PROTECTING YOUR RETIREMENT

Mitigating Market Risk With Insurance Solutions

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EXECUTIVE SUMMARY

- Insurance plays an important role throughout our lifetimes by mitigating risks and helping to create wealth.
- Approaching retirement, we need to take less risk in our portfolios, which has traditionally been accomplished by investing more in bonds.
- With today's yields below 1%, de-risking retirement portfolios with bonds may not provide sufficient returns going forward. Investors are encouraged to seek out alternative safe-haven assets.
- Capital-protected insurance solutions may be an alternative and effective way to mitigate market risk while potentially providing for more income in retirement.
- We illustrate a floor-design, smart beta index-linked annuity as part of an asset allocation mix, showing that its inclusion could increase portfolio growth while mitigating the worst annual portfolio returns.

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Abstract

Asset allocation and insurance can play a role in creating returns, mitigating risk, and providing income across our lifetime. As we approach retirement, the relatively steady income from our human capital will soon be declining, and most of us will have to rely primarily on our financial capital in retirement. This is a time to take less risk, which has been traditionally accomplished by shifting asset allocation toward bonds. Going forward, bonds are very unlikely to provide sufficient returns considering the current near-zero yields. Instead, we consider various types of insured accumulation annuities as a way of achieving growth while protecting our retirement. Asset allocation mixes including capital-protected annuities with a floor-design are illustrated, showing how stock, bond, and annuity combinations can potentially enhance portfolio returns while mitigating losses.

Introduction

In 2007, the Research Foundation of CFA Institute published a monograph I co-authored along with Moshe Milevsky, Peng Chen, and Kevin Zhu, entitled ***"Lifetime Financial Advice: Human Capital, Asset Allocation, and Insurance."*** Our motivation in writing the monograph was to help individual investors better achieve their financial retirement goals and better understand how insurance integrates into their financial plans. We presented a new, holistic framework for asset allocation decisions throughout one's lifetime. We also discussed the risks we face, how they evolve over time, how to put them in context, and how to manage them with the tools of asset allocation and insurance, including life insurance and annuities.

Thirteen years later, the advice and framework we presented then still holds true. Insurance remains an integral tool in retirement planning. Since then, however, the role of insurance solutions has expanded. Innovations in financial engineering have created more flexible and affordable offerings to mitigate risk.

The purpose of this paper is to build upon ***"Lifetime Financial Advice,"*** focusing mainly on market risk in pre-retirement. Historically, market risk is managed with the tools of asset allocation, "de-risking" portfolios approaching retirement. Bonds have served us well in this regard providing both income and capital appreciation. However, with interest rates now approaching zero, investors are right to re-think traditional asset allocation strategies and seek out alternative safe-haven assets and new tools to mitigate market risk.

In this environment, capital-protected insurance solutions (fixed indexed annuities and floor-design annuities) may be an alternative and effective way to mitigate market risk while potentially providing for more income in retirement.

A BRIEF REVIEW: *"LIFETIME FINANCIAL ADVICE"*

The key insight from ***"Lifetime Financial Advice"*** was that asset allocation and insurance decisions protecting our total wealth should holistically consider both our human capital and financial capital as well as how they interact with each other over our lifespan.

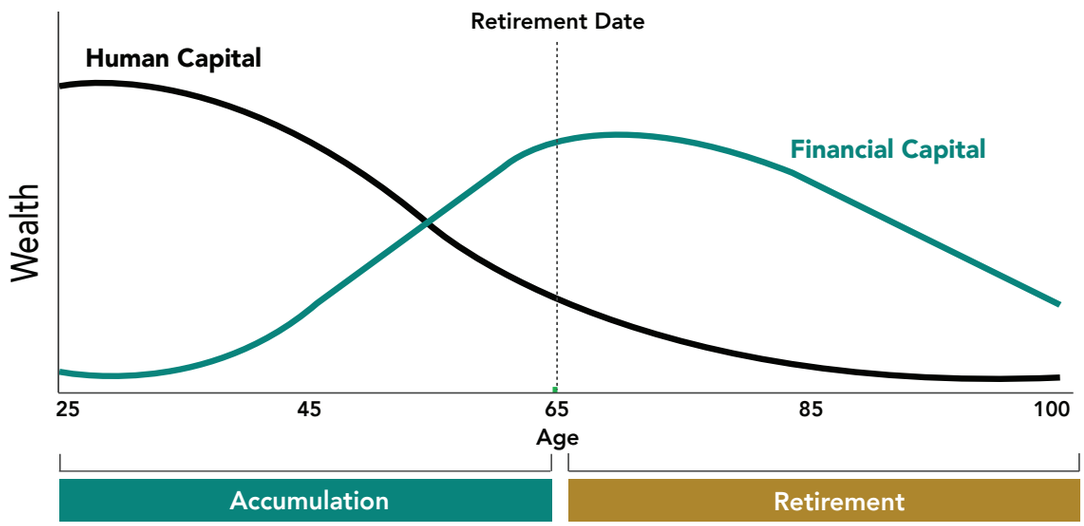
Human capital can be thought of as the present value of our future earnings. Our earnings are typically a steady stream of income (bond-like). After we complete our education, we enter the job market and our future earnings are at their peak, usually representing most of our total wealth. As we approach retirement, our human capital diminishes, until during retirement our human capital consists only of our Social Security and any other retirement income streams from which we might benefit.

Financial Capital represents our portfolio of investments (e.g. stocks, bonds, and real estate). We create financial capital by monetizing human capital (earning wages) and through savings. We also create financial capital through earnings on our investments. Typically, when we are young, our financial capital is low. As we approach retirement, financial capital becomes most of our total wealth. In retirement we usually start drawing down our financial capital, with anything left over at death as a bequest.

Total Wealth is the sum of human capital and financial capital.

Exhibit 1 presents the relationship between human capital, financial capital, and total wealth as they typically evolve over our lives.

Exhibit 1: The Evolution of Human Capital & Financial Capital



Understanding that our total wealth is the sum of human capital and financial capital changes our perspective and provides a unified framework for risk management and financial decisions. The goal is to maximize and protect total wealth, not just financial capital. Financial decisions (investments, asset allocation, etc.) should not be made in isolation of human capital. Financial capital should be thought of and managed as a complement to our human capital.

HUMAN CAPITAL AND FINANCIAL CAPITAL IN THE THREE STAGES OF LIFE

We can broadly break our lives into three stages: Education, Accumulation, and Retirement. In each stage human capital and financial capital play a different role. These changing roles affect our investment asset allocation and insurance decisions.

Education (roughly until 25, but this varies greatly across individuals). During this stage of our lives we are building and attempting to maximize our human capital. It is the stage where we are investing in ourselves. The main risk during education is that we do not invest appropriately or sufficiently in ourselves, although it is also a stage when we can potentially take on too much debt.

Accumulation (roughly 25-65, but once again this will vary across individuals). It is during this stage of life where we are monetizing human capital into wages and creating financial capital through saving and investment. During accumulation, new risks begin to materialize. They include mortality risk, savings risk, and market risk. From a financial perspective, mortality risk is the risk of dying early and losing our human capital. Savings risk is the risk we do not save enough of our human capital (wages) to convert to financial capital. Market risk is the risk that our financial capital will fall in value with market fluctuations.

The accumulation stage of our lives has an early period when we are just starting to accumulate financial capital, and a pre-retirement period when most of our total wealth is in financial capital. In the early years of accumulation, most of our wealth is in human capital because we have a lifetime of earnings ahead of us. As we age, we save and invest, converting our human capital into financial capital. As we approach retirement, most of our human capital is used up, but our financial capital is near its peak. Life insurance can play a role in mitigating mortality risk, especially early in the accumulation stage when most of our wealth is in human capital. Accumulation annuities can play a role in mitigating market risk, especially for those of us in the pre-retirement stage when our financial capital represents most of our wealth.

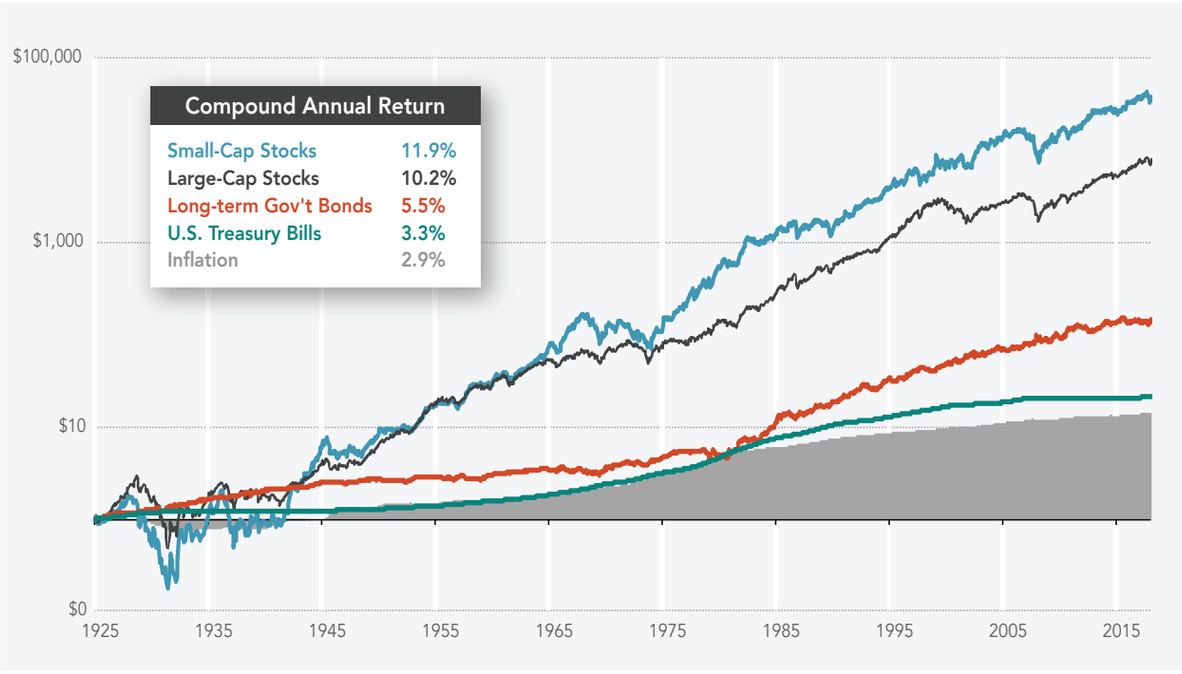
Retirement (say 65+, but of course people retire at different ages). This is the stage of life where we are drawing from our financial capital. Risks during retirement are market risk and longevity risk. Longevity risk is the risk of outliving our assets. It is the opposite of mortality risk, in that instead of being concerned about dying too young, we are concerned from the financial perspective of living so long that we draw down our financial capital within our lifetimes. With the decline in defined benefit plans (traditional pensions) and increases in life expectancy, longevity risk has become a more significant concern. Insurance companies offer various forms of payout annuities that can effectively hedge this risk. Payout annuities supplement Social Security payments and any defined benefit plans by making regular payments to individuals (or couples) for the rest of their lives, no matter how long they live.

THE DILEMMA NOW FACING PRE-RETIREES

As we have seen, as individuals approach retirement their human capital or earning power has mostly been spent or converted through savings and investment into financial capital. In fact, for most pre-retirees, financial capital is near its peak since they will likely start spending it down through their retirement years. Since their human capital mostly consisted of steady income, it was bond-like, and investors could have afforded to take quite a lot of risk with their financial capital, e.g. have had a heavy equity component since their financial capital was only a part of their total wealth. But pre-retirement is a time of transition, in that financial capital takes on most of the burden of covering future retirement expenditures. It is during this stage that most investors need to take on less risk.

In capital markets, especially across asset classes, there is a strong relationship between risk and return. We can see this in the historical returns of stocks and bonds. In U.S. capital markets over the period 1926-2019, large cap stocks have realized an annualized total return of 10.2%, while long-term U.S. government bonds had a total return of 5.5%, and more cash-like Treasury Bills had a return of 3.3%. Exhibit 2 below shows the value of $1 invested at the beginning of 1926 with all income reinvested and no costs or taxes subtracted over the full 94-year period.

Exhibit 2: Ibbotson SBBI Stocks, Bonds, Bills and Inflation 1926 – 2019

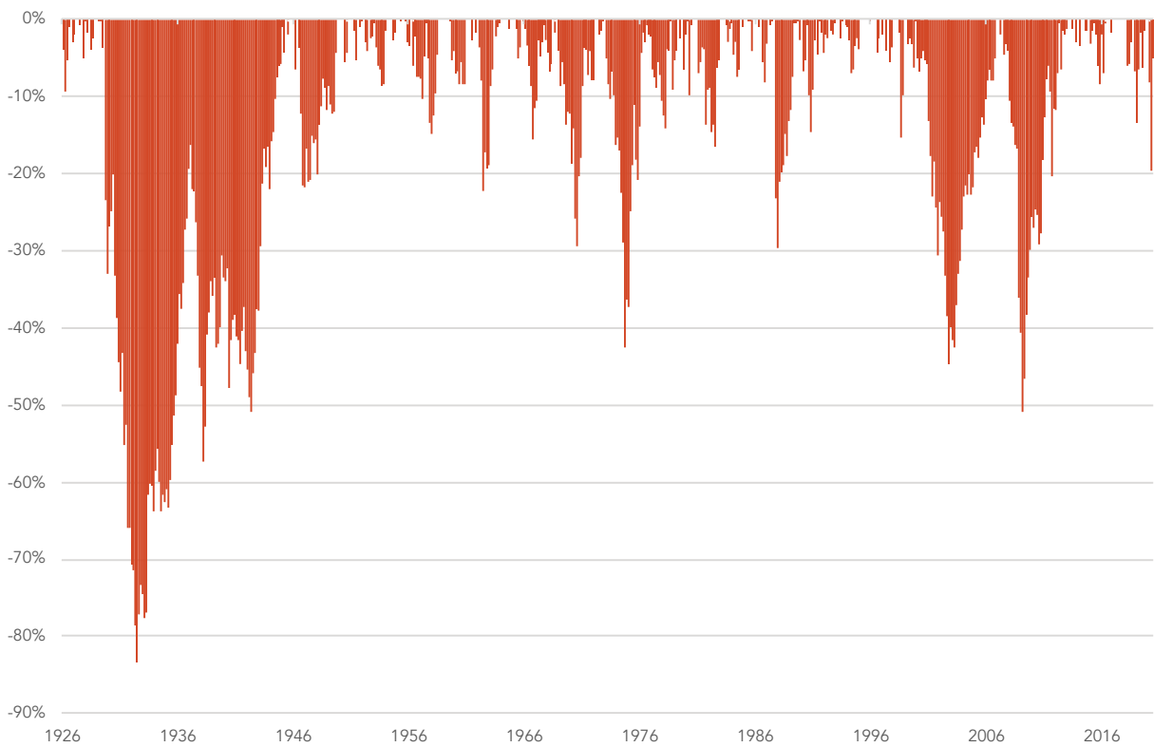


Source: 2020 SBBI® Yearbook Stocks, Bonds, Bills & Inflation® Duff & Phelps

It can clearly be seen that investing in stocks would have been a great choice for anyone with long horizons and a willingness to take risk. This paper in fact advocates for an all-in equity strategy for those investors early in their accumulation years with enough (low risk, bond-like) human capital. However, pre-retirees no longer have much human capital (forward earnings potential) left. With their financial capital near its peak, they face the potential for large dollar drawdowns, likely more so than at any other point in their lives, either past or future. These are critical years.

The primary risk at this stage is market risk, especially if poor returns happen in a sequence without sufficient time to recover. In Exhibit 3 below, we can get an idea of the scale (in return space) and what drawdowns have happened in large capitalization equities in the past.

Exhibit 3: Ibbotson SBBI US Large Cap Stocks with Dividends - Historical Drawdowns (January 1926 – June 2020)



Source: 2020 SBBI® Yearbook Stocks, Bonds, Bills & Inflation® Duff & Phelps

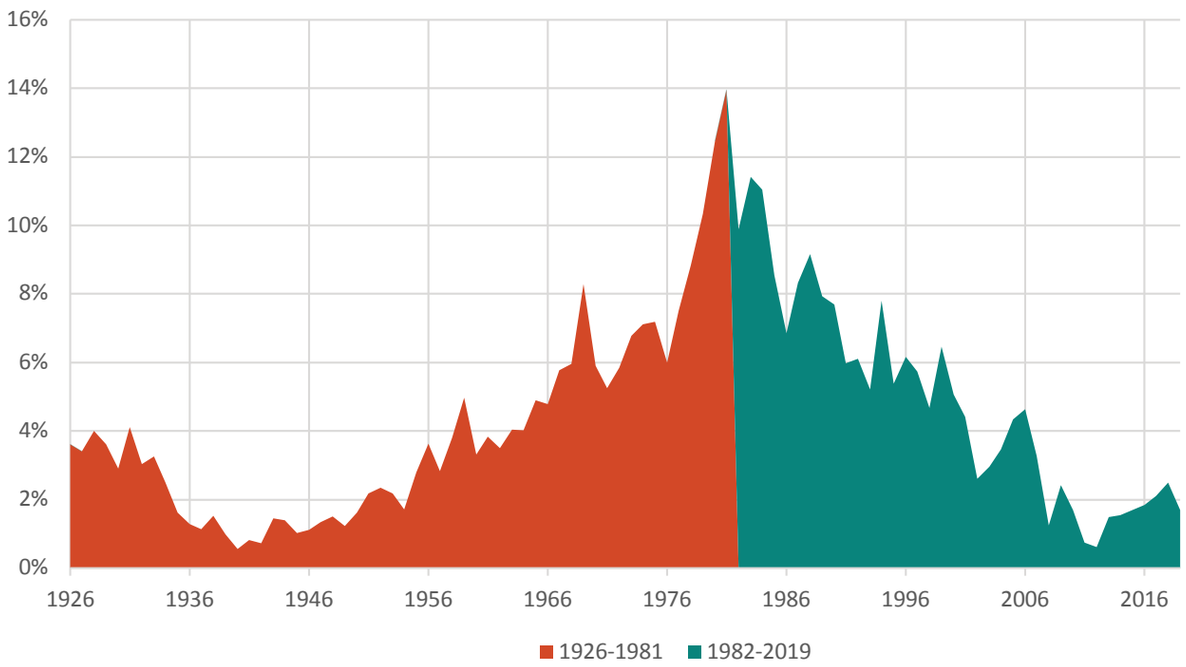
We can see that there have been many major drawdowns, some lasting several years. And two of the largest drawdowns happened in the last two decades. The worst drawdown (83.4%) was from September 1929 through June 1932, from which investors did not recover until December 1944. Yes, equities have done great over the long run, but if you were heavily allocated to equities when you had the most financial capital during your pre-retirement years, you might never have recovered financially.

Equity risk today is heightened, and valuations remain high. That said, considering the amount of global monetary and fiscal stimulus, the case for equities remains strong long-term. Shorter-term, however, given the uncertainty, timing and path of recovery, volatility will likely remain elevated.

THE BEST FORECAST FOR A BOND RETURN IS ITS CURRENT YIELD TO MATURITY

Traditionally, individuals have protected their total wealth by de-risking their financial capital leading up to retirement (gradually increasing exposure to lower-risk investments like bonds). As a result, glidepath and target date funds have become extremely popular solutions as "set it and forget it" investments. The challenge, however, is that we are currently in a historically low interest rate environment. The recent yield on the 5-year U.S. Treasury note was less than half a percent. The yield is at its historical low, falling steadily since it reached a high of almost 14% at the beginning of the 1980s, as seen in Exhibit 4.

Exhibit 4: Ibbotson SBBI Intermediate-Term U.S. Government Bond Year End Yields 1926 – 2019



Source: 2020 SBBI® Yearbook Stocks, Bonds, Bills & Inflation® Duff & Phelps

What does a low current yield mean for future bond returns? The total return of a bond consists of two parts. One part is the yield, which is generally considered to be the expected return of the bond. The other part is the change in yield, which causes existing bonds to drop in price when interest rates rise, and, correspondingly, bond prices to rise when interest rates fall. The amount of the price rise or fall is related to the duration of the bond. Interest rate changes impact longer-duration bond prices more than shorter-duration bonds.

Exhibit 5 shows stock and bond market total returns, along with their yield and capital gain components (which only approximately add up because of reinvestment and compounding effects). In the stock market, for the whole period beginning in 1926, the total return came primarily from capital gains. During the earlier period ending in 1981, dividends and capital gains were roughly equal. But dividend yields have been declining over time and have been much lower in the latter period. However, the high capital gain returns in the period beginning in 1982 were large enough to more than offset the lower dividend yield, so that the total return in latter period is even higher than the earlier period.

Exhibit 5: Ibbotson SBBI Decomposing Total Return

		1926 - 2019	1926 - 1981	1982 - 2019
U.S. Large Cap Stocks	Dividends	3.93%	4.78%	2.67%
	Capital Gain	6.06%	4.12%	8.99%
	Total Return	**10.20%**	**9.14%**	**11.79%**
Long-Term U.S. Treasury Bonds	Yield	4.95%	4.35%	5.84%
	Capital Gain	0.43%	-1.32%	3.07%
	Total Return	**5.54%**	**2.98%**	**9.44%**
Intermediate-Term U.S. Treasury Bonds	Yield	4.29%	3.92%	4.82%
	Capital Gain	0.58%	-0.18%	1.72%
	Total Return	**5.09%**	**3.77%**	**7.07%**

Source: 2020 SBBI® Yearbook Stocks, Bonds, Bills & Inflation® Duff & Phelps

Bond returns behave completely differently. As we have seen, capital gains are positive when yields fall, as they did in the latter period, but negative when yields rise as they did in the earlier period. Bonds have done very well since 1982, starting with high yields and earning capital gains as the yields fell. Unfortunately, the high returns of the last four decades are not a good predictor of future bond returns. With today's yield below 1.00% and at near-record lows, future bond returns are likely to be very low and potentially negative.

A good estimate of an expected bond return is today's yield. If yields rise, bonds will have capital losses. If yields continue to decline, they may go negative, and the total returns will be low despite the capital gain. In either case, we can expect very low returns from bonds at the near-zero yields that we have in recent bond markets.

MITIGATING MARKET RISK WITH INSURANCE SOLUTIONS

As we approach retirement, the steady (bond-like) income provided by our human capital will soon decline. On the other hand, our financial capital may be near its peak. Since we will have to rely primarily on our financial capital in retirement, this is a time to take less risk with our investment portfolios. Traditionally, this is done by reducing the equity allocation and investing more in the less risky bonds. However, with the historically low bond yields in today's bond markets, adding bonds will not likely provide very good returns. In fact, the best estimate of a bond's expected return is its (current) near-zero yield. This is an opportune time to consider various insurance products that can protect your financial capital from market risk while offering upside market participation.

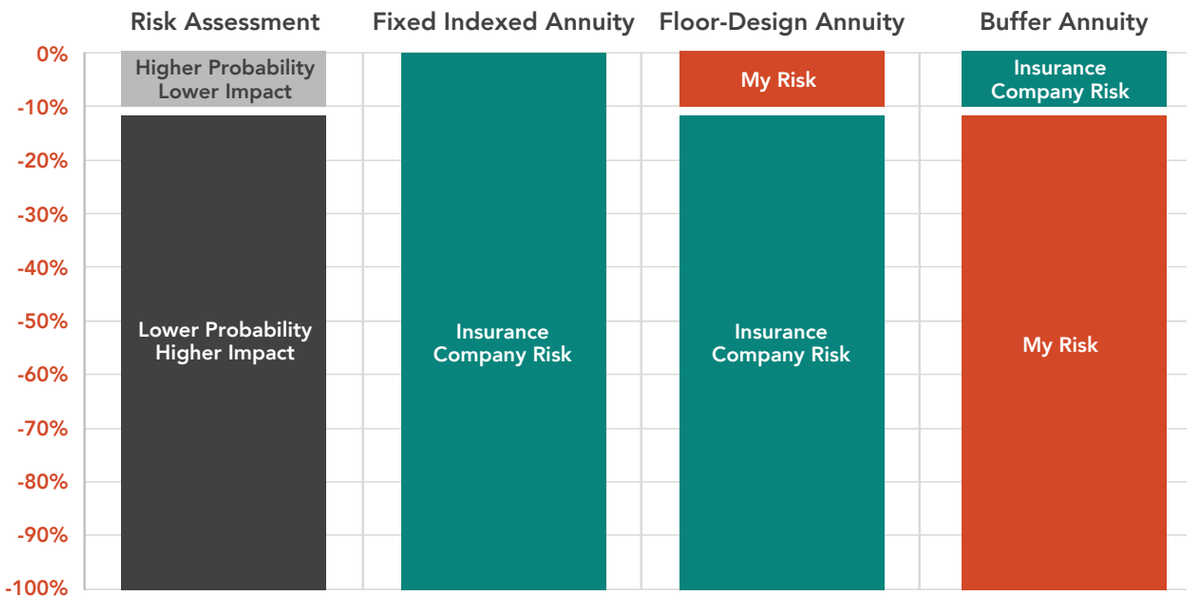
The insurance industry today offers a variety of growth and accumulation vehicles that allow investors to participate in the upside of various indexes while protecting much of the downside for potential negative returns. The return that an investor earns is based on changes in indexes. The indexes are based upon equity market prices or other risky assets. These index accumulation annuities can be tailored to the specific needs of each investor. The products can take on various levels of market participation, sometimes capped on the upside, but always providing some level of downside protection through insurance. Since an insurance company is involved, it is important that the insurance company is credit-worthy, so that investors can rely on the insurance guaranteeing the protection being offered.

The insurance vehicles are usually Fixed Indexed Annuities (FIAs), Registered Index Linked Annuities (RILAs), and potentially some Variable Annuity (VA) products that might offer protection. RILAs have been widely accepted over the past several years and used quite successfully. RILAs come in two forms: buffered annuities and floor-design annuities. Each capital-protected insurance product may be based upon a different index and come in a different insurance vehicle.

Exhibit 6 illustrates different types of Index-linked Annuities. Note the bars in the exhibit only show the potential losses, not the upside that each vehicle provides. Generally, the more the insurance protection provided, the less equity or upside index participation the investor may receive. The left bar shows that there is a higher probability of small market losses, but that these losses have less impact on the investor. There is a lower probability of big losses, but these losses have a much bigger impact on investors in retirement. The FIA protects against all losses, the buffer design protects against the small losses (but not big losses), and the floor-design only protects against the bigger losses. The buffer and the floor-design products can vary the level of protection (shown in the exhibit as negative 10%), to provide for more or less upside potential.

Insurance companies are able to offer capital-protected products because they efficiently hedge market risk. They do this by dynamically purchasing various call options to participate in the upside and put options to protect the downside, often writing calls or puts as well, as these products can be tailor-made to fit individual needs. These are complex hedging strategies, so it would be difficult for investors to do this on their own. At the end of the contract period, the investor can often either get cash, reinvest, or convert to a payout annuity offering a steady stream of income for the rest of their life, protecting against longevity risk. Many of these contracts also allow for no-fee withdrawals, which effectively creates an income stream and increased flexibility.

Exhibit 6: Index-linked Annuities



The various annuity insurance products presented here are very effective protecting against losses. However, by their very nature of being designed to protect differing levels of market risk, there are costs involved, and the products may be complex. Thus, the role of a trusted advisor is key to the investor's selecting appropriate annuity products in pre-retirement. Also, because these products usually involve multi-year contracts, they are not for every investor. Early termination usually involves surrender charges, so the products are relatively illiquid. Rather, these accumulation index annuities are appropriate for those investors who want to participate in the upside of the indexes, protect the downside, and commit to the term of the contract.

INDEX SELECTION: THE ENGINES OF GROWTH

By design, the insurance solutions presented above are effective protecting against losses. Generally speaking, the more protection the insurance company offers, the less upside opportunity and growth the investor may receive.

For example, in a floor-design, for a given index, you should expect a higher participation rate and growth potential for a 90% protection level (maximum 10% loss) versus a 95% protection level (maximum 5% loss). This tradeoff is intuitive. The insurance carrier is assuming more risk at the 95% protection level and it is more costly for them to offer this insurance. As a result, and to compensate for this, the carrier is willing to offer less upside exposure to the index (in the form of a participation rate). Said another way: you are buying more insurance for a 95% protection level, and the cost of the insurance is embedded into your lower growth potential. The tradeoff may be entirely appropriate for a given risk tolerance.

Participation rates are also dependent upon the riskiness or volatility of the selected index. For example, the S&P 500 Index and NASDAQ 100 Index are well-known and popular indexes used by many carriers in capital-protected structures. In general, the NASDAQ 100 Index is a more volatile index than the S&P 500 Index. As a result, it is more expensive for the carrier to offer insurance for a given level of protection. The options the insurance company purchases to hedge their risk are more costly for the NASDAQ 100 Index as compared to the S&P 500 Index. You should expect a lower participation rate selecting the NASDAQ 100 Index vs the S&P 500 Index for the same level of protection.

Over the course of my career, our understanding of the sources of equity returns has grown exponentially as have the portfolio construction methods we have developed to capture those sources more effectively. Modern portfolios and indexes today strategically target "style factors" or "smart betas," seeking to achieve better risk adjusted returns versus traditional cap weighted indexes. For example, investors today may assume the S&P 500 Index reflects the performance of U.S. large cap equities. Because the index design is cap weighted (the stocks with the largest market capitalizations have the largest weights in the index), the S&P 500 is heavily dependent upon the fortunes of the very largest stocks. As of this writing, the top 5 weights in the S&P 500 Index represent almost a quarter of the index's total (Apple, Microsoft, Amazon, Facebook and Alphabet/Google A and C Shares). By investing in the S&P 500 Index today, you are implicitly (and perhaps unintentionally) making a bet on technology, momentum, and mega cap stocks.

Modern smart beta indexes are weighted to target specific style factors or smart betas that have demonstrated attractive risk-adjusted returns over time. This does not need to be complicated. For example, if you believe that smaller capitalization stocks will outperform larger capitalization stocks (and there is a lot of academic research to support this) you could simply reweight the S&P 500 Index from a capitalization weight to an equal weight. If you believe that stocks with lower volatility will outperform those with higher volatility, you could come up with a weighting scheme to favor stocks with low volatility. Conceptually, this is simple. In practice, researching the desired factors, combining them, and controlling risk is part art and part science. Within an insurance product, the potential benefits of smart beta indexing are higher participation rates and superior risk adjusted returns over time. The bottom line is smart beta strategies have the potential to outperform traditional cap weighted strategies.

ILLUSTRATION: ASSET ALLOCATION INCLUDING A FLOOR-DESIGN ACCUMULATION INDEX ANNUITY

Conceptually, insured solutions are attractive, but how might they perform in practice and combine with other investments?

For the period January 2001 – June 2020, we simulated a floor-design (90% capital protected with a 1% spread) accumulation index annuity featuring the NYSE® Zebra Edge® Index. In full disclosure, my asset management firm, Zebra Capital Management, LLC, designed this index based upon my academic research in behavioral finance.

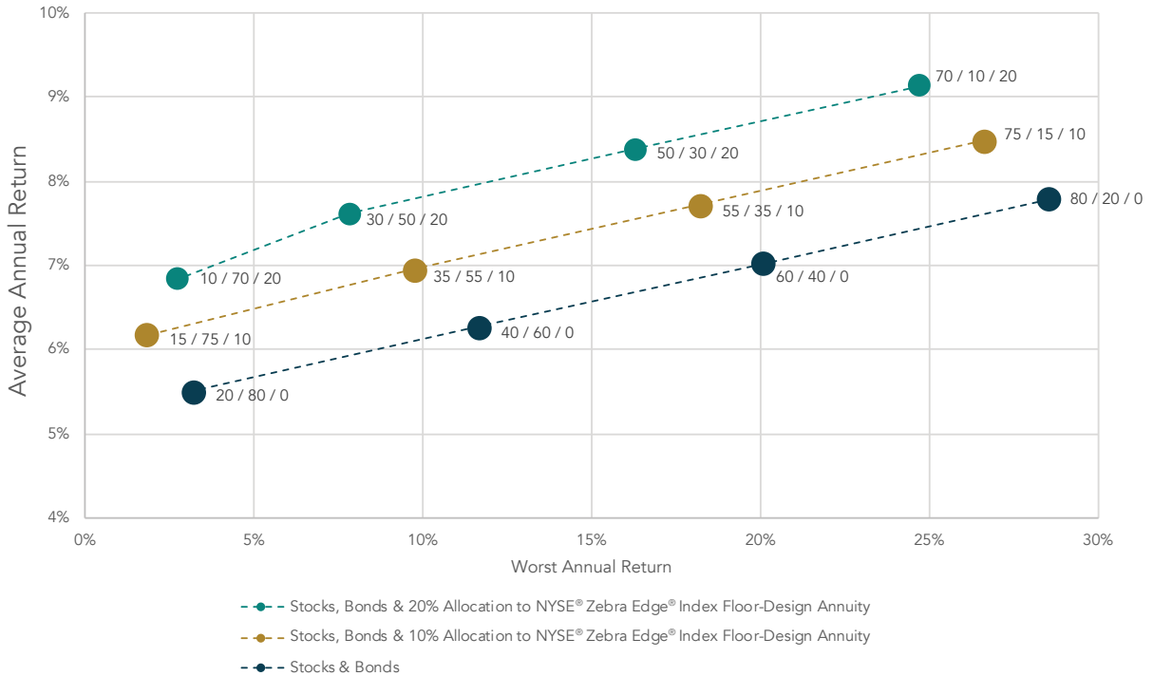
Assume beginning in 2001 you had invested $100,000. Each year on January 1st, the floor, or capital guarantee, were adjusted to reflect 90% of current investment value. In other words, during the calendar year 2001, no matter how the index performed, your investment could not have suffered a loss greater than negative 10%, i.e. $90,000 of your capital is protected. Assume at the end of 2001, interest was credited, and your cash value grew to $110,000. Beginning in 2002, your floor would have been adjusted to reflect 90% of your capital or $99,000 (90% x $110,000).

To simulate growth, on January 1st of each year, a dynamic participation rate was calculated. In partnership with Annexus, a leading expert in annuity product design and development, a model was developed to estimate the participation rate-setting process of the insurance carrier. Inputs to this model include historical bond yields, implied carrier operating margins, implied hedge budgets (used to purchase options), and option prices using a Black-Scholes model relying upon inputs including historical interest rates, index volatility, financing costs, dealer margin, and index license fees. In other words, knowing what we know today, we attempt to predict the behavior of the insurance carrier and estimate the participation rate for a 90% floor each year since 2001. Note that there are many ways to model the growth of the annuity and all have limitations. We chose to use dynamic participation rates (as opposed to static current participation rates) believing these are more realistic and better allow for a more direct comparison to historical asset class returns for stocks and bonds.

We then formed portfolios of stocks, bonds and the NYSE® Zebra Edge® Index floor-design annuity for the period January 2001 – June 2020. We used the S&P 500 Index with dividends as a proxy for stocks and the Bloomberg Barclays US Aggregate Bond Index as a proxy for bonds. Exhibit 7 summarizes our results. Note that the worst annual returns are presented on the horizontal axis of the graph. Insurance accumulation annuity products are particularly designed to provide protection against poor performance.

Adding exposure to the floor-design index annuity would have mitigated market risk (here defined as the worst annual return) and would have enhanced the overall portfolio return (here defined as the average annual return).

Exhibit 7: Asset Allocation Illustration of a Floor-Design Annuity selecting the NYSE® Zebra Edge® Index (January 2001 – June 2020)



The NYSE® Zebra Edge® Index was established on October 11, 2016. This illustration uses historical index performance when available and back-tested index performance for periods the selected index was not available. *See "Simulated Performance Results" in the attached "Important Disclosures"*

The growth and level of protection illustrated above are based upon both backtested and live NYSE® Zebra Edge® Index performance results and model dynamic participation rates estimated back in time using the current product methodology and cost structure. Participation rates are influenced by index volatility and interest rates, so they may perform differently in the future.

There is no assurance that these asset allocation risk and return results are predictive or a guarantee of future performance. In particular, during this historical period equity returns were reasonably high, bond returns benefitted from falling yields, and the underlying index (NYSE® Zebra Edge® Index) used in the floor-design annuity performed well. Although future returns are uncertain, the insurance mitigates market risk subject to the credit worthiness of the carrier.

CONCLUSIONS

Asset allocation and insurance can together play an important role throughout our lifetime. During our early working years, we have substantial human capital (the present value of our future earnings), but usually little financial capital (e.g. stocks, bonds). Life insurance can protect our human capital, and we can take on substantial equity risk. As we age, our human capital diminishes, but through savings and investment, our financial capital increases. Finally, in retirement we spend down our financial capital, potentially including payout annuities to provide income and protect against longevity risk.

As we approach retirement, we have little remaining human capital, but our financial capital may be near its peak. This is a time when most of us need to take on less risk with our investment portfolios, because we will have to rely on our financial capital to get us through retirement. The traditional way we accomplish this is by allocating less to equities and more to bonds. However, with today's low yields, bonds are not likely to provide much of a return. Now is an opportune time to consider accumulation annuities in investment portfolios.

Accumulation annuities can provide both growth potential and protection against market risk. We consider various insured solutions (FIAs, Buffers, and Floors) that can offer differing levels of upside participation in capital market indexes, while protecting against all, small, or large losses. In general, the more downside protection, the less upside participation that the insurance company can offer.

Index selection is an important consideration. The use of risk-controlled, smart beta indexes within capital-protected solutions may provide higher and more stable participation rates, as well superior risk adjusted returns compared to market cap weighted strategies.

Investors can potentially benefit from including accumulation annuities as part of the asset allocation mix. However, these products are not for everyone since they may be costly, are relatively illiquid, and may involve surrender charges for early termination. The products are tailor made to protect against particular types of market risk, especially for those investors who can commit to holding the annuity throughout the contract period.

An illustration is provided using a floor-design annuity as part of an asset allocation mix, showing that their inclusion can potentially increase portfolio growth, while mitigating the worst annual returns of a portfolio.

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Stock, Bonds, Bills and Inflation®

Roger G. Ibbotson

Duff & Phelps

Fixed Indexed Annuities

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2017

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Annuities have limitations. They are long-term vehicles designed for retirement purposes. They are not intended to replace emergency funds, to be used as income for day-to-day expenses or to fund short-term savings goals. In addition, guarantees and protections are subject to the claims-paying ability of the issuing carrier.

Past performance is no guarantee of future results. No representation is made that any investor will or is likely to achieve results similar to those shown in this material.

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The simulated performance results presented herein were prepared using computer models, were derived by backtesting, not from actual accounts, and are provided for informational purposes only. Simulated performance data has inherent limitations, as the simulated data is produced by the retroactive application of a backtested methodology. Simulated performance data is based on criteria applied retroactively with the benefit of hindsight and knowledge of factors that may have positively affected its performance and may reflect a bias toward strategies that have performed well in the past. Simulated performance does not represent actual account performance and should not be interpreted as an indication of such performance. In addition, simulated performance does not represent the impact that material economic and market factors might have on an investment adviser's decision-making process, if any, if the adviser were actually managing clients' money. Future performance cannot be predicted based on simulated performance described herein.

IMPORTANT DISCLOSURES

NYSE® Zebra Edge® Index *(Ticker "ZEDGENY")*

The NYSE® Zebra Edge® Index is an excess return index that targets a 5% annualized volatility by allocating between three components: (1) the NYSE® Zebra Edge® U.S. Equity Index, and either (2) the ICE® U.S. 5 Year Treasury Futures Index or the ICE® U.S. 10 Year Treasury Futures Index, and (3) non-interest cash account. The NYSE® Zebra Edge® Index went live on October 11, 2016. All index data prior to that date is based upon hypothetical historical performance.

Stocks: S&P 500® Total Return Index *(Ticker "SPXT")*

The S&P 500® is widely regarded as the best single gauge of large-cap U.S. equities. The index includes the 500 largest companies with stock listed on NYSE and NASDAQ weighted by market cap. The index includes dividends, if any, reinvested.

Bonds: Bloomberg Barclays US Aggregate Bond Index *(Ticker "LBUSTRUU")*

The Bloomberg Barclays US Aggregate Bond Index is a broad-based flagship benchmark that measures the investment grade, US dollar-denominated, fixed-rate taxable bond market. The index includes Treasuries, government-related and corporate securities, MBS (agency fixed-rate and hybrid ARM pass-throughs), ABS and CMBS (agency and non-agency).

NASDAQ 100 Index *(Ticker "NDX")*

The Nasdaq 100 Index is a market-capitalization-weighted index of the largest and most active nonfinancial domestic and international issues listed on the Nasdaq Stock Market. The index was launched in 1985 to represent Nasdaq's largest companies across major industry groups.

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