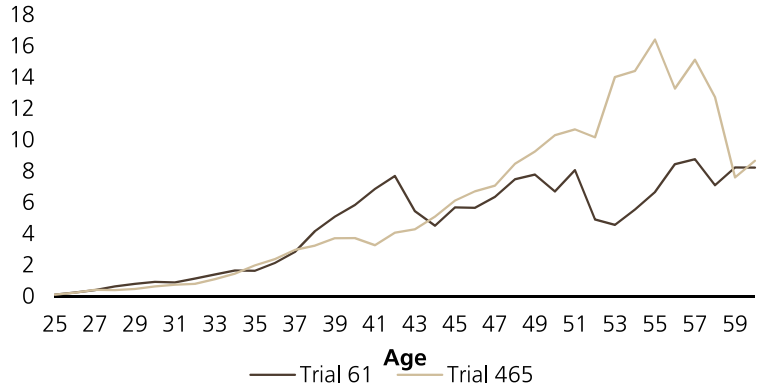
Save your progress. There are no cheat codes for retirement.

Blog

I recently wrote a blog that looked at the outcomes from various portfolios when saving for retirement. The conclusion was pretty clear: When viewed across a 30-year period of saving and accumulation, investors holding an all-equity portfolio will generally accumulate more assets, except in the worst 5% of outcomes.

In order to avoid the worst-case outcomes inherent in all-equity portfolios, we need to first identify how they occur. There are two main causes: (1) low returns and (2) sequence of returns risk. I've selected two trials from my simulation to illustrate both of these causes.

Fig. 1: Two hypothetical accumulation trials



Source: Morningstar, UBS. Analysis assumes real income growth of 127% between age 25 and 51, and –16% real income growth between 51 and 60. Terminal portfolio values are specified as multiples of final year income.

Trial 61 is a low-return trial. At no point did the accumulated assets surpass 8.5x final year's earnings. In many ways, a 35-year period of low returns is simply bad luck. It's possible that it will occur, but there's only so much an investor can do to mitigate such an outcome. One option is to hold fixed income and other asset classes, but the obvious trade-off is worse outcomes most of the time. Without perfect foresight, it's hard to confidently predict a multi-decade period where equities underperform most other asset classes.

Trial 465 is a sequence of returns risk trial. In this trial, the investor had accumulated the equivalent of 16.4x final year's earnings, only to see the portfolio decline by nearly half due to a bear market right before retirement.

Unlike the investor in trial 61, the investor in trial 465 can potentially improve her outcomes recognizing that she's close to meeting her objectives and "saving her progress" by derisking her portfolio ahead of retirement. This way of thinking about portfolio selection, where the future goals and objectives for a pool of assets have a big impact on how those assets are invested, is what pensions call liability-driven or liability-responsive investing. It's also a big part of our Liquidity. Longevity. Legacy. (3L) framework.

In simple terms, using liability-responsive asset allocation in this situation might mean starting with an all equity portfolio, but reducing the equity portion by 20% when the investor has 70% of her target retirement funds, reducing by another 20% when she's reached 80% of her target funds, and so on.

I reran the same analysis as in my last post, but included a liability-responsive strategy that reduces risk as the investor gets closer to fully-funding her retirement portfolio. The result: better outcomes across the board, except in the top 25% of outcomes. That's the trade-off. An investor taking this approach potentially misses a really big final year in the market in exchange for also avoiding the other side of the same coin: a bear market right before retirement.

There was a time when video games didn't allow players to save their progress. Zelda, I believe, was the first Nintendo game to include a battery in the cartridge that enabled players to go save a game and restart from that point. As an 8-year-old playing Contra, we used cheat codes to get 30 lives in order to try and beat the game. There are no cheat codes to go back and restart after a bear market, but we can save our progress. If the decade-long bull market means you're further along in saving for retirement than you expected to be, now might be a good time to do so.

Fig. 2: Heat map of outcomes for various portfolios

Percentiles	20/80	40/60	60/40	80/20	All Equity	All FI	Liability-responsive
5%	9.0	9.9	9.3	9.0	8.2	8.0	10.1
25%	10.6	11.8	12.4	12.5	12.5	9.1	13.8
50%	11.8	13.5	15.0	16.2	17.3	10.1	16.7
75%	13.1	15.1	18.6	20.8	23.8	11.3	20.1
95%	15.3	17.9	24.4	28.9	35.8	13.1	26.4

Source: Morningstar, UBS. Analysis assumes real income growth of 127% between age 25 and 51, and –16% real income growth between 51 and 60. Percentile outcomes are based on 500 trials simulated from resampled historical data between 1970 and 2018. Terminal portfolio values are specified as multiples of final year income.

Liquidity. Longevity. Legacy. disclaimer. Timeframes may vary. Strategies are subject to individual client goals, objectives, and suitability. This approach is not a promise or guarantee that wealth, or any financial results, can or will be achieved.

Michael Crook, Head Americas Investment Strategy, UBS Financial Services Inc. (UBS FS)

Appendix

UBS Chief Investment Office's ("CIO") investment views are prepared and published by the Global Wealth Management business of UBS Switzerland AG (regulated by FINMA in Switzerland) or its affiliates ("UBS").
The investment views have been prepared in accordance with legal requirements designed to promote **the independence of investment research.**

Generic investment research – Risk information:

This publication is **for your information only** and is not intended as an offer, or a solicitation of an offer, to buy or sell any investment or other specific product. The analysis contained herein does not constitute a personal recommendation or take into account the particular investment objectives, investment strategies, financial situation and needs of any specific recipient. It is based on numerous assumptions. Different assumptions could result in materially different results. Certain services and products are subject to legal restrictions and cannot be offered worldwide on an unrestricted basis and/or may not be eligible for sale to all investors. All information and opinions expressed in this document were obtained from sources believed to be reliable and in good faith, but no representation or warranty, express or implied, is made as to its accuracy or completeness (other than disclosures relating to UBS). All information and opinions as well as any forecasts, estimates and market prices indicated are current as of the date of this report, and are subject to change without notice. Opinions expressed herein may differ or be contrary to those expressed by other business areas or divisions of UBS as a result of using different assumptions and/or criteria.
In no circumstances may this document or any of the information (including any forecast, value, index or other calculated amount ("Values")) be used for any of the following purposes (i) valuation or accounting purposes; (ii) to determine the amounts due or payable, the price or the value of any financial instrument or financial contract; or (iii) to measure the performance of any financial instrument including, without limitation, for the purpose of tracking the return or performance of any Value or of defining the asset allocation of portfolio or of computing performance fees. By receiving this document and the information you will be deemed to represent and warrant to UBS that you will not use this document or otherwise rely on any of the information for any of the above purposes. UBS and any of its directors or employees may be entitled at any time to hold long or short positions in investment instruments referred to herein, carry out transactions involving relevant investment instruments in the capacity of principal or agent, or provide any other services or have officers, who serve as directors, either to/for the issuer, the investment instrument itself or to/for any company commercially or financially affiliated to such issuers. At any time, investment decisions (including whether to buy, sell or hold securities) made by UBS and its employees may differ from or be contrary to the opinions expressed in UBS research publications. Some investments may not be readily realizable since the market in the securities is illiquid and therefore valuing the investment and identifying the risk to which you are exposed may be difficult to quantify. UBS relies on information barriers to control the flow of information contained in one or more areas within UBS, into other areas, units, divisions or affiliates of UBS. Futures and options trading is not suitable for every investor as there is a substantial risk of loss, and losses in excess of an initial investment may occur. Past performance of an investment is no guarantee for its future performance. Additional information will be made available upon request. Some investments may be subject to sudden and large falls in value and on realization you may receive back less than you invested or may be required to pay more. Changes in foreign exchange rates may have an adverse effect on the price, value or income of an investment. The analyst(s) responsible for the preparation of this report may interact with trading desk personnel, sales personnel and other constituencies for the purpose of gathering, synthesizing and interpreting market information.
Tax treatment depends on the individual circumstances and may be subject to change in the future. UBS does not provide legal or tax advice and makes no representations as to the tax treatment of assets or the investment returns thereon both in general or with reference to specific client's circumstances and needs. We are of necessity unable to take into account the particular investment objectives, financial situation and needs of our individual clients and we would recommend that you take financial and/or tax advice as to the implications (including tax) of investing in any of the products mentioned herein.
This material may not be reproduced or copies circulated without prior authority of UBS. Unless otherwise agreed in writing UBS expressly prohibits the distribution and transfer of this material to third parties for any reason. UBS accepts no liability whatsoever for any claims or lawsuits from any third parties arising from the use or distribution of this material. This report is for distribution only under such circumstances as may be permitted by applicable law. For information on the ways in which CIO manages conflicts and maintains independence of its investment views and publication offering, and research and rating

methodologies, please visit www.ubs.com/research. Additional information on the relevant authors of this publication and other CIO publication(s) referenced in this report; and copies of any past reports on this topic; are available upon request from your client advisor.

Important Information about Sustainable Investing Strategies: Incorporating environmental, social and governance (ESG) factors or Sustainable Investing considerations may inhibit the portfolio manager's ability to participate in certain investment opportunities that otherwise would be consistent with its investment objective and other principal investment strategies. The returns on a portfolio consisting primarily of ESG or sustainable investments may be lower than a portfolio where such factors are not considered by the portfolio manager. Because sustainability criteria can exclude some investments, investors may not be able to take advantage of the same opportunities or market trends as investors that do not use such criteria. Companies may not necessarily meet high performance standards on all aspects of ESG or sustainable investing issues; there is also no guarantee that any company will meet expectations in connection with corporate responsibility, sustainability, and/or impact performance.

Distributed to US persons by UBS Financial Services Inc. or UBS Securities LLC, subsidiaries of UBS AG. UBS Switzerland AG, UBS Europe SE, UBS Bank, S.A., UBS Brasil Administradora de Valores Mobiliarios Ltda, UBS Asesores Mexico, S.A. de C.V., UBS Securities Japan Co., Ltd, UBS Wealth Management Israel Ltd and UBS Menkul Degerler AS are affiliates of UBS AG. UBS Financial Services Incorporated of Puerto Rico is a subsidiary of UBS Financial Services Inc. **UBS Financial Services Inc. accepts responsibility for the content of a report prepared by a non-US affiliate when it distributes reports to US persons. All transactions by a US person in the securities mentioned in this report should be effected through a US-registered broker dealer affiliated with UBS, and not through a non-US affiliate. The contents of this report have not been and will not be approved by any securities or investment authority in the United States or elsewhere. UBS Financial Services Inc. is not acting as a municipal advisor to any municipal entity or obligated person within the meaning of Section 15B of the Securities Exchange Act (the "Municipal Advisor Rule") and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of the Municipal Advisor Rule.**

External Asset Managers / External Financial Consultants: In case this research or publication is provided to an External Asset Manager or an External Financial Consultant, UBS expressly prohibits that it is redistributed by the External Asset Manager or the External Financial Consultant and is made available to their clients and/or third parties. For country disclosures, click here.

Version 04/2019. CIO82652744