Spending in Retirement

Faisal Habib

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CANNEX

Imagine you are an advisor to a 65-year-old retiree, Cindy Banks, who is in good health and who has amassed $120,000 in her personal savings (invested in a balanced fund) for retirement. She has a monthly pension of $1,200 and she wants you to tell her how much to withdraw annually from her balanced fund investment account.

What is your response?

In retirement parlance, the scenario described above is known as decumulation. The word decumulation has only entered our lexicon quite recently, as is evidenced by the lack of any formal definition. No definition exists in the online Oxford English Dictionary while Merriam-Webster defines it as "Disposal of something accumulated." I dislike the negative connotations of 'disposal' – after all, who wants to dispose of the wealth they have worked so hard to accumulate? I define decumulation as the process of drawing down income from financial assets, such as investments and savings accounts. More specifically, decumulation involves determining an appropriate spending rate from your investments.

Three decades ago, when interest rates were north of 10%, decumulation did not enter our retirement plans. Many individuals were members of defined benefit plans and those that needed to rely upon personal savings did so by living off the interest earned. Fast-forward 35 years and interest rates are no longer in the double digits – you are lucky to earn any rate of return with everyday deposit accounts. Add to that the decline of defined benefit pension plans along with the impending increase in the number of retirees and suddenly, decumulation comes to the fore. Also, with the demise of defined benefit pensions over the last two decades, a greater amount of wealth is being accumulated in defined contribution plans, thus putting decumulation into prominence. In Canada, it is estimated that upwards of $1.1 trillion is in Registered Retirement Savings Accounts.[1] It is projected that by the year 2030, more than 25% of Canada's population will be retirement age.[2] Therefore, more advisors will be asked to advise clients on how much to withdraw from their nest egg.

Before we attempt to address Cindy's decumulation question, I should mention that there are retirement products to consider such as income annuities and many of us will rightly purchase these products as they provide a guaranteed hedge against longevity risk. Nevertheless, there will always be investments in mutual funds, ETFs, Segregated Funds, portfolio of stocks and bonds, or simply GICs and these are the focus of this article.

More often than not, I have come across naïve solutions to decumulation. Many will use life expectancy (or a few years more than life expectancy) as the de facto number of planning years and use it to divide accumulated wealth. In the example that I presented in the beginning and using this naïve solution, if I assume that Cindy will live to be 90, then spending 4% (100% ÷ 25 years) of the wealth every year is the solution to her spending rate. However, as financial practitioners we know that wealth is usually invested at a rate of return. In that case, the solution begins to look like a mortgage in reverse. Instead of making installment payments for a fixed number of years whereby the bank extends the principal, we can imagine handing over the principal to the bank and the bank making regular payments to us. While these types of calculations are not wrong, they tend to assume a fixed rate of return and a fixed number of planning years – both of which in reality are unknown and uncertain. Most importantly, these types of calculations ignore individual risk preferences and inflation as well as any pension income that the client may receive in retirement.

Back in 1994, William Bengen's work in this area established a 4% withdrawal rate as the sustainable withdrawal rate from a portfolio of balanced investments.[3] However, many economists have criticized the 4% rule for lacking a sound economic basis and ignoring individual risk preferences. Moreover, the 4% rule does not consider gender, levels of individual guaranteed income (pensions and social security), health, and attitudes toward risk.

So how should one truly think about decumulation? Cindy does have a choice of purchasing an immediate income annuity and at today's prevailing rates, she would expect to receive $650 / month on average. That is a 6.5% income rate on her nest egg of $120,000. Cindy's annuity purchase decision will be set in stone and she will never have to think of decumulation! However, this type of product requires that you surrender your principal completely and pass control over to the insurance company. Many individuals are uncomfortable with this option[4] even though it may be a rational choice given that our cognitive faculties decline with age and that it may make sense to set things up on autopilot. On the other hand, considerations such as a reduced legacy if one dies young or the feeling of a reduced liquidity

cushion are common behavioral reasons annuitization option is often unappealing.

A few weeks ago, my wife signed us up for a 'Learn to Camp' session. This was a two-night camping experience at one of the provincial parks. For my two boys this was quite exciting, especially when each of them was given a box of Hershey's S'mores and shown how to roast marshmallows over the campfire. As soon as the S'mores boxes were handed out (one to each of the kids in our group), I noticed that all but one consumed their boxes completely. My youngest came over to me and asked me to save his leftover treat for the next day. His plan was to save some today and consume them the following day.

Now you might wonder, what is the connection between S'mores and retirement spending? Well as it turns out, my youngest son did not want the joy of roasting marshmallows to end on the first day. He wanted to save some for consumption the following day. In doing so, he was acting conservatively (he didn't want to run out of marshmallows) and exhibiting what is known as delayed gratification – precisely what many of us do when uncertain. When we behave in such a manner, economists say that we exhibit risk averse behavior. Retirees are unsure what may come about in the future; they may live a very long time or their portfolios may decline. The uncertainty and our reaction toward it make us reconsider our level of consumption, especially for those of us who may not have an adequate cushion of guaranteed lifetime income. On the other hand, there are individuals who might perceive their relative longevity quite differently and may want to spend more early on in retirement while they can. They might not be as concerned about running out of money in old age if they feel that an event (living to age 100) has less than 5% chance of occurring. Indeed, research shows that retirees spend more early on in retirement and less so at advanced ages.[5]

If our behavior, meaning our consumption, is dependent upon how we perceive risk, how we invest, the level of pension, and our age, then does it not make sense to provide advice on decumulation in a new framework?

It turns out that economists use a mathematical model that measures 'happiness' or satisfaction derived from consumption. They call it utility. A discounted utility model allows us to capture an individual's personal risk preferences and how much of an importance he or she gives to consumption today versus consumption tomorrow. In a recent research paper,[6] my co-authors

and I construct such a model for retirees who would want to consume optimally. Without getting into technical details, we use a discounted utility model to measure the gratification from current and future consumption. The discounting accounts for mortality and time value of money. Our approach uses the client's age and gender as some of the very basic demographic information along with the amount of investible wealth and how it is allocated across various asset classes. The distribution of wealth across asset classes also allows us to peek into how our clients perceive risk. Next, if the client has any guaranteed forms of income (almost all of us have some form of government pension) then that is also factored into the model. We use techniques from dynamic programming to solve for optimal consumption and answer questions on decumulation and spending rates in a setting whereby market returns and lifetimes are random.

THE FOLLOWING ARE SOME BROAD INSIGHTS FROM OUR RESEARCH:

1. Risk aversion and one's personal attitude to lifetime uncertainty has a significant impact on the optimal spending rate at retirement.

2. Just as financially risk averse individuals limit exposure to risky assets by optimally allocating across various asset classes, longevity risk averse individuals behave as if they will have a longer than average lifespan and limit their consumption or spending rate.

3. If the client does not have any guaranteed income, the account must be sustained for a very long time. Initial spending rate at retirement will be lower than what it might be if the client had guaranteed forms of income.

4. For those clients with guaranteed income, their initial spending rates are higher compared to clients with no forms of guaranteed income. A little indulgence early on in retirement isn't that big of a concern because there is always a cushion of income available at advanced ages.

5. The change in consumption after a portfolio shock (either positive or negative) is non-linear to the change in portfolio value.

6. When one has access to some form of pension annuity income, running out of money during retirement shouldn't be feared or avoided. There will be some that will be concerned about a very long lifespan and will choose their investments conservatively, while there will be others who would not concern themselves with an outcome that has less than 5% chance of occurring.[7]

Before I conclude, let us revisit Cindy. Her $1,200 of monthly social security income means that her annual pension rate is 12% of her initial wealth. Based on our model for optimal consumption, she should withdraw 7.15% of her investible wealth (or $8,580) during her first year in retirement. Her total consumption (combined with her pension) would be $22,980 annually. The following year, her advisor will reevaluate her portfolio (to account for changes) and her perceived outlook on risk.

To illustrate Cindy's Year 2 meeting with her advisor, let's consider two hypothetical scenarios: one in which her portfolio increases by 10% and another in which her portfolio declines by 10%. The table below summarizes her withdrawal and consumption in year two.

	Wealth in Year 2	Withdrawal Amount (%)	Total Consumption
Up Market	**$122,560**	**$9,240 (7.54%)**	**$23,640**
Down Market	**$100,280**	**$6,170 (6.15%)**	**$20,570**

Observe how her total consumption goes up by $660, an increase of 2.9% when the market goes up. Her investments have performed very well; therefore, she can reward herself. On the other hand, when the market goes down, her consumption declines as well – down by 10.5%. **Herein lies an important message: clients have to adjust their consumption in the face of uncertainty and as they age, it is often rational to deplete your assets (completely) as long as you have pensions to meet or satisfy your basic needs.**

1. Statistics Canada. Table 378-0117 *Pension satellite account, pension assets at market value, by type of plan, annual (dollars)*, CANSIM (database). (accessed: September 27, 2017)

2. Parkinson, D., McFarland, J., McKenna B. (2015, November 6). Boom, Bust and Economic Headaches. *The Globe and Mail*. Retrieved from https://beta.theglobeandmail.com/globe-investor/retirement/the-boomer-shift-how-canadas-economy-is-headed-for-majorchange/article27159892/?ref=http://www.theglobeandmail.com&

3. Bengen, W.P., 1994, Determining Withdrawal Rates Using Historical Data, *Journal of Financial Planning* vol. 7, 171-181.

4. Hamilton, M., 2009, Longevity Risk from Three Perspectives. Available at Department of Finance, Canada: https://www.fin.gc.ca/activty/pubs/pension/ref-bib/hamilton-eng.asp#toc015

5. Vettese, F., Why Canada Has No Retirement Crisis, *Rotman International Journal of Pension Management*, Vol 6-1.

6. Habib, F., Huaxiong, H. and Milevsky, M., Approximate Solutions to Retirement Spending Problems and the Optimality of Ruin (March 31, 2017). Available at SSRN: https://ssrn.com/abstract=2944125

7. A 65 year old individual (male or female) has less than 5% chance of surviving to age 100.

Contact Information

CANNEX Financial Exchanges Limited
1200 Bay Street, Suite 1001
Toronto, Ontario
Canada
M5R 2A5

Phone: (416) 926-0882
Toll Free: (800) 387-1269
Fax: (416) 926-0706

Email: cannex@cannex.com
www.cannex.com