Executive Summary

In 2015, the life settlements market witnessed the emergence of a new class of risk. For the first time, life insurance carriers began increasing premiums on large blocks of in-force life insurance policies. To date, increases appear to have been deliberately targeted at secondary investors and have had a significant impact on expected returns. Having analysed several hundred individual cases, we have developed a parsimonious model that describes an association between policies that have already experienced a COI increase and certain features of those policies. The model allows us to rank the risk of COI increase for any given case, and we await the next carrier action to test the validity of our predictions to date. We employed some machine reading techniques to assist in the harvesting of key fields that are not typically digitised by life settlements investors.

Introduction

In 2015, a number of life insurance carriers began increasing their current assumption cost of insurance (COI) rates on selected blocks of in-force universal life (UL) policies[1]. COI increase had been sufficiently isolated prior to this that the received wisdom among life settlements investors was to ignore it as a risk factor; any required changes in COI would be applied to new issuance, and in-force policies would remain unaffected. The increases in 2015 brought an end to this line of reasoning, as life settlements investors began to experience systematic waves of premium hikes.

Source and Scope

The analysis below presents the findings from a number of projects carried out by Matthew Sheridan engaged as an independent consultant to ClearLife, and on behalf of its clients. The combined sample comprised of several hundred cases that had experienced a COI increase at the time of writing, alongside an equivalent number of as-yet un-increased cases. The findings set out below are deliberately high level in order to protect clients' proprietary data.

UL policy contracts permit carriers to raise COI in certain -- usually restricted -- circumstances. The language in the contracts varies as to: (i) the *cost factors* that can cause an increase, (ii) the *class* of policyholders to whom the increase is applied to, and (iii) a restriction to applying increases to offset *future expectations* of loss. Interpretation of these clauses is central to the on-going litigation against carriers that have applied increases to date. For the purposes of this analysis we deliberately take a position that any carrier is free to apply a COI increase (i.e. there are no contractual restrictions); we are interested in determining the policies to which it may apply those increases.

[1] When a carrier issues a policy, it projects COI annually into the future in order to reflect the risk of the insured dying each year. Since the insured is getting older with time, these annual COI rates increase and form a COI curve. Here we are referring to a parallel shift to the whole curve, rather than this age-related increase.

Measuring COI Risk

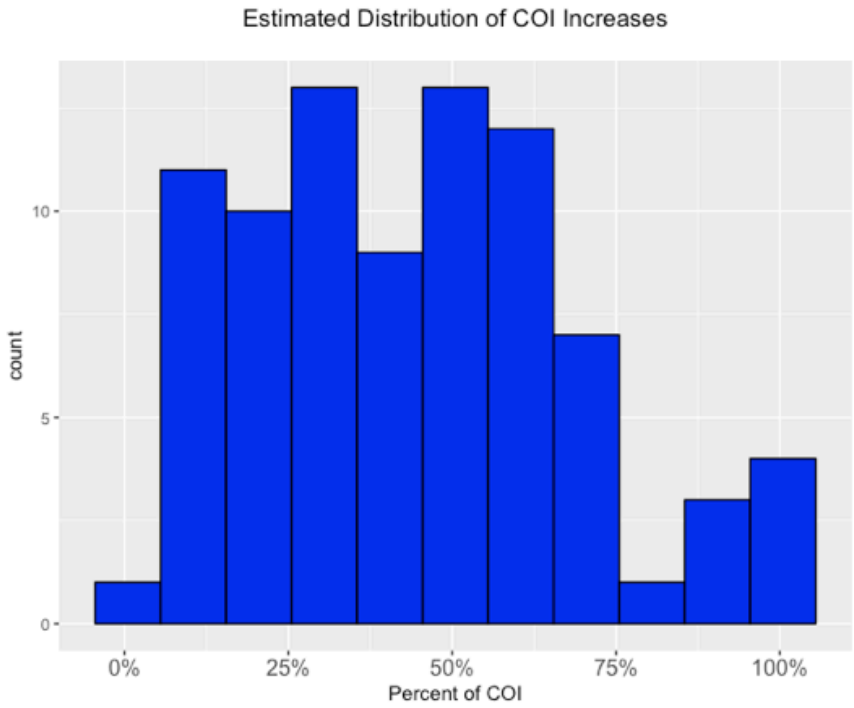

Figure 1

Figure 1 above displays the range of percentage COI increases that we have witnessed to date. The variation is large, with a median increase around 40% and several cases at 100%, i.e. a premium doubling. We can look to the effect on valuation to translate these increases to a measure more relevant to an investor; however, even when expressed as a percentage of face, life settlements' present value (PV) can range anywhere between 0% and 100%, making case-by-case comparison difficult. Expressing the effect of a COI increase as an adjustment to a policy's internal rate of return (IRR) is more useful because it is more bounded and can be visualised in the context of other investment classes. Investors know what IRR was projected at entry, so any subsequent COI increase can be expressed as a haircut to that IRR.

Figure 2 below shows the reduction in IRR for an assumed 10% increase in COI across 500 policies, using a market standard pricing approach. The variation in results is driven by two main factors. The first is the absolute level of premiums; high premium policies will have a larger sensitivity to a change in those premiums (a metric which we term "COI delta"). The second driver is the life expectancy (LE) assumed in pricing. In a probabilistic pricing model, a short LE will cause the premium stream - and any increases – to be discounted more heavily. Bear in mind that a carrier could consider the existing premium level in deciding whether to apply an increase, but it cannot incorporate any LE information as there is no opportunity to "re-underwrite" an existing contract.

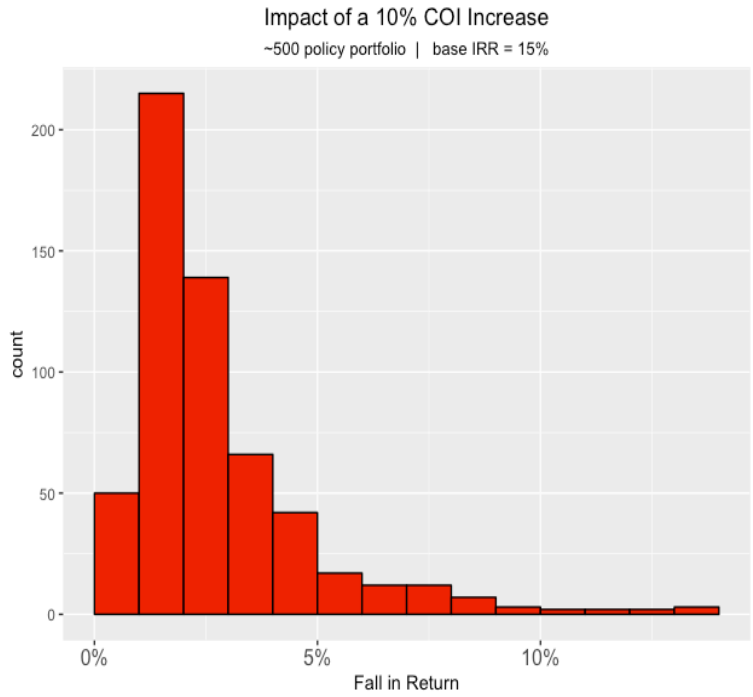

Figure 2

As a rule of thumb: taking the median shift from Figure 1 (40%) and the median delta from Figure 2 (2% of IRR for a 10% COI shift), we conclude that an average COI increase would result in an 8% reduction in expected return, i.e. *half* of an advertised 16%, say.

Policies Impacted

The grey circles in Figure 3 below depict a typical life settlements portfolio as of 2017. Circle size is representative of net death benefit (NDB) and the x-y position shows insured age and policy vintage (years since issue). There is a focus on 80-90 year olds and on policies originated in the mid-2000's, a period associated with heavy issuance of policies which many would claim were "manufactured" for the life settlements market.

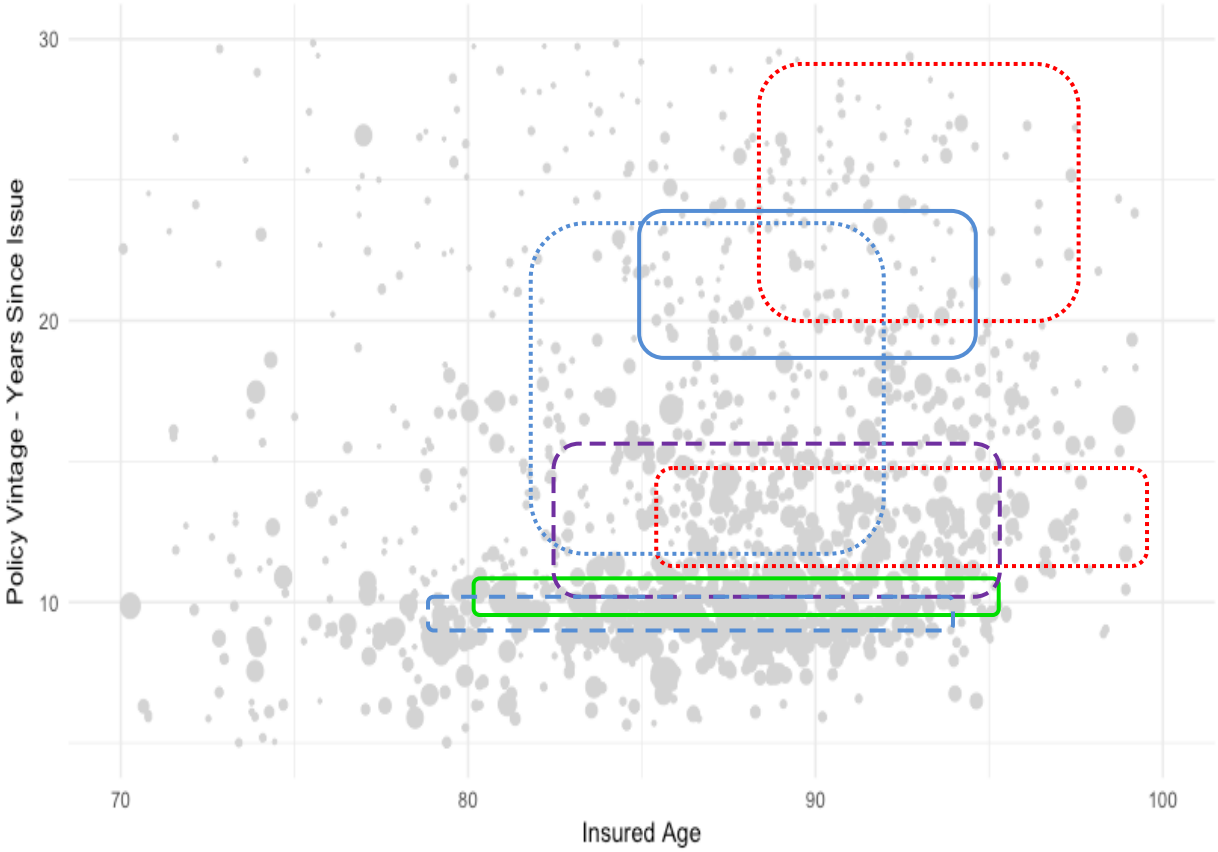

Figure 3

The coloured borders represent areas where different carriers have applied COI increases. The horizontal skewing indicates a focus on issue date rather than insured age and whereas some cases lie outside traditional life settlement zones (higher up on the chart), the majority share characteristics of life settlements activity.

A COI risk hedging strategy, then, could be to invest outside this manufactured paper zone. The problem with this is that the manufactured zone is the source of most of the available supply. An alternative hedge could be to invest below the zone, i.e. into more recently issued paper; however, this conflicts with another preference of investors, to mitigate anti-selection at the insure level through purchasing older vintage policies.

We conclude that COI increases appear to be targeted at life settlements portfolios. Given this, we now seek to identify characteristics of policies within those portfolios that can help predict which cases may be at risk in the future.

Developing a Classifier Model

We theorise that the underlying motivation for COI increases is an economic one, brought about mainly by sustained downward pressure on interest rates and investment returns. We believe that the approach taken by the carriers that have increased COI is an attempt to

redress the economics on those books of business which were priced most aggressively upon issue, i.e. those with the lowest *relative* premiums. While COI increases appear to apply to numerous 'classes', they have been product-specific, suggesting some product-level features that cause the carrier to focus on those particular cases.

Our inclination, therefore, is to focus on *product* economics, as opposed to *carrier* economics. In May 2017, Transamerica reportedly refused to provide policyholders with current assumption illustrations[2]. This was the precise pattern of behaviour that preceded their earlier COI increases, and it challenges the 'double jeopardy' assumption that all of Transamerica's as yet un-increased products are safe. Similar refusals from John Hancock & Genworth limit the value of asking which carrier is likely to be next.

Figure 4 below shows how -- with careful stratification, and a compact expression of information in the premium stream -- we can begin to develop a classifier model that shows promise in separating those cases that have been subject to increase, from those that have not *yet*. The x-axis represents policy vintage, i.e. time since issuance, and the y-axis is a measure of relative premium (COI) cost. The solid circles are cases that experienced a COI increase (the COI represented is the pre-increase level), and the rings are cases that have not been increased.

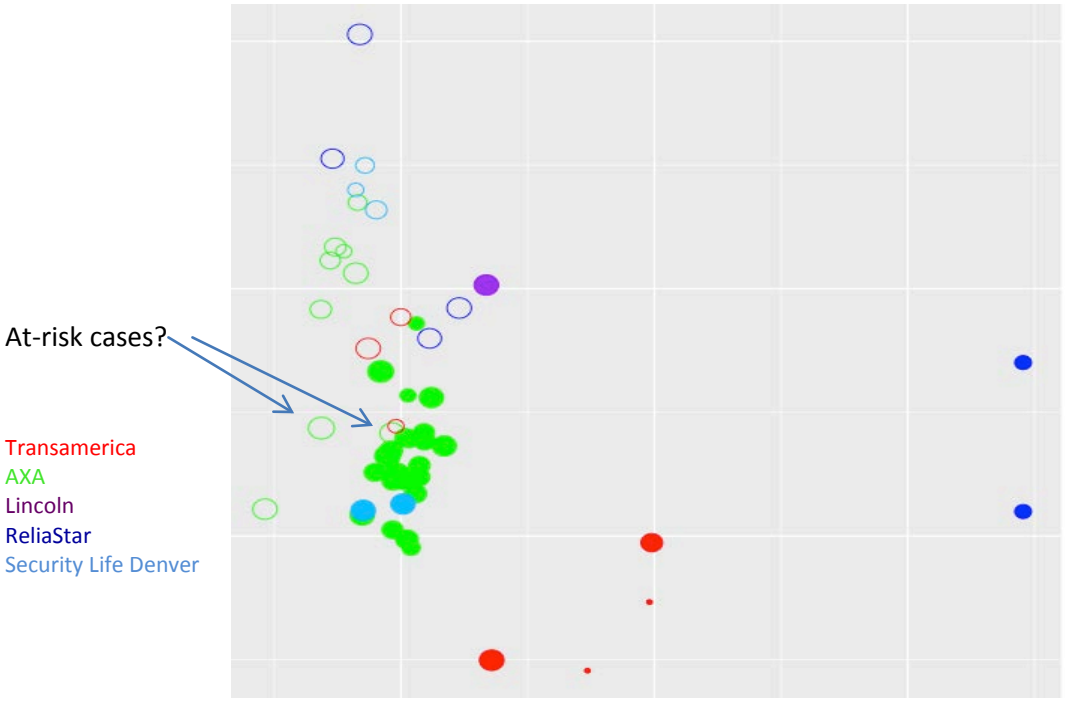

Figure 4

As can be seen, on a carrier level the solid circles almost always sit lower on the chart from their un-increased peers (the rings), supporting the idea that carriers are targeting cheaper policies for increase.

[2] https://blog.itm21st.com/2017/04/10/genworth-joins-the-list-of-carriers-restricting-in-force-ledgers/

A true COI classifier would require a huge number of examples from which to learn. Since we are limited to the relatively small number of increased cases in our sample (a couple of hundred), we rapidly encounter the 'curse of dimensionality'. Figure 4 already represents five dimensions[3]. The AXA case labelled 'at risk' that sits among the increased AXA cases is a policy with an insured in his 70's. We can see from Figure 3 that AXA applied increases to insured over age 80, so without an age dimension in Figure 4, we lose information. However, adding the attained age dimension to the chart – if we could imagine how to do it – would render it unreadable. The trade-off between information and statistical robustness is a classic conflict in this type of analysis.

Narrow AI

COI risk analysis looks more to characteristics at a policy's issue date, than those at the point of life settlement. To that end, the analysis requires data fields that are not traditionally captured by life settlements investors, e.g. product name, premium class, and policy cost factors, to name but a few. Harvesting this information policy-by-policy across a large portfolio is arduous; however, 'machine reading' techniques can help.

Using natural language processing (NLP) and regular expression (RegEx) functionality, we extracted, with a high degree of success, the policy cost factor clauses from each policy contract in a large portfolio. An advantage of RegEx over standard search techniques is that it does not require an exact string match, and therefore is untroubled by either the variations in phrasing or the typographical errors that naturally appear during the (OCR) digitisation process.

Conclusion

In the past two years, COI increase has become a permanent fixture on a life settlement risk manager's radar. Increases seen to date are worrying, both in terms of the estimated reduction to anticipated returns, and the seemingly deliberate focus on life settlement investors.

We find support for our hypothesis that information contained in the premium stream, when appropriately stratified, is associated with the chance of COI increase. We also find NLP techniques useful in automating and accelerating the data harvesting process, required to appropriately calibrate the premium information.

[3] COI cost, vintage, carrier, NDB, and increase / no increase.