



Do-It-Yourself Equity-Indexed Annuities

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Equity indexed annuities offer retirees a compelling combination of guaranteed income and participation in the market's upside. But EIAs are exceedingly complex and have been the subject of numerous regulatory challenges. For those who seek a simpler alternative with a comparable return profile, a combination of fixed-income securities and options is viable choice.

I will describe how advisors can construct a do-it-yourself portfolio, to which EIAs – also known as fixed-index annuities – can be compared. First, however, let's look at some of the complexities of today's EIA offerings.

With an EIA, an insurer provides a guarantee that you will receive a minimum rate-of-return on your investment over a stated time period, along with upside potential based on the performance of a market index, such as the S&P 500 or the Dow Jones Industrial Average. If the index generates a positive return over the period, the purchaser receives a fraction of index's price return (not including dividends) and/or 100% of the price gains up to a specific limit. The purchaser of an EIA typically agrees to pay a surrender charge if he or she ends the contract prior to the contractually specified end date.

There are various permutations on this basic idea, but the simplest is one in which the potential for receiving a return greater than the guaranteed minimum is determined by the change in the market index between the beginning and end of the contract. This is referred to as a "point-to-point" or "European" EIA. An investor may not receive all of the price gains from the index. The fraction of the price appreciation that the investor is credited is referred to as the *participation rate*. If the EIA has a specific participation rate (say 80%), and the index's price gains 6% while the EIA is in force, the purchaser would receive a return of $6\% \times 80\% = 4.8\%$. Some EIAs also have a *cap*, which limits the rate-of-return that you can receive regardless of how well the index performs.

Criticisms of EIAs

While EIAs, in theory, are designed to offer the best of both worlds, critics say they are too expensive and too complex.

Indeed, the complexity of these products is evident in this product [listing](#), which is maintained by a firm that promotes annuities. Participation rate and cap are only two of the characteristics that define an EIA; the buyer must also consider features such as the frequency of reset, the averaging method and the creditworthiness of the EIA's issuer.



Moreover, the fees for EIAs are not transparent. Because these products are not regulated as a security by the SEC, issuers are not required to disclose the built-in fees that investors will incur.

Wall Street Journal columnist Jason Zweig wrote a widely cited [article](#) in September of 2010 criticizing EIAs. His main problems with EIAs were sales commissions that can range from 5% to 8% of the invested principal, as well as the ability of the issuer to reset the cap on an annual basis. Zweig claimed, for example, that while typical caps were around 6%, some insurance companies had the right to ratchet the cap down to 1.5%.

He was also concerned about the liquidity constraint inherent in EIAs. Some EIAs have surrender charges as high as 12% of the principal if a purchaser ends the contract within the first year. Bloomberg published a similarly critical [article](#) in January of 2011.

FINRA issued an [Investor Alert](#) on EIAs in September 2010, which explicitly warned that these are complex financial instruments and which outlined a number of the key differences among contracts and how these may affect investors' outcomes. The FINRA statement also mentioned a number of the issues outlined by Zweig in his *Wall Street Journal* piece

Finally, because of the wide variety of contracts available and the general lack of transparency, it is very hard to determine how well EIAs have served their stated objectives. This issue was examined in an Advisor Perspectives [article](#) earlier this year.

Do-it-yourself EIAs

Despite an EIA's complexity, it's actually quite easy to create a financial structure that mimics their desirable features. We can learn a considerable amount by exploring these types of portfolios. An EIA-like portfolio consists of an income and a capital appreciation part. I will examine each of these in turn.

Income component

As I write this, it is possible to purchase a 10-year CD with an annual yield of 2.5%. CDs with terms of 2-3 years are available at a yield of 1.4%. These low yields reflect the interest rate environment.

A CD is a simple and low-cost baseline for the income portion of the portfolio. In addition, a CD is backed by FDIC insurance. By contrast, the principal of an EIA is guaranteed only by the insurance company that sells the contract.

Alternatively, one could purchase state-issued general-obligation (GO) municipal bonds for the income component. These bonds currently [yield](#) 2.67% for a 10-year maturity on a taxable-equivalent basis (using a 28% tax rate). These have historically been virtually



risk-free; the last time one of these bonds [defaulted](#) was in 1937, during the depths of the Great Depression. The historical risk of default that bond investors have experienced is unquestionably less than that of an EIA issuer.

Capital appreciation component

There are number of different ways to create the capital appreciation component of an EIA. One approach, proposed by Zweig, is to invest that component in a market index, such as the ETF VTI. The upside of this approach is severely limited because the fraction of the portfolio that is invested in the market index is very low, because of the low interest rates on CDs. In the parlance of EIAs, your participation rate is very low.

A better approach to creating the capital appreciation component is to buy an at-the-money (ATM) call option on the relevant index. Buying options provides leverage because the price of the option is far less than the cost of the share itself. The tradeoff is that if the option expires out-of-the-money, it is worthless.

The relative attractiveness of these two approaches depends on the rate-of-return available from CDs and the prices of call options. The rate-of-return on CDs determines the fraction of the total investment that can be used to purchase shares of the index fund or call options while maintaining the desired level of guaranteed principal. Higher yield from CDs means that a larger initial fraction of the investment can be used to fund the capital appreciation component.

The key driver of the price of call options is implied volatility – the expected future volatility that is priced into the options. If implied volatility is high, the call options will be more expensive relative to buying the ETF.

Alternative 1: CDs plus SPY

To explore these tradeoffs, I have created a simple computational tool to compare the outcomes from these strategies. First, I obtained the implied volatility on long-dated S&P 500 options and the prices of at-the-money call options, again on the S&P 500. Second, I obtained the maximum CD rates as a function of term. It was then fairly straightforward to calculate (1) the guaranteed payoff over the term of the DIY EIA and (2) the range of outcomes that are available because of the upside that call options or the long position in the index provide.

There are no 10-year call options available, so the option-based strategy is limited to shorter terms. I will first explore a fairly short-term example and then look at what can be done over longer terms. While this short-term approach may seem less attractive than a 10-year EIA contract, it has the same degree of uncertainty, since EIA issuers typically have the ability to reset the cap and other features of their offerings on an annual basis.



As a first example, a CD with a term between two and three years pays 1.4% annually. There are options on SPY, an S&P 500 ETF, expiring on January 18, 2014 (the longest-dated exchange-traded contract) expiring in 2.14 years. The at-the-money call option on SPY with a strike of \$125 has an ask price of \$17.46 and SPY is trading at \$124.99. The implied volatility of these call options is 23.3%.

Let's first consider the case of purchasing a two-year CD, plus an investment in an S&P 500 fund of \$100K (below).

In this case, the investor receives the dividends on the index, gains that EIAs preclude. The dividend yield on the S&P 500 is currently approximately 2%.

Outcomes from \$100K invested in a DIY EIA using a CD plus position in S&P500 Index Fund

Percentage Invested in CD	Minimum Final Value	Percentile Outcomes for Total Return					Average Annualized Return
		5%	25%	50%	75%	95%	
100%	\$102,820	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
98%	\$100,763	1.0%	1.3%	1.5%	1.7%	2.0%	1.5%
96%	\$98,707	0.6%	1.2%	1.7%	2.1%	2.7%	1.7%
94%	\$96,650	0.2%	1.1%	1.8%	2.4%	3.3%	1.8%
92%	\$94,594	-0.2%	1.1%	1.9%	2.8%	3.9%	1.9%
90%	\$92,538	-0.6%	1.0%	2.1%	3.1%	4.5%	2.1%

If you invest 100% of your money in the two-year CD, you get 1.4% total return (see above). Your participation rate in any gains in the S&P 500 is equal to the allocation that you have to the S&P 500.

Consider a case in which you invest 94% in a CD and 6% in the S&P 500. This situation is guaranteed to provide at least \$96,650 at the end of two years (this minimum would only occur if the value of the 6% invested in the S&P 500 goes to zero). Realistically, the S&P 500 investment will not end up worthless; if it did, it is likely the EIA issuer would be insolvent. Using the current levels of implied volatility to project risk, the worst 1-in-20 outcome (the 5th percentile) will result in the investor receiving \$100,3211 at the end of two years.

The estimated worst 1-in-100 outcome results in \$98,964 being returned to the investor, although I have not included that value in the table above. Estimates of truly extreme bad outcomes, such as 1-in-100 events, are notoriously inaccurate. The median (50th percentile) yield for the two-year period is 1.8%, and the estimated 95th percentile is 3.3%.



Alternative 2: CDs plus European options

Now let's look at an alternative, constructed by combining a CD with a December 2013 at-the-money European call option on the S&P500 index (below). American options allow continuous exercise, while European options can be exercised only on the expiration date. The lack of early exercise makes European options cheaper than American options and, because our EIA alternative is to be held for a specific period, early exercise is unimportant to us. While even longer-dated options would be desirable, the December 2013 option is the longest-dated option on the S&P500 index (SPX) available on [eTrade](#) as of this writing.

Investing in an S&P 500 index fund provides an investor with the dividends generated by the index, while a call option does not provide dividends. The payoff from an option is determined entirely by the price appreciation of the index. Therefore, the returns from this alternative can be compared directly to projected EIA returns.

The first approach to using options is to buy a CD and an ATM call option on SPX. The ask price of Dec 2013 option on SPX with a strike of \$1,225 is \$162.9 and the current price of SPX is \$1,225.4. The projected results from using this strategy are shown below.

Outcomes from \$100K invested in a DIY EIA with long CD and long ATM call on SPX

Percentage Invested in CD	Minimum Final Value	Percentile Outcomes for Total Return					Average Annualized Return
		5%	25%	50%	75%	95%	
100%	\$102,851	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
98%	\$100,794	0.4%	0.4%	1.3%	2.9%	5.1%	1.9%
96%	\$98,737	-0.6%	-0.6%	1.2%	4.3%	8.5%	2.3%
94%	\$96,680	-1.7%	-1.7%	1.0%	5.7%	11.7%	2.8%
92%	\$94,623	-2.7%	-2.7%	0.9%	7.1%	14.7%	3.2%

In the case in which 98% is invested in the 2-year CD, the minimum final value of the portfolio in December 2013 is \$100,794, and there is a 5% chance of receiving an annualized return of 5.1% over the period. Even at the median case (the 50th percentile), the projected return is slightly less than that of the CD.

If an investor were willing to take a very modest risk and have a guaranteed minimum repayment of \$98,737, he would have a 1-in-20 chance of getting as high as 8.5% per year in return.



While the median return and average returns are equal in the first example, the median return is less than the mean return in the case in which we purchase a call option on SPX. This is a natural outcome of the difference in strategies.

Alternative 3: CDs plus European options and selling American options

Alternatively, a more conservative approach is to sell an out-of-the-money (OTM) call option on SPX while also buying the ATM call. This approach creates a cap on the total upside return than would be generated by a rise in the S&P 500, but it allows for a higher guaranteed minimum portfolio at the end of the period, and it provides additional income from the sale of the American call options. The December 2013 call option on SPX with a strike of \$1,475 has a bid price of \$58.1. When one sells this call option, the median return increases, while still allowing the investor to benefit from as much as a 20% rise in the S&P500 (the 1475 strike is 20% higher than the current price of SPX). The results are shown below.

Outcomes from \$100K invested in a DIY EIA with long CD, long ATM call on SPX, and short OTM call on SPX

Percentage Invested in CD	Minimum Final Value	Percentile Outcomes for Total Return					Average Annualized Return
		5%	25%	50%	75%	95%	
100%	\$102,851	1.4%	1.4%	1.4%	1.4%	1.4%	1.4%
99%	\$101,528	0.7%	0.7%	1.6%	2.2%	2.2%	1.5%
97%	\$100,204	0.1%	0.1%	1.9%	3.0%	3.0%	1.7%
96%	\$98,881	-0.6%	-0.6%	2.1%	3.8%	3.8%	1.8%
95%	\$97,557	-1.2%	-1.2%	2.3%	4.6%	4.6%	1.9%

The outcomes from this strategy differ from the case in which we simply buy the ATM call, in that the investor obtains greater exposure to the index (a higher participant rate), but the upside potential is capped. In the median outcome (the 50th percentile), the annualized rate of return is higher but the potential upside (the 95th percentile) is much lower.

Generally speaking, this approach provides the highest level of capital preservation, along with the highest median return.

There are, of course, many permutations that are possible depending on how far the strike of the OTM call option is from the current price of the index.



Next, I will compare the three strategies in the case in which the investor is guaranteed that his or her original investment amount, of \$100,000, will be returned at the end of two years.

Comparison of the three strategies

Strategy	Minimum Final Value	Percentile Outcomes for Total Return					Average Return
		5%	25%	50%	75%	95%	
Long CD, Long S&P500	\$99,992	0.9%	1.3%	1.6%	1.9%	2.3%	1.6%
Long CD, Long ATM SPX Call	\$99,994	0.0%	0.0%	1.2%	3.4%	6.4%	2.0%
Long CD, Long ATM SPX Call, Short OTM SPX Call	\$99,998	0.0%	0.0%	2.0%	3.2%	3.2%	1.7%

For the two-year term, all three alternatives have higher average returns than a pure investment in the CD (1.4%) because of the additional variability in the returns.

These are the baseline scenarios that can be used to evaluate an EIA, with a few caveats. First, as noted above, you must adjust for the fact that EIA returns do not include dividends. Second, these projections do not include any fees that advisors may impose. Third, these projections are for a two-year time horizon, and the investor must construct a new portfolio every two years.

Discussion

The challenge for potential EIA investors is figuring out whether they are likely to end with a benefit net of fees.

There are a number of benefits to constructing an EIA equivalent. First, the costs are entirely transparent and will be very low. Second, the principal component can be FDIC insured (in the case of a CD) or would be very low risk (in the case of municipal bonds). While highly-rated insurance companies have very little default risk, it is inarguable that these two alternatives are less risky. Third, while there are high expenses for early termination of an EIA, we can construct the EIA equivalent on any term that we desire. An investor who creates successive two-year investments has the option to exit with no cost at the end of each two-year period.



Some investors are prone to demanding liquidity in times of adverse market movements, and they cannot tolerate the volatility in the equity markets. For these investors, the EIA (or other variable annuities) may be preferable, since the investor is forced to remain invested in order to avoid paying surrender penalties.

One of the additional factors that need to be considered, of course, is taxes. An annuity is tax-deferred until you begin receiving interest. You may have to pay a tax penalty if you withdraw funds before you age 59½. When you draw your money out of the annuity at the end of the term, it is taxed as ordinary income. If you invested in either an S&P 500 index fund or a call option on the S&P 500 with a term longer than one year, the gains will be taxed as long-term capital gains. The current 15% Federal tax rate on long-term capital gains makes the DIY EIA very attractive, as compared to tax rates on ordinary income.

For investors whose primary goals are principal protection, but who also seek some potential for gains due to market appreciation, the simple alternative of buying a CD and an SPX call option is relatively attractive. The average expected return for the two-year alternative is 2%, but there is a 1-in-20 chance of having an annualized return of 6.4% if the S&P500 rallies.

Rates on CDs are very low, and options prices are quite high today, reducing the appeal of the DIY alternative relative to an EIA. Investors who choose the EIA need to understand all of the constraints associated with it. Market conditions will change the relative attractiveness of different levels of capital preservation. The model that I have created to calculate the levels of capital preservation vs. upside potential is simple to maintain. Performing this analysis every two years and reconstructing the DIY EIA forward through time should be the standard against which any EIA should be compared.

Geoff Considine is founder of Quantext and the developer of Quantext Portfolio Planner, a portfolio management tool. More information is available at www.quantext.com.

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