Using a Behavioral Approach to Mitigate Panic and Improve Investor Outcomes

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Executive Summary

- In standard practice for financial planning, at least two competing demands are placed on the asset allocation process: taking on risk to help clients reach their financial goals, and decreasing risk to keep clients from panicking and abandoning the plan.
- To manage these competing demands, financial planners can apply two approaches: a risk capacity approach that focuses on goals and generating the required returns; and/or a risk preference approach that seeks to avoid panic. In isolation or in combination, these two approaches may fail to help clients reach their goals and forestall panic.
- This paper presents a third approach to helping clients. This behavioral approach brings behavioral interventions into the investment process and can potentially relieve the burden of these competing demands on asset allocation.
- To understand the benefits and limitations of each approach, this paper presents results from a novel simulation model of investor behavior. The model demonstrated how investor panic resulted in a loss of between 8 percent and 15 percent of assets over a 10-year period, under standard risk capacity-based asset allocations and risk preference-adjusted glide paths. The results were robust to a range of model specifications and assumptions.
- In moving from a standard approach of risk preference, adjusting glide paths to the proposed behavioral approach, investors may receive a net increase of 17 percent to 23 percent in assets over 10 years.

Financial planners want to help investors reach their financial goals, and they commonly employ asset allocation as one of their primary tools. When considering the appropriate level of risk for a client, financial planners often draw upon two distinct approaches: one based on the client's risk preferences, and one based on their risk capacity. These approaches each focus on a different, and real, danger to client success. The risk preference approach addresses the risk of panicked selling during downturns by steering clients to less volatile assets. The risk capacity approach addresses the risk of insufficient funds by including stocks as needed to achieve the client's financial target.

However, in practice, clients may fail to meet their goals in both cases. The risk preference approach can increase the likelihood that clients invest too conservatively and fail to generate the required returns, and the risk capacity approach can increase the chance that clients panic and sell at a loss. To chart a prudent investment course between these two dangers, many planners combine the two methods—investing as aggressively as one can without unduly triggering panic during volatile times. Unfortunately, this combination does not appear to cancel the risks inherent in each approach. The client's asset allocation cannot solve both problems simultaneously.

For clients who can meet their financial goals with cash (and do not need to face market volatility) or for clients who are immune to emotional reactions (and will not respond to market volatility), there are easy options available. For all other clients, there appear to be unavoidable trade-offs between insufficient returns to meet the client's goals or panicked selling that derails the goals. It is important to note that these dangers, and the trade-offs they create, are present regardless of the investing strategy employed; panic selling and insufficient returns are both unambiguously negative.

These approaches falter because the

same tool—asset allocation—is used to address the two fundamentally different problems of panic and insufficient returns. It is proposed here that planners should address the two problems separately. The danger of panic—of investors undermining their own goals by violating their investment plans—is inherently about investor behavior. It is not the portfolio that needs assistance, rather it is the investor. To assist the investor directly, financial planners can use tools from behavioral science. Research in behavioral science illustrates how financial planners can help investors avoid self-destructive financial behavior by focusing on the emotions, information, and decision-making processes of the individual client. These opportunities arise because of the uniquely human interaction between planners and investors.

Background: Two Approaches to Risk Tolerance

Definitions vary in the field, however this paper will use these relatively standard ones from Brayman, Finke, Bessner, Grable, Griffin, and Clement (2015):

Risk preference measures an investor's "gut feeling" about taking on risk; how comfortable a person is investing in assets that are volatile, where more volatility means a greater chance of both positive and negative returns.

Risk capacity measures how much financial loss a person can sustain without failing to meet financial goals.

Risk perception measures how risky an investor believes investments are, especially regarding the overall economic environment.

Risk profile is the compilation of an investor's risk preference, capacity, and sometimes perception.

Financial planners often employ written risk tolerance questionnaires to assess their clients in these areas, and a particular questionnaire may measure a mix of risk preferences, risk capacity (especially time horizon), and sometimes risk perception. The distinct concepts are rarely treated as such in the questionnaires, however. As a result, the term "risk tolerance" can become muddled and has no consensus definition (see Nobre and Grable 2015 for one attempt to clarify definitions). Thus, for the sake of clarity, this paper will talk about risk tolerance questionnaires, risk preference, risk capacity, and risk perception as distinct items.

A risk capacity approach. A commonly used and discussed approach to asset allocation is based on risk capacity, or identifying the individual client's financial goals and the optimal investments to best meet those goals (Kitces 2014). This approach avoids the challenges scholars have identified concerning the measurement and use of risk preferences (Brayman et al. 2015). Risk capacity may be measured by the investor's time horizon and liquidity needs, and used to construct a glide path that moves from stocks into bonds over time as the date of need approaches. Other implementations of risk capacity include optimizing allocations for multiple goals and changes in income or spending to create a more nuanced picture of the time horizon to be considered. For example, Blanchett and Straehl (2015) examined the holistic sources of wealth a person might have and their relative risks.

A risk preference approach and reckless conservatism. Another familiar approach, risk preference, entails using a risk tolerance questionnaire or a verbal interview with a client to rate an individual investor's appetite for taking on volatility risk, often on a scale from "conservative" to "aggressive." Then, the financial planner would select a mix of bonds and stocks considered appropriate for that client's risk preferences. There is a significant debate in the field about this approach, however, because it steers risk averse individuals away from risky investments. "Reckless conservatism" can aptly describe this approach (Collard 2015); it is conservative because risk averse people receive less risky asset allocations (bonds over stocks). It is also conservative by erring on the side of caution, keeping investors away from investments with negative financial outcomes they might dump. However, it is reckless because in attempting to help clients avoid negative outcomes (based on investor behavior) it can ensure negative outcomes based on asset allocation. Risk averse investors—including those who most need to improve their long-term financial health—are placed in less volatile investments like bonds that have historically underperformed stocks.

The danger of panic—of investors undermining their own goals—is inherently about investor behavior.

In practice, many planners combine the two approaches, basing the client's asset allocation on a risk capacity glide path, and then adjusting the stock/bond mix based on the person's risk preferences. In a world in which investors simply stick with the investment plan no matter what happens in the market, a pure risk capacity approach is ideal because it gives the planner full freedom to invest according to the client's goals. However, in the real world where investors can and do deviate from their investment plan, the value of each approach is unclear.

The following section introduces a simulation model to quantify the effect of each option and demonstrates how each are flawed.

Table 1: Profile of Investors

Investor Profile	Gender	Age	Starting Investing	Starting Salary	Annual Contribution	Risk Preference
1	Male	30	$25,000	$50,000	5%	Aggressive
2	Female	45	$100,000	$75,000	7.5%	Moderate
3	Female	55	$1,000,000	$250,000	15%	Aggressive
4	Male	55	$500,000	$250,000	20%	Moderate
5	Male	55	$1,000,000	$250,000	15%	Conservative

Methodology: Simulating Investor Behavior

To clearly understand the implications of these approaches to asset allocation, one needs to analyze their actual effect on investor behavior and on subsequent investor outcomes. To do so, this research developed a novel simulation model of investor behavior over time.

The model simulates the month-by-month interaction between an investor, the markets, and her portfolio. Each month, the markets generate returns, which affect the value of the investor's portfolio. Each month, the investor then has the option to react to the markets and adjust her current portfolio allocation and the allocation of future contributions. The investor then receives income, contributes a portion of it to new investments, and allocates it accordingly.

The key challenge with studying investor behavior is that there is very limited research on precisely when and how panic and market exit occur. Similarly, there is no empirically based consensus on how risk preferences or other characteristics affect the probability of panic at a given moment. For a simulation model, this means there is a lack of agreed upon input parameters to govern behavior.

With a well-designed simulation model, one can nevertheless tackle the ambiguity and insufficiency of empirical data by explicitly testing a range of reasonable parameters and determining the degree to which the parameters matter. If the underspecified parameters do not substantially affect the outcome within their likely range, one can make well-grounded statements about likely investor behavior and outcomes, despite unideal empirical inputs. That is the primary approach taken here.

Similarly, the model employed a range of reasonable investor profiles to determine the degree to which specific details of the investor's circumstances matter as well. In addition, an analysis below reveals how these results compare to the existing literature on these topics.

Construction of the Model

The model was intentionally stylized and straightforward to allow one to focus on the core issues of investor behavior and outcomes. For simplicity, investments were all made in tax-advantaged vehicles (e.g. with tax-advantaged retirement contributions). The markets were represented by a simple three-asset class model: (1) stocks, which provide historical returns based on the Ibbotson SBBI U.S. Large Stock TR Index; (2) bonds, which provide historical returns based on the Ibbotson Associates SBBI U.S. Intermediate Term Government TR Index; and (3) cash-equivalents, which have a real return of zero. All returns were given in real terms, adjusted for inflation according to the Bureau of Labor Statistics' Consumer Price Index for All Urban Consumers (not seasonally adjusted).[1]

At the heart of the simulation is an extensible model of investor behavior with four stylized types of investors:

An emotionless risk capacity investor. This client invests according to a cubic glide path, starting at the equity level indicated by her risk capacity and gliding to zero equity at 20 years past retirement. This asset allocation is followed regardless of risk preferences; the client does not panic during downturns.

An emotional risk capacity investor. This investor is similar to the prior one, but can panic and exit the stock market if there is too much of a drawdown, relative to risk preferences. Specifically, the investor panics when there is either a sudden one-month drop in stocks, or a cumulative drop over a specified period (default: four months). Panic entails leaving the stock market altogether, moving into cash-equivalent vehicles and returning after either a minimum waiting period (default: six months) or a significant increase in the stock market (default: a 10 percent increase), whichever is later. The level of drop that triggers panic depends on the investor's risk preferences. By default, these parameters are: very conservative (3.33 percent), conservative (6.66 percent), moderate (10 percent), aggressive (13.33 percent), and very aggressive (16.66 percent).

An emotionless risk preference investor. This investor follows a risk-preference adjusted glide path, a hybrid approach employed by many investment companies. The glide path's function is the same as for the risk capacity investor (a cubic curve, leading to zero equity at 20 years past retirement), but the starting allocation is based on the person's risk preferences. The starting asset allocations, by risk preference level are: very conservative (100 percent bonds), conservative (60 percent bonds, 40 percent stock), moderate (40 percent bonds, 60 percent stock), aggressive (20

Table 2: What Happens When Investors Use a Risk Preference-Adjusted Glide Path but Might Still Panic During Downturns?

Investor Profile	Average Wealth After 10 Years: With risk preference-adjusted glide path and emotionless investors	Average Wealth After 10 Years: With risk preference-adjusted glide path and investors can panic	Percent Change
1	$84,830	$73,909	–12.87%
2	$241,133	$219,825	–8.84%
3	$2,284,175	$1,985,047	–13.10%
4	$1,442,362	$1,330,392	–7.76%
5	$1,958,686	$1,804,952	–7.85%

percent bonds, 80 percent stock), and very aggressive (0 percent bonds, 100 percent stock).

An emotional risk preference investor. This investor is given a risk preference-adjusted glide path, but can also panic and exit the market as described for the emotional risk capacity investor.

Each investor receives a salary payment each month, of which she contributes a given percent to her investments according to her current asset allocation. Over time, the investor's salary changes according to her lifetime earnings curve, calculated using the U.S. Census Bureau's Current Population Survey based on her starting salary, age, and gender. The salary curve is documented in Torralba (2011); the estimation process follows Murphy and Welch (1990).

The model simulates the five stylized investor profiles shown in Table 1. For each of the stylized investors, each of the four behavioral types was analyzed (emotionless risk capacity, emotional risk capacity, emotionless risk preference, and emotional risk preference).

For this analysis, the model was executed over every 120-month (10-year) window from 1926 to 2015 (in other words, starting at the 1926–1935 window and ending with the 2006–2015 window, incrementing the starting point by one year in each successive simulation. The model is written in the R programming language. Both market behavior and investor characteristics are controlled by input parameters that can be readily adjusted and examined as needed.

As noted earlier, risk capacity and risk preference-adjusted approaches are effectively the same when the preference-adjusted allocation is sufficient to meet investors' goals within their time frame. If investors don't need to take on additional risk to meet their goals, the theoretical difference in approaches is not particularly interesting. Thus, for these simulations, a capacity-based asset allocation was operationalized with a more aggressive starting point for the individual's glide path, relative to what the risk preferences for that person would otherwise indicate. To keep the analysis conceptually simple (and the results more conservative), "more aggressive" here is defined as increasing the person's equity allocation by one notch: moderate shifts to aggressive, aggressive shifts to very aggressive, etc.

Results for Investor Behavior and Outcomes Using Current Approaches

The panic effect. The analysis starts by looking at the effect of panic, with two sets of comparisons. First, the simulation was analyzed for investors using risk capacity-based allocations, with and without the ability to panic.

The effect of panic was calculated as follows: wealth at the end of the simulations with the potential for panic, minus wealth without the potential for panic, averaged across each of the 10-year executions of the simulation. Second, the simulation was re-analyzed for investors using risk preference-adjusted allocations, with and without the ability to panic, using the same metric.

In both allocation strategies, the effect of panic was significant. In the first risk capacity scenario, panic caused investors to lose between 9.8 percent and 15.4 percent of their total wealth. That corresponds to an annual loss of 100 to 154 bps. We see similar, though less extreme, results even when risk preferences were used to decrease the volatility of investments down to a more acceptable level for investors: i.e., the hybrid approach that many planners employ. Investors can still panic during downturns and undermine their returns. The result was a loss of 7.8 percent to 13.1 percent of the investor's total wealth after only 10 years, as shown in Table 2. Annually, the corresponding loss would be 81 to 133 bps.

Although empirical research on investor behavior and panic is relatively limited, one question has been well studied: how much do individual investors underperform the markets because they enter and exit at the wrong times? This is also referred to as the behavior gap, or the difference between an investment's theoretical returns over time and what investors actually receive (not accounting for fees).

Friesen and Sapp (2007) estimated that poor market timing decreased investor returns by 150 basis points per year. In their research, the main cause of

this gap in returns came from exiting the market during downturns, which is the behavior this simulation model covers. In another study, researchers estimated that financial planners and advisers can have a 150 basis-point effect on investor returns by helping clients avoid self-destructive behavior through behavioral coaching (Bennyhoff and Kinniry 2013). A 150 basis-point difference in returns per year translates roughly to a 13 percent increase in wealth over 10 years (on baseline returns of 7 percent)—similar to the upper estimate in this model.

Adjusting asset allocation based on risk preferences is simply not enough to avoid self-destructive behavior.

It is important to note that the underlying investing scenarios simulated here are different and not directly comparable. The simulations analyze extra returns on the client's initial investment, plus extra returns on ongoing contributions. Bennyhoff and Kinniry's (2013) estimate was based solely on extra returns from an initial investment. Their estimate was across all investors in their Vanguard dataset (those who panic and those who do not); the simulation here looked at panic among five stylized investors. However, the fact that the simulation results are similar is encouraging.

This result is important because it shows the relative impotence of asset allocation as a tool for weathering market volatility. If financial planners carefully assess their clients' risk preferences and encourage them to invest accordingly, they might believe that their clients are "safe." However, the idealized scenario of investors emotionlessly following a strategy is a mirage. Investors can and do panic, even when placed in investments considered suitable to their risk preferences. The problem is certainly exacerbated when risk preferences are ignored, but adjusting asset allocations based on risk preferences is simply not enough to avoid self-destructive investor behavior.

Sensitivity analyses on the impact of panic. The main innovation of the simulation model, relative to a standard analysis of expected returns, is investor panic, or the tendency of investors to react to downward market volatility and pull their investments out of the markets. It is reasonable to ask how much the results depend on the particular specification of investor panic used in the model.

Based on prior research, including Browning and Finke (2015), and the anecdotal experience of many financial planners, it is clear that some investors quickly sell off stocks during market downturns. However, the exact conditions under which that occurs are not clear. The simulation results above started with a set of seemingly reasonable assumptions: for a person with moderate risk preferences, a 10 percent drop in the markets leads to reallocation. To analyze the importance of these assumptions, the same scenarios (five investors, across each 10-year period from 1926 to 2015) were simulated while varying two key parameters: the duration of panic and the threshold for panic. Investors used a risk-preference-adjusted glide path for their asset allocation.

The first sensitivity analysis considered six possible panic durations, or how long investors stayed out of the market. In addition to the default scenario of a six-month waiting period, waiting periods of two, four, 12, 18, and 24 months were also considered. The assumption of a six-month waiting period turned out to be the least-worst case. If that period increased or decreased significantly, the negative impact of panicking on investor outcomes grew from a baseline 9.9 percent average loss of wealth up to a 17.1 percent average loss for frequent, short panics of two months, and up to 12.1 percent for longer infrequent panics of 24 months.

The second sensitivity analysis compared the default threshold of a 10 percent drop (for investors of moderate risk preferences) before investors panic, with two lower thresholds, 7.5 percent and 5 percent; and five higher thresholds, 10 percent, 12.5 percent, 15 percent, 20 percent, and 25 percent. As the threshold decreased from the baseline 10 percent, the frequency—and thus the impact—of panic increased to 11.7 percent and 16.0 percent of wealth. As the threshold increased, the frequency and impact of panic on investor outcomes decreased, as one would expect. The net impact ranged from –8.6 percent of wealth for a 12.5 percent threshold and 6.5 percent for a 15 percent threshold, to a 1.9 percent loss of wealth at a 25 percent threshold.

Similar to the prior sensitivity analysis, the conclusion was strong: across the five stylized investors, seven thresholds for panic, and six durations of panic, as long as panic could occur at all (i.e., the threshold for panic for moderate investors was at or below a "bear market" with a 20 percent decline), it was highly destructive to investor wealth.

Risk Capacity–Based Allocation Versus Risk Preference–Adjusted Allocation

Thus far, this paper has analyzed the effect of panic. But financial planners don't have a choice between living in a world in which investors panic or one in which investors do not. Instead, planners choose an asset allocation strategy in the real world, with panic. The question naturally arises: does a pure risk-capacity approach (a more

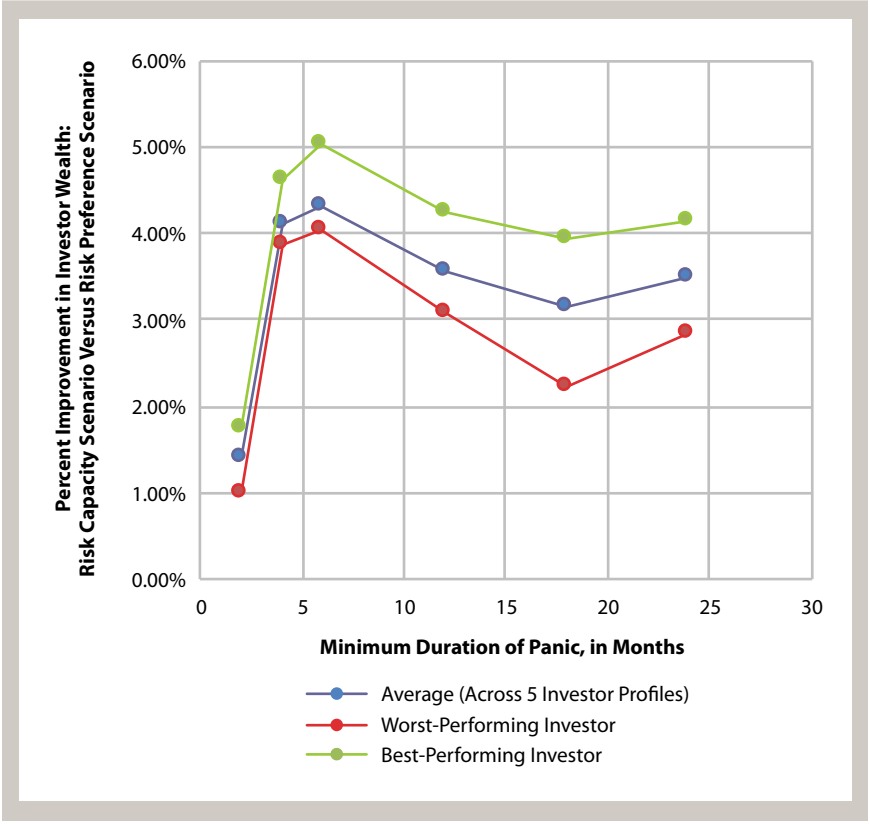
aggressive asset allocation, in this case), outweigh the approach of using risk preferences to adjust the investor's glide path? It is obvious that a more aggressive allocation on its own would increase returns. However, it is less obvious what happens when that more aggressive allocation also increases the psychological cost to the investor and the likelihood of panic. Could the benefit of a more aggressive portfolio be outweighed by an increased chance of panicking?

In this set of simulations, two types of investors were analyzed: emotional investors with risk capacity-based allocations, and emotional investors with risk preference-adjusted glide paths. The investor's underlying risk preference and criteria for reacting to swings in the market were unchanged; just the asset allocation changed.

The results were straightforward. Overall, ignoring risk preferences and putting investors into a more aggressive portfolio, when warranted by the risk capacity analysis, made investors moderately better off. Average assets at the end of the 10-year period increased by 4.0 percent to 5.0 percent for each of the investor profiles in the study. On the surface, this provided evidence that among the two existing approaches, a risk capacity approach was "better" than a risk preference-based one, at least in strictly financial terms that ignored the cost of an anxiety-inducing portfolio on the client and their relationship with the planner. Before digging in deeper, consider the robustness of the model's results.

Sensitivity analysis. To double check these results, additional simulations analyzed the impact of panic on investor wealth. In these sensitivity analyses, the same variations described above (threshold and duration of panic) were analyzed. In terms of the duration of panic, the assumption of a six-month waiting period turned out to be relatively innocuous. If the period increased or decreased significantly, the results above held: a risk capacity approach, on net, provided better financial outcomes for investors than a risk preference approach. This is illustrated in Figure 1.

Figure 1: How the Duration of Panic Affects Investor Outcomes



Second, consider the effect of the investor's threshold for panic. For thresholds lower than the 10 percent default (7.5 percent and 5 percent), investor outcomes were similar: the risk capacity approach delivered higher average total wealth for investors than the more conservative risk preference-adjusted glide path by 3.1 percent and 1.2 percent, respectively. As the threshold increased, there was little change in the benchmark result.

The risk capacity approach delivered higher average total wealth from 4.3 percent of assets for a 10 percent threshold, 4.8 percent for 12.5 percent, 5.4 percent for 15 percent, 6 percent for 20 percent, and 6.7 percent for a threshold of 25 percent drop in the stock market before investors panicked. The magnitude of impact changed, but the direction stayed the same.

Thus, across the five stylized investors, seven thresholds for panic, and six durations of panic, the results were effectively the same: a risk capacity approach appeared to be "better" than a risk preference one, in narrow financial terms. Two forces are working at cross purposes, however; more aggressive allocations lead to better returns, but the increased likelihood of panic significantly undermined some of that increase.

In a professional context, the increased likelihood of panic means stress for the investor, and potential loss of the client. The next two sections analyze those opposing forces in greater detail before examining how to mitigate investor stress.

The Impact of More Aggressive Asset Allocation

To distinguish between the effects of panic and the effects of asset allocation, the next set of simulations removed the possibility of panic altogether. The previous scenarios were reapplied, but investors emotionlessly stayed with their investments despite market volatility. Thus, the only difference between the two scenarios was asset allocation—the risk capacity-based investors were placed in investments that were one notch more aggressive than those of their risk preference-adjusted peers. In a world of emotionless investors, a more aggressive asset allocation alone increased wealth between 6.6 percent and 7.7 percent over the 10-year simulation period.

The Impact of an Increased Risk of Panic

What about the downside of a risk capacity approach: the increased likelihood of panic with more aggressive investments? The simulation can help quantify that effect by subtracting net effect of an aggressive asset allocation and panic (4.0 percent to 5.0 percent) from the narrow effect of the more aggressive asset allocation without panic (6.6 percent to 7.7 percent). The result was that an increased likelihood of panic, due solely to the more aggressive allocation, cost investors an *additional* 2.4 percent to 3.6 percent of their total wealth over 10 years.

What would happen if financial planners could help investors overcome their tendency to panic during downturns, without resorting to changing their asset allocation and undermining their returns? Financial planners have a unique opportunity to do so by drawing on the behavioral literature on investing and saving behavior.

A Behavioral Approach to Risk Tolerance

Behavioral scientists have long studied why investors make costly mistakes that undermine their long-term goals (e.g., Barber and Odean 2000, Shefrin 2007, Thaler 2005, Baker and Ricciardi 2014), and have developed tools to help overcome these challenges. While a comprehensive review is beyond the scope of this paper, this section provides an overview of techniques available to financial planners as they seek to help clients through volatile markets.

Lessons from behavioral science offer a different route to helping investors on their journey.

The focus here will be on methods to stop investors from panicking during down markets, but similar lessons can be applied to other behavioral mistakes like over-allocating to stocks during boom periods or chasing returns overall.

Conceptually, one can think about the five stages that occur on the path to panicked selling:

Stage 1, investments: volatility occurs within a portfolio because of the nature of the investments;

Stage 2, information: the investor receives information about that volatility;

Stage 3, emotion: the information triggers an emotional response, often anxiety or fear;

Stage 4, decision: the investor decides to change investments imprudently based on that emotion; and

Stage 5, action: the investor executes that decision, to their detriment.

At each of these stages, financial planners can intervene and redirect behavior, regardless of the particular investment strategy that the client follows. Here are some brief examples from the research literature.

Investments

- Use target date funds or other vehicles packaged as set-it-and-forget-it tools to help investors avoid common mistakes with market timing (Holt and Yang 2016).
- Reduce volatility via hybrid funds, funds and managers who limit downside risk, or bucket strategies that separate short time horizon (low-volatility) investments from long-horizon, higher-volatility ones (Benz 2016).

Information

- Avoid frequent price updates because they lead to less risky asset allocations, even among professional traders (Larson, List, and Metcalfe 2016).
- Understand that perceived risk and volatility may be quite different than actual risk (Davies and Brooks 2014). The more vivid the volatility, and the more investors see it, hear it, and visualize the panic (or excitement) around it, the more "real" it feels.

Emotion

- Educate clients about investment biases, such as overconfidence, to help counteract them (Perttula 2010).
- Help clients consciously and intentionally change how they interpret their bodies' response to situations, turning anxiety into excitement (Brooks 2014). This reappraisal is more effective than asking people to simply ignore their emotions (Hofmann, Heering, Sawyer, and Asnaani 2009). Contrarians recommend this approach to investors: instead of feeling anxious during down markets, be excited.

Decision

- Refer to the client's written financial plan or investment policy statement during volatile times; this has been

Table 3: What Happens When Investors Can Overcome the Tendency to Panic and Embrace Their Risk Capacity?

Investor Profile	Average Wealth With risk-preference adjusted allocations and the potential to panic	Average Wealth With the combined behavioral approach: risk capacity-based allocations without panic	% Change with the Behavioral Approach
1	$73,909	$90,999	23%
2	$219,825	$259,664	18%
3	$1,985,047	$2,451,011	23%
4	$1,330,392	$1,538,007	16%
5	$1,804,952	$2,109,062	17%

shown to help investors (Winchester, Huston, and Finke 2011).

- Similarly, have investors write out their personal motivations and values behind their investing strategy, sign it, and commit to those values regardless of the whims of the market (Wendel, Newcomb, and Edmonds 2016); this is a type of "commitment device" found to be effective in other contexts (Bryan, Karlan, and Nelson 2010).
- Intervene at the time of decision. Betterment provides an interesting example: when an investor wants to execute a trade, Betterment pops up a window reminding her about the tax consequences of the trade; in a randomly assigned experiment, this approach convinced many investors not to proceed (Egan 2015).

Action

- To add friction and give an opportunity to reevaluate hasty actions, investors and planners can make it more difficult to change investments or strategies, for example, by requiring that one's spouse also sign off on a decision, or adding verification procedures within online portals.
- Similarly, request a "delay period" between the decision and the execution.

These behavioral approaches have been found to work in particular situations and contexts; more study is needed to determine the nuances for specific investors and situations. However, financial planners can apply these approaches in their practices, to see what works for them. In the aggregate, these approaches provide an outline for what may be—for some planners—a new way of managing volatility: one in which these behavioral tools are used side by side with asset allocation to help clients reach their goals.

Mitigating Panic with Behavioral Tools

The final set of simulations compared a risk preference-adjusted glide path (where investors can panic) to a hypothetical "behavioral" approach: combining hypothetical behavioral tools to stop panic with asset allocations based on the investor's risk capacity. Although the simulation could not model the specific techniques outlined above, it attempted to analyze their effect: short-circuiting, self-destructive emotional responses that cause panicking. In this version of the simulation, the ideal outcome—investors no longer panic—was analyzed.

Table 3 shows the result. In short, if financial planners can successfully employ a behavioral approach to risk tolerance, there are significant increases in long-term wealth creation.

For the five stylized investors, the gains ranged from 17 percent to 23 percent over 10 years. Annualized, that would represent an additional 170 to 225 basis points per year (on an assumed baseline return of 7 percent per year). The outcome is an impressive increase in wealth over time.

This result shows the tremendous promise of behavioral interventions, which allow financial planners to select the investments the best help clients meet their financial goals according to their risk capacity while employing complementary behavioral interventions to mitigate the stresses of volatility on the investor and the investor's relationship with the planner.

Conclusion

Risk capacity and risk preference-based approaches to asset allocation are both limited tools because they each focus on only one of two simultaneous dangers to investors: panicking during volatile markets and generating insufficient returns. Lessons from behavioral science offer a different route to helping investors on their journey, namely one that allows financial planners to support investors' long-term goals by deploying asset allocation effectively while not turning a blind eye to investors' emotions.

To help planners understand the promise of this behavioral approach, this paper presented a conceptual framework for thinking about the five steps that lead to self-destructive investor behavior, and the practical tools that financial planners can use to help investors at each step. *Volatility* in an investment leads to investors *receiving information* about that volatility, which leads to investors *reacting emotionally*, which leads to investors *deciding to act rashly*, which leads to investors *acting on* that decision and changing their portfolios at an

inopportune time. One can short-circuit this process at each step of the way with techniques ranging from commitment devices, to less frequent performance updates, to cool-down periods.

This combination of asset allocation to deliver returns, and behavioral tools to limit stress on the client could significantly help planners and their clients. For the five investor profiles used in this simulation model, the gains ranged from 17 percent to 23 percent over 10 years. Annualized, that would represent an additional 170 to 225 basis points per year (on an assumed baseline return of 7 percent per year).

Financial planners know that investors struggle during times of volatility, especially those who have a lower appetite for risk. This paper points planners toward the tools being developed in the behavioral science community to help clients better manage volatility and reach their goals. ■

Endnote

1. Investors in the simulation react to changes in the market in real terms. In reality, they likely react to nominal changes in the market. Over the short time frames that these reactions occur, nominal changes are close approximations to real changes.

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