

# Variable Annuities: Fees High or Too Low?

P.A. Forsyth \*

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In our previous white paper “*Defined Benefit Plans are disappearing: Are variable annuities the answer?*” we made the case that a retiree is exposed to a significant risk when deciding on how to invest a retirement fund. To illustrate the basic idea of how a Variable Annuity can mitigate this risk, we will first examine a very simple product: a Guaranteed Minimum Withdrawal Benefit (GMWB). Suppose that the investor pays \$100,000 to an insurance company, which is invested in a stock market index. Make the assumption that the contract runs for 10 years, and that the guaranteed withdrawal rate is \$10,000 per year. Each year, the investor can withdraw \$10,000 per year, which is subtracted from the amount invested in the stock market account. At the end of ten years, the retiree can withdraw anything left in the account. The interesting aspect of this contract is that the insurance company guarantees that the retiree can withdraw \$10,000 each year, *even if the actual amount in the stock market account is zero.*

Let’s consider an example to illustrate how this works. We will generate a set of ten random returns for the stock market. We assume that the retiree withdraws \$10,000 per year, and makes a final withdrawal of any funds left in the account. The results are illustrated in Table 0.1.

Time	Return (%)	Balance (\$)	Withdrawal (\$)
1	41.65	141,650	10,000
2	31.12	172,620	10,000
3	20.15	195,390	10,000
4	-30.25	129,310	10,000
5	18.05	140,850	10,000
6	16.82	152,860	10,000
7	20.12	171,600	10,000
8	7.44	173,620	10,000
9	-40.90	96,700	10,000
10	-7.5	80,200	80,200
Total Withdrawal Amount (\$)			170,200
Ten year balance if no withdrawal (\$)			151,370

TABLE 0.1: *Initial investment: \$100,000. The retiree is lucky: good returns at the start.*

Now, we suppose the retiree is not so lucky, and has not purchased any sort of guarantee. We take the same set of random returns, but simply change the order in which they occur. The results are shown in Table 0.2.

\*D. Cheriton School of Computer Science, University of Waterloo, Waterloo ON, Canada N2L 3G1  
paforsyt@uwaterloo.ca

Time	Return (%)	Balance (\$)	Withdrawal (\$)
1	-30.25	69,750	10,000
2	-40.90	35,310	10,000
3	16.82	29,570	10,000
4	7.44	21,030	10,000
5	41.65	15,620	10,000
6	20.12	6,750	6,750
7	31.12	0	0
8	18.05	0	0
9	20.15	0	0
10	-7.5	0	0
Total Withdrawal Amount (\$)			56,750
Ten year balance if no withdrawal (\$)			151,370

TABLE 0.2: *Initial investment: \$100,000. No GMWB, poor returns at start. These are the same returns as in Table 0.1, but simply reordered.*

21 Next, we assume that the retiree has purchased a GMWB guarantee, but has the same unlucky  
22 order of returns. The results are shown in Table 0.3.

Time	Return (%)	Balance (\$)	Withdrawal (\$)
1	-30.25	69,750	10,000
2	-40.90	35,310	10,000
3	16.82	29,570	10,000
4	7.44	21,030	10,000
5	41.65	15,620	10,000
6	20.12	6,750	10,000
7	31.12	0	10,000
8	18.05	0	10,000
9	20.15	0	10,000
10	-7.5	0	10,000
Total Withdrawal Amount (\$)			100,000
Ten year balance if no withdrawal (\$)			151,370

TABLE 0.3: *Initial investment: \$100,000. GMWB Protection: poor returns at start. These are the same returns as in Table 0.1, but simply reordered.*

23 Why is this useful? With a GMWB guarantee, the retiree can participate in market gains, but  
24 still has a guaranteed cash flow, in the case of market losses. This insulates pensioners from losses  
25 in the early years of retirement. This protection is paid for by deducting a yearly fee from the  
26 investment account.

27 Perhaps an even more useful Variable Annuity is a Guaranteed Lifelong Withdrawal Benefit  
28 (GLWB). We will illustrate this guarantee by an example. Suppose the retiree buys a contract  
29 from an insurance company for \$100,000. Assume that the initial withdrawal rate is set at 5% of  
30 the initial capital, which means that the retiree can withdraw *at least* \$5,000 per year for life. The

31 initial capital is invested in a stock fund.

32 At the end of the first year, suppose that the market value of the fund has gone up to \$120,000.  
33 Most GLWBs have a *ratchet* feature. In this case, the new withdrawal rate is set at 5% of \$120,000,  
34 which is now \$6,000. The retiree withdraws \$6,000, which leaves \$114,000 in the fund. At the end  
35 of the next year, the market drops, so that the value in the fund is now \$90,000. However, the  
36 retiree can still withdraw at least \$6,000 per year, for life, even if the fund becomes completely  
37 exhausted.

38 Again, we can see the advantages of this guarantee. The retiree has a guaranteed cash flow for  
39 life, but can still participate in market gains.

40 Of course, the insurance company charges a fee for this guarantee, which is extracted from the  
41 investment account. Personal financial planners often pan these products, pointing out that the  
42 guarantee fee is expensive, and that investors would be better off with a diversified mix of stocks  
43 and bonds.

44 On the other hand, academics have for years insisted that the fees being charged for these  
45 guarantees are too low, in the sense that insufficient fees are being charged to hedge these products.

46 Who is right? In a sense, both camps have a point.

47 Let's examine the academic argument first. The academics determine the worst case cost of  
48 hedging these guarantees, based on the assumption that retail investors actions will maximize the  
49 value of the product. This worst case hedge turns out to be quite expensive. Insurance companies,  
50 on the other hand, suggest that retail investors often act in ways which do not maximize the  
51 value of the guarantees, and that assuming the worst case is unnecessarily conservative. Who is  
52 right? Well, many academics were discussing these guarantees in the early 2000's. During the  
53 financial crisis of 2008, many retail customers did act in such a way as to maximize the value of the  
54 guarantees, which resulted in several Canadian insurance companies taking massive writedowns on  
55 their balance sheets. These companies had not hedged the worst case.

56 On the the other hand, the personal financial planners note the following facts. In practice,  
57 most insurance companies offer these guarantees only when the underlying stock fund is a mutual  
58 fund managed by the same insurance company. These mutual funds typically charge quite high  
59 MERs. In addition to the MER, the retail client is charged for an extra *rider* which pays for the  
60 guarantee. The total fee (MER + rider) can approach 3 – 4%. Since, as we all know, the MERs  
61 charged for active management typically add no value compared to an index fund, this total fee  
62 grab does seem quite excessive.

63 These two points of view can be easily reconciled. The academic computations of the hedging  
64 cost include the typical (large) MER for the underlying stock mutual fund. This MER acts as a  
65 drag on the fund, increasing the cost of the rider (the guarantee fee). A simple solution to this  
66 problem is to base the guarantee on an inexpensive index ETF, rather than a high cost mutual  
67 fund. In this way, the rider cost is reduced, and the fund MER is reduced to 5 – 10 bps. The total  
68 cost (MER + rider) now becomes more reasonable. Vanguard, the low cost US ETF provider, has  
69 recently introduced such Variable Annuity products.