INVESTMENTNEWSLETTER

> It will soon be the 10-year anniversary of when, in early October 2007, the S&P 500 Index hit what was its highest point before losing more than half its value over the next year and a half during the global financial crisis.

LESSONS FOR THE NEXT CRISIS

SEPTEMBER 2017
Dimensional Fund Advisors

Over the coming weeks and months, as other anniversaries of major crisis-related events pass (for example, 10 years since the bank run on Northern Rock or 10 years since the collapse of Lehman Brothers), there will likely be a steady stream of retrospectives on what happened as well as opinions on how the environment today may be similar or different from the period leading up to the crisis. It is difficult to draw useful conclusions based on such observations; financial markets have a habit of behaving unpredictably in the short run. There are, however, important lessons that investors might be well-served to remember: Capital markets have rewarded investors over the long term, and having an investment approach you can stick with—especially during tough times—may better prepare you for the next crisis and its aftermath.

BENEFITS OF HINDSIGHT

In 2008, the stock market dropped in value by almost half. Being a decade removed from the crisis may make it easier to take the past in stride. The eventual rebound and subsequent years of double-digit gains have also likely helped in this regard. While the events of the crisis were unfolding, however, a future of this sort looked anything but certain. Headlines such as "Worst Crisis Since '30s, With No End Yet in Sight,"[1] "Markets in Disarray as Lending Locks Up,"[2] and "For Stocks, Worst Single-Day Drop in Two Decades"[3] were common front page news. Reading the news, opening up quarterly statements, or going online to check an account balance were, for many, stomach-churning experiences.

While being an investor today (or during any period, for that matter), is by no means a worry-free experience, the feelings of panic and dread felt by many during the financial crisis were distinctly acute. Many investors reacted emotionally to these developments. In the heat of the moment, some decided it was more than they could stomach, so they sold out of stocks. On the other hand, many who were able to stay the course and stick to their approach recovered from the crisis and benefited from the subsequent rebound in markets.

It is important to remember that this crisis and the subsequent recovery in financial markets was not the first time in history that periods of substantial volatility have occurred. Exhibit 1 helps illustrate this point. The exhibit shows the performance of a balanced investment strategy following several crises, including the bankruptcy of Lehman Brothers in September of 2008, which took place in the middle of the financial crisis. Each event is labeled with the month and year that it occurred or peaked.

Although a globally diversified balanced investment strategy invested at the time of each event would have suffered losses immediately following most of these events, financial markets did recover, as can be seen by the three- and five-year cumulative returns shown in the exhibit. In advance of such periods of discomfort, having a long-term perspective, appropriate diversification, and an asset allocation that aligns with their risk tolerance and goals can help investors remain disciplined enough to ride out the storm. A financial advisor can play a critical role in helping to work through these issues and in counseling investors when things look their darkest.

Canandaigua National Bank & Trust

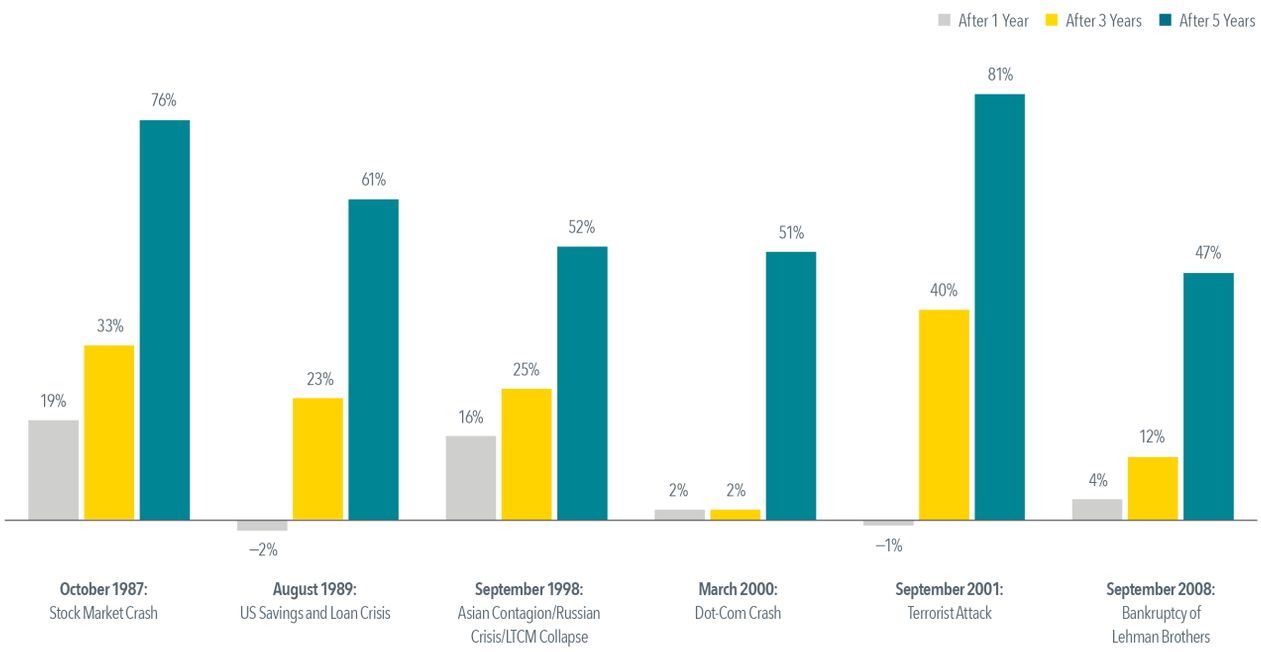
1 wsj.com/articles/SB122169431617549947.
2 washingtonpost.com/wp-dyn/content/article/2008/09/17/AR2008091700707.html.
3 nytimes.com/2008/09/30/business/30markets.html.

CONCLUSION

In the mind of some investors, there is always a "crisis of the day" or potential major event looming that could mean the beginning of the next drop in markets. As we know, predicting future events correctly, or how the market will react to future events, is a difficult exercise. It is important to understand, however, that market volatility is a part of investing. To enjoy the benefit of higher potential returns, investors must be willing to accept increased uncertainty. A key part of a good long-term investment experience is being able to stay with your investment philosophy, even during tough times. A well-thought-out, transparent investment approach can help people be better prepared to face uncertainty and may improve their ability to stick with their plan and ultimately capture the long-term returns of capital markets.

Exhibit 1. The Market's Response to Crisis

Performance of a Balanced Strategy: 60% Stocks, 40% Bonds (Cumulative Total Return)



In US dollars. Represents cumulative total returns of a balanced strategy invested on the first day of the following calendar month of the event noted. Balanced Strategy: 12% S&P 500 Index,12% Dimensional US Large Cap Value Index, 6% Dow Jones US Select REIT Index, 6% Dimensional International Marketwide Value Index, 6% Dimensional US Small Cap Index, 6% Dimensional US Small Cap Value Index, 3% Dimensional International Small Cap Index, 3% Dimensional International Small Cap Value Index, 2.4% Dimensional Emerging Markets Small Index, 1.8% Dimensional Emerging Markets Value Index, 1.8% Dimensional Emerging Markets Index, 10% Bloomberg Barclays Treasury Bond Index 1-5 Years, 10% Citigroup World Government Bond Index 1-5 Years (hedged), 10% Citigroup World Government Bond Index 1-3 Years (hedged), 10% BofA Merrill Lynch 1-Year US Treasury Note Index. The S&P data are provided by Standard & Poor's Index Services Group. The Merrill Lynch Indices are used with permission; copyright 2017 Merrill Lynch, Pierce, Fenner & Smith Incorporated; all rights reserved. Citigroup Indices used with permission, © 2017 by Citigroup. Bloomberg Barclays data provided by Bloomberg. For illustrative purposes only. Dimensional indices use CRSP and Compustat data. Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio. Past performance is not a guarantee of future results. Not to be construed as investment advice. Rebalanced monthly. Returns of model portfolios are based on back-tested model allocation mixes designed with the benefit of hindsight and do not represent actual investment performance. See Appendix for additional information.

APPENDIX

Balanced Strategy 60/40

The model's performance does not reflect advisory fees or other expenses associated with the management of an actual portfolio. There are limitations inherent in model allocations. In particular, model performance may not reflect the impact that economic and market factors may have had on the advisor's decision making if the advisor were actually managing client money. The balanced strategies are not recommendations for an actual allocation.

International Value represented by Fama/French International Value Index for 1975–1993. Emerging Markets represented by MSCI Emerging Markets Index (gross dividends) for 1988–1993. Emerging Markets weighting allocated evenly between International Small Cap and International Value prior to January 1988 data inception. Emerging Markets Small Cap represented by Fama/French Emerging Markets Small Cap Index for 1989–1993. Emerging Markets Value and Small Cap weighting allocated evenly between International Small Cap and International Value prior to January 1989 data inception. Two-Year Global weighting allocated to One-Year prior to January 1990 data inception. Five-Year Global weighting allocated to Five-Year Government prior to January 1990 data inception. For illustrative purposes only. The Dimensional Indices used have been retrospectively calculated by Dimensional Fund Advisors LP and did not exist prior to their index inceptions dates. Accordingly, results shown during the periods prior to each Index's index inception date do not represent actual returns of the Index. Other periods selected may have different results, including losses.

Index Descriptions

Dimensional US Large Cap Value Index is compiled by Dimensional from CRSP and Compustat data. Targets securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market with market capitalizations above the 1,000th-largest company whose relative price is in the bottom 30% of the Dimensional US Large Cap Index after the exclusion of utilities, companies lacking financial data, and companies with negative relative price. The index emphasizes securities with higher profitability, lower relative price, and lower market capitalization. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. Exclusions: non-US companies, REITs, UITs, and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to March 2007. The calculation methodology for the Dimensional US Large Cap Value Index was

amended in January 2014 to include direct profitability as a factor in selecting securities for inclusion in the index. Prior to January 1975: Targets securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market with market capitalizations above the 1,000th-largest company whose relative price is in the bottom 20% of the Dimensional US Large Cap Index after the exclusion of utilities, companies lacking financial data, and companies with negative relative price.

Dimensional US Small Cap Index was created by Dimensional in March 2007 and is compiled by Dimensional. It represents a market-capitalization-weighted index of securities of the smallest US companies whose market capitalization falls in the lowest 8% of the total market capitalization of the Eligible Market. The Eligible Market is composed of securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market. Exclusions: Non-US companies, REITs, UITs, and investment companies. From January 1975 to the present, the index also excludes companies with the lowest profitability and highest relative price within the small cap universe. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. Source: CRSP and Compustat. The index monthly returns are computed as the simple average of the monthly returns of 12 sub-indices, each one reconstituted once a year at the end of a different month of the year. The calculation methodology for the Dimensional US Small Cap Index was amended on January 1, 2014, to include profitability as a factor in selecting securities for inclusion in the index.

Dimensional US Small Cap Value Index is compiled by Dimensional from CRSP and Compustat data. Targets securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market whose relative price is in the bottom 35% of the Dimensional US Small Cap Index after the exclusion of utilities, companies lacking financial data, and companies with negative relative price. The index emphasizes securities with higher profitability, lower relative price, and lower market capitalization. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. Exclusions: non-US companies, REITs, UITs, and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to March 2007. The calculation methodology for the Dimensional US Small Cap Value Index was amended in January 2014 to include direct profitability as a factor in selecting securities for inclusion in the index. Prior to January 1975: Targets securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market whose relative price is in the bottom 25% of the Dimensional US Small Cap Index after the exclusion of utilities, companies lacking financial data, and companies with negative relative price.

Dimensional International Marketwide Value Index is compiled by Dimensional from Bloomberg securities data. The index consists of companies whose relative price is in the bottom 33% of their country's companies after the exclusion of utilities and companies with either negative or missing relative price data. The index emphasizes companies with smaller capitalization, lower relative price, and higher profitability. The index also excludes those companies with the lowest profitability and highest relative price within their country's value universe. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. Exclusions: REITs and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to April 2008. The calculation methodology for the Dimensional International Marketwide Value Index was amended in January 2014 to include direct profitability as a factor in selecting securities for inclusion in the index.

Dimensional International Small Cap Index was created by Dimensional in April 2008 and is compiled by Dimensional. July 1981–December 1993: It Includes non-US developed securities in the bottom 10% of market capitalization in each eligible country. All securities are market capitalization weighted. Each country is capped at 50%. Rebalanced semi-annually. January 1994–Present: Market-capitalization-weighted index of small company securities in the eligible markets excluding those with the lowest profitability and highest relative price within the small cap universe. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. The index monthly returns are computed as the simple average of the monthly returns of four sub-indices, each one reconstituted once a year at the end of a different quarter of the year. Prior to July 1981, the index is 50% UK and 50% Japan. The calculation methodology for the Dimensional International Small Cap Index was amended on January 1, 2014, to include profitability as a factor in selecting securities for inclusion in the index.

Dimensional International Small Cap Value Index is defined as companies whose relative price is in the bottom 35% of their country's respective constituents in the Dimensional International Small Cap Index after the exclusion of utilities and companies with either negative or missing relative price data. The index also excludes those companies with the lowest profitability within their country's small value universe. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. Exclusions: REITs and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to April 2008. The calculation methodology for the Dimensional International Small Cap Value Index was amended in January 2014 to include direct profitability as a factor in selecting securities for inclusion in the index. Prior to January 1994: Created by Dimensional; includes securities of MSCI EAFE countries in the top 30% of book-to-market by market capitalization conditional on the securities being in the bottom 10% of market capitalization, excluding the bottom 1%. All securities are market-capitalization weighted. Each country is capped at 50%; rebalanced semi-annually.

Dimensional Emerging Markets Index is compiled by Dimensional from Bloomberg securities data. Market capitalization-weighted index of all securities in the eligible markets. The index has been retroactively calculated by Dimensional and did not exist prior to April 2008.

Dimensional Emerging Markets Value Index is compiled by Dimensional from Bloomberg securities data. The index consists of companies whose relative price is in the bottom 33% of their country's companies after the exclusion of utilities and companies with either negative or missing relative price data. The index emphasizes companies with smaller capitalization, lower relative price, and higher profitability. The index also excludes those companies with the lowest profitability and highest relative price within their country's value universe. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. Exclusions: REITs and investment companies. The index has been retroactively calculated by Dimensional and did not exist prior to April 2008. The calculation methodology for the Dimensional Emerging Markets Value Index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. Prior to January 1994: Fama/French Emerging Markets Value Index.

Dimensional Emerging Markets Small Cap Index was created by Dimensional in April 2008 and is compiled by Dimensional. January 1989–December 1993: Fama/French Emerging Markets Small Cap Index. January 1994–Present: Dimensional Emerging Markets Small Index Composition: Market-capitalization-weighted index of small company securities in the eligible markets excluding those with the lowest profitability and highest relative price within the small cap universe. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. The index monthly returns are computed as the simple average of the monthly returns of four sub-indices, each one reconstituted once a year at the end of a different quarter of the year. Source: Bloomberg. The calculation methodology for the Dimensional Emerging Markets Small Cap Index was amended on January 1, 2014, to include profitability as a factor in selecting securities for inclusion in the index.

Source: Dimensional Fund Advisors LP.

There is no guarantee investment strategies will be successful. Investing involves risks including possible loss of principal. Diversification does not eliminate the risk of market loss.

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FINANCIAL PREPARATIONS FOR A NATURAL DISASTER

TIMOTHY STRAUTS
Morningstar

As residents of areas affected by Hurricane Harvey and Irma found out, a natural disaster can bring about not only emotional hardship, but financial hardship, as well. From keeping important documents safe and accessible to having enough cash on hand to get by until things return to normal, being prepared for a disaster is an important part of protecting your home and your family. It could be a natural disaster like a hurricane, tornado, flood, fire, mudslide, or earthquake. Or it could be something on a more limited scale like a power outage. Whatever the crisis, taking the steps below will help you better handle whatever might come your way.

Get Organized Before a Disaster Strikes

Chances are that's not at the top of your to-do list for the weekend, so it's very easy to procrastinate. But think of it this way: You buy insurance to protect you from catastrophes; disaster preparedness is just another kind of insurance that you prepare yourself. It doesn't have to cost a lot, but it could really save time and added frustration should something happen to you. Once you've got a plan, you only need to update it periodically.

Keep Important Papers and Documents Safe and Easily Accessible

You might need to gather your most important papers in a hurry. Do you know where they are? Can you grab them quickly and leave the house immediately if you need to? Here are some of the documents to which you may need access: IDs (driver's license, Social Security card, passport, birth certificate), financial documents (checkbooks, investment account numbers, passwords, and phone numbers, retirement account information, estate documents, insurance policies), and medical records. Most importantly, you'll need cash (at least enough to cover one to two weeks' emergency expenses).

You might also want to have a list of key contacts/phone numbers, which may include family cell-phone numbers and e-mail addresses, police, fire, and ambulance numbers, Red Cross and emergency response center local numbers, as well as your company's human resources department number.

Keep all these important papers in a plastic bag in your home safe, or in any safe place from where you can grab them quickly if you need to leave your home in a hurry. Also, it may be a good idea to leave copies of everything with your attorney and/or financial advisor, in case the original documents get lost or damaged.

Prepare for a Medical Emergency

What if you or a family member suffer an injury (or worse) when disaster strikes? Check your health-insurance coverage to determine out-of-pocket costs in case surgery or emergency treatment is needed, and try to set aside enough money to cover these costs. Designate a family member or close friend as your primary contact, and prepare a living will and power of attorney for health care (documents that specify your wishes in case you're incapacitated).

Create an Emergency Fund

Most experts recommend setting aside enough money to cover about six months of living expenses. But it is equally important that this money be easily accessible. It may be a good idea to keep about half in cash, ready to use (what if it's impossible to get to a bank in the aftermath of the disaster?), and the other half in liquid investments that you can cash out easily.

What to Do if Disaster Strikes

If your house has been damaged, you may need emergency shelter. The Red Cross or your local emergency response center should be able to help. Your property insurance agent can help you file a claim on your homeowners or other types of insurance policies. If your area has been declared a federal disaster area, you may qualify for financial relief. If you have been injured, you might need to file for disability benefits. If you are healthy but a family member needs your care, you may be able to take as many as 12 weeks of unpaid leave under the Family and Medical Leave Act without losing your job.

PLANNING AND INVESTING FOR RETIREMENT CONSUMPTION

MASSI DE SANTIS, PHD
SEPTEMBER 2017
DIMENSIONAL FUND ADVISORS

For most people, a successful retirement begins with being able to maintain the standard of living they are accustomed to. This means the primary goal of their retirement savings is to help sustain their desired, inflation-adjusted expenses throughout retirement: a "consumption stream." Defining the goal as an in-retirement consumption stream is a key step in designing an appropriate investment solution.

Any asset allocation decision represents a trade-off between the opportunity of future growth and reducing uncertainty about future outcomes. Accordingly, a solution to the retirement problem should provide the ability to grow assets in an effort to increase expected consumption in retirement while seeking to manage the uncertainty of retirement consumption. Clearly defining the risks for the goal can help identify investment instruments that help manage these risks effectively and lead to a better tradeoff for investors.

If the goal is a future consumption stream, the key uncertainty is how much consumption the accumulated savings can sustain. This uncertainty is driven by the uncertainty of future stock and bond returns, interest rates, and inflation. We call these market risk, interest rate risk, and inflation risk. In this article we describe Dimensional's approach to managing the uncertainty of in-retirement consumption, considering the key risks that affect this uncertainty. After the appropriate risk management strategy for the goal is identified, the asset allocation question becomes how to balance the tradeoff between growth assets and risk management assets. This question can then be addressed using tools from modern life cycle finance research. Separate from market, interest rate, and inflation risks is longevity risk. We will describe one approach to managing this risk.

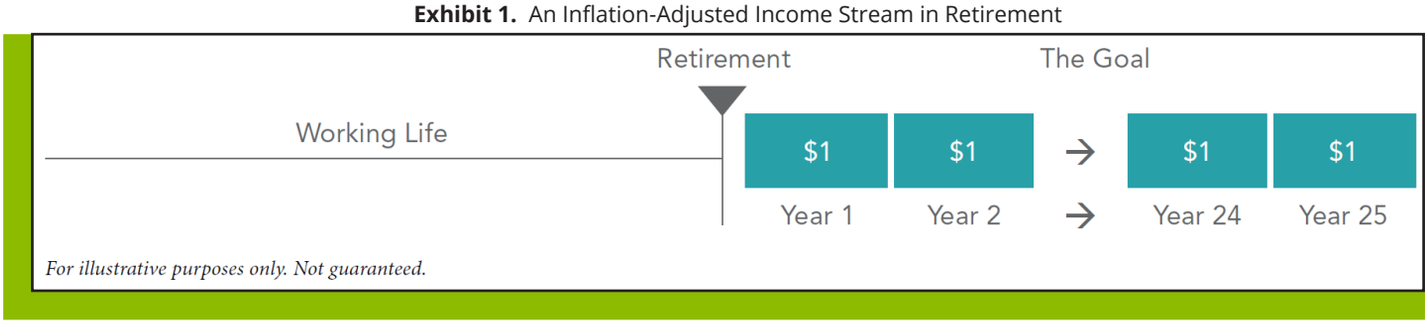
As discussed below, identifying the appropriate risk management strategy is not only a crucial element of the asset allocation question but also a key aspect of planning and monitoring progress towards the retirement goal. The risk management strategy allows communication in terms of units that matter for the goal (meaningful communication)—in this case a future consumption stream. Through meaningful communication, the risk management strategy enables savers to make important decisions. How much do I need to save? When can I retire? How much can I expect to withdraw from my retirement account every month? What is the uncertainty around these estimates?

While this article does not address the details of implementation, Dimensional has developed a set of solutions, including target date retirement income funds, that implement the life cycle approach we describe here. Retirement investors can use Dimensional's mutual fund solutions as a standalone solution or in combination with other solutions that help manage the uncertainty of future retirement income, including annuities.

RETIREMENT CONSUMPTION AND RISK MANAGEMENT

The first step to determine how to manage key risks is to define how long accumulated savings can be expected to support in-retirement consumption. Starting with life expectancy at the typical retirement age is usually a good place to begin. It also makes sense to include a buffer to account for uncertainty about life expectancy. Assuming an average life expectancy of 20 years plus a buffer of five years, the retirement goal can be thought of as $1 of inflation-adjusted consumption over 25 years.

Exhibit 1. An Inflation-Adjusted Income Stream in Retirement



For illustrative purposes only. Not guaranteed.

With this framework for the withdrawal period, we can think about a solution that manages the volatility of how much in-retirement consumption an investor's accumulated savings can support over that period. At any point in time, the goal illustrated in Exhibit 1 has a cost, which can be computed as the present value of the future cash flows. This cost can be estimated using real interest rates. Real interest rates are used because we think of the consumption stream in inflation-adjusted terms.

The cost of the goal will fluctuate with changes in inflation and interest rates. For example, if interest rates go down (up), the cost of the goal goes up (down). Stated differently, this implies that for a given account balance, the amount that can be consumed is lower (higher) when interest rates are lower (higher). Interest rates constitute a risk to the level of consumption that can be sustained from a level of savings. Inflation has a similar effect. The purchasing power of an account balance declines with positive inflation and increases with negative inflation.

The sensitivity of the goal to real interest rates and inflation depends on the maturity of the cash flows. The longer the average maturity, or more technically the duration of the cash flow, the higher the sensitivity.[1] An investment that matches the sensitivity of the goal to interest rates and inflation can reduce the uncertainty about how much consumption can be sustained with the investment. This can be achieved by computing the duration of the in-retirement consumption stream and constructing an inflation-protected portfolio of government bonds with the same duration. This is an example of liability-driven investing or "LDI."[2]

How does this investment strategy reduce uncertainty about future consumption? Because the sensitivity of the investment to inflation and interest rate risks is the same as that of the goal, the value of the investment tends to increase (decline) when interest rates go down (up) or when inflation is positive (negative), thus protecting the future purchasing power of the portfolio.

A COMPLETE SOLUTION

The importance of the risk management framework goes beyond managing key risks like inflation and interest rates. The risk management strategy is a key element in balancing the tradeoff between growth opportunities and reducing the uncertainty of in-retirement consumption. It allows investors to control the level of exposure to market risk they desire in expectation of future growth over their working career and in retirement.

Modern life cycle research highlights the importance of considering (i) the entire life cycle of the investor and (ii) the sources of capital for the goal when making asset allocation decisions. The first element means considering the retirement consumption goal throughout the accumulation phase, not simply waiting until retirement to figure out how to sustain future consumption. The second point is important because different sources of capital can have different risks for the goal. Most people fund their consumption through a combination of accumulated savings (financial capital) and future savings (human capital). Early in an investor's career, most of the funding for retirement is expected to come from future savings, while financial capital is a small fraction of expected funding. At this stage, investing in a growth portfolio does not have a material effect on the overall risk of the total retirement funding because most of it will happen in the future. But as time goes by, the accumulated assets become a larger fraction of the funding and a more conservative allocation is needed for those assets.

The duration of the future consumption stream can be matched as early as around 20 years prior to retirement. Investors can devote a portion of their assets to risk management gradually over the 20 years, effectively saving toward "slices" of future consumption and reducing uncertainty about the level of retirement consumption the savings can support. At retirement, the focus of the allocation is on providing clarity and confidence about how much consumption the savings can support, so the majority of the assets are invested in the LDI risk management strategy. Following this life cycle approach allows investors to seamlessly transition from their working life into retirement.

WITHDRAWAL RATES AND SEQUENCING RISK

The question about how much consumption a portfolio can generate over time is often asked in the context of a traditional portfolio of stocks and bonds in which the fixed income is used to reduce portfolio volatility rather than matched to the consumption goal. Given the portfolio, what is a withdrawal rate that the portfolio can sustain with a high likelihood?

1 Duration is a measure of the sensitivity of a cash flow stream (like a bond) to interest rates. It is a weighted average maturity across the cash flows, with weights given by the relative present value of each cash flow.

2 A liability-driven investment (LDI) strategy is designed to focus on assets that match future liabilities. LDI strategies contain certain risks that prospective investors should evaluate and understand prior to making a decision to invest. These risks may include, but are not limited to, interest rate risk, counterparty risk, liquidity risk, and leverage risk.

Without the proper risk management, the estimated withdrawal rate is necessarily based on assumptions about future expected returns from that portfolio. This causes uncertainty, above and beyond the time series variability of returns, about how long money can last in retirement.

For investors drawing down from their portfolios, the sequence in which they experience returns may also matter to their ability to sustain consumption. For example, a sequence of bad market returns early in retirement increases the likelihood of running out of money early. Market risk is not the only cause of sequencing risk. Interest rates and inflation risks also matter. For example, an unexpected rise in inflation early in retirement increases the likelihood of running out of money early. A traditional allocation to stocks and bonds introduces sequencing risk because of market, interest rate, and inflation risks.

In contrast, the risk management strategy we described solves both of these problems. First, the LDI strategy does not need estimates of future returns to determine the level of income it can sustain. Market data on real interest rates at any point in time can be used. Because a retiree has the majority of their savings for the consumption goal invested in the consumption risk management strategy, the reliance on assumptions is greatly reduced. Second, because a large portion of the portfolio is invested in assets that hedge consumption risk, sequencing risk is also reduced.[3]

IMPORTANCE OF RISK MANAGEMENT FOR PLANNING

Having the right risk management strategy is also important to help investors plan toward retirement and monitor their progress. Retirement investors are often shown estimates of projected future income. It is important to realize that income projections can be very sensitive to future changes in the market, inflation, and interest rates, and there is no reliable way to say what those will be in the future. Without the proper risk management strategy, the estimates are not very meaningful. For income estimates to be meaningful to an investor, so that he or she can use them to plan for retirement, investors need a solution that manages risks related to the projections. If the goal is future consumption, the investment solution should manage consumption risk. This way, the uncertainty about future consumption can be reduced over time as participants approach retirement, providing clarity and confidence about the estimate of in-retirement consumption their savings can support.

If participants have tools that provide the right information and manage the right risks, they can be empowered to solve their retirement problem. How much do I need to save? When can I retire? What is the monthly paycheck I can expect from my savings? Dimensional has developed a retirement income calculator to help retirement savers plan and budget for retirement consumption.

LONGEVITY RISK AND ANNUITIES

In defining the consumption goal, we used life expectancy plus a buffer to account for uncertainty about one's lifetime. This approach is helpful in that it provides a reasonable framework for investors who plan to draw down from their portfolios. The approach may require an adjustment to consumption should the investor realize he or she needs to withdraw for longer than planned. For investors concerned with longevity risk, one risk management tool is annuities. For example, investors could plan for the 25-year horizon using available target date retirement income funds and devote a portion of their savings to deferred annuities that start paying 25 years into retirement. Additionally, annuities with income benefits can also be used as a tool to reduce the volatility of lifetime retirement income.

Dimensional's retirement solutions, annuities, and a combination of both can be used to provide more clarity and confidence about future retirement consumption, making their planned consumption stream less subject to market, interest rate, inflation, sequencing of returns, and longevity risks.

3 With the LDI approach, sequencing risk only comes though growth assets, which in retirement are a small fraction of the portfolio.

CONCLUSIONS

A good retirement solution should provide robust and well-diversified strategies that are expected to grow the value of a participants' savings so they can afford higher levels of consumption in the future, while managing uncertainty about the level of future retirement consumption the portfolio can support.

The asset allocation framework should balance the tradeoff between the growth objective and managing the risks associated with the uncertainty about the level of consumption. The right risk management strategies remove the need to rely heavily on assumptions about future returns, making information about future retirement consumption meaningful. These tools can empower investors to make informed decisions about their retirement future.

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CONTACT US 419 482 4500 | Marketing@obsmail.com | www.obsfs.com