



Indexed Universal Life

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Background

- John Hancock Financial
- Manulife acquisition in 2004
- Products
 - 401(k), Mutual Funds, Annuities, College savings, Long Term Care, Life Insurance



Indexed Universal Life

- Offered by John Hancock since 2011
- Credits interest based on stock market performance
 - Offers protection from market downturns
- Flexible premiums



Project Goal



- John Hancock wants to accurately illustrate the policy to potential customers
 - The illustrated rate of return should not be too high or too low
- Our goal is to determine a rate of return that would accurately illustrate the product to a potential customer

Random Walk Simulation

Historical S&P500 Data

	Mean monthly return	Standard Deviation
Poor		
(2000 -	-0.11%	4.62%
2009)		
Average		
(1961 -	0.60%	4.34%
2010)		
Great		
(1990 -	1.28%	3.83%
1999)		

Year	Age	Time	Month	Monthly Return	Annual Return	Annual Return (Adjusted)
1	40	1	Jan	4.64%		
1	40	2	Feb	-0.79%		
1	40	3	Mar	-2.76%		
1	40	4	Apr	-1.98%		
1	40	5	May	-6.24%		
1	40	6	Jun	-0.88%		
1	40	7	Jul	2.75%		
1	40	8	Aug	-4.82%		
1	40	9	Sep	-4.35%		
1	40	10	Oct	-3.05%		
1	40	11	Nov	2.74%		
1	40	12	Dec	4.16%		
2	41	13	Jan	1.96%	-10.75%	
2	41	14	Feb	3.70%	-13.03%	0.00%
2	41	15	Mar	5.53%	-9.10%	0.00%
2	41	16	Apr	-3.24%	-1.35%	0.00%
2	41	17	May	5.46%	-2.62%	0.00%
2	41	18	Jun	-9.87%	9.54%	9.54%
2	41	19	Jul	-1.62%	-0.39%	0.00%
2	41	20	Aug	4.76%	-4.63%	0.00%
2	41	21	Sep	-1.72%	1.07%	1.07%
2	41	22	Oct	1.57%	7.85%	7.85%
2	41	23	Nov	8.96%	12.99%	12.99%
2	41	24	Dec	-1.66%	19.82%	13.00%
3	42	25	Jan	-3.18%	13.13%	13.00%
3	42	26	Feb	4.99%	7.43%	7.43%
3	42	27	Mar	-2.43%	8.77%	8.77%
3	42	28	Apr	-1.38%	0.56%	0.56%
3	42	29	May	-2.68%	2.49%	2.49%
3	42	30	Jun	-1.13%	-5.42%	0.00%
3	42	31	Jul	7.08%	3.76%	3.76%
3	42	32	Aug	11.77%	12.94%	12.94%
3	42	33	Sep	3.06%	20.49%	13.00%
3	42	34	Oct	-2.86%	26.36%	
3	42	35	Nov	1.41%	20.05%	13.00%
3	42	36	Dec	-2.69%	12.48%	12.48%

Major Features of the IUL

- 12 monthly segments/buckets
- Policy charges
- Cash flows
 - Deposit/withdrawal patterns
- Mortality scenarios

Fund Value - Jan	Fund Value - Feb	Fund Value - Mar				
1745.7	75 0.00	0.00				
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Analysis

- Simulated the policy under different scenarios
 - Monthly Premiums vs. Single Premium
 - Comparing different withdrawal patterns
 - Measuring the effect of the cap/floor
- Ran 10,000 simulations for each scenario
- Conducted probability analysis on the simulation outcomes

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Analysis of Premium Options



Analysis of Withdrawal Patterns



Analysis of Cap/Floor effects

Conclusions and Recommendations

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