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THE FINAL SAY ON SPENDING RULES

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March 31, 2015[1]

After decades of focused research, why can't finance experts decide on a safe withdrawal rate for retirement? Ibbotson and Sinquefield documented long-run rates of return on stocks and bonds as early as the 1970s, and came up with generous return projections for diversified portfolios based on this information.[2] While they did not specifically calculate withdrawal rates, others used the Ibbotson and Sinquefield data to so do. In the mid-1990s, William Bengen, a trio of authors associated with Trinity University in San Antonio and others coalesced around a safe withdrawal rate of 4%. More recently, three distinguished writers — David Blanchett, Michael Finke, and Wade Pfau — have argued that it's closer to 3%.[3] The question does not seem that difficult. Why has answering this problem been so contentious?

There are three reasonable possibilities:

1. Like string theory, it's just too hard. Two decades of study are not enough to determine a safe withdrawal rate.

2. Market conditions changed, so the safe withdrawal rate changed.

3. With risky investments, there is no such thing as a safe withdrawal rate (other than zero).

In a recent *Financial Analysts Journal* piece called "The Only Spending Rule Article You Will Ever Need," Barton Waring and I argue that the answer is number 3. Here's our logic. There are three goals that investors pursue:

- A minimum income or withdrawal amount that's fixed in real terms;

- The possibility of capital growth through risk-taking;

- A guarantee of not running out of money over some time horizon associated with their potential longevity, such as 30 years.

It's mathematically impossible to achieve all three. Something has to give.

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[1] This article first appeared in *Advisor Perspectives*, March 31, 2015, http://www.advisorperspectives.com/newsletters15/The_Final_Say_on_Spending.php.

[2] Full disclosure — I worked on the Ibbotson studies. Yes, I'm that old. I was Ibbotson Associates' first employee in 1979.

[3] http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2201323; http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2286146

The financial planning community, in proposing withdrawal rates that have less than a 100% chance of success, has given up on the guarantee criterion. In the simulation methods that most planners use, the probability of failure is explicitly calculated and found acceptable. That is one way to make it crystal clear that things might not work out!

By eliminating all investment risk, it's possible to achieve the other two goals. The real riskless rate (that is, the yield on a risk-free portfolio of TIPS bonds) is currently hovering around zero. If you have a 30-year spend-down period, just spend 1/30 of your initial capital each year. That's a withdrawal rate of 3.33% of initial capital, and exhausts the portfolio by the end of the period.[4]

But very few investors will be satisfied with consumption equal to 1/30 of at-retirement capital each year for 30 years. They will want to squeeze more out of the portfolio. The only way to do this, leaving out annuitization for the moment, is to take investment risk, say by buying equities as well as riskless bonds. If the market value of the portfolio fluctuates because you hold equities, as Waring and I demonstrate, then year-to-year consumption also has to fluctuate. Otherwise you will be taking a very real risk of running out of money during the spend-down period.

Put another way, accentuating the positive: If your withdrawal amount is variable and is calculated according to the formula we propose, you will *never* run out of money.

ALL RIGHT ALREADY, WHAT IS THE MAGIC FORMULA?

It's not a single formula, but a procedure. The first year's spending is given by (in Excel™ notation):

$$S_1 = pmt(r_0, 30, 1000000, , 1) \qquad (1)$$

In this equation, 30 is a placeholder for the time horizon in years and $1,000,000 is a placeholder for the initial amount of capital in dollars. The *pmt* (payment) function gives the amount that a fairly priced annuity would pay out in that first year[5] given the current interest rate on a 30-year riskless Treasury bond, r_0.

By an "annuity," we don't mean a life annuity, but a fixed-term, 30-year annuity. That's why the investor's age and gender aren't inputs; the money just has to last for our retiree's planning horizon of 30 years, whether he or she is alive or not. In the current environment, most investors use the word "annuity" to mean a *life* annuity

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[4] In another *Financial Analysts Journal* article, A Pension Promise to Oneself, Stephen Sexauer and I recommend such an approach mostly as a benchmark or "paper portfolio" designed to measure one's progress toward an adequate retirement income. In that article, we note that real-life investors are more likely to want to earn a real return of at least 2%, which can only be attained with a good helping of equities, accepting the risk of possible disappointment alongside the hope of doing well. (Why only 2%? If the equity risk premium is 4% — and we have support for that estimate — and if the real riskless interest rate is zero, a 50/50 equity-bond allocation has an expected real return of 2%. Sorry.)

[5] More precisely, it is the amount that the fixed-term annuity would pay out at the *beginning* of the first year, assuming that the annuity is set up to pay out each year's cash flow in advance (that is, the payment is for the whole year).

(immediate or deferred), offering longevity insurance; but the real meaning of the word is more general and refers to any return of capital to the investor according to a schedule over time. (Insurance companies offer many kinds of annuities that don't involve longevity insurance including the fixed-term annuity to which we referred above.) We'll get to life annuities later.

In the solution we propose, you don't actually buy a fixed-term annuity; you use annuity thinking to set the payout amount. Each year, you repeat the calculation with new inputs. Let's say that, at the beginning of the second year (after withdrawals and market action in the portfolio), you have $970,000 left and the interest rate has changed to some other number, let's call it r_1:

$$S_2 = pmt(r_1, 29{,}970000, ,1) \tag{1}$$

Note that the time horizon has gone down by 1 year to 29, and r_1 is a 29-year, not 30-year, interest rate. Rinse and repeat. By the end of the 30 years, you've created for yourself an annually recalculated variable annuity (ARVA) without ever transferring your capital to an insurance company or other annuity provider. (Investors hate to do that because they can't get the money back.)

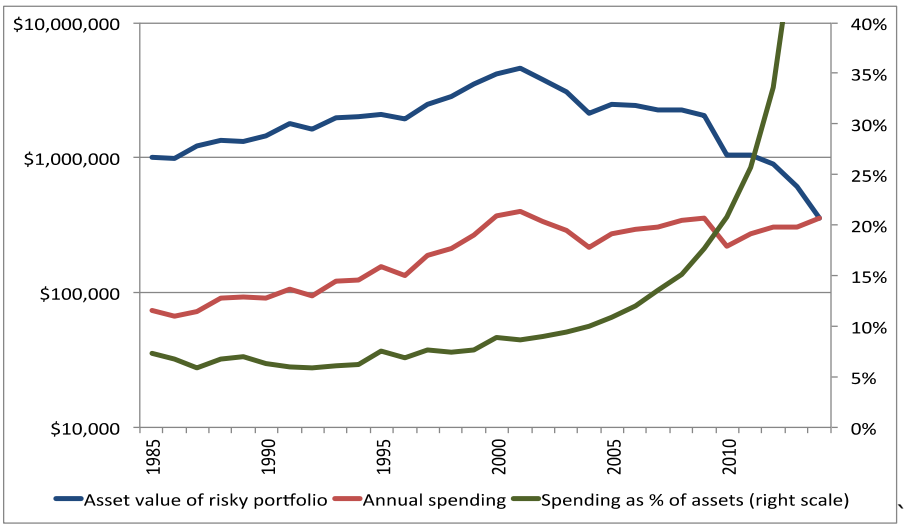
Over the 30-year period, the withdrawal amount fluctuates with portfolio returns and with changes in the real interest rate. That is, the term is fixed but the size of the payments is variable. However, there is never any risk of running out of money. Why? Because you've adjusted your spending in real time to reflect the amount of money you have.

As an input variable for figuring out how much to spend, the amount of money you have is important. Our method takes this into account. Conventional "safe" withdrawal rules such as the 4% rule do not do this except at the beginning of the drawdown period.

Let's look at a graphical example:

EXHIBIT 1

30 YEARS OF SPENDING AND ASSET VALUES FOR RISKY PORTFOLIO



In the graph, the risky portfolio is the S&P 500 over the period from 1985 to 2014; the blue line shows the portfolio value as it changes due to market fluctuations and as it is spent down over the 30-year period. Future returns will, of course, be different. In practice, one would take much less risk, but we show 100% equities in the example to show vividly how spending varies with wealth in an ARVA. The dollar amounts shown are nominal. Inflation ran at a compound average of 2.6% over the period, so that $2.18 was needed in 2015 to purchase what $1.00 could purchase in 1985. Nominal spending grew from $73,151 in the first year to $356,330 in the last; thus, the growth in nominal spending, which was 4.9-to-1, ran ahead of inflation. (Spending, calculated according to an ARVA, might not always beat inflation in the future; remember that the period shown in the illustration includes most of the great bull market of 1982-2000).

Spending fluctuates with wealth, but not exactly; changes in the real interest rate also affect spending (higher real rates mean more spending). If the real rate were a constant, then spending and wealth would fluctuate exactly in parallel, with changes in wealth flowing through fully to spending in the period in which the wealth change occurs.

The effect of fluctuations in real interest rates on spending is considerable. In 1985, for example, when real interest rates fell from 6.68% to 5.67%, spending fell considerably — by almost 10% — even though the stock market was up.[6] Spending was high in the mid-1980s because real interest rates were high.
There is also sequence-of-returns risk. In the illustration, spending grows robustly because the bull market of the 1980s gave the portfolio a big boost right at the beginning when most of the money was still in the portfolio. Today — with the market at all-time highs — the possibility of negative or near-zero returns at the beginning of a 30-year spend-down period should be a source of concern, but there is nothing you can do about it other than take less risk or lower the spending rate below the ARVA rate, building a reserve for the future.

To sum up, here's The Only Spending Rule You'll Ever Need in one sentence with no math:

> *Each year, one should spend (at most) the amount that a freshly purchased fixed-term annuity — at then-current portfolio values, interest rates and number of years of required cash flow remaining — would pay out in that year.*

WHY NOT JUST ELIMINATE ALL INVESTMENT RISK AND MAKE FIXED WITHDRAWALS?

In an article I wrote with Barton Waring, we noted that it's possible to hedge *all* risk to consumption by limiting the portfolio to riskless investments (in this case, TIPS, because of the need to keep spending whole in inflation-adjusted terms). With such a strategy, spending is protected not just from bear markets in stocks — which are

[6] Until 1997 when TIPS were first issued in the United States, we estimated that the real interest rate was equal to the long-term nominal U.S. Treasury bond yield minus the three-year trailing average inflation rate (the latter being a proxy for expected inflation over the life of the bond). Starting in 1997 we used the yield on a long-term TIPS bond directly as the real interest rate.

not held — but also from fluctuations in real interest rates because the laddered structure of the TIPS portfolio creates a natural hedge against such fluctuations.

What's wrong with this ultraconservative strategy?

Nothing, if the investor is satisfied with the minuscule amount of spending that can be supported in that way. The current riskless TIPS yield (averaging across various maturities) is near zero, so the spending rate for a 30-year time horizon is simply 1/30, or 3.33%, of the portfolio each year as we saw earlier.

That's bad enough, but Waring and I noted that 30 years might not be nearly long enough a planning horizon. More and more people are living into their eleventh decade (age 101-110), and life expectancy is continuing to grow with no sign of slowing.[7] Social Security life expectancy tables go out to age 120. Thus, it's conceivable that one might have to make one's savings last over a 55-year retirement, from age 65 to 120.

To make spending last 55 years with a riskless portfolio earning a real return of zero, the spending rate would have to be 1/55 or 1.8%. At a 2% real rate of return the situation is much improved — because, over such long time horizons, the real interest rate earned on the portfolio becomes more important as the gradual return of capital becomes less important — and the initial ARVA spending rate is 3.7%. Not great, but much better than 1.8%.

But a 2% real rate of return depends on risk-taking, so year-by-year spending will fluctuate, much as it did in Exhibit 1. Spending could even decrease below the initial level and stay below it (if there is a sufficiently persistent bear market close to the beginning of the period, or if long term returns tend to be below expectations). Today's would-be retirees really have their work cut out for them unless they take advantage of longevity risk pooling, the topic to which I turn next.

Life annuities! Love 'em or hate 'em?

Until now, we have had the investor "on her own;" that is, only able to consume what she has saved without pooling her resources with anyone else's. Pension funds and commercial life annuities issued by insurance companies don't do that. They rely on the insurance principle, which is that if you form a large enough group of people, the bad luck of some of them and the good luck of others will average out.

Usually we think of dying young as terrible luck and living to a ripe old age as good luck. But let's turn this around and view it from the perspective of the person *paying* for your standard of living, who (surprise!) is you. Outliving your money is bad luck indeed, and the older you are when this happens, the less you can do about it.

Moreover, living on the small amount of spending allowed in the 55-year ARVA strategy is no picnic either, especially if you avoid taking equity risk. One must

[7] In the U.S., life expectancy is increasing by about three years every decade, an astonishing rate if you consider the idea that if that number were 10 years every decade, no one would ever die.

choose between two unpleasant scenarios: living like a miser with certainty because of the fear of penury or having a small probability of actually running out of money.

Combining life annuities with conventional investing

The investor can build actual life annuities (not just the "annuity thinking" we referred to earlier) into the retirement solution, boosting expected incomes considerably. In an article I wrote with Stephen Sexauer,[8] we suggested building a portfolio of laddered TIPS intended to be spent down over the first 20 years of retirement then relying on the payout from a deferred income annuity bought at the time the TIPS portfolio is assembled.

Without taking any equity risk, this strategy has an initial spending rate of 4.66%, well above the spending rate from any riskless strategy that does not involve annuities. And it does not require you to estimate your life span. The payments just go on and on until you expire.[9] The difference between this spending rate and the lower ones achieved in an on-your-own strategy comes from the insurance principle; that is, from the pooling of longer and shorter lives by the deferred annuity provider.

Problems with life annuities

Note that I said "expected incomes," not guaranteed incomes. An insurance company guarantee is not an ironclad guarantee. Insurance companies sometimes go bankrupt and, when they do, their assets are seized by state insurance guarantee pools, which make partial payouts to annuitants. For large policies bought by high-income annuitants, the payouts can be very partial; they're subject to Draconian caps that vary by state. Life annuities have the additional disadvantage of lacking liquidity, so that investors can't get their money back in case of emergency; and annuities often suffer from excessively high fees, complex and impenetrable contract structures and adverse selection (the fact that only people who think they're going to live a long time buy them).

Life annuities: Summary

Thus, using commercial deferred-income life annuities (DIAs) in an investment program adds several layers of risk and cost. But the benefit of longevity risk pooling — having those who die young subsidize the retirement income of those who die old — is large enough to overcome these risks and costs in the judgment of many investors.

Further, as Sexauer and I pointed out, the TIPS-plus-deferred-annuities strategy isn't intended for everyone. It's a benchmark, as close to riskless as you can get in today's markets, to which one can compare one's preferred strategy. The most risk-averse people will want to hold the benchmark, but most people will want to try to beat the

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[8] Sexauer, Stephen C., and Laurence B. Siegel, "A Pension Promise To Oneself," *Financial Analysts Journal,* November/December 2013.

[9] With the Sexauer and Siegel strategy, spending grows at the rate of inflation for 20 years, and then remains flat in nominal terms. The "flatness" occurs because, at the time we wrote our article, there were no commercially available deferred life annuities with an inflation-adjusted payout. When they're issued, we'll simply build the added cost of such an annuity into the strategy.

benchmark by including equities as well as fixed-income assets and deferred annuities in their retirement portfolios.

Toward a solution to the retirement crisis

A great deal has been written about the current retirement crisis, which consists (at a minimum) of the following problems:

- Many, if not most, people in or approaching retirement haven't saved nearly enough to live comfortably at economically sensible withdrawal rates
- Defined-benefit pension plans have all but disappeared outside the public sector and, even in that sector, plans are threatened by poor investment management, insufficient contributions and populations unwilling to be taxed further to achieve a bailout
- Defined-contribution plans are plagued by low savings rates, lack of universal enrollment, and the foibles of individuals investing for their own accounts

We can use the thinking in the prior sections to begin building a solution, or set of solutions, to these challenges. Investment strategy and spending policy can't make up for past undersaving, but we can start in the present to adopt best practices (many of them borrowed from the defined-benefit, or DB, pension world) and move toward better outcomes in the future.

DB plans are a thing of the past for reasons that are extremely complex (including inadequate contributions to the plan by employers and, in some cases, excessive benefit promises). But the payout from a DB plan — the beneficiary gets a check every month — is a good thing, highly desired by almost every retiree. If individual savings-based retirement plans, including 401(k)'s, and IRAs, are what we've got, let's make the best of the situation and see if we can enable such plans to provide a DB-like payout and otherwise emulate the best features of DB plans.

Savings rates

Spreading the income from one's working life over one's whole life is quite a challenge, especially as we live longer but don't necessarily work longer. The savings rate has to be much higher than what we would otherwise anticipate. In a series of simulations for people at various income levels, Sexauer and I show that savings rates must exceed 30% of the saver's income in the high-paying, mid-career years in order to have a comfortable retirement. This number is lower for lower-income workers because of the redistributive aspect of Social Security, but even the lowest-income category that we studied needs to save more than 20% of income in mid-career.[10]

[10] For realism, Sexauer and Siegel [2013] assumed that savings rates would start out low and rise through auto-escalation (the "Save More Tomorrow™" program of Thaler and Benartzi, in which portions of *future* raises are pledged to a savings program). Ideally, savings rates should start out high because investing early in life is very fruitful due to compounding, but this is difficult to achieve in practice.

Working longer

But, as the time needed to prepare for one's career gets longer, the number of years spent working gets shorter — just at a time when more money is needed for the increasingly old ages to which people are living. Many professional and technical careers don't really pay off until one's thirties. Meanwhile, workers seek to retire when quite young — say, 55 or 60. The math doesn't add up.

The only solution is to work longer. But since many older workers are less productive, it must be possible (and legal) to pay them less and to allow them to work shorter hours performing easier tasks. This will require cultural, legislative and regulatory change.

Conversion of assets to income

Once people have saved more, or saved whatever they've saved, it's incumbent on the investment management industry to create avenues for safe and convenient conversion of the assets to income. In this article, I've provided some detail on one approach — the ARVA — and referred to another approach, combining DIAs with laddered bonds or other conventional investments.

But there is much more to decumulation than just these two methods. In fact, decumulation is such a hot topic that there is a decumulation magazine (the *Retirement Income Journal*) and a Decumulation Institute. Every major investment management firm, brokerage and consultancy seems to be devoting some effort to the question.

Much of the work on decumulation focuses on safe spending rates for self-managed assets. As I've suggested, the whole concept of a safe spending rate leaves something to be desired; there's no safe fixed rate if you take investment risk. The ARVA method generates a variable rate that is safe, but many investors will want more income than what an ARVA can provide. Because that larger income must rely on longevity-risk pooling (there being no other source of extra money), some sort of financial intermediation is necessary whether by a traditional pension fund or by an insurance company, mutual benefit society or other entity that writes a periodic and mostly predictable check to the investor. I encourage investment professionals to think creatively about the institutions and practices needed to create a vibrant, competitive market in these services.

Riskless life annuities

One reason that life annuity products are not more widely used is that investors do not perceive them as safe. They are worried about credit or counterparty risk, the possibility that, in the distant future when the annuity payouts come due, the annuity provider will have gone bankrupt.

While insurance company bankruptcies are rare and there are some protections from state insurance guarantee pools, this worry is legitimate. Insurance companies are often poorly hedged against changes in interest rates, loss experience and other market conditions. They may also have side businesses that imperil the insurance lines. In the global financial crisis of 2008-2009, several insurance companies came close to melting down. AIG would not have survived without a bailout, even though

that company's life annuities — considered as a standalone business — were never in danger. It was the company's issuance of credit default swaps that almost sank it.

So that investors can be confident of their life annuity purchases, Waring and I wrote that we'd like to challenge the insurance industry to create a truly safe and low-cost, index fund-like, annuity company. Such a company would have the following characteristics:

- Separate corporate structure insulated from financial exposure to affiliated companies.

- All reserves held in default-free Treasury bonds and TIPS and properly hedged to the liability as closely as possible at all times.

- "Participating" policies, so that any longevity surprises are used to reduce annuity benefits proportionally instead of forcing the insurer to default entirely on some of the benefits (after going bankrupt)

- Very broad participation so there is little adverse selection.

Low costs

Annuities aren't the only investment that should be index fund-like. Index funds should be the base-case structure for the entire retirement portfolio, including laddered bonds, with active management being a choice that the investor makes with full awareness of the risks and large cumulative added costs. If there is no existing index for a bond ladder, let's create one.

Global scaling using the Internet

The retirement investment structure that we've been describing doesn't need teams of "quants" or financial engineers to create it. Mostly it involves a lot of effort in changing the culture of the investment business, refocusing it on doing what's best for the consumer. The needed changes are not only cultural but also institutional, legal and regulatory. And, once the products are built, an incentive structure needs to be developed that motivates advisors and salespeople to place investors in these products.

The advent of robo-advisors operating at a global, or at least national, scale over the Internet is a welcome development. The investment policy question can be reduced to choosing among a very small number of model portfolios, much as is done now with target-date funds; like sock sizes, a few asset mixes fit many different feet pretty well. What's customized is everything else — retirement income requirement, initial savings rate, auto-escalation and so forth — and the investor can perform these tasks herself using well-designed software.

With such a structure, investors can think about saving for retirement and generating retirement income in a way that, until now, was only possible with a well-managed and well-funded defined-benefit plan. Let's get to work.

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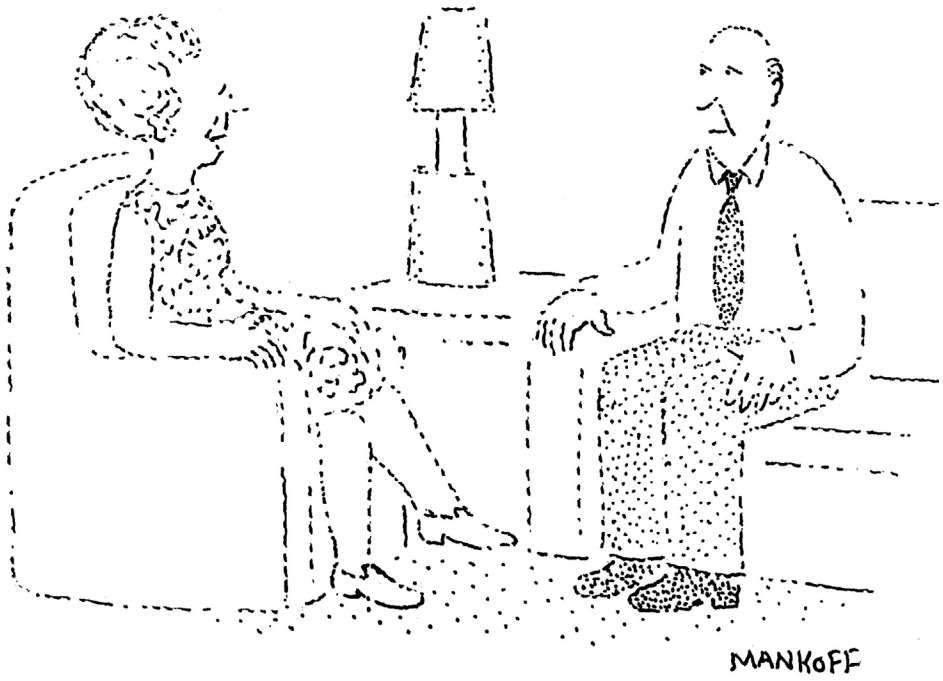

"Edgar, you've been retired for three years now.
Why don't you loosen your tie?"