoing globalization of the financial services industry.

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