Actuarial Review of Commercial General Insurance

Syed Danish Ali

Situating the context

This report sheds light on 'the other side' of general insurance of commercial general insurance and why it is seen as so esoteric and mysterious as well as give suggestions as to how actuaries should get more involved in commercial general insurance in emerging markets like the GCC (Middle Eastern countries like UAE, Saudi Arabia, Bahrain, Oman, Qatar etc.), instead of only focusing on personal general insurance (motor and medical insurance). The techniques developed in this report will already be implemented in developed countries but it is important fill the gap in literature that specifically concerns itself with emerging markets and providing guidance to them. It is also hoped that many generic issues highlighted and review may be of benefit to practitioners in the developed countries as well when focusing on the bare fundamentals of commercial general insurance.

The oil crisis has certainly shaken the GCC markets as they realize that they cannot remain addicted to oil revenues and must diversify now on a concrete basis. This has brought in a number of structural changes. Technical skills should now be seen as a source of competitive advantage and of monetary value when undertaking such structural changes. Industry wide initiatives need to be undertaken to increase awareness and a gradual opening of the black box of insurance operations and especially commercial general insurance needs to be given priority.

Regulations have taken a key stage in making structural changes to emerging markets especially in UAE and Saudi. Actuaries are more in demand for the value addition they bring from motor pricing, medical pricing, reserving and other quantitative assessments. This is the need of the hour as such regulations induct actuaries in private general insurance instead of the conventional fields of life insurance and retirement benefits only. The next step for actuaries is now to focus on commercial insurance and have their impact felt in this esoteric black box.

Crux of the curious problem

Commercial general insurance is far less amenable to quantitative analysis than private general insurance. Unlike private general insurance of mostly Motor and Medical, there are many differentiating points that set commercial general insurance apart. These are:

1. Risks are heterogenous with no two risks being the same. The statistical nature is low frequency but high severity which results in erratic volatile trends that are to justify as statistically credible. Order is more difficult to tease out here also due to long tailed nature of claims.[1]
2. Type of risks and type of coverages are far more complex than in personal general insurance. Even same insurance product is different because standardized product is sold to small groups but more tailor-made policies are sold to large groups for the same product [2]
3. Poor, scarce incomplete data
4. The claims are heavily impacted by large losses
5. High level of underwriting judgment and intuition utilized for pricing individual risks in the commercial arena[3]
6. From behavioral point of view, personalities of people are quite fixed and that means that there are tried and test risk factors that remain stable over time for individuals. This is not the case with commercial insurance. Organizations continuously change due to rapidly changing macro-economic and market conditions as well as due to internal reasons such as priorities, growth, location and so on. This means that risk factors are continuously evolving. [4]
7. Some basic level of Private Motor and Medical schemes are mandatory in most of countries which guarantees a specific number of business that must be provided to the consumers. This is less prevalent in commercial general insurance which means more conscious or unconscious scope for the insurance cycle to bear its mark on the premium rates charged.

For commercial insurance, in particular, the market rate determined by underwriter can be quite different to actuary's technical rates, for a number of reasons[5]:

- The lead underwriter(s) might have made a different assessment of the risk based on their own knowledge and experience. This can include client experience, better understanding of the complex coverages, exclusions and product wordings than the actuary.
- This might be cycle related: in a hard market, the underwriter is taking advantage and writing for abnormal profits, or in a soft market the main focus is on client retention instead of sound pricing
- Sometimes there will be significant terms and conditions or other more qualitative features of the risk that are factored in to the market rate (up or down), but which do not feature in the actuary's technical calculations;
- There may be commercial considerations at play, such as writing one contract at an expected underwriting loss (or minimal profit) in order to access other contracts that generate sufficient expected profits that it makes good sense to write the full set. Insurance companies also

[1] Actuaries Institute Australia. Alina Pettifer and James Pettifer: A Practical guide to commercial insurance pricing
[2] Ibid
[3] Ibid
[4] CAS; Actuarial Review Vol 44/No 6/Nov-Dec 2016: Annmarie Geddes Baribeau: Predictive Modeling the Quest for Data Gold
[5] GIRO 1997; Institute and Faculty of Actuaries IFoA; The premium rating of commercial risks

sometimes write medical insurance at a loss and medical acts as a loss leader because once it is sold, a relationship can be developed and clients can be potentially sold other lines of insurance.

Key solutions and strategic review; opening up the black box

Establishing premiums for commercial insurance risks is indeed a blend of art and science in which the former has perhaps dominated, and an aura of mystique often surrounds the subject. Although the heterogeneity of commercial business requires judgements to be made within the pricing process, there are nevertheless ways in which actuaries can add value. Particularly, an actuary can help to provide

- A rigorous approach to risk assessment due to their training in Enterprise Risk Management
- A firmer basis for underwriting decision making due to less focus on market considerations and the insurance cycle as well as helping in setting more objective criteria for underwriting
- Improved treatment of large claims and their allocation to the portfolio due to their focus on catastrophe modeling of both natural and man-made catastrophes and large/clash/accumulated claims. Actuaries also have good understanding risk metrics like Value at Risk and Tail Value at Risk to assess worst-case scenarios

The ways in which the Actuary can be most effective in being able to influence business outcomes in Commercial insurance are:[6]

- That the Actuary builds an in depth understanding of the Commercial portfolios, the market and the external environment
- That the Actuary works in partnership with the Portfolio Manager
- That the Actuary develops a detailed understanding of the data and its limitations
- That the Actuary adopts appropriate technical pricing methods which allow for the characteristics of the portfolio.

To build in depth understanding of the commercial portfolio, an understanding of the policy wording along with its various terminologies should be the main priority of the actuary. This can be done by extensive and regular readings as well as by text mining of the qualitative notes. The actuary must also regularly spend time with portfolio managers, underwriters and claim managers to understand first-hand on how the whole process is achieved. External dynamics and being able to look at the bigger picture is far more important in commercial than drilling down to precise numbers that create undue confidence to the stakeholders. This means keeping an eye out on emerging trends, the insurance market cycle and relationship between various intermediaries. Actuary has to see the strategy of the company and see how it fits well with these external dynamics.

Any results that the Actuary will provide will have considerable uncertainty so it is good practice to recommend a range based on confidence intervals instead of a single point estimate. The Actuary must also be transparent about his/her assumptions and modeling and provide sensitivity analysis of key assumptions.

Inflation is also a far more important consideration in commercial space due to large claims. Many trends like health insurance, tort and legal claims are not following the economic inflation and is in most cases much higher than the economic inflation. Moreover, inflation is not constant over all sizes of claims. For claims with larger amounts, inflation is greater relative to small claims. This means that

[6] Actuaries Institute Australia. Alina Pettifer and James Pettifer: A Practical guide to commercial insurance pricing

inflation is superimposed inflation for reinsurance, especially for facultative and excess of loss which absorbs only large claims. Actuary should provide objective and quantitative assessment of superimposed inflation to assume when pricing and reserving for commercial policies.

The Actuary has to be holistic as well and see the aggregate Reinsurance protection instead of seeing only by lines of commercial business. This is because CAT, aggregate XOL and whole account treaties are also there that takes aggregate loss experience of many lines of business into account. The Actuary can hence add value by optimizing reinsurance arrangements for commercial portfolio.

There are two basic methodologies utilized for pricing reinsurance that equally applies to commercial risks: [7]

1. experience rating
2. exposure rating

A lot has been said on these two measures in a lot of publications but we will highlight only some key points here. There is normally no homogenous class of risks and high uncertainty in both commercial insurance and reinsurance.

Exposure rating sees the exposure that is at risk instead of historical experience. It takes a forward-looking approach rather than the historical approach of experience rating. However as best to our knowledge, there are no ILFs to guide quantitative exposure rating specific to the GCC region. Building region specific ILF is need of the hour to enable more use of exposure rating. Currently, experience rating is only applied mixed with commercial reasons but exposure rating is better potentially because it does not give over importance to recent experience but takes the risks and exposure into account (including propensity for large claims which is usually blinded by short term focus on recent experience).

ILF is not a sure shot to obtain every answer. It should be seen more as a quantified version of market intuition and long term experience instead of giving it a very scientific feel. Relationship building, qualitative market assessment and reinsurance cycles are the bread and butter of how reinsurance is performed in the GCC.

Generalized Linear Modeling (GLM) should not be used in emerging markets at this stage for most of commercial insurance as there is little data available, the data is heterogenous and not credible enough to sufficiently train and test the GLM model in most cases. GLM is more frequently used in personal lines like motor and medical pricing because of large data and relatively homogenous risks as compared to commercial insurance and truncated & layered reinsurance data. The results that GLM give with such incomplete poor data will lead to worse decisions than if we hadn't used GLM at all.

It is important not to take confidence and comfort in precision and quantitative assessments. VaR has become famous for inducing a false sense of security by for instance implying that 95% claims will occur within AED 250,000 amount. This is dangerous because when tail events do occur, they are usually more than capitalization of the whole company in question. A case in point in is the 63 floors

[7] Reinsurance Pricing: Practical Issues & Considerations, 8th Sep 2006; 2006 GIRO Reinsurance Matters! Working Party, Mark Flower et al.

luxury Address Hotel in Dubai which burnt in new years' eve and lead to extremely massive clash cover claim which is still under development. Companies had hardly ever seen such event before.

Ultimately, the uncertainty surrounding commercial pricing cannot be eliminated or even minimized, it can only be contained. insurance is all about peak risks or risk volatility on Severity, frequency or both (Aggregate loss amount). Mathematics and Statistics help to decompose information available and to analyze each component, to recompose results into a synthesis and translate results into economic and business interpretations[8]. This is because while insurers take on tail risks for consumers and so are by definition in the business of extremes and tail risk management. Moreover, if consumers could know the exact timing and amount of losses with certainty, there would be no need for insurance in the first place.
Commercial general liability, product liability and all risks products are especially vulnerable to emerging liabilities and latent claims. It is of no importance that previous mass liabilities are excluded in today's contracts as no one emerging liability is the same. The next major liability catastrophe will be mostly covered in today's benefits in one form or the other. Regular research by the Actuary should be done to keep an eye out for latent claims.

Some commercial products do not have maximum liability and are unlimited like motor bodily injury, workmen compensation's bodily injury and certain umbrella terms. Hence the insurer should carefully evaluate experience to form realistic expectations of such losses. Moreover, even when there are very high but maximum limits, actual losses can still be higher due to Extra Contractual Obligations. Emerging liabilities like liability catastrophes and mass torts like asbestos highlights these points accurately.

Fat tails represent correlation that has not been recognized. Fat tails are much more prevalent in large losses which is again more common in commercial general insurer, making such insurers harbingers of tail liabilities. Two approaches are suggested to take these into account. Firstly, deep underwriting experience and market intuition as well as expert opinion should not be discarded. This qualitative input can be as important as quantitative, if not more. Secondly, complexity science is a whole field dedicated to handling the complexities of reality but it is not expected that this emerging field will be practically implemented by companies in emerging markets. Hence, for the foreseeable future, the main recourse should be on integrating expert opinion to understand correlations better.

Correlation is very important to take into account for commercial insurance. Think what the key correlations might be and try to model these explicitly. For example, if pricing is needed for business interruption that compensates for lost revenues, it has to be linked to state of the economy, turnover of the company with fluctuations etc. – in the simulation model these can be treated dependently.

Due to the lack of data, it can be difficult to model correlation rigorously. Even the covariance of 2 variables is often difficult to estimate. It may be that a simple model of linear correlations makes more practical sense that a more complex method (copulas etc.). The time saved with the simplified modelling can be used to test the model. The actuary in collaboration with underwriters should try correlating a minimal number of variables with crude correlation coefficients, such as by restricting the choice of correlation to one of:[9]

[8] Reinsurance Pricing: Dr. Michael Frohlich 3 Sep 2014. DEUTSCHE AKTUAR AKADEMIE GmbH
[9] Reinsurance Pricing: Practical Issues & Considerations, 8th Sep 2006; 2006 GIRO Reinsurance Matters! Working Party, Mark Flower et al.

o 0% No correlation
o 30% Weak correlation
o 60% Reasonable correlation
o 90% Strong correlation

When doing this, remember that 30% correlation for example really is weak and will not have a dramatic impact.

Another factor that can significantly skew rate level indices is what we would call "cycle spikes" i.e. chunks of opportunistic business written at appropriate times in the underwriting cycle. When markets are hard, the underwriter may write an extra-ordinary category of business at exceptional rates. When markets soften, they will rapidly ditch this same block of contracts. Such behavior can lead to exaggerated swings in the rate level index that are actually not reflective of what is happening in the "core" business. Applying this to core pricing can be misleading.[10]

Due to the limited amount of data available, it is often quite difficult to accurately price a Clash cover. Actuarial judgment and market knowledge are necessary and so are discussions with the underwriter. Sometimes the source of a potential clash will be obvious (e.g. medical malpractice, where there are often several doctors and a hospital all named in the same lawsuit, a fire in building triggering multiple other insurances as well) and in other cases it might be less obvious (e.g. cat insurance in non-cat prone zones).

How does the insurer then monitor its accumulations? Sometimes this simply is not possible, for example Marine Hull and Cargo classes obviously clash but it isn't feasible to monitor the contents and exact whereabouts of every container throughout the year. If the accumulations are not properly monitored, we should not rely exclusively on the available information as it probably underestimates the risk. Building in a margin for the unreported accumulations can help reduce such potential accumulations.[11]

There are material differences even between distributions that are similar. For instance, data can be fit using Lognormal or Pareto distribution with similar moments and goodness of fit. Both of these can have similar aggregate expected losses but the recoveries on high level layers of excess of loss can be significantly different and hence will materially change the evaluation on the adequacy of the depth of aggregate reinsurance coverage. [12]

If there are no large losses above high excess layers, the Monte-Carlo or stochastic model should avail market knowledge that are deterministic such as using ILFs to assess these higher layers. While ILFs are mentioned in reports in developed countries and can be easily bought by insurers, there appears to be no market wide initiative for GCC markets to make ILF curves or yield curves that commercial insurers can avail.

Underwriters are usually under immense pressure by organizations in commercial insurance that evaluate insurance on the inflow-to-outflow method (paying premiums and receiving claims) instead

[10] Ibid
[11] Ibid
[12] Ibid

of on value addition like quality, claims handling servicing, product features etc. This means that undue weightage is given to recent claim experience than is statistically justified instead of looking at the risk and exposure holistically along with potential for large claims. Experience rating implicitly facilities this systematic over-reaction and shows the danger of pricing purely on numbers without a solid appreciation of the underlying exposures. [13]

There are many benefits of division of labor that separates underwriters from claim adjusters and reserving actuaries but if there is not collaboration between them, this can cause business strategy to take a reactive stance on information provision rather than a proactive. For instance, some products generated large premiums which underwriters felt positive about. However, it resulted in significant increase in subsequent reserving exercise. Even later, premium deficiency was arrived at by the actuary when calculating whether to set a premium deficiency reserve or not. [14]

Hence to be more pro-active, the four components of price of risk premium, expenses, investment income and loadings for profits and contingencies must be determined on best estimated basis by the underwriter separately. Once this is determined, only then should the commercial aspects be considered like discounts that make a policy competitive. Thus, the real margins would be revealed at policy inception and renewal instead of reactively from reserving. [15]

Furthermore, given the cyclical nature of market rates, it is worthwhile for the actuary to track the technical rates as a consistent benchmark against which to monitor. It is hard to infer anything from individual risks deviating from benchmark, but observing an entire portfolio moving up or down can be very instructive.[16]

Modeling extreme events and modeling random fluctuations under less extreme conditions are two distinct elements. It looks like a small caveat but it actually is of utmost importance. We can do modeling of random fluctuations under slightly adverse circumstances and conclude that there is a 0.001% of bankruptcy of the Company in a given year. However, randomness is devoid of any situational context and it is the modeler that has to provide that context. The context should be stressed scenarios and then model those extreme events to determine its impact on the Company. It is very easy to ignore this fine line and non-technical audience cannot arrive at this distinction without the modeler telling them. That's why it is important for the actuary to clearly distinguish these two elements.

Aside from setting confidence intervals and stochastic modeling to quantify ranges instead of point estimate, it is also important to qualitatively assess uncertainty. More specifically, areas of highest uncertainty should be differentiated from aspects where these is more certainty.

Using burning cost to represent a minimum floor of premium that must be charged has the disadvantage of being deterministic and trying to encapsulate a world of information in just one statistic. The burning cost is also more smooth whereas commercial insurance ratios are very erratic and volatile and so burning cost seems to provide an artificial smoothing of the results.

[13] GIRO 1997; Institute and Faculty of Actuaries IFoA; The premium rating of commercial risks
[14] Ibid
[15] Ibid
[16] Ibid

A study was conducted where 22 full or partial returns were received from underwriters from eight different companies. Although this study was undertaken in 1997, my experience makes me realize that it is the same condition of today for commercial general insurance in at least the emerging markets.[17]

The main conclusions which this study arrives at, and which my experience corroborates are:[18]

1. underwriters emphasize aggregate claim amounts per unit of exposure instead of looking at severity and claim frequency separately. The useful insight to be derived from looking at claim frequency on its own is hence missed.
2. underwriters have a very short time horizon in sight with mostly looking only at past three years. Of course, older data can be redundant due to significant changes in the three years but a more complete picture could be seen from evaluating data for more years like for instance it can show a rare but very large claim which would've otherwise not been seen by the underwriter.

These two factors combine to create over-reaction to either good or bad recent claims experience of the insurer by the underwriters. Old large claims are swiftly forgotten and implied that such instance will never happen again even though it was random and hence we are 'fooled by randomness'. Similarly, recent bad claim experience will lead to larger rate increases and penalties and the good previous experience will be forgotten like in amnesia. Market expectations like pressure on brokers and the insurance cycle magnifies the amplitude of these systematic over-reactions. [19]

[17] Ibid
[18] Ibid
[19] Ibid

Further Synopsis of the commercial condition

Insurance companies do not become insolvent due to having vulnerable balance sheets. As insurance is the business of risk taking so there are always vulnerabilities that have the potential to cascade and develop into a larger crisis. This vulnerability is kept in balance by risk management and market confidence. This is why stress testing should be performed regularly by the Actuary. The realistic side of stress testing also shows that practically stakeholders do not withhold action until the entire share capital has evaporated to react to an insurance company under stress. Their actions are preemptive while they can still reclaim some of their investments. So, despite the stress testing showing insolvency in for example, 4 years, the realistic bankruptcy will usually likely occur much sooner.

It must be emphasized that assumptions are not static quantitative undertakings that occur and impact in silos but rather they form an interesting pact with other assumptions and the broader economic and social context.

Based on stress testing assumptions, the company's management should understand the insurance business as the specificity of the insurance-related-reverse production cycle (collecting premiums first, paying out claims later and accumulating assets to cover future payouts) and the requirement to control and mitigate operational risks that are generated everywhere in the insurance value chain. [20]Future claims payments are effectively pre-funded by premium income.

Finally, since they are funded long term, insurers are essentially "deep-pocket" investors which can act counter-cyclically. This makes insurers react very differently to downward market pressure compared with a short-term bank and allows them to still maintain focus on the long term.[21]

Regarding data issues some common data problems are that there is only data available in bunches instead of on individual claims. Triangles are rare, only latest claim position is supplied and there can be lack of veracity (validity) in the data due to changing terms & conditions as well as variable uncertain deductibles. Limited number of origin years is provided in the data as well.[22]

Organizational dynamics that commercial clients experience should be regularly observed and monitored by the commercial general insurer. In soft market, probability for lapse increases and voluntary insurance is avoided by companies. Increase in severity is also experienced in times of economic collapses such as lack of funds to focus on maintaining safety levels and increase in frauds to overcome losses in times of crises. Practically speaking, insurers cannot change prices abruptly or significantly just because the actuary is suggesting that premiums were historically overpriced or underpriced. Changes in prices have to be gradually implemented. For instance, if premium is significantly increased this year than the client can think that insurer is 'ripping me off' and if insurer decreases prices significantly than the client will tend to think that the insurer 'ripped me off last year'. [23]

Buying behavior of insurance also varies across companies dictated by their business strategies and type of market standards. It is also important to identify that who has the buy decision for the

[20] Hans Willert; Dec 2014: The role of governance in Solvency II.
[21] The Geneva Papers; 2015; Thimann; Systematic Features Of Insurance And Banking, And The Role Of Leverage, Capital And Loss Absorption.
[22] GIRO Sep 2008; Simon Sheaf; Commercial Lines: Pricing in an imperfect world
[23] GIRO June 2008; conflicting objectives; pricing commercial lines in context

insurance? Sometimes it is the finance department, sometimes it's the broker calling the shots and sometimes it's the risk management department. Insurer has to ask "What do the clients desire?" Is it a one stop shop where all coverages are to be bought with a single insurance company or is it something more complex?[24]

Practically, pricing commercial insurance faces several hurdles. This includes incomplete information captured on systems due to lack of IT systems or other operational reasons. Even the data that is captured is not a reliable indicator of explaining the actual prices charged. Most of reliance is done on intellectual capital of senior underwriters which dial in the knobs of insurance levers to produce practical rates and this capital is lost if they shift to other companies.

It is important for the actuary not to jump in the pricing process immediately and start suggesting prices that should be quoted to the underwriters. This is because commercial general insurance will not easily lead to good numbers and if actuary does not perform his homework thoroughly, his inaccurate and hasty premium suggestions are likely to make him/her lose respect of the underwriters and they might hence not give much weight to the actuary's suggestions in the future. In technical words, it means first explore your data, establish the qualitative understanding, connect the bigger picture to the specific risk being priced and apply descriptive statistics before given suggestions, predictive statistics and forecasting.

Hence, to establish a firm context and feel for commercial general insurance, a suitable governance framework has to be adhered to that has implementations in various stages instead of blitzing the way from ground zero to premiums in one leap. This framework can be described as follows:[25]

1. collection of rating factors
2. building MIS reports
3. Building rating model
4. Reviewing adequacy of rates
5. Setting technical rates and additional improvements

Stage 1 collection of rating factors involves a through reading of underwriting guidelines for the commercial lines of relevance for the actuary. Review the standard contracts, work along with underwriters in observing them and how they actually underwrite, read any rate books and premium quotation calculators that underwriters use. Once the risk factors are compiled through this research, make a comprehensive survey that underwriters have to fill and ratify that shows what risk factors underwriters use and how they apply their subjective judgments as well.

Stage 2 is building MIS reports. Traditionally Management Information Systems have tended to be multi-million projects where intensive software is made by software companies and takes a lot of time and effort for the MIS system to be functional and to run as business-as-usual. However, there are many open source business intelligence software now readily available like BRIT previously known as Eclipse, Pentaho, Jasper Report and Seal Report. Even for data bases management software there is open source MySQL, MongoDB and free edition version of QlikView. Now even Microsoft Office 2016 has power pivot, power query and other power business intelligence tools that can swiftly handle

[24] Ibid

[25] GIRO; Derek Newton and Jason Doughty: Price Monitoring for commercial lines;

up to 2 billion rows. For visualization, Microsoft Office has good visualization tools like charts, graphs and smart arts. There is also free version of Tableau, Plotly, Polymaps, Google Charts and D3.JS. If you want to apply advanced statistics in the future, there is always R or Python opensource available.

There is no future without acquiring technological skills. The time and era of propriety software and relying only on spreadsheets is being reduced to ashes with the big data and data science revolution. Actuaries must adapt now new technologies in order to keep pace and not become irrelevant with the past faced changing times of today and the coming future. Actuaries must also realize that mathematics, theory and subject knowledge will only get us so far if we continue relying only on propriety software and spreadsheets.

The MIS reports can identify key ratios and core statistics like loss ratios, retention, hit rates, conversion rates, claims performance, rate adequacy movements. Key Performance Indicators (KPIs) and Key Risk Indicators (KRIs) have to be decided in collaboration with other management and decided mutually for the MIS reports to generate. Of course, if an actuary has limited power in the Company than he cannot implement this step but only advocate it and hope that it will be picked up by the management in due course of time.

Stage 3 is to build the actual rating models using data and understanding arrived at from the previous two stages. Analyze the collected data, produce a reliable rating algorithm that describes current rates and practices. This will allow the actuary to capture the intellectual capital inherent in the underwriting practices. Use the rates as benchmark and do not discard them if they appear unrealistic as yet.

Stage 4 is then to review whether the rates are adequate or not. Monitoring changes in rate have to be performed and assessed what are the reasons for changing premiums. Is it inflation, insurance cycle, change in terms and conditions, change in exposure of risk, with this analysis done for both new business and renewal business to assess if there's any significant between these two types of businesses. Monitor the expected prices/benchmark prices that actuary quoted to actual prices charged. Monitor the production metrics such quote rates, hit rates, lapse rates, and performance ratios (like loss ratios, severity, frequency, combined ratios) expected to actual.

Stage 5 is focusing on the technical rates. Eclectic blend of statistical models as well as qualitative profiling like market research, underwriting considerations have to be taken into account to produce the final technical rates as no one risk is the same in commercial general insurance. This is the stage to provide underwriters with actuarial recommendations of rates, rate adequacies and one-way or two-way tables analyzing rates that shows the statistical credibility associated with each factor under consideration. Comment on weaknesses in the current rating structures and how they can be overcome. Present solutions and not just problems. Build improved calculators in spreadsheets for quoting premium rates that separately highlights key factors like expected cost of claims, loading for large/attritional/clash/catastrophic claims, profit margin, expenses (fixed, variable, claims handling, tax & levies), commission, cost of reinsurance and discounts given.

Only few leading companies are the price makers and so if the insurer is a price maker, the only decision would be to whether to accept the business at the given price or not. This given price can be compared to the technical price generated and not accepted if given price is significantly below the technical price. It is also not recommended to produce one grand premium calculator for all lines as each line have unique elements and unique intellectual capital. So, while basic standards should be

followed for quality and relatability sake, the calculators should be made when the situation demands so for each line or even sub-lines. [26]

Remember that pricing is only one aspect of the control cycle and the actuary must have integrated view on all aspects so as to provide value addition in commercial general insurance.[27]

[26] GIRO conference and exhibition 2010; Phil Ellis; Plenary one; commercial lines pricing; October 2010;
[27] GIRO June 2008; Martin Cross; practical pricing for commercial lines: an introduction

Arriving at a Conclusion; tying it all down

The key takeaway from this report is that we should strive to find the balance between model complexity and realism. Advantage of simple mathematical models is that it focuses on trends detection and calibration, there is economic interpretation (and control of assumptions) and is easier to communicate to other key stakeholders. Mixing simple models ensures accuracy and ease of interpretation.

It is important to remember not to over-complicate matters. This is not personal lines or life insurance where the actuary can accurately quantify and evaluate much of the risks. There will usually be significant uncertainty and so so a complex risk load that takes a lot more effort to calculate and communicate than a simple approach, but which offers only a small increase in "theoretical robustness", may not be the best one to use. It could also undermine actuary's credibility with the underwriter if they struggle to understand and accept the actuary's approach.[28]

Even with large data availability in the required form, pricing is never meant to be merely an arithmetic exercise. It is a value addition process which focuses our attention on measuring and appreciating a better picture of the true risk involved.

Since commercial insurance requires actuaries to collaborate with other departments like claims, Culture should be of mutual trust and cooperation instead of Darwinian capitalism. If there is survival of the fittest and name-blaming culture, then each employee will remain within his/her silo instead of collaborating together for the betterment of the Company. This must be avoided at all costs.

The qualitative insights speak to us but generally we are too constrained within quantitative structures to make appropriate allowance for them. Some actuaries may see qualitative information as harming the objective purity of actuarial science. However, it must be reminded that data-driven methodologies are not pure or precise; instead, they only feature an unbiased ignorance of real-world issues facing the insurance landscape.[29]

One very powerful technique for actuaries is to utilize quantitative models and qualitative methods simultaneously. Models and statistics create discipline and uniformity for actuaries and analysts and is a powerful source for 'herding' toward similar opinions. Actuary can use the quantitative models to arrive at the 'normal' state of opinion and use qualitative, deep and context specific explanations to understand and explain deviations from the normal standards.[30]

To avoid being ambiguity averse, we can train ourselves to explore the unexplored. As actuaries, perhaps we could make a greater effort to uncover hidden patterns. Actuarial and statistical modeling is a double-edged sword. If applied correctly, it is a very powerful and effective tool to discover

[28] Reinsurance Pricing: Practical Issues & Considerations, 8th Sep 2006; 2006 GIRO Reinsurance Matters! Working Party, Mark Flower et al.
[29] Richard Stein; The Actuary As Product Manager In A Dynamic Product Analysis Environment
[30] Werther; SOA 2013; Recognizing When Black Swans Aren't: Holistically Training Management to Better Recognize, Assess and Respond to Emerging Extreme Events

knowledge in data, but in the wrong hands it can also be distorted and generate absurd results. It is not only our results that can be absurd, but our risk-averse and ambiguity-averse mentalities as well.[31]

Finally, we must ensure that actuarial output highlights fundamental questions at hand to stakeholders instead of confusing them with complicated numbers and lack of decisiveness. There is obviously a premium to be established but the management running the company does not care what the actual premium is—they need to know the likely impacts of that premium on the business. From a financial perspective, we should avoid saying that we have priced for a certain margin because that exact margin is, in the end, going to be exactly wrong! The better approach would be to explain the range of possible outcomes and the impacts of each.[32] As Nassim Nicholas Taleb explains: "There are so many errors we can no longer predict, what you can predict is the effect of the error on you!" Sophistication divorced from fundamental realities lead to instances like the Financial crises of 2008, Brexit and Trump.

In conclusion, it is hoped that this review was able to lead to a better understanding of the inherent realities and trends in commercial general insurance and compels us to view this exercise holistically so as to bear more fruitful results. It is also meant to contribute fruitfully to the current existing dialogue on actuarial involvement in the commercial general insurance arena.

[31] Mills, A. SOA Predictive Analytics and Futurism Newsletter; Issue 1, 2009. Should Actuaries Get Another Job? Nassim Taleb's Work And Its Significance For Actuaries

[32] Ibid