

## **Risk-Neutral Valuation of a Guaranteed Minimum Income Benefit Rider Offered in Practice**

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**Abstract:** A Guaranteed Minimum Income Benefit (GMIB) is a rider that may be added when buying a deferred variable annuity, which offers the policyholder a guaranteed minimum level of annuity payments. GMIBs are attractive guarantees because they protect the policyholder's annuity investment against market declines while also allowing it to benefit from strong market performance. The key factors affecting the cost of the GMIB are the returns on the annuity investment, interest rates and mortality. The issuer of the GMIB recovers the cost of the guarantee through charging annual fees on the annuity investment. We consider the relationship between fees and cost of a GMIB using a risk-neutral pricing approach, focusing on the financial risks. The sensitivity of the value of the GMIB to model assumptions is explored.