



# Liquidity. Longevity. Legacy.

A purpose-driven approach to wealth management

UBS Chief Investment Office

Global Wealth Management **White Paper**



# Contents

---

01	<b>Dear reader</b>
02	<b>Our approach</b>
04	<b>Total wealth</b>
09	<b>Benefits of the 3L approach</b>
13	<b>Managing the 3L strategies</b>
	<b>1</b> The Liquidity strategy
	<b>2</b> The Longevity strategy
	<b>3</b> The Legacy strategy
20	<b>Conclusion</b>
21	<b>Bibliography and related reading</b>
22	<b>Endnotes</b>

---

This report has been prepared by UBS Financial Services Inc.  
Please see important disclaimers and disclosures at the end  
of this document.

## Authors

### Michael Crook

michael.crook@ubs.com  
212.649.8153

### Ronald Sutedja

ronald.sutedja@ubs.com  
212.713.2812

### Jeff LeForge

jeff.leforge@ubs.com  
212.882.5594

# Dear reader,



Mike Ryan, CFA



Michael Crook, CAIA, CRPC

Understanding your values and what you want to accomplish in life is essential to how we work together at UBS. Investing is a deeply personal undertaking, which is why we always start with a discussion about what's really important to you. This helps us shape your wealth strategy around three key dimensions of your financial life:

- 1 **Liquidity** to help maintain your lifestyle.
- 2 **Longevity** to help improve your lifestyle.
- 3 **Legacy** to help improve the lives of others.

In this white paper, UBS CIO explains the fundamental underpinnings of the Liquidity. Longevity. Legacy. (3L)\* approach—how it works, why it works, and how to implement it in practice.

Our unique wealth management approach helps you clearly understand where your money is—and why. Through this process and the plan we create together, you'll have the comfort of knowing you have all you need—for today, for tomorrow and for generations to come.

Regards,

Handwritten signature of Mike Ryan in black ink.

Mike Ryan, CFA  
Chief Investment Officer Americas  
UBS Global Wealth Management

Handwritten signature of Michael Crook in black ink.

Michael Crook, CAIA, CRPC  
Head of Investment Strategy Americas  
UBS CIO Global Wealth Management

\* 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.

# Our approach

Every family’s financial plan is unique, but most investment strategies are organized quite similarly. Instead of using “risk tolerance” as the primary guiding factor, our approach is built on the foundation of your financial objectives. The Liquidity. Longevity. Legacy. approach<sup>1</sup> allocates family wealth into three strategies that we have designated the 3Ls:<sup>2</sup>

## 1 Liquidity

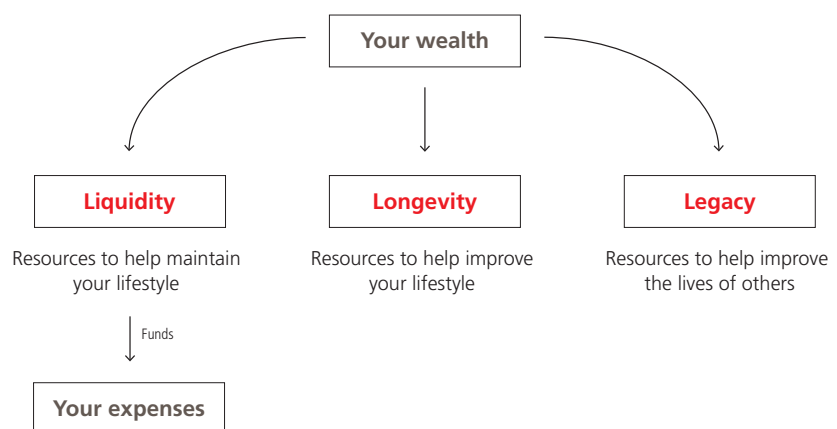
Assets in the Liquidity strategy are allocated to match expenditures in order to provide an automatic (or nearly automatic) and steady cash flows for the next 2 to 5 years. For example, a retiree’s Liquidity assets might include Social Security, a pension, cash, and a 3-year bond ladder that, in sum, match the retiree’s planned expenditures.

## 2 Longevity

The Longevity strategy is designed and sized to include all of the assets and resources the family plans to utilize for the remainder of their lifetimes, which provides a clear picture of what future spending objectives will cost. It is also managed appropriately for that task—a well-diversified portfolio but with an eye to inflation while managing downside risk. Longevity assets include retirement assets, growth portfolios, long-term care policies, primary residence, and similar assets. Over time, these assets can be transitioned to replenish the Liquidity strategy.

## 3 Legacy

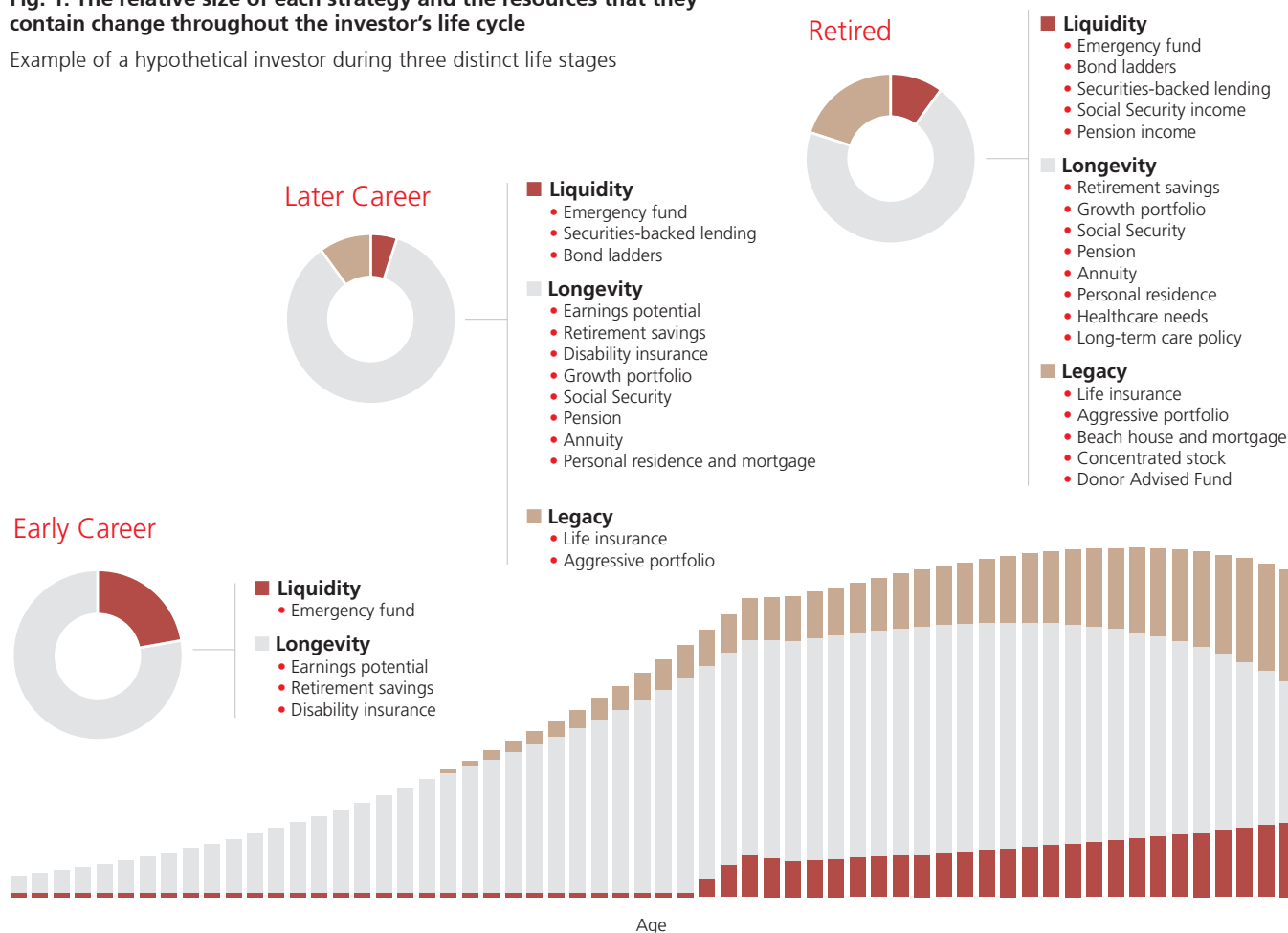
The Legacy strategy clarifies how much a family can do to improve the lives of others—either now or in the future. It includes assets that are in excess of what the family members need to meet their own lifetime objectives, and generally is the focus of estate planning. Investment portfolios in the Legacy strategy are typically invested fairly aggressively since the time horizon associated with the portfolio can usually be measured in decades and might also include collectibles, charitable funds, or other homes and real estate.



\* 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.

**Fig. 1: The relative size of each strategy and the resources that they contain change throughout the investor's life cycle**

Example of a hypothetical investor during three distinct life stages



Source: UBS

At its core, the 3L approach is a blueprint for families who want to understand how they can better allocate all of their assets and manage their liabilities to help meet their objectives. It is designed to provide clarity for all financial decisions embedded in the family's specific goals and objectives.

The relative sizing of each strategy Liquidity. Longevity. Legacy. changes over an investor's life cycle. Pre-retirement, an investor would not hold many financial assets in the Liquidity strategy, as current income would pay for all expenses. The Longevity strategy would concurrently be in the process of being filled through savings and growth,

and the Legacy strategy would probably be empty for most of that period. The natural result is that nearly all of the investor's assets would be invested in the Longevity strategy.

Closer to retirement, the Longevity strategy should be completely funded and some assets might now also be in the Legacy strategy. However, assets earmarked for spending over the next few years have also started to move into the Liquidity strategy, which has a natural de-risking effect for the overall strategy.

Finally, an investor will slowly spend down his or her Longevity assets during

retirement. At the same time, Legacy assets are unencumbered so they can appreciate in value. In fact, investors who have large Legacy strategy assets relative to their spending will actually find that their average risk increases during retirement, as Legacy assets comprise a growing portion of their overall assets. Although this might seem to conflict with conventional wisdom, it is fairly intuitive once assets have been segmented using this framework. **Figure 1** illustrates this changing segmentation of assets over time for a hypothetical investor.

\* 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.



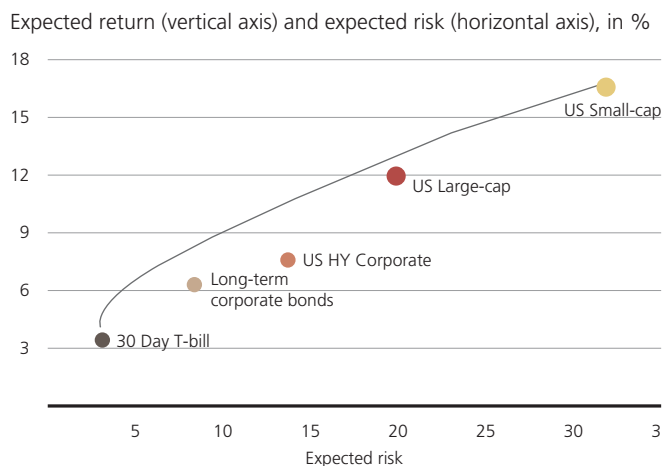
# Total wealth

In 1952, Harry Markowitz published “Portfolio Selection” in *The Journal of Finance*. It was the first article to present the concepts that have since developed into so-called Modern Portfolio Theory (MPT). The premise of MPT—that portfolio optimization is a choice of the average return and variance (i.e. risk) of the portfolio—is well-understood by investors today. The main insight of MPT is that by estimating risk and return characteristics for the investments in their portfolio, as well as the correlations between assets, investors can maximize return for a given level of risk, or minimize risk for a targeted level of return (i.e., mean-variance optimization).

In addition to providing the first quantitative framework for allocating a portfolio, MPT provided two important pieces of insight for investors. The first, that investment decisions should be made in the context of all of the other assets that are held in a portfolio, is perhaps an aspect of investment selection that remains underappreciated by many investors. The second insight, that investors can reduce overall risk by diversifying their holdings, has been more widely accepted.

Of course, investors have long known that they should diversify their holdings. In the fourth century, Rabbi Isaac Bar Aha proposed that one should have “a third in land, a third in merchandise, and a third ready at hand” (Babylonian Talmud). Markowitz added quantitative support and precision 1,600 years after the rabbi’s fundamental insight.

**Fig. 2: Long-term efficient frontier, 1925–2016**



Source: Morningstar Direct, UBS, as of 31 December 2016

MPT has the added benefit of actually working in practice—at least over long horizons and in hindsight. **Figure 2** illustrates the risk and return characteristics of five major asset classes between 1926 and 2016. The line is the efficient frontier over the same period—the set of efficient portfolios that would have maximized return for a given level of risk. Because the efficient frontier resides above all of the individual asset classes (with the exception of the extremes), diversifying among assets would have added to portfolio efficiency.

\* 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.

**Fig. 3: Liquidity. Longevity. Legacy. combines liability-driven investing (LDI), the endowment model of investing, behavioral finance, and a holistic balance sheet approach.**

Theoretical underpinnings of the 3L approach

	Liquidity	Longevity	Legacy
<b>Purpose</b>	Provide liquidity for near-term spending	Provide asset growth and appropriate risk hedging to meet lifetime goals	Growth of legacy assets
<b>Investment approach</b>	Asset-liability matching	Total wealth LDI	Taxable endowment
<b>Sizing</b>	Next three years of cash flow	Based on objectives, age	Surplus
<b>Risk assessment</b>	Probability of success, funding ratio, surplus risk		Long-term risk-adjusted return
<b>Intellectual Framework</b>	Merton, Samuelson, Kahneman, Thaler, Waring, Sharpe 2.0		Markowitz, Sharpe 1.0, Swensen

Source: UBS

But there's a big difference in showing a hypothetical, backward-looking efficient frontier and forecasting an efficient frontier ahead of time. An optimal portfolio between 1926 and 2017 comprised mainly long-term corporate bonds and small-cap stocks—could anyone have predicted that in December 1925? In fact, recent research indicates that a simple equal weighted approach outperforms as frequently as much more sophisticated MPT-based approaches.<sup>3</sup> It turns out that the narrow focus on “optimizing portfolios” has not led to max outcomes for investors.

The 3L approach utilizes four distinct advancements that build on Markowitz's initial insights by moving away from the notion that day-to-day volatility appropriately measures investment risk: Liability-driven investing, the endowment model of investing, behavioral finance, and a holistic balance sheet approach. We believe each of these concepts further benefits investors when compared to the traditional Markowitz approach (see Fig. 3).

### Liability-driven investing

The basic premise behind liability-driven investing (LDI) is a move away from an asset-centric approach to one that assigns pools of money to fund specific future expenses, or *liabilities*.<sup>4</sup> Instead of focusing on day-to-day volatility as the primary measure of risk, a liability-driven approach builds a portfolio optimized to help meet the investor's future liabilities. Risk is redefined as not meeting those liabilities.

Pension funds are primary users of a LDI approach and we've seen this strategy work very well with many such institutions. The success of a pension plan's investment program is measured based on whether or not the probability of meeting its liabilities has increased and is on target.

Conceptually, this objective can be achieved by modeling the future liability as a constrained short position in the portfolio. Retirement spending, for instance, might be modeled as a short position in Treasury inflation-protected securities (TIPS). Most households have future goals and objectives that they'd like their investment assets to meet. College tuition, a home purchase, retirement spending, vacations, and bequests are all examples of spending that have fairly specific dollar amounts and timing associated with them, and investments can be made specifically to help minimize the volatility associated with meeting those goals.

From a technical standpoint, what really matters in these situations is the surplus or deficit of the strategy—the assets minus the liabilities—and not the absolute level of assets or variance in the portfolio. Accordingly, the objective function should shift from maximizing assets relative to portfolio volatility to a strategy that maximizes the surplus in context of the volatility of the surplus.

\* 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.

No matter the “risk tolerance” of the individual, investing funds earmarked for a grandchild’s college tuition in a moderate portfolio makes very little sense if the check is due at the bursar’s office in six months but might be perfectly rational if college is still seven years away. The same can be said, as many investors unfortunately realized in 2008, about holding money needed for the next two years of living expenses in an aggressive portfolio or illiquid assets.

Probability of loss in any asset or portfolio is dependent on time horizon, which means time horizon should have an impact on the appropriate investment portfolio (see Fig. 4). The probability of loss when holding cash is near-zero over short periods, like one year. The same cannot be said about equities. Over the last 90 years, equity holders have lost money (sometimes significant amounts) one-fifth of the time over one-year periods. Cash is safer than equities for short-term investors.

Conversely, the conclusions change over decade-long holding periods. Equity investors have lost money, net of inflation, only about 10% of the time when they’ve held it for at least 10 years. Cash has actually declined in value 22% of the time when held for 10 years or more. Over 20-year periods US equity investors have always experienced positive inflation-adjusted returns. The worst

20-year returns for US stocks are nearly as good as the best 20-year returns for cash. Time horizon matters a great deal, and liability-driven optimization intuitively drives dynamic decisions that take all of these factors into account.

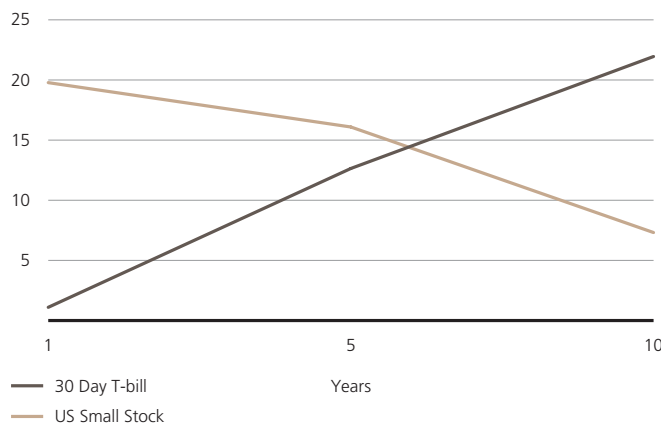
Of course, individuals and families are not pensions. Many individual investors are overfunded in regard to future lifetime spending and don’t need to utilize a liability-driven approach for the entirety of their assets. Asset segmentation is a viable solution. In the 3L framework, the Liquidity and Longevity strategies work together to form a LDI strategy, and the household’s surplus assets are held separately in the Legacy strategy.

**The endowment model**

The endowment model is an investment process, popularized by the Yale University endowment, among others, that embraces value orientation, illiquidity, and an opportunistic approach as drivers of superior long-term investment returns. The Legacy strategy leverages this model—adjusted accordingly for taxable investors—as a way to achieve superior long-term after-tax performance. We discuss portfolio management for the Legacy strategy further on **page 18**.

**Fig. 4: Cash is safer in the short run, but equities are safer in the long run**

Probability (vertical axis) of an inflation-adjusted 5% or greater loss for various time periods (horizontal axis), in %



Source: Morningstar Direct, UBS, as of 31 December 2016

\* 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.



## Behavioral finance

In finance and economics, we assume that individuals and investors behave rationally, as modeled by mathematicians and economists. But the reality is very different. Information and anticipation of future market performance produce strong emotional reactions (see Fig. 5). The excitement and subsequent fear of loss can drastically change investors' short-term willingness to allocate their assets effectively—often at the expense of long-term goals.

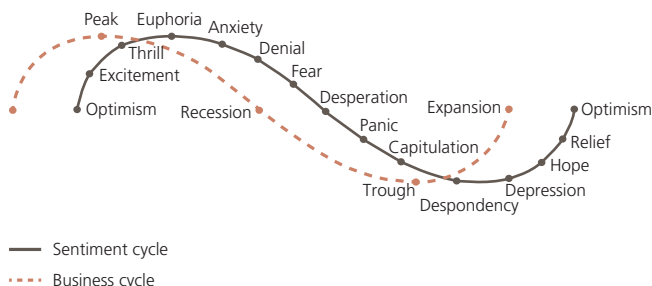
For example, fear of a market downturn can cause investors to become risk-averse and to de-risk during times when they should be invested. On the other hand, anxiety associated with selling losses, as well as the regret that comes with acknowledging a potential investment mistake, causes investors to freeze and to hold on to a losing position instead of reinvesting in a better alternative. A point of panic comes next as they realize that they need to act, but rather than buying at a discount, they sell.

Similarly, given sustained positive performance, some investors get excited by small gains and sell too soon—this is called the disposition effect. For others, greed and overconfidence take over, and many investors frequently have a hard time selling assets that have outperformed and instead choose to add risk to their portfolios. Examples might be investors adding exposure to technology in December 1999, adding exposure to financial services in October 2007, and selling equity exposure in March 2009. Emotions overruled logic and facts and led to underperformance.

Since our risk preferences can change over time, the 3L approach helps avoid costly mental mistakes, especially during the most difficult market environments, by providing the comfort that assets earmarked for short-term spending needs are insulated from

**Fig. 5: Investor emotions often drive counterproductive actions**

Illustrative investor sentiment cycle



Source: Fisher, G. S. (2014) *Advising the Behavioral Investor: Lessons from the Real World*, in *Investor Behavior: The Psychology of Financial Planning and Investing* (eds H. K. Baker and V. Ricciardi), John Wiley & Sons, Inc., Hoboken, NJ, USA.

market risk. The Liquidity strategy, which is sized to help meet the next 2 to 5 years of spending needs, and contains financial assets that are more stable during bear markets. This helps investors maintain focus, secure in the knowledge that their Longevity and Legacy strategy—invested for long-term growth—won't be utilized for many years. During market downturns, where most poor investment decisions are made, this comfort is invaluable, but also has tangible benefits by increasing probability that investment discipline is maintained during periods of market, macro, and geopolitical stress.

In addition, the 3L framework aims to turn behavioral biases from an obstacle into an advantage. For example, mental accounting describes a tendency that leads people to segment their assets and spending goals into distinct parts and treat those parts differently without thinking of the whole. This proclivity can lead to suboptimal decision-making, such as holding a credit card balance at a 15% interest rate when this could be paid off by an investment that yields 2%. The 3L framework takes advantage of this segmenting inclination by separating assets to help meet specific spending objectives. The result is an intuitive investment strategy that creates a clear connection between assets and the objectives for those assets.

\* 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.

### Holistic balance sheet approach

Traditional balance sheets include the tangible assets and liabilities of a household. Assets might include real estate, retirement accounts, partnership interests, brokerage accounts, a pension, and Social Security. Liabilities tend to be limited to outstanding obligations: A mortgage, securities-backed lending (SBL), student loans, and other types of debt.

In addition to tangible assets, individuals and households have intangible assets and liabilities that can be included on a holistic balance sheet to provide a more complete picture of the household’s financial situation (see Fig. 6).

An extraordinarily important intangible asset is human capital. Objectively, a 30-year-old newly minted surgeon is wealthier than a 30-year-old without post-high-school education or stable employment. Although it is difficult to quantify human capital with a high level of precision, understanding and accounting for general risk attributes and balance sheet impact of human capital can drive better allocation decisions—like purchasing disability insurance to hedge human capital during a career.<sup>5</sup>

Liabilities can also be expanded to include future spending objectives, like a second home purchase, a child or grandchild’s education, and retirement spending. Such spending is a future liability for the household, similar to mortgage payments or other debt. The 3L framework also allows families to clearly see how they are using liabilities, like mortgages and securities-backed loans, to accomplish their objectives. Examples might be a SBL utilized as a Liquidity asset to cover an unexpected expense that would otherwise have required selling investment assets and realizing otherwise deferrable taxes; or a mortgage in the Longevity strategy to enable a family to purchase their primary residence; or a mortgage used to more efficiently purchase a Legacy asset, like a vacation home that’s intended to be part of a bequest.

Once the full balance sheet has been composed, comparing assets to liabilities provides important information. If assets exceed liabilities, the household has a surplus, or margin of safety, in excess of liabilities. If liabilities exceed assets, the deficit should be addressed by finding a way to increase assets, reduce planned spending, or modify the investment strategy.

**Fig. 6: Balance sheets include tangible and intangible assets and liabilities**

Holistic balance sheet pre- and post-retirement

Pre-retirement		Post-retirement	
Total Assets	Total Liabilities	Total Assets	Total Liabilities
<b>Liquidity</b> 5%	<b>Liquidity</b>	<b>Liquidity</b> 10%	<b>Liquidity</b>
Emergency fund (cash)	Securities-backed loan	Emergency fund (cash)	Private equity capital calls
		Bond ladder (3 years)	Retirement expenses (3 years)
		Social Security income	Healthcare expenses (3 years)
		Pension income	Securities-backed loan
<b>Longevity</b> 85%	<b>Longevity</b>	<b>Longevity</b> 70%	<b>Longevity</b>
Growth portfolio	Mortgage	Growth portfolio	Retirement spending needs
529 Account	Student loans	LTC policy	Healthcare needs in retirement
Disability insurance	Retirement spending needs	Social Security	LTC needs
Social Security	Healthcare needs in retirement	Pension	Grandchildren’s college
Pension	Future LTC needs	Annuity	
Annuity	Children’s college	Personal residence	
Personal residence			
Human capital			
<b>Legacy</b> 10%	<b>Legacy</b>	<b>Legacy</b> 20%	<b>Legacy</b>
Life insurance		Life insurance	Loan for childrens’ homes
Aggressive portfolio		Aggressive portfolio	Mortgage on beach home
		Beach house	Irrevocable bequest pledges
		Concentrated stock	Planned giving
		Donor advised fund	Estate tax

Source: UBS

\* 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.

# Benefits of the 3L approach

## 1 Shows improved performance relative to other approaches

A fundamental benefit of the 3L approach is that it helps an investor select the right asset allocation strategy—at the right time. Although selecting the right asset allocation might sound trivial, it’s not. For instance, investors frequently don’t account for assets like human capital or Social Security when allocating to fixed income and therefore hold suboptimal portfolios.

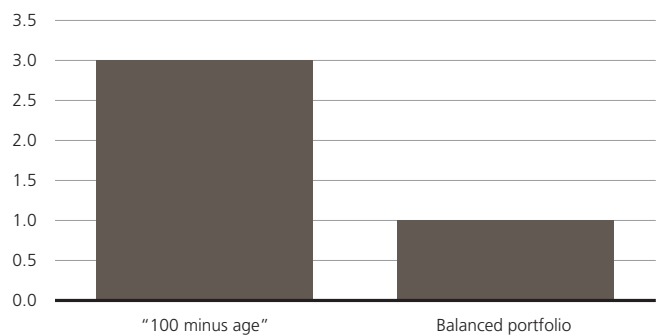
The impact is real: We estimate increasing the equity portion of a portfolio by just 10 percentage points, relative to fixed income, could lead to an increased average return of 0.5% annually. Of course, risk has to be managed appropriately—an additional 0.5% per year isn’t worthwhile if it subjects a household to sequence risk at the start of retirement. Sequence risk refers to the risk that highly negative returns at the beginning of retirement will derail the remainder of the retirement plan and put the family at risk of running out of money. That’s one reason why the 3Ls work so well. The strategy naturally adjusts over the life cycle to increase or decrease risk as appropriate.

We used Monte Carlo analysis to compare two common allocation strategies to the 3Ls for a 45-year-old couple: (1) a static balanced portfolio strategy and (2) a “100 minus your age” strategy. A Monte Carlo analysis provides a simulation of investment returns, contributions, and withdrawals that mimics what an investor might experience over years and decades. Monte Carlo simulations are a vital part of investment planning, because they allow us to account for investment return variability, providing a better assessment of investment success probability across a number of different market environments.

We found the 3L approach leads to an increase in risk-adjusted outperformance of about 1% annually when compared to a static balanced portfolio. Performance relative to a “100 minus age” strategy is even more significant—over 3% per year on average, mainly because using a “100 minus age” strategy leads to holding far-too-conservative portfolios once the couple reaches their 50s and 60s (see Fig. 7).

**Fig. 7: The 3L approach shows more favorable outcomes relative to other strategies**

Simulated equivalent alpha for 3L, in %



Note: Outcomes simulated for scenarios described in the text. Equivalent alpha is a net present value metric that estimates the annual outperformance necessary to match the 3L strategy on a net present value basis. '100 minus age' is an adage that suggests investor's annually adjust their asset allocation to stocks so that it's equal to 100 minus their age. For example, a 65-year-old would have (100-65) 35% of their portfolio in stocks. The 'Balanced portfolio' assumes a constant 60% stock / 40% bond allocation, regardless of age or stage in life.

Source: UBS, as of 1 August 2017

The primary reason that the 3L approach typically outperforms is because other strategies don't effectively address the financial decisions that are embedded in a family's goals and objectives (e.g., lifetime spending). Little or no distinction is made between the assets that are intended to be used today (e.g., near-term) and the assets that are intended to be used in 10- 20- or 30-years (certainly not the assets that are unlikely to ever be used during their lifetime). The various purposes for financial assets becomes homogenized and abstract. As a result, the investment and allocation decisions are misaligned with the family's objectives and capacity for risk which, in turn, produces suboptimal portfolios across time.

\* 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.

## 2 Segmenting helps manage through bear markets

Most investors hate equity bear markets, but a bear market during a working career tends to be an important opportunity to invest at a lower price point. Bear markets are emotionally difficult, but highly accretive to long-term wealth.

Retirees, and portfolio managers for retirees, have a more difficult challenge. By definition, retirees don't have labor market income to add to their portfolios during a bear market. They are doing the opposite—relying on their portfolios for income. A bear market early in retirement, coupled with portfolio distributions, can lead to sequence risk.

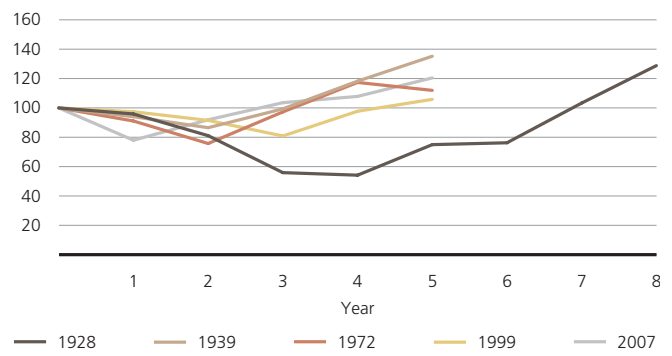
Investors have faced five multi-year US equity market declines in the last 90 years. Those declines started in 1928, 1939, 1972, 1999, and 2007. The Great Depression-era decline that started in 1928 was far and away the worst. A growth portfolio comprising 30% US Treasuries and 70% US equities declined by half and didn't fully recover for seven years. The declines of 1939, 1972, 1999, and 2007 were smaller in magnitude, but still resulted in portfolio drawdowns of 20–30% and took three to four years to reach full recovery (see Fig. 8).

The tech crash that started in 2000 posed the most recent example of sequence risk for investors. Assuming a 60/40 stock/bond portfolio and an initial 5% inflation-adjusted distribution, 1999 retirees' portfolios have dropped to half of their original values, and absent any spending cuts those retirees are now taking 13% withdrawals per year (see Fig. 9).

The 3L approach helps prevent sequence risk by enabling investors to spend out of their Liquidity strategy during drawdowns. By spending Liquidity assets, investors can allow risk assets held in their Longevity strategy time to recover before having to sell them for spending needs. Looking back over the last 80 years, our analysis indicates the 3L strategy would have added an average of 0.25% in annual alpha during each bear market cycle.

**Fig. 8: Most equity market sell-offs recover in less than four years**

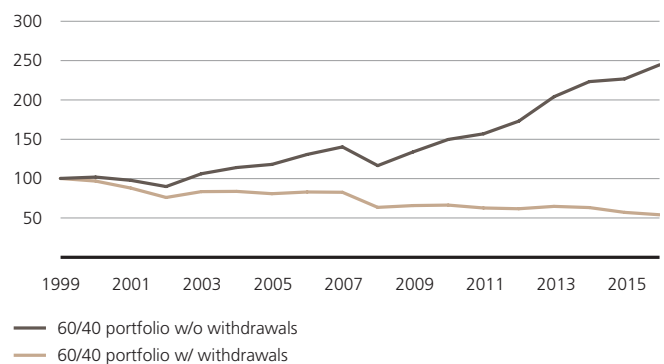
Drawdowns and recovery periods (years) for multi-year US equity market corrections



Source: Morningstar, UBS as of 31 December 2016.

**Fig. 9: 1999 retiree's portfolios experienced negative sequence risk**

Hypothetical portfolios, 1999–2016



Source: Morningstar, UBS as of 31 December 2016.

\* 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.

### 3 Focus on tax efficiency is key

---

From a portfolio management standpoint, one of the most important factors is tax awareness. High pre-tax returns can look much worse after taxes are paid, and the US tax code provides opportunities to produce alpha by segmenting Legacy assets from assets a family will use during their lifetimes.

For instance, under current tax law, beneficiaries receive a step-up in cost basis when they inherit Legacy assets. The “step-up” means that beneficiaries inherit the assets with a basis that represents the value at which they receive the assets, instead of the basis at which the assets were originally purchased. The embedded tax obligation effectively disappears at the time of transfer.

Actively managed mutual funds create tax burdens of about 1% per year for investors, making them inappropriate for use in the Legacy strategy. Assets in the Legacy strategy should be invested in a way that defers taxes as long as possible and allows the investor to maintain control over when taxes are incurred. Therefore, single-stock positions, exchange traded funds (ETFs) and separately managed accounts tend to provide a good deal of after-tax alpha vs. actively managed mutual funds. Our estimate of total after-tax alpha, proactively managed, is about 1.5% per year, broken into a 1% gain from avoiding costly turnover in active management and another 0.50% from proactively harvesting losses in order to defer gains.

\* 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.

## 4 Applying behavioral finance can help achieve better performance

---

One of the best-known investors of the last century, Benjamin Graham, observed that “The investor’s chief problem—and even his worst enemy—is likely to be himself.” Investors overtrade, chase returns, panic, and generally buy high and sell low—resulting in underperformance.

For instance, in “Trading is Hazardous to your Wealth,”<sup>6</sup> Brad Barber and Terrance Odean found average households turned over 75% of their equity portfolios annually and underperformed by 1.5% per year. Our own work, focused on the buy-sell behavior of mutual fund investors, found average underperformance of 0.9% per year for core equity fund investors, compared to the performance of the fund itself, between April 2007 and March 2016. To be clear, the 0.9% underperformance is due entirely to mis-timing when to buy and sell a specific fund, not the underlying performance of the fund itself. While some researchers believe the behavioral gap to be much larger, our approach uses a conservative methodology that accounts for timing and the magnitude of flows.

One way of minimizing risk related to costly emotional behavior is to establish a disciplined investment approach such as rebalancing. While selling top-performing asset classes and buying worse-performing can be counterintuitive, establishing a disciplined rebalancing approach within the 3L framework can add an additional 0.8% alpha on an annual basis.

The 3L framework isn’t a panacea for solving our own emotional biases, but it does provide a concrete framework for decision-making that investors can fall back on during times of market stress and distress. By embedding major financial decisions in the family’s specific goals and objectives, instead of trying to time markets, the framework provides a guidance for action during difficult periods.

\* 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.



# Managing the 3L strategies

The final part of this report provides an in-depth discussion regarding how to allocate and manage the Liquidity. Longevity. Legacy. strategies. The difference between implementing strategies correctly vs. incorrectly can be substantial in regard to meeting objectives and after-tax net worth.

## You, your family, and the lives of others

Your goals should form the basis of nearly all investment and estate-planning decisions. Developing and updating your goals requires the deliberate action of asking yourself what your desired lifestyle includes and how you want to improve the lives of others. Some goals, like to update and sell your home, pay for college, or contribute to charity are easy to recognize. Other goals, like ensuring potential health issues don't burden your children, can be more obscure.

Identifying your goals and objectives, no matter their clarity, is like marking points on a map. It's a necessity for planning a meaningful path forward. The 3L approach uses those points to allocate and manage your assets and resources effectively—throughout time—in order to reduce the role of luck in your investment success and help you make better decisions.

\* 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.

# 1 The Liquidity strategy

The Liquidity strategy contains assets and resources to help meet the next 2 to 5 years of spending.

<b>Purpose</b>	Provide assets and resources for the next 2–5 years of spending needs
<b>Sizing</b>	Net present value of spending target
<b>Discount rate</b>	Currently near zero
<b>Assets and resources</b>	Cash, cash equivalents, high-quality fixed income, salary/wage income, Social Security income, pension income, and annuity income

The Liquidity strategy contains the assets that a family plans to use to meet near-term spending objectives. This strategy is a replacement for outside income. Investors don’t need to hold investment assets in the Liquidity strategy—absent an emergency fund—if they have labor market income that meets day-to-day spending needs. In general, families will not utilize a Liquidity strategy in a meaningful way until retirement. In retirement, the investment portion of a Liquidity investment assets in the Liquidity strategy should be sized to provide spending in excess of income from pensions, annuities, Social Security, and similar sources of income.

We generally recommend a three-year Liquidity strategy coupled with a growth portfolio in the Longevity strategy, but the correct sizing of the Liquidity strategy will depend on the risk taken in the Longevity strategy. As discussed in the *Segmenting helps manage through bear markets* section, we want the Liquidity strategy to be sufficiently sized to reduce the impact of sequence risk during a bear market. Generally speaking, investors holding a conservative or moderately conservative portfolio in their Longevity strategy should consider targeting two years of spending needs in the Liquidity strategy; investors holding a moderate or moderately aggressive portfolio in their Longevity strategy should consider targeting three years of spending needs in their Liquidity strategy; and investors holding an aggressive portfolio in their Longevity strategy should consider targeting four years of spending needs in the Liquidity strategy.

\* 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.

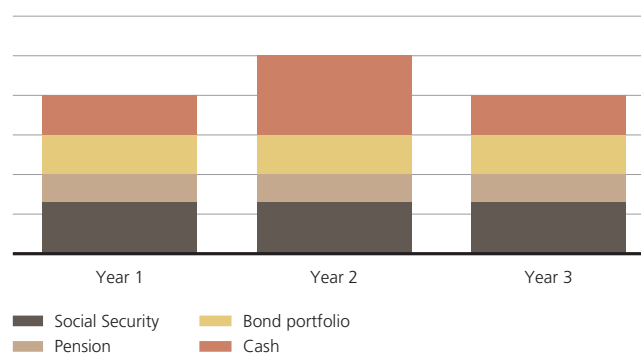
In a low interest rate environment, investors will need to fund the Liquidity strategy with nearly the full dollar amount of spending needs. But even though the Liquidity strategy will have a low rate of return, it serves a very important purpose in providing a stable source of income for the family as well as the comfort level for holding more risk in other portfolios. The Longevity strategy is responsible for providing growth. Muddling those objectives together results in suboptimal allocations, so we recommend avoiding higher-risk, higher-return investments in the Liquidity portfolio.

Our preferred way to construct the Liquidity strategy is to hold one year of cash coupled with a three-year bond ladder that has been sized to provide assets needed for spending as the bonds mature (see Fig. 10). Taxable investors should consider using municipal bonds, whereas investors with assets in tax-deferred accounts should construct the ladder with taxable fixed income.

Defined-maturity bond mutual funds and exchange traded funds offer an alternative for investors who don't want to manage a portfolio of individual bonds.<sup>7</sup> These funds are explicitly designed with a target maturity date, which enables an investor to build a diversified bond ladder through the purchase of a limited number of funds. For instance, an investor could purchase 2018, 2019, and 2020 defined-maturity funds in order to provide assets for spending in 2018-2020.

**Fig. 10: Liquidity assets should match planned spending**

Hypothetical spending, by source of income, over three years



Source: UBS

Defined-maturity bond funds offer the benefit of simplicity, but there are notable drawbacks. For instance, investors in bond funds cannot match more flexibility around portfolio characteristics and the timing of cash flows available in a custom-built bond ladder. On the other hand, it can be hard to achieve sufficient diversification through individual bond purchases without a large asset pool. Bond funds provide an effective way to help achieve that diversification. These trade-offs should be considered when deciding on implementation.

Bond ladders are not the only way to create a Liquidity strategy. The most important criteria are that the assets are liquid and have a high degree of price stability. Although it can be tempting to allow "yield creep" into riskier investments, a Liquidity strategy has a purpose—to match income and safe assets to spending needs—and should be managed with that objective in mind.

\* 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.

## 2 The Longevity strategy

The Longevity strategy contains the assets and resources for the family's lifetime goals and objectives.

<b>Purpose</b>	Provide assets and resources for lifetime spending needs (for the years beyond the Liquidity strategy)
<b>Sizing</b>	Net present value of estimated lifetime spending or through a simulation approach that calculates the value necessary for a high probability of success
<b>Discount rate</b>	1–5%
<b>Approach</b>	Multi-asset class growth portfolio. Assets include pensions, Social Security, disability insurance, and long-term care insurance

The Longevity strategy holds a growth portfolio that contains the assets the family plans to use for lifetime living expenses. The sizing of this portfolio is based on those expected expenditures, which means a family who spends USD 50,000 per year will hold a smaller Longevity strategy than a family that spends USD 500,000 per year; an 80-year-old will typically have a smaller Longevity strategy than a recently retired 60-year-old.

Because the objective of the Longevity strategy is long-term growth, a moderately aggressive allocation is typically appropriate. However, some investors will choose to hold more- or less-risky portfolios in their Longevity strategy. There are tradeoffs. A more-conservative Longevity strategy essentially means the family will need to dedicate more assets to their lifetime spending needs,

whereas a more-aggressive portfolio increases the chance of a sustained drawdown. Our analysis finds that a well-diversified, moderately aggressive growth portfolio balances these various risks when coupled with an appropriately sized Liquidity strategy.

Prior to retirement, an investor might have nearly all of his or her assets invested in the Longevity strategy. Closer to retirement and at the start of retirement, the combination of the Liquidity strategy and Longevity strategy will typically result in a balanced allocation overall, which is appropriate for mitigating sequence risk. Due to the importance of avoiding sequence risk, investment strategies and products that are designed to reduce downside capture are also good candidates for the Longevity strategy.

\* 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.

From an asset allocation standpoint, cash or short-duration fixed income generally do not help to achieve the goal of the Longevity strategy. Cash and short-duration bonds are risky for long-term investors, just as long-duration bonds are risky for short-term investors. Although long-duration bonds have high short-term price volatility, investors have a high degree of certainty in regard to the purchasing power that a long-duration inflation-linked bond will offer at some point in the future. The same cannot be said about a long-term position in cash.

For example, in 2006, USD 1mn in cash would have purchased roughly USD 47,000 of income for an investor in the Treasury market. Presently, that same USD 1mn in cash will only purchase about USD 23,000 in annual income due to lower interest rates (**see Fig. 11**). Holding cash—and waiting to buy bonds—in 2006 was a very risky strategy for an investor who needed USD 50,000 of income in 2017.

Equally important, Longevity strategy is designed to include non-tradable assets, like human capital, Social Security, pensions, long-term care policies, disability policies, residential real estate, and any other assets that will provide for the future well-being of the family during their lifetimes.

**Fig. 11: The income-potential of USD 1mn has declined dramatically**



Source: Bloomberg, UBS as of 31 December 2016

\* 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.

# 3 The Legacy strategy

The Legacy strategy represents a family's surplus.

<b>Purpose</b>	Bequests, philanthropy, and other legacy or estate planning purposes
<b>Sizing</b>	Assets in excess of what the family needs for achieving lifetime goals
<b>Discount rate</b>	n/a
<b>Approach</b>	Modified endowment model, value orientation with illiquidity premium

The Legacy strategy represents a family's surplus. Once the Liquidity and Longevity strategies are fully funded, excess assets are segregated into a Legacy strategy. There are important reasons for this segmentation, many of which are both behavioral and investment related.

Importantly, the Legacy segmentation provides clarity in regard to how wealth is going to be utilized. It enables a family to look at its balance sheet and know, with a high degree of confidence, that the Liquidity and Longevity strategies contain the assets that the family will need for the remainder of their lifetimes. This viewpoint is important because it alters the investor's mindset when it comes to thinking about risk in the Legacy strategy. Instead of day-to-day volatility, which has very little relevance in a portfolio that is intended to grow for years or decades, the investor can focus on patient strategies that offer long-term superior after-tax performance.

As discussed in the Legacy tax alpha section, one of the most important factors in a Legacy strategy is tax-awareness and effective intergenerational transfer. Accounting for the tax hurdle, how should the Legacy strategy be allocated? We can follow the lead of successful university endowments in this regard, but we have to adjust their strategies for tax consequences.<sup>8</sup> The average university endowment holds an aggressive portfolio with a large allocation to illiquid assets (e.g., hedge funds, private equity, and private real estate). Many endowments are also fairly active in regard to managing their public equity portfolios.

\* 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.



Taxable investors need to modify the traditional endowment strategy to focus on assets that prioritize unrealized gains vs. realized gains and, when realized gains are unavoidable, long-term capital gains instead of short-term capital gains since the latter are taxed at a higher rate. Pre-tax returns can look much worse after-taxes (see Fig. 12). In general, the resultant tax-adjusted asset allocation predominantly comprises a blend of municipal bonds, tax-advantaged or indexed public equity, private equity, and private real estate. The appropriateness of assets like natural resources depends to a large extent on the tax implications of the ownership structure.

This allocation guidance notwithstanding, many families will find their Legacy strategy populated by multiple structures (e.g., donor-advised funds, trusts, private foundations, privately held businesses, etc.) that have specific objectives and divergent investment strategies that are best suited for the particular trust. Please see “Executive Decision: Planning in the Context of Goals-Based Wealth Management” for more information around estate planning within the 3L framework.

**Fig. 12: High returns can look much worse after taxes**

Fifteen-year total return and tax cost ratios, in %

Asset class	Annualized total return	Tax cost ratio	Post-tax return
Municipal high-yield	4.39	0.00	4.38
Municipal national intermediate	3.68	0.04	3.56
US Large-cap blend	8.42	0.82	6.70
Real estate	9.99	1.66	7.69
Corporate bond	5.47	1.67	3.52
Emerging markets bond	9.57	2.45	6.56
High yield bond	7.83	2.55	4.97

\*Morningstar calculates the tax cost ratio in-house on a monthly basis, using load-adjusted and tax-adjusted returns for different time periods. The “tax cost ratio” measures how much a fund’s annualized return is reduced by the taxes investors pay on distributions.

Source: Morningstar Direct, UBS, as of 10 August 2017

\* 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.

# Conclusion

Based on our analysis and observation, we believe that the Liquidity. Longevity. Legacy. approach is highly effective for managing family wealth. We've made a technical and behavioral case for the approach in this report, but our practical experience has provided additional evidence.

Over the last 36 months, we've advised and educated hundreds of families on the 3L approach. The results are promising. By adopting the framework, many investors have realized that their Legacy strategy, previously undefined, deserved the bulk of their attention. Other investors made changes to their asset allocations to better align their investments with their objectives.

Ultimately, our goal is straightforward: To help families understand how their assets can best be used to meet their objectives. It's a purpose-driven approach to wealth management. What should you do to maintain your current lifestyle? What should you do to improve your lifestyle? What should you do to improve the lives of others? The 3L approach provides the answers to those questions.

\* 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.

# Bibliography and related reading

Babylonian Talmud: Tractate Baba Mezi'a, folio 42a.

Baredes, Matthew and Michael Crook. "Frequently Asked Questions about Liability Driven Investing." Investment Strategy Insights, UBS, 2014.

Blanchett, David and P. Kaplan. "Alpha, Beta, and Now... Gamma." The Journal of Retirement, Vol. 1, No. 2 (2013), pp. 29-45.

Blanchett, David, and Philip Straehl. "No Portfolio is an Island." Financial Analysts Journal, Vol. 71, No. 3 (May/June 2015), pp. 15-33.

Chhabra, Ashvin B. "Beyond Markowitz: A Comprehensive Wealth Allocation Framework for Individual Investors." The Journal of Wealth Management, Vol. 7, No. 4 (2005), pp. 8-34. Available at SSRN: <http://ssrn.com/abstract=925138>.

DeMiguel, V., L. Garlappi and R. Uppal. "Optimal versus naïve diversification: how inefficient is the 1/N portfolio strategy?" Review of Financial Studies, Vol. 22, No. 5 (2008), pp. 1915-1953.

Dichev, Iliya. "What are stock investors' actual historical returns? Evidence from dollar-weighted returns." American Economic Review, Vol. 97, No. 1 (2007), pp. 386-401.

Graham, Benjamin and David Dodd. *The Intelligent Investor*. New York, NY: Harper & Brothers, 1949.

Huggert, Mark and Greg Kaplan. "How large is the stock component of human capital?" NBER Working Paper No. 21238, 2015.

Ibbotson, R., M.A. Milevsky, P. Chen, and K. Zhu. "Lifetime Financial Advice: Human Capital, Asset Allocation and Insurance." The Research Foundation of the CFA Institute, 2007.

Leibowitz, Martin L. "Pension Asset Allocation Through Surplus Management." Financial Analysts Journal, Vol. 43, No. 2 (March/April 1987), pp. 29-40.

Leibowitz, Martin L., and Roy D. Henriksson. "Portfolio Optimization Within a Surplus Framework." Financial Analysts Journal, Vol. 44, No. 2 (March/April 1988), pp. 43-51.

Markowitz, H. M. "Portfolio selection," The Journal of Finance, Vol. 7, No. 1 (1952), pp. 77-91.

Milevsky, Moshe. Are You a Stock or a Bond? Identify Your Own Human Capital for a Secure Financial Future, 2nd ed. Upper Saddle River, NJ: FT Press, 2013.

Pfau, Wade D., and Michael E. Kitces. "Reducing Retirement Risk with a Rising Equity Glide Path." Journal of Financial Planning, Vol. 27, No. 1 (2014), pp. 38-45.

Sharpe, William F., and Lawrence G. Tint. "Liabilities: A New Approach." Journal of Portfolio Management, Vol. 16, No. 2 (1990), pp. 5-10.

Sharpe, William F. "Budgeting and Monitoring Pension Fund Risk." Financial Analysts Journal, Vol. 58, No. 5 (September/October 2002), pp. 74-86

Thaler, Richard. "Mental Accounting Matters." Journal of Behavioral Decision Making, Vol. 12, No. 3 (1999), pp. 183-206.

Tversky, Amos and Daniel Kahneman. "Loss aversion in riskless choice: a reference-dependent model." The Quarterly Journal of Economics, Vol. 106, No. 4 (1991), pp 1039-1061.

Waring, M. Barton. "Liability-Relative Investing: Be Dual-Duration Matched and on the Surplus Efficient Frontier." Journal of Portfolio Management, Vol. 30, No. 4 (2004), pp. 8-20.

Waring, M. Barton. "Liability-Relative Investing II." Journal of Portfolio Management, Vol. 31, No. 1 (2004), pp. 40-53.

# Endnotes

- 1 Your Wealth & Life: Goals-Based Wealth Management, Q1, 2015.
- 2 Crook, Michael. "Total Wealth Allocation: Liquidity, Longevity, and Legacy," *The Journal of Wealth Management*, Winter 2015, Vol. 18, No. 3: pp. 18-26 DOI: 10.3905/jwm.2015.18.3.018
- 3 DeMiguel V., L. Garlappi and R. Uppal (2008), Optimal versus naïve diversification: how inefficient is the 1/N portfolio strategy?, *Review of Financial Studies*, 1915-1953
- 4 Leibowitz (1987), Leibowitz, Martin L, and Henriksson (1988), Sharpe and Tint (1990) are important foundational articles. More recently, Waring (2004a) and Waring (2004b) are fully-developed explorations of liability relative allocation policies for pension funds.
- 5 Ibbotson et al (2007), Milevsky (2012), Blanchett and Straehl (2015) and Huggett and Kaplan (2015) provide a good background in regard to quantifying the size and characteristics of human capital.
- 6 Barber, Brad M., and Terrance Odean, 2000, Trading is hazardous to your wealth: The common stock investment performance of individual investors, *Journal of Finance* 55, 773–806.
- 7 For more information see Perlman, David. "Exchange-traded funds: Target maturity ETFs," UBS WMA, February 13, 2015.
- 8 Geddes, Patrick and Goldberg, Lisa R. and Bianchi, Stephen W., "What Would Yale Do If It Were Taxable?" (June 8, 2014). *Financial Analysts Journal*, Vol. 71, No. 4, 2015. Available at SSRN: <http://ssrn.com/abstract=2447403> or <http://dx.doi.org/10.2139/ssrn.2447403>

# Disclaimer

## **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.

## **Disclaimer**

Research publications from Chief Investment Office Global Wealth Management, formerly known as CIO Americas, Wealth Management, are published by UBS Global Wealth Management, a Business Division of UBS AG or an affiliate thereof (collectively, UBS). In certain countries UBS AG is referred to as UBS SA. 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. We recommend that you obtain financial and/or tax advice as to the implications (including tax) of investing in the manner described or in any of the products mentioned herein. 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 prices indicated are current only 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. 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 considered risky. Past performance of an investment is no guarantee for its future performance. 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 FX rates may have an adverse effect on the price, value or income of an investment. This report is for distribution only under such circumstances as may be permitted by applicable law.

Distributed to US persons by UBS Financial Services Inc. or UBS Securities LLC, subsidiaries of UBS AG. UBS Switzerland AG, UBS Deutschland AG, 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. UBS specifically prohibits the redistribution or reproduction of this material in whole or in part without the prior written permission of UBS. UBS accepts no liability whatsoever for any redistribution of this document or its contents by third parties.

Version as per April 2018.

© UBS 2018. The key symbol and UBS are among the registered and unregistered trademarks of UBS. All rights reserved.

## Publication details

### **Publisher**

UBS Financial Services Inc.  
CIO Americas, Wealth Management  
1285 Avenue of the Americas, 20th Floor  
New York, NY 10019

This report was originally published on 13 September 2017  
and updated on 21 August 2018.

### **Editor in chief**

Michael Crook

### **Primary authors**

Michael Crook

### **Editors**

Kate Hazelwood

### **Contributors**

(in alphabetical order)

Svetlana Gherzi  
Jeff LeForge  
Mike Ryan  
Ronald Sutedja

### **Project management**

John Collura  
Paul Leeming  
Matt Siegel

### **Report design**

Candice Stern

### **Graphics support**

Cognizant Group – Basavaraj Gudihal,  
Srinivas Addugula, Pavan Mekala  
and Virender Negi



