

# Why Curve Shape Matters: Moving Beyond Constant Multiples in Life Settlement Mortality

Actuarial Analysis

By Liam Bodemeaid

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Prepared by Paragon Longevity Analytics – Intelligence in Longevity Markets

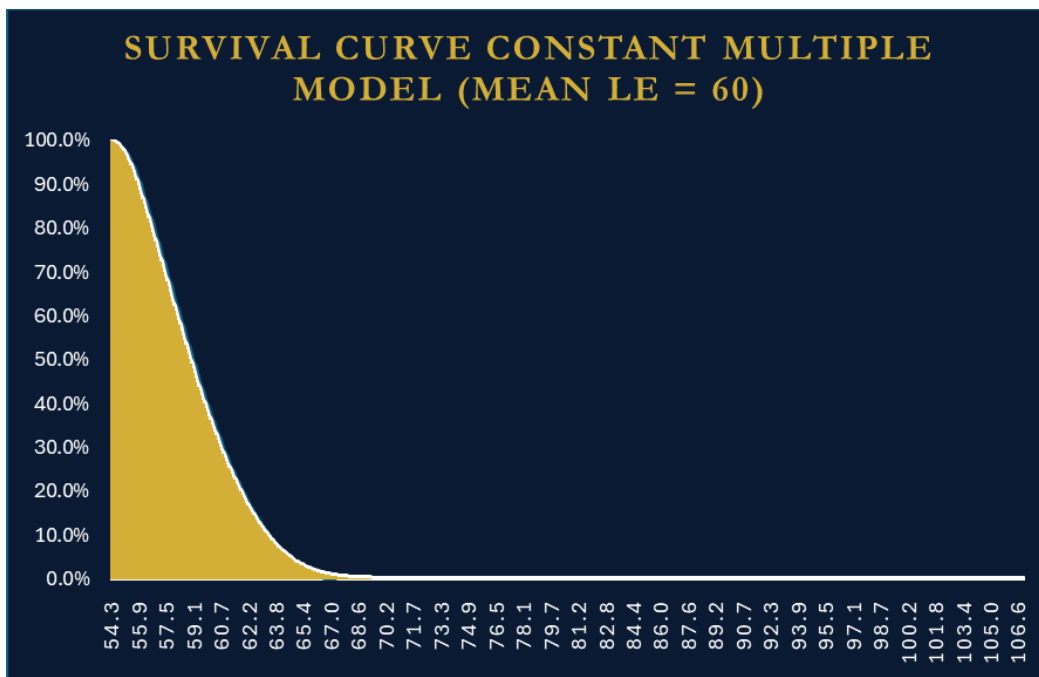
## Why Curve Shape Matters: Moving Beyond Constant Multiples in Life Settlement Mortality

For years the life settlement market has relied on a familiar routine. An underwriter provides a life expectancy. You take the 2015 VBT at the insured’s age and solve for the single mortality multiple that reproduces that LE. Then the same multiple is applied at every future age.

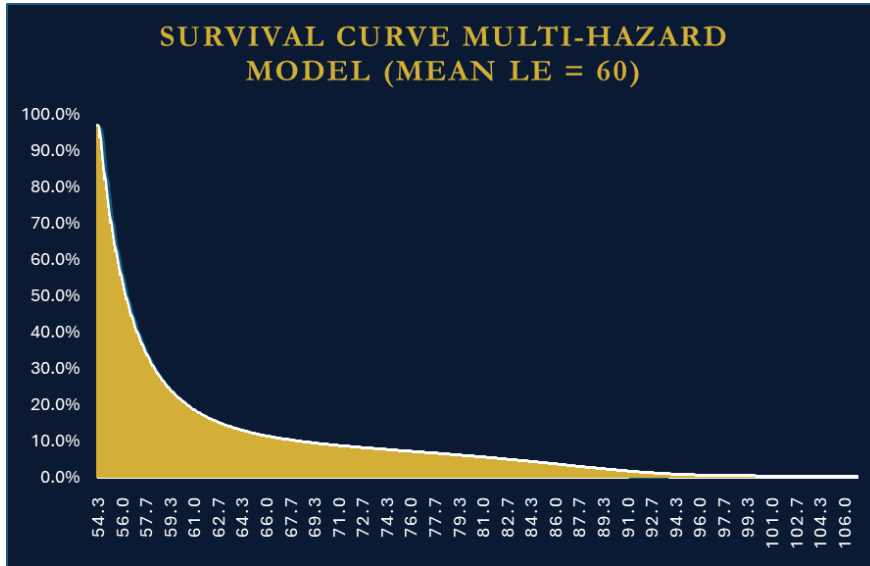
It is simple. It is convenient. And in many situations it is completely wrong.

Anyone who has spent time with clinical survival curves knows they do not behave like a single VBT curve scaled uniformly. This is especially true for younger, highly impaired lives in their fifties and sixties. Mortality risk is genuinely elevated in the early durations. In the later durations the tail does not collapse in the way a constant multiple forces it to do. Yet the constant-multiple approach still sits inside most pricing and valuation engines today.

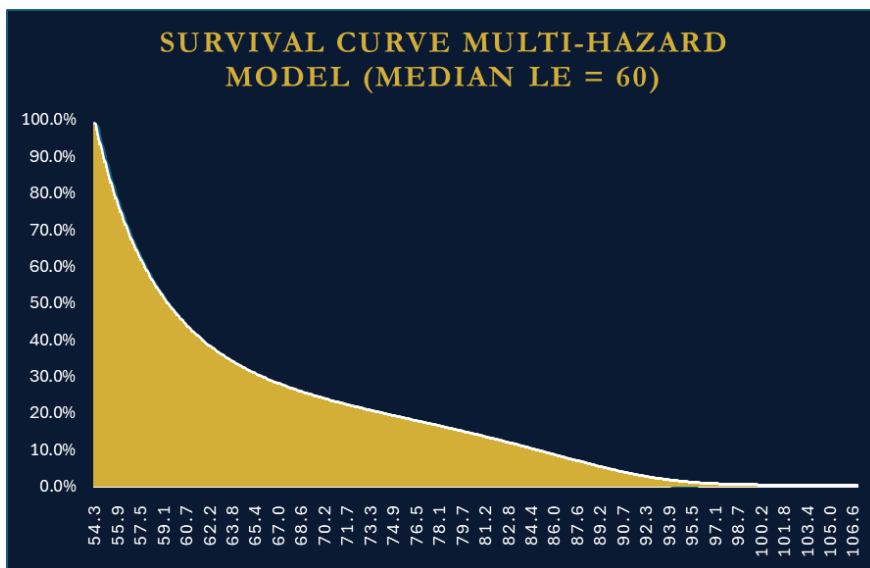
Consider a realistic example: a 54-year-old with Stage 3 cancer and an underwriter LE of 60 months. Under a constant-multiple approach the model requires an extremely large multiplier. The mortality curve then rockets upwards with age. Survival probability at 15 years is effectively zero. The cash-flow tail disappears. The economics shift entirely. And a buyer could easily walk into an opportunity that, with a less accurate curve, might deliver a weak risk-adjusted return.



Now take the same case and apply a mixed-hazard approach. The multiple is capped. The remaining impairment severity is expressed through a flat extra hazard that gradually decays. The LE is matched exactly, but the curve behaves much more sensibly. Mortality is elevated where the clinical studies say it should be. The tail is preserved in a way that mirrors long-term cancer survivor data. Fifteen-year survival is no longer forced to zero. Risk can be assessed on more realistic grounds.



Calibrating to the median LE, which is often more consistent with clinical underwriter practice for cancer cases, produces an even more intuitive shape. Ten-year survival rises to a level that reflects the underwriter’s intent, and the tail remains intact. Pricing, risk and portfolio construction all benefit from a distribution that behaves as the medical literature suggests it should.



The contrast becomes sharper when the curves are aged forward by three years. The constant-multiple model stays rigid. It remains overly punitive and completely ignores the fact that the insured has already passed through the riskiest early period. The mixed-hazard model adjusts naturally. The highest early hazard has already been absorbed. What remains looks much more like the long-term survival experience that clinical models have shown for decades.

This is not an academic nuance. It changes the economics of a policy in real terms. Prices move. Probability of profit moves. Capital allocation decisions move. And one of the most important long-tail risk metrics, the probability of expiry, can shift materially depending on how the curve is shaped.

A portfolio built purely on constant multiples will often understate tail exposure and overstate the speed at which value should emerge.

What this really highlights is that the industry needs to move on from single-lever curve shaping. Matching the LE on day one with a single factor multiple is not enough. The future path of mortality matters just as much. Clinical practice understands this. Underwriters understand this. Yet many actuarial models still flatten everything into a constant multiplier.

At Paragon Longevity Analytics I have been developing an approach that remains anchored to the 2015 VBT, fits directly to the underwriter LE, and is fully transparent within an actuarial governance framework. It allows for elevated early-duration mortality without collapsing the curve at older ages. It produces a more realistic tail for valuation, pricing and portfolio risk work.

The intention is not to replace underwriter judgement but to reflect it more accurately. Life expectancy is the anchor. The curve shape is the narrative beneath it. When those two are aligned, decisions become clearer, pricing becomes more robust and portfolio outcomes become easier to trust.

If you would like to explore how this can support your pricing, experience studies or portfolio modelling & analytics, I would be happy to discuss it. There is a better way of doing this, and the gains from getting it right can be significant.



# Paragon Longevity Analytics

Intelligence in Longevity Markets

[www.paragonlongevity.com](http://www.paragonlongevity.com)

[info@paragonlongevity.com](mailto:info@paragonlongevity.com)

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