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The Behavioral Portfolio

By Phillip “Felipe” Toews



INVESTMENTS & WEALTH INSTITUTE®

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One of the most clearly understood roles of financial advisors is guiding investors away from emotional investing and toward evidence-based portfolio management. When internet stocks were valued at what felt like infinity times earnings, it was our job to steer clients away from portfolios with significant allocations to stocks such as dogfood.com. During the worst days of the financial crisis, our main focus was to try to avoid a sale at the bottom, to avert the stampede of the herd, and to help investors stick to their plans.

Before embarking on the task of attempting to manage investor behavior, however, we need to ask a foundational question that is asked too infrequently: How well are investment portfolios suited to meet investors’ economic and psychological needs? Our conclusion is that many conventional portfolios are built in ways that make investors vulnerable to economic adversity and well-known behavioral biases that can lead to poor decision-making. Viewing portfolio construction through a behavioral lens allows advisors to frame decisions based on investor needs rather than maximizing returns for various levels of risk. In this article, I’ll discuss the work that we’ve done in consultations with advisors to create behavioral portfolios, and I’ll give several examples of how they might be implemented.¹

VIEWING PORTFOLIO CONSTRUCTION THROUGH A BEHAVIORAL LENS

In a March 2020 investor survey that we conducted with the Investments & Wealth Institute and Absolute Engagement,²

we asked a group of investors questions related to their ability to tolerate market disruptions. Among other findings, the survey showed the following:

1. Investors generally are unaware of the severity of past market declines such as stock market losses during the Great Depression.
2. A number of investors would stop investing in the stock market completely, switch to bonds, or leave their financial advisors if they experienced declines of more than 40 percent (during the Great Depression, markets experienced declines of 86 percent).³
3. Two-thirds of investors⁴ said that they were inclined to accept lower returns if they were confident that the probability of experiencing significant losses due to negative market events would be lowered; and only 11 percent disagreed.

This survey seems to support prospect theory, which suggests that investors experience more pain from losses than they feel pleasure from gains. But perhaps more revealing is investors’ lack of understanding about the severity of historical market losses and their willingness to abandon plans during market crises.

ARE WE CONSIDERING WORST-CASE SCENARIOS IN PORTFOLIO CONSTRUCTION?

We as advisors, and our industry collectively, may be vulnerable to recency bias. But recency bias shouldn’t be isolated to relying on last year’s results to predict this year’s returns; it’s much broader than that. Advisors may look at the world

through the prism of what has happened within their working lifetimes rather than through the broader range of historical possibilities. As a result, generational market trends may hinder our ability to understand and guide investors.

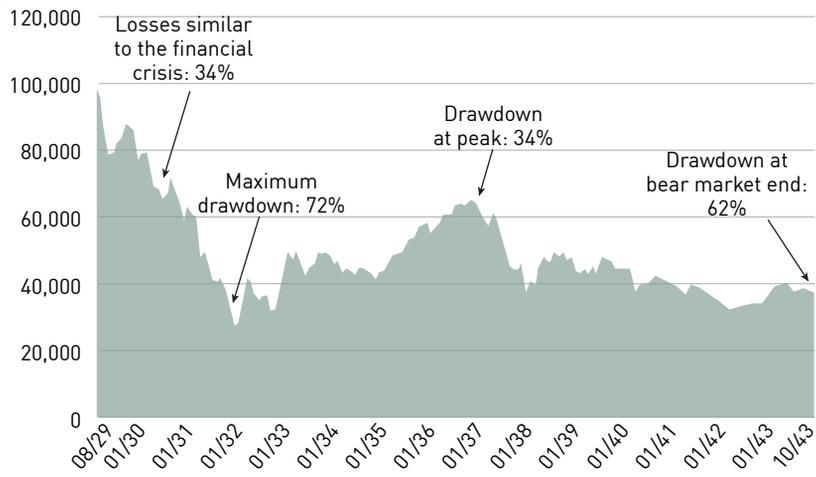
As a part of the consultative process that we provide through our Behavioral Investing Institute, we walk advisors through a visualization of how a sample 60/40 portfolio would have fared during the Great Depression with some real-world assumptions (advisor fees, rebalancing, etc.).⁵

During the first 16 months of the decline during the Great Depression, a sample balanced portfolio would have lost an amount similar to what it would have lost during the entire 2008–2009 financial crisis. Advisors who experienced the 2008–2009 financial crisis likely recall the extreme challenges and negativity associated with that market fall. Yet after the first 16 months of the Great Depression,⁶ stocks fell 47.1 percent further in 1931,⁷ and another 45.4 percent in the first six months of 1932,⁸ resulting in a total loss of 86 percent.⁹ A sample balanced portfolio assuming 4-percent annual withdrawals and all-in portfolio costs would have reached a maximum drawdown of 72 percent over that time (see figure 1).

From the low in May 1932, stocks mercifully began to move higher over the next five years. However, the bull market that began that month played out as significant but short bursts of gains followed by longer-duration losses or languishing markets. For advisors and their investors, the down months in some cases

Figure 1

BALANCED INDEX ILLUSTRATION



Past performance is no guarantee of future performance. It is not possible to invest directly in an index. Figure 1 reflects monthly performance of a blend of 60-percent S&P 500 TR Index and 40-percent Dow Jones Corporate Bond TR Index from August 31, 1929 to December 31, 1943, rebalanced annually, with a 4-percent annual withdrawal of the initial value adjusted for inflation and a 1.6-percent all-in portfolio cost deducted on a monthly basis. Four percent is a commonly used withdrawal rate for retirees; 1.6 percent was used as an all-in portfolio cost based on the median total annual cost of \$500,000-\$1-million client portfolios (1.65 percent) as reported in the 2017 Planning Profession Fee Survey presented by Inside Information. Source of Data: Global Financial Data for S&P 500 TR Index and Dow Jones Corporate Bond TR Index, Shiller for Inflation data. Accessed on September 11, 2019. Note: It is not possible to invest directly in the Balanced Index. Illustration comprises a blended index performance. Drawdown is defined, herein, as the loss in value of the illustration from the inception.

were significant enough to become bear markets and would have added to the negativity of a depression economy. If investors had exited the stock market, they would have had to re-enter quickly after rallies began, or they would have missed the bulk of gains. The sample balanced model would have gained 56 percent in three months off the bottom, only to fall 20 percent over the following six months. It then would have rallied 63 percent over six months but would have fallen 9 percent over the following one-and-one-half years.

Beginning in March 1935, the sample portfolio would have realized its greatest stretch of gains, increasing 75 percent over almost two years.

This two-year rally might have created enough positivity to potentially lure investors back into stocks, but the economy was still suffering. Although improving, unemployment was still 14.3 percent in 1937, down from 24.9 percent at its peak in 1932, but significantly higher than the 3.2-percent level in 1929 at the beginning of the depression (Amadeo 2020).

After the 1937 peak, the subsequent bear market would have resulted in a decline in the sample portfolio equal to the decline during the 2008-2009 financial crisis, except that instead of lasting for 16 months, it would have lasted for five years. For investors drawing 4 percent from portfolios, a balanced portfolio eventually would have been depleted (which could, arguably, be considered one of the most severe examples of economic risk). For investors not drawing from portfolios, it would have taken more than 1.3 years to recover original value.

We conclude that our own recency bias may be shielding us from preparing investors for all types of markets. Indeed, few investors would be able to tolerate this level of decline experienced in the Great Depression. But by selectively limiting our screen of historical outcomes to those of the past 30 or 50 years, we're setting up our investors for potential disruption far beyond what can be managed using behavioral coaching. These disruptions include other existential risks such as high or hyper inflation and stagflation.

THE BEHAVIORAL PORTFOLIO

Hersh Shefrin and Meir Statman wrote the first paper on behavioral portfolio theory. Shefrin and Statman (2000) suggested an alternative to the assumption that the ultimate motivation for investors is the maximization of the value of their portfolios. They suggested that investors have varied aims and they create investment portfolios that meet a broad range of goals. Statman continues to speak and write about behavioral portfolios, suggesting that investors have three types of needs from their portfolios: utilitarian, expressive, and emotional (Janowski 2013).

Our behavioral portfolio guidance, which was built based on consulting with advisors over the past decade, accepts Statman's premise. Our articulation of behavioral portfolios defines two types of needs, economic (utilitarian) and psychological or behavioral (encompassing expressive and emotional needs). Both types of needs are recognized as valid, and both have minimum thresholds that, if met, may result in desirable outcomes for investors. In other words, behavioral portfolios are created to try to help investors achieve their goals and simultaneously create the fewest emotional and economic challenges along the way.

In our view, there are two objectives to behavioral coaching. The first is to create a communications framework that

RETURN PROFILE

The return profile that we believe investors may want includes the following characteristics. They attempt to:

- Avoid principal losses
- Provide growth that exceeds inflation
- Provide upside capture during rising markets
- Preserve gains
- Provide consistent returns

helps guide investors to make decisions that may seem counterintuitive. This is where much of the focus has been in our industry. A second, and we believe equally important, objective is to attempt to build behavioral portfolios (i.e., “products”) that provide a glide path that investors can reasonably be expected to follow. Double-digit portfolio losses that span more than a decade are an extreme example of a type of behavioral challenge that, for many, is unnavigable, or, if it is, may create significant economic risks and emotional turmoil for investors.

BUILDING BEHAVIORAL PORTFOLIOS

The best quantitative expression of the objectives of a behavioral portfolio is a modified return distribution. A normal distribution has similar left and right tails, implying that investors may experience both extreme losses and extreme gains, albeit with low probabilities (see figure 2). Attempting to avoid principal losses and preserve gains is expressed by a left tail that is shortened (less risk of extreme losses). Yet ideally, behavioral portfolios shouldn’t significantly alter the right tail. This indicates that portfolios are positioned to potentially provide above-inflation growth and gains when markets are rising. Although there is a desire to mimic the right tail to provide market returns during rising markets, there is an assumed cost to shorten the left tail. This cost can also be thought of as a budget that can be used to help provide hedging for portions of the portfolio. This is represented by a shift of the right tail of the curve to the left.

Managing both tails to match investor needs is important. Creating a portfolio that has a shorter left tail is an obvious objective for advisors when building investor portfolios. But managing the right tail is equally important. If the right tail of a portfolio’s historical return distribution differs significantly from a traditional portfolio, this may suggest that the portfolio may not provide

SEPARATE DOWNSIDE AND UPSIDE PORTFOLIO ANALYSIS

DOWN-MARKET

Set maximum downside parameters based on economic and behavioral needs of investors to include:

- Expanded historical data
- Absolute and real returns
- Maximum drawdown
- Time underwater/pain index
- Downside deviation
- Downside probability
- Downside capture
- Downside correlation

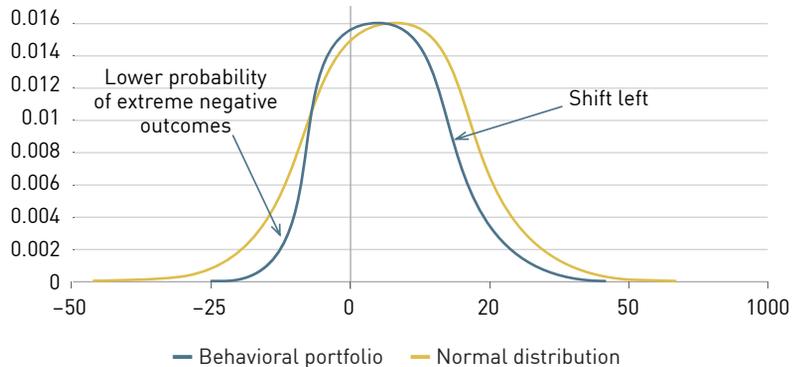
UP-MARKET

Evaluate upside to attempt to reduce portfolio underperformance with the following:

- Up-capture ratio
- Upside deviation
- Up-market correlation
- Upside probability
- Up-market tracking error

Figure 2

NORMAL AND MODIFIED RETURN DISTRIBUTIONS



The graph is for illustrative purposes only.

growth that exceeds inflation or, if it does, may not provide upside capture when markets are rising, presenting potential investor retention issues.

When building portfolios that have abnormal distributions, it’s necessary to do separate analyses of upside and downside measures including volatility, instead of managing according to one volatility measure (standard deviation). If we could identify one persistent problem across the advisor landscape, it is the continued dominance of standard deviation as a primary risk measure rather than segregating down-market and up-market volatility. The objective is to match a market portfolio’s upside volatility (good volatility) but reduce downside volatility (bad volatility).

It also may be helpful to do separate analyses of the equity and fixed income portions of portfolios to try to provide a clearer picture of the effects of managers or strategies on the potential ability to achieve a high up-market correlation and a low down-market correlation.

Obvious measures to include in attempting to complete down-market analysis are loss deviation and maximum drawdown. Loss deviation is among the best overall indicators of potential loss, but maximum drawdown may be the most effective way to communicate loss potential to investors. However, we recommend including a broader group of statistics to get a fuller picture of a portfolio’s down-market exposure. Among some of the most

effective are time underwater (or the pain index), downside probability, and downside capture. Downside correlation is also a very useful statistic. Portfolios that exhibit low downside correlation may be the most likely to be effective at shortening the left tail. We recommend that advisors attempt to expand historical data to include at least the 2008–2009 financial crisis and, if that’s not possible for all investments, attempt to use best-fit indexes or other proxies to help evaluate returns.

When completing up-market analysis, we recommend attempting to expand datasets to include a sufficient amount of history to be meaningful and, if necessary, use proxies or best-fit indexes to estimate returns. Upside deviation and upside correlation may be among the most important statistics to evaluate when building behavioral portfolios.

Another statistic we have developed to help evaluate behavioral portfolios is a variation on tracking error that looks only at positive years. Up-market tracking error helps provide insight to the consistency with which portfolios participate in benchmark gains by measuring the standard deviation of the difference between investment strategies and a benchmark during rising markets.

TWO SAMPLE PORTFOLIOS DESIGNED TO SHORTEN THE LEFT TAIL

To articulate behavioral portfolio construction, I’ll show two different approaches to reducing downside capture. One is an iteration of the all-weather portfolio popularized by Ray Dalio, founder of the hedge fund firm Bridgewater Associates. This all-weather portfolio attempts to reduce losses by investing far less in stocks than a conventional 60/40 portfolio and adds outsized allocations to gold, commodities, and long-term bonds. A second portfolio, which we refer to as a behavioral portfolio, maintains a 60-percent allocation to stocks and a 40-percent allocation to fixed income, making it more in line with a conventional portfolio. It invests half of its equity allocation in low-cost beta funds (such as a Vanguard Total Stock Market Index Fund), and invests the other half into strategies that offer portfolio hedging or other explicit risk management characteristics. The behavioral portfolio allocates its fixed income assets to unconstrained fixed income strategies that are designed to attempt to lessen risks to rising interest rates or inflation. Although we have not experienced either significant interest-rate increases or high inflation in a very long time,

these have been significant historical risks to portfolios and real returns.

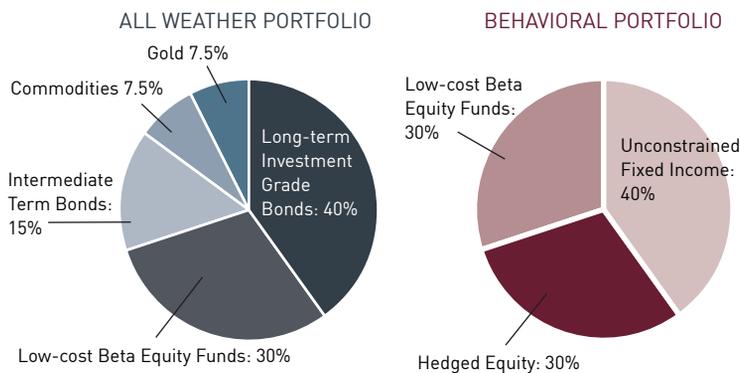
In building the behavioral portfolio, the hedged equity allocation is made up of all funds and separate accounts on the Morningstar database that had a 0.5 or lower bear market correlation, a 0.5 or greater bull market correlation to the S&P 500 Index, and an explicit loss-avoidance strategy in the objectives. Similarly, the unconstrained fixed income allocation is made up of all funds and separate accounts that had a 0.5 or lower bear market correlation to both the ICE BofA High Yield Index and the Bloomberg Barclays Agg Bond Index and a 0.5 or higher bull market correlation to the ICE BofA High Yield Index. Proprietary strategies were excluded from consideration for this analysis (see figure 3).

RESULTS

Both the all-weather and behavioral portfolios would have done a decent job of producing above-inflation returns during January 2008–June 2020 (see figure 4). Both portfolios also would have reduced the down-capture ratio to 68.7 percent and 72.4 percent, respectively, relative to a blended 60/40 index allocation. Maximum drawdown of the all-weather, behavioral, and balanced index portfolios would have been 19.9 percent, 18.6 percent, and 29.7 percent, respectively (see figure 5).

Upon seeing these down-market statistics, an advisor might conclude that the all-weather portfolio is an approach that could be adopted in order to shorten the left tail. However, up-market statistics show the vulnerability of this approach. Bull market correlation of the all-weather portfolio would have been just 0.78 versus the behavioral portfolio’s capture of 0.96 relative to a balanced portfolio. It’s important, however, to view more than just the overall up-capture and down-capture statistics, in order to gain understanding of any consistency and variation of returns during rising markets. Note that consistency of the difference of returns was poorer for the all-weather

Figure 3 ALL-WEATHER PORTFOLIO VS. BEHAVIORAL PORTFOLIO ALLOCATIONS



The allocation of the back-tested “Hypothetical: All-weather Portfolio” consists of 40-percent Vanguard Long-Term Investment-Grade Inv, 30-percent Vanguard Total Stock Mkt Idx Adm, 15-percent Vanguard Inter-Term Bond Index Inv, 7.5-percent Bloomberg Commodity Index, and 7.5-percent VanEck International Investors Gold A. The allocation and performance of the portfolios are hypothetical backtested and were created by Toews. They are not indicative of any third-party portfolios with the same or similar names. The allocation of the backtested “Hypothetical: Behavioral Portfolio” and additional disclosures can be found at <https://toewscorp.com/downloads/monitor-paper-disclosure.pdf>.

approach during rising markets: It realized a tracking error of 1.43 percent versus 0.57 percent for the behavioral portfolio (see figure 5 and table 1).

The historical return distributions illustrate that the all-weather portfolio would have created a shorter left tail, but it also would have dramatically shortened the right tail, and the behavioral portfolio would have produced a right tail that conformed more closely to a balanced portfolio (see figure 6).

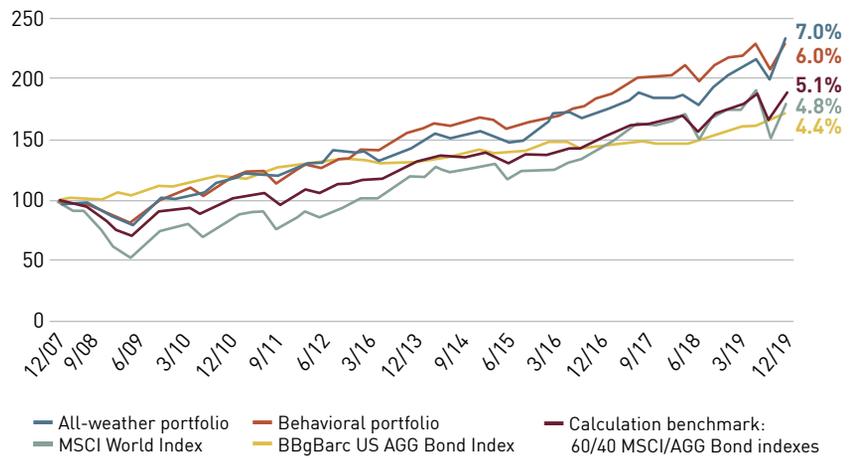
In our conversations with advisors who have implemented variations of the all-weather portfolio, they reported significant investor retention issues during the lengthy bull market that followed the

Figure 4

ILLUSTRATIVE HYPOTHETICAL/MODEL PERFORMANCE*

Time Period: Since Common Inception, January 1, 2008 to June 20, 2020

Calculation benchmark: 60/40 MSCI/AGG BOND INDEXES



* Figure 4 and Figure 5: Past performance is no guarantee of future results. All investments involve risk, including the potential loss of principal invested. The use of Toews does not eliminate risks associated with investing. Consider the investment objectives, risks, charges, and expenses carefully before investing. The investment return and principal value of an investment will fluctuate. The investor's account may be worth less than the original investment when liquidated. The returns were obtained in an unusual market which may not occur again. Investors cannot invest directly in an index.

The presentation of the Hypothetical: All-weather Portfolio and Hypothetical: Behavioral Portfolio blend portfolio is intended merely as a sample illustration of how third-party products can be combined with each other and is not reflective of any actual client account. This presentation should not be deemed an offer of any such third-party products or services. Toews is not affiliated with Bloomberg, VanEck, or Vanguard and is not providing any advice as to the advisability of engaging such third parties or the value of such products and services.

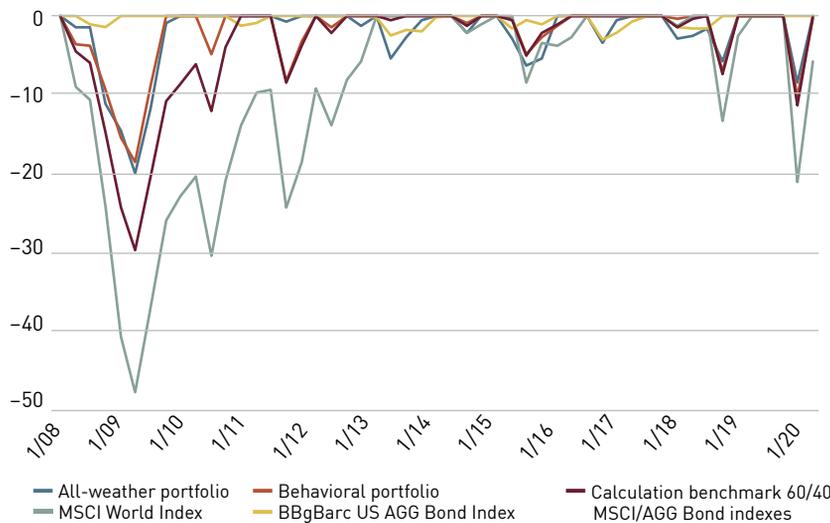
Note: The benchmark shown does not necessarily contain the same equity/bond allocation of the portfolios shown. Therefore, the performance of the sample portfolio is not expected to be similar to the benchmark performance. The 60-percent MSCI World / 40-percent BBgBarc US Agg Bond Index was used as a comparative benchmark herein merely to compare the performance to the performance to the overall equity market. Please see additional disclosures at <https://toewscorp.com/downloads/monitor-paper-disclosure.pdf>.

Figure 5

ILLUSTRATIVE HYPOTHETICAL/MODEL PORTFOLIO RETURN/LOSS DEVIATION*

Time Period: Since Common Inception, January 1, 2008 to June 20, 2020

Calculation illustrative hypothetical / model portfolio return / loss deviation



	Loss Deviation	Standard Deviation	Average Loss	Maximum Drawdown	Average Drawdown	Worst Quarter	Down-Capture Ratio
All-Weather Portfolio	5.0%	10.0%	-3.8%	-19.9%	-4.3%	-9.9%	68.7%
Behavioral Portfolio	5.5%	9.6%	-4.2%	-18.6%	-4.5%	-10.2%	72.4%
MSCI World Index	13.0%	18.7%	-10.3%	-47.8%	-10.6%	-21.8%	181.1%
BBgBarc US Agg Bond Index	1.3%	3.3%	-1.1%	-3.0%	-0.9%	-3.0%	-15.3%
Benchmark: 60/40 MSCI/Agg Bond Indexes	7.0%	11.1%	-4.9%	-29.7%	-5.9%	-11.4%	100.0%

Table
1

UP-MARKET STATISTICS

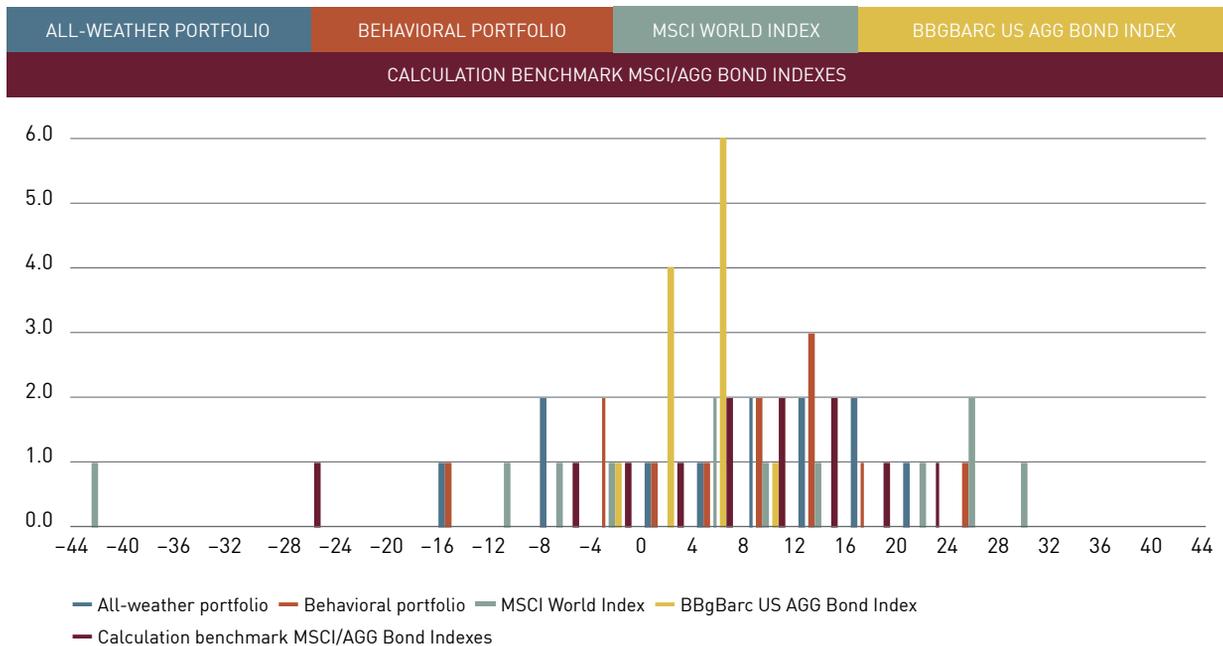
	Bull Correction	Up-Capture Return	Up Number	Up Number Ratio	Up-Period Percent	Up-Market Percent	Up-Market Tracking Error
All-Weather Portfolio	0.78%	4.2%	35	1.0%	0.32	70.0%	1.43
Behavioral Portfolio	0.96%	4.2%	36	1.0%	0.47	72.0%	0.57
MSCI World Index	0.99%	6.3%	36	1.0%	0.82	72.0%	N/A
BBgBarc US Agg Bond Index	0.30%	1.2%	39	0.9%	0.18	78.0%	N/A
Benchmark: 60/40 MSCI/Agg Bond Indexes	1.0%	4.3%	34	1.0%	0.00	68.0%	0.00

See figure 6 for disclosures.

Figure
6

YEARLY RETURN DISTRIBUTION

Time Period: Since Common Inception, January 1, 2008 to December 31, 2019



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Note: The benchmark shown does not necessarily contain the same equity/bond allocation of the portfolios shown. Therefore, the performance of the sample portfolio is not expected to be similar to the benchmark performance. The 60-percent MSCI World / 40-percent BBgBarc US Agg Bond Index was used as a comparative benchmark herein merely to compare the performance to the performance to the overall equity market. Please see additional disclosures at <https://toewscorp.com/downloads/monitor-paper-disclosure.pdf>.

2008–2009 financial crisis, highlighting the need to focus on both tails of a portfolio's return distribution.

The behavioral portfolio illustrates the potential behavioral benefit of adhering more closely to a conventional allocation of 60-percent equities, with a right tail that is more consistent with a 60/40 balanced approach.

COMMUNICATING TO CLIENTS DURING CRISES

Having just experienced a significant market decline in the first quarter of 2020, it's easy to understand the potential benefits of portfolios that attempt to address significant declines. Either the all-weather portfolio or the behavioral portfolio would have reduced losses through the bottom of the market in

March 2020. Addressing true worst-case scenarios, however, requires building strategies that explicitly address the possibility of a severe recession, or even a depression. These strategies allow advisors to point to a portion of a portfolio that may attempt to reduce participation in market declines and potentially could benefit as a result of economic chaos.

Continued on page 74 →

THE BEHAVIORAL PORTFOLIO

*Continued from page 42***CONCLUSION**

The emergent field of behavioral coaching represents an opportunity to add a significant value to clients at a time when many roles that advisors serve (diversification, rebalancing, tax management) can be automated easily. There are two aspects to behavioral coaching: creating a communications framework for managing behavior and attempting to build portfolios that meet investors' economic and psychological needs.

Behavioral portfolios explicitly acknowledge the behavioral challenges that conventional portfolios present. They force an expanded dataset to incorporate true worst-case scenarios and acknowledge the emotional and economic stresses presented by market crises. However, behavioral portfolios accept that markets are generally efficient, and failing to participate in the gains produced by conventional portfolios creates investor retention issues along with risks that investors will fail to realize portfolio gains. ●

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that seeks to help advisors manage investor behavior through market challenges. Contact him at ptoews@toewscorp.com.

ENDNOTES

1. In this article, all statements other than statements of historical fact are forward-looking statements (including words such as "believe," "estimate," "anticipate," "may," "will," "should," and "expect"). Although we believe that the expectations reflected in such forward-looking statements are reasonable, we can give no assurance that such expectations will prove to be correct. Various factors could cause actual results or performance to differ materially from those discussed in such forward-looking statements.
2. Toews sponsored and designed the survey, which was implemented by Absolute Engagement and distributed by Investments & Wealth Institute. See "2020 Investor Research Special Report: Investor Behavior in a Market Crisis," Investments & Wealth Institute (June 2020), iwicentral.org/2020BehavioralResearch.
3. Source: Bloomberg Financial L.P. S&P 500 Index from 8/30/1929 to 6/30/1932.
4. Two-thirds includes both participants who somewhat agreed with the statement and those who strongly agreed with the statement: 35.9 percent of participants said that they somewhat agreed; 29 percent of participants said that they strongly agreed.
5. The sample 60/40 portfolio comprised a 60-percent allocation to the S&P 500 Index and a 40-percent allocation to the Bloomberg Barclays US Aggregate Bond Index. The performance described is hypothetical backtested performance. It is not possible to invest in an index. Other assumptions regarding inflation,

advisor fees, the effect of rebalancing and withdrawals, etc., were included. There is no guarantee that these assumptions are accurate or would be representative of an average investor, and they do not represent any accounts at Toews. Past performance is no guarantee of future results. Backtested performance has certain inherent limitations, including that it does not reflect the impact of material market or economic factors or individual client considerations that might impact an advisor's decision in the management of actual client accounts.

6. Source of Data: Bloomberg Financial L.P. The S&P 500 Index declined 51.6 percent from 8/30/1929 to 12/31/1930.
7. Source of Data: Bloomberg Financial L.P. S&P 500 Index from 12/31/1930 to 12/31/1931.
8. Source of Data: Bloomberg Financial L.P. S&P 500 Index from 12/31/1931 to 6/30/1932.
9. Source of Data: Bloomberg Financial L.P. S&P 500 Index from 8/30/1929 to 6/30/1932.

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