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## Understanding the Death Benefit Switch Option in Universal Life Policies

Lifelong universal life policies are the most important individual life insurance contract type in the United States. They have either a *level* death benefit paying a fixed face amount, or an *increasing* death benefit, which additionally pays the available cash value. Either type of contract typically embeds the option to switch from level to increasing or vice versa (the *death benefit switch option*). A switch from level to increasing requires new evidence of insurability and, possibly, an extra fee since the net amount at risk, i.e., the difference between death benefit and cash value, immediately increases by the amount of cash value at the time the option is exercised. In contrast, as the switch from increasing to level does not affect the net amount at risk at the switch exercise time, there are usually no special requirements or fees to make this type of switch. However, development of the net amount at risk after the switch depends on premium payment behavior. Thus, there is some question as to whether insurers should be concerned about death benefit switches under otherwise unchanged actuarial assumptions.

In our paper, we aim to comprehensively examine the described feature. Universal life policies with increasing death benefit as well as the death benefit switch option have not been investigated in the literature to date. We provide an actuarial model framework of a universal life contract with increasing death benefit and incorporate the death benefit switch option. In a simulation analysis, we quantify the net present value of the option from the insurer's perspective using risk-neutral valuation under stochastic interest rates and assuming empirical exercise probabilities. To account for adverse option exercise behavior, our model includes mortality heterogeneity via a stochastic frailty factor. This allows an investigation of the necessity of requiring evidence of insurability.

A crucial point regarding the death benefit switch option is that exercise of the option means an automatic adjustment of premium payments since the former increasing policy premium is no longer adequate for the new level policy. An evaluation of the switch option thus necessarily involves assumptions about modified premium payment behavior after switch. It is this combination of options—the death benefit switch option and premium payment options—that can have substantial negative effects for the insurer.

Results show that the value of the death benefit switch option is strongly dependent on premium payment behavior after exercise and on the health status of an exercising insured. Altogether, we find that combined exercise of the switch option and premium payment options can generate substantial negative net present values from the insurer's perspective due to adverse exercise behavior with respect to insureds' health status.

Overall, insurers should be aware of the potential impact the death benefit switch option can have and should consider implementing risk reduction measures. From our findings, we derive policy implications and provide recommendations for insurers, which can be applied depending on specific—mortality and behavioral—experience in an insurance portfolio.