

**Indexed Annuity Case Study: An Analysis of Growth and Income Return**

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**Abstract**

This case study deals with the comparison of the return of an indexed annuity versus that of an index exchange traded fund (ETF). The case study takes into consideration the unique features of the indexed annuity such as a cap on monthly returns, a floor of annual returns, historical monthly prices, and dividend payments for the ETF. The case study also deals with a quantitative analysis of such aspects as the monthly returns, participation rate, average monthly return for the ETF as well as average annual return, compounded return, and examining the various alternative investment options available to the client.

**Keywords:** Indexed annuity, Annuity, Cap, Participation rate, Dividends, Returns, Exchange Traded Funds (ETF), Floor, Participation rate, surrender charge, Spread, Margin fee, Asset fee, Riders, Monthly returns, Annual returns, Average monthly return, Compounded return, Total return, Compounded Average Growth Rate (CAGR), Treasury bonds

**Introduction**

Janet Walling is a financial advisor with her own firm for the past 25 years. Her goal has always been in assisting her clients with various aspects of financial planning from retirement to education funds for their children and grandchildren to special situations such as setting up trusts accounts for a special needs child. She had seen many unique situations and no two cases were ever the same. However, the reason she stayed in the business, through up markets and down was the opportunity to help her clients achieve their financial goals or deal with a problem they often thought was insurmountable.

Janet was licensed in various aspects of insurance, held numerous securities licenses, was a Certified Financial Planner (CFP), a Chartered Financial Analyst (CFA), had a Master's in Business Administration (MBA) majoring in financial analysis, and took various courses to update her knowledge of corporate and personal finance, and financial planning. She read as much as she could to stay up-to-date in the ever-changing world of finance but still such things stumped her as Bitcoin and block-chain technology. However, she kept learning as much as she could and asked questions of other experts in the field until she received an answer she could understand and discuss with her present and prospective clients. While it was not always easy, she enjoyed the challenge and the opportunity to learn new concepts and ideas and expand her knowledge and skill set as much as she could.

**Case background:** Janet has an appointment today at 1 PM in her office with a long-time client, Mr. Russell Warren. She had known Russell since he was first married and helped him set up college education funds for his children and grandchildren as well as retirement planning. When Russel decided to set up his own manufacturing firm years ago, Janet worked with him regarding insurance and setting up a pension plan for the company's workers. While overall, they have had a good working relationship; Russell often came across new financial schemes and investment opportunities that were complex and high-risk. They did not always agree on everything, but they worked well together.

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Russell called a few days ago wanting to discuss an annuity product Janet had sold him some years ago for supplemental income for retirement purposes. That was as much as he was willing to talk about until he came to her office on this late Fall day.

When Russel arrived, Janet engaged in the obligatory chatting about family and how the manufacturing company was going. Russell was semi-retired and his son and daughter were becoming more involved in the day-to-day operations of the company. This allowed Russell to keep a closer eye on his own retirement finances and eventually retire to either Florida or the Dominican Republic.

Russell started the meeting by complaining about his annuity product that Janet sold more than ten years ago. The annuity product tracks the SPDR Standard and Poor's 500 ETF (ticker symbol: SPY) and is known as an Indexed Annuity. While Russell favored the downside annual floor of 0 percent thereby ensuring there would be no negative return in any year, he felt the cap and the participation rate were hampering the potential returns on the investment. In addition, the annuity did not include the dividends in the calculation of the returns, which he felt was not fair to him as an investor. He felt he would have been better off by just investing in the SPY ETF directly.

The key reason he wanted to meet with Janet is to know if his suspicion was justified and correct and, if so, he would like to switch to another type of annuity or some type of equivalent but ultimately a better investment.

Janet was willing to work with Russell on this matter and stated that she would look into his request with a research analyst her firm often employed on a per diem basis for such a case. Janet told Russell that she would like to write a memo to the research analyst that would examine such items as the specifications of Russell's annuity, provide a monthly and annual analysis, find the compounded return, and the various alternative investment options as opposed to the indexed annuity. She told Russell it would take a few weeks to prepare the analysis and the recommendation and she would call him to schedule another appointment as a follow-up visit to discuss the findings. Russell agreed to her plan of action and he would wait for her call.

When Russell left Janet's office, she spent the rest of the afternoon formulating a memorandum to the research analyst she often used for such a situation, Dr. Stanley Jacobs, a finance professor at the local state university who specialized in financial and investment analysis. Dr. Jacobs was always thorough in his analysis and welcomed new challenges relating to finance and investments. His fee was reasonable and he wrote so anyone could understand finance and investments, no matter how complicated the problem was. The only problem was that Dr. Jacobs was always in demand and he wrote numerous scholarly articles regarding economics, finance, and public policy.

By noon the next day, Janet finished the memorandum and was able to contact Dr. Jacobs. After laying out the task to Dr. Jacobs, Janet was deeply relieved that the professor agreed to take on the job since he had some time in-between writing projects. He estimated that it would take a week between researching the matter and writing the reply memorandum. Janet and Dr. Jacobs agreed upon his fee and she promptly sent her memorandum to him via e-mail.

**Assignment**

**Walling Financial Advisors, LLC**

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**TO:** Stanley Jacobs, Ph.D.

**FROM:** Janet Walling, MBA, CFP, CFA

**DATE:** October 15, 2018

**RE:** Annuity product analysis

As I have spoken to you earlier, my client has some issues with the annuity product he purchased from my firm approximately ten years ago. The annuity product tracks the SPDR Standard and Poor's 500 ETF (ticker symbol: SPY) and is known as an Indexed Annuity. While my client likes that the downside annual floor of 0 percent thereby ensuring there would be no negative return in any year, he feels the cap and the participation rate were hampering the potential returns on the investment. Also, the annuity does not include the dividends in the calculation of the returns, which he felt was not correct. He feels he would have been better off by just investing in the SPY ETF directly. The key reason he wanted to meet with me is to know if his suspicion was justified and correct and, if so, he would like to switch to another type of annuity or some type of equivalent but ultimately a better investment.

Here are the specifications regarding the annuity:

1. There is a **cap of 1.5 percent** on the monthly returns. If the monthly return is 3.0 percent, then the **credited return** is only 1.5 percent. But, on the other hand, if the return is -4.0 percent, then the credited return is -4.0 percent. The maximum gain for any year is 12 times the 1.5 percent cap, resulting in an 18 percent return.
2. There is a **floor of 0 percent** applied to the annual total return. If the sum of the monthly credited returns for the year is negative, then the return is set to 0 percent. The floor applies even when the SPY's actual return is positive for that year.
3. There is a **participation rate of 80 percent** applied to the total return. For example, if the total monthly credited return for the year reaches the maximum of 18 percent, then the actual credited gain is only 14.4 percent.
4. The **surrender charge period** is the period of time in which a charge will be levied on an annuity upon cancellation. The typical charges are 7 percent for 1 to 3 years, 5 percent for 4 to 5 years, and 1 percent for 6 to 10 years.
5. There are no **spread, margin or asset fees**. This is a percentage fee that may be subtracted from the gain in the index (or in this case the ETF) linked to the annuity.
6. There are **no riders** that are extra features such as minimum lifetime guaranteed income that can be added to the annuity as additional costs.

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Monthly Analysis

The 2009 monthly prices for SPY are shown in *Table A* below.

<i>Month and Year</i>	<i>Month-end prices of SPY ETF</i>
December 2008	\$90.24
January 2009	\$82.83
February 2009	\$73.93
March 2009	\$79.52
April 2009	\$87.42
May 2009	\$92.53
June 2009	\$91.95
July 2009	\$98.81
August 2009	\$102.46
September 2009	\$105.59
October 2009	\$103.56
November 2009	\$109.94
December 2009	\$111.44

For the monthly analysis, you need to perform the following:

- A. Calculate the monthly returns for the SPY ETF
- B. Calculate the credited monthly returns with the return capped at 1.5% per month.
- C. Calculate the annual credited return by summing up the monthly credited returns
- D. Find if the annual floor applies for the annual return being from December 2008 to December 2009
- E. Apply the 80 percent participation rate
- F. Calculate the average monthly return for SPY and the annual return for SPY
- G. Provide your analysis of the results

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Annual Analysis

**Table B** shows the annual returns. The SPY return in **Table B** is the price return that excludes the dividends in the calculation. This is the common method of calculating an index return for annuities. The total is the sum of the 25 annual returns.

Table B	Year-End		Dividend Yield	Credited	
	SPY Prices	SPY Return		100% rate	80% rate
1993	\$ 46.594	7.14%	2.58%	2.87%	2.30%
1994	\$ 45.563	-2.21%	2.63%	0.00%	0.00%
1995	\$ 61.484	34.94%	2.80%	14.53%	11.62%
1996	\$ 73.844	20.10%	2.20%	4.68%	3.74%
1997	\$ 97.063	31.44%	1.86%	0.55%	0.44%
1998	\$ 123.313	27.04%	1.46%	0.00%	0.00%
1999	\$ 146.875	19.11%	1.17%	0.00%	0.00%
2000	\$ 131.188	-10.68%	1.02%	0.00%	0.00%
2001	\$ 114.300	-12.87%	1.09%	0.00%	0.00%
2002	\$ 88.230	-22.81%	1.31%	0.00%	0.00%
2003	\$ 111.280	26.12%	1.85%	5.33%	4.26%
2004	\$ 120.870	8.62%	1.97%	4.17%	3.34%
2005	\$ 124.510	3.01%	1.78%	0.00%	0.00%
2006	\$ 141.620	13.74%	1.96%	8.61%	6.89%
2007	\$ 146.210	3.24%	1.91%	0.00%	0.00%
2008	\$ 90.240	-38.28%	1.86%	0.00%	0.00%
2009	\$ 111.440	23.49%	2.41%	0.00%	0.00%
2010	\$ 125.750	12.84%	2.03%	0.00%	0.00%
2011	\$ 125.500	-0.20%	2.05%	0.00%	0.00%
2012	\$ 142.410	13.47%	2.47%	2.44%	1.95%
2013	\$ 184.690	29.69%	2.35%	9.92%	7.94%
2014	\$ 205.540	11.29%	2.08%	2.57%	2.06%
2015	\$ 203.870	-0.81%	2.05%	0.00%	0.00%
2016	\$ 223.530	9.64%	2.23%	0.48%	0.38%
2017	\$ 266.860	19.38%	2.15%	12.23%	9.78%
Average		<b>9.06%</b>	<b>1.97%</b>	<b>2.74%</b>	<b>2.19%</b>
Total		<b>226.47%</b>	<b>49.29%</b>	<b>68.38%</b>	<b>54.70%</b>

Discuss the results of the findings and the results when the dividend is taken into consideration.

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Compounded Return

In *Table C*, an initial \$100 invested in SPY at the start of 1993 would yield \$613.63 by the end of 2017. The 80 percent participation rate annuity would yield \$169.59.

For each column in *Table C*, compute the following:

- A. The total return for the entire period (Base year to 2017)
- B. The Compounded Average Growth Rate (CAGR)
- C. Provide an analysis of the results

<b>Compounded Return</b>				
<b>Table C</b>	<b>SPY</b>	<b>100% Annuity</b>	<b>80% Annuity</b>	<b>SPY+Div</b>
	100.00	100.00	100.00	100.00
1993	107.14	102.87	102.30	109.72
1994	104.77	102.87	102.30	110.18
1995	141.38	117.82	114.19	151.78
1996	169.80	123.33	118.46	185.63
1997	223.19	124.01	118.98	247.46
1998	283.55	124.01	118.98	317.99
1999	337.73	124.01	118.98	382.48
2000	301.66	124.01	118.98	345.55
2001	262.83	124.01	118.98	304.82
2002	202.88	124.01	118.98	239.29
2003	255.88	130.62	124.06	306.22
2004	277.93	136.07	128.20	338.66
2005	286.30	136.07	128.20	354.88
2006	325.65	147.78	137.03	410.62
2007	336.20	147.78	137.03	431.76
2008	207.50	147.78	137.03	274.51
2009	256.25	147.78	137.03	345.63
2010	289.16	147.78	137.03	397.04
2011	288.58	147.78	137.03	404.38
2012	327.47	151.39	139.70	468.87
2013	424.69	166.40	150.79	619.10
2014	472.63	170.68	153.89	701.85
2015	468.79	170.68	153.89	710.51
2016	514.00	171.50	154.48	794.84
2017	613.63	192.47	169.59	965.99

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**Alternative Investments**

The final task of this analysis is to discuss the various alternative investment options as opposed to the indexed annuity.

For example, suppose there was a replacement of the annuity with a mix allocation between SPY and Treasury bonds. Assuming that the average yield for long-term bonds was 2.5 percent, show a matrix of average return for allocations of 80/20, 60/40, 50/50, 40/60, 20/80, and 10/90 in stocks and bonds. Dividends should be included in the calculations. Provide an analysis of the results.

Also, discuss the key features an investor should focus on in choosing an indexed annuity. What, if any, is the extra feature that can make the annuity more attractive?

Could you respond to each of these scenarios and provide a detailed analysis at your earliest convenience. The client understands the relative complexity in providing the calculations, research, and analysis for such a task. Please feel free to contact me if you have any questions, comments, or concerns. Thanks for your help in this matter.

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