## Contents

1	Introduction	1
2	Background2.1The Neural Network2.2The Physics-Informed Neural Network	2 2 2
3	Approach3.1 Initialization3.2 The Loss Function3.3 The Training and Discretization Process3.4 Applications to the GMIB Variable Annuity	3 5 5 5
4	Results	7
5	Discussion	11
6	Conclusion	11
7	Acknowledgments	11
8	References	12