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Putting Investors' Eggs in Separate Time Baskets

STRATEGIC THINKING

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Planning for financial goals and funding future liabilities that occur at different points in life through a time-segmented approach to asset allocation provides the clarity needed to help investors stay on track.

EXECUTIVE SUMMARY

The most common approach to asset allocation has centered on a single-portfolio solution for individuals and for many institutional investors. It's easy to see why: Single-portfolio solutions offer the convenience of simplicity and are well suited to a variety of circumstances, which can be adequately addressed using a straightforward accumulation plan coupled with a systematic withdrawal schedule.

However, longer life spans, rising health care costs, a reduced reliance on defined pension plans and the possibility of prolonged periods of portfolio returns below expectations have elevated the degree of uncertainty that comes with planning far into the future. What's more, when portfolio returns are exceptionally volatile or poor, investors tend to become vulnerable to rash or emotional decision making. Indeed, many investors have suffered below-average returns after selling assets that have already fallen in value and then re-establishing prior positions only when they have substantially recovered.

To help investors keep their emotions at bay during tumultuous times, an asset allocation approach that adds clarity by unbundling a single portfolio into separate time periods—each targeting financial objectives that apply at different times in the future—makes practical sense. For one, time-segmented asset allocation makes it easier to assess whether objectives are on track, ahead or behind plan as the asset class returns advance or decline. We believe that the transparency afforded by this approach not only helps temper any emotionally driven decision making but, according to our analysis, also may result in a higher success rate—in terms of not running out of income or principal through a target date—than a single-portfolio approach.

CONTINUED ON INSIDE COVER

Introduction

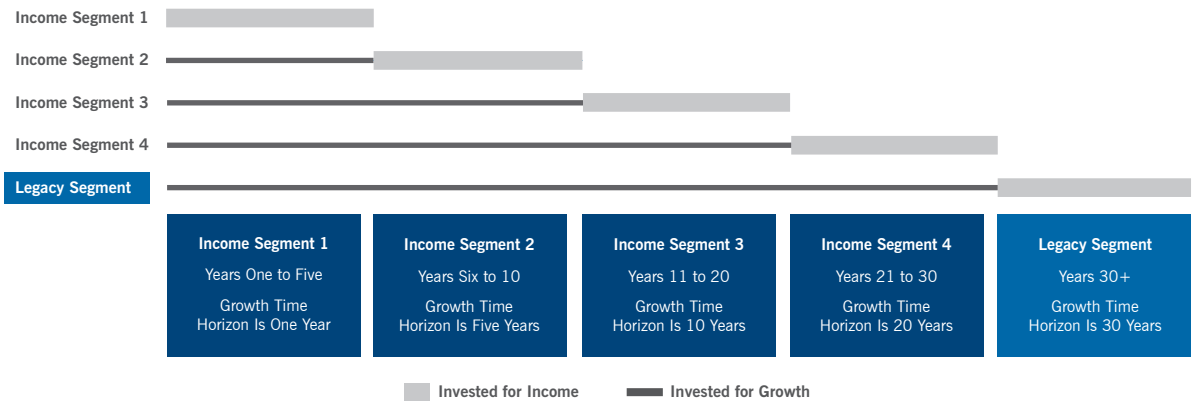
Time-segmented asset allocation involves creating distinct portfolios, which apply to specific time periods in the future, in separate pools that are to be drawn upon sequentially. The approach evaluates the timing of an investor's income in retirement derived from Social Security, pensions, royalties, rental income, annuities and any other predictable sources. Based on the estimated gap between these sources of retirement income and an investor's future cash-flow needs, assets are divided into separate accounts, each of which is invested according to how and when it is expected to be used. Each separate, time-segmented account is intended to fund a specific phase of retirement with an asset allocation consistent with the time horizon and investment objective of the investor. Typically, the nearest time segment tends to be the most liquid and conservative, as it is scheduled to be withdrawn first. Subsequent portfolios are invested with an eye toward generating an increasing amount of wealth accumulation and are invested with an understanding of having a longer period of time to weather market volatility.

The illustration below (Fig. 1) depicts a simple example of time-segmented asset allocation using four fixed-length periods and a legacy segment thereafter, which is common.

Volatility and Time-Segmented Asset Allocation

Due to market volatility, ongoing asset allocation adjustments are an essential part of the investment process. If left unchecked for too long, a portfolio could end up being partially drawn down when it was intended to be fully utilized. Far worse, a portfolio could be depleted before its target date. Thus, a disciplined approach to balancing the trade-offs between wealth generation and income security has merit. Indeed, the analysis described in this report supports the efficacy of capturing unexpected gains when they occur and

Figure 1. Time-Segmented Asset Allocation Process



For illustrative purposes only
Source: Morgan Stanley Smith Barney Investment Strategy

converting them into increased income security, which, though not universally applicable, could represent a favorable option for more-conservative investors.

Given the market volatility experienced from 2000 through 2009, it is worthwhile to consider how time-segmented asset allocation would have performed. We back tested the time-segmented approach for three periods, each corresponding to the start of a difficult time for investors: 1973, 2000 and 2008. In each instance, the back-tested period concluded at the end of 2009. For portfolios with similar risk-reward characteristics, the time-segmented asset allocation approach produced encouraging results.

There are limits to what time segmentation can do. For investors who require a very high degree of certainty, annuities and life insurance may represent an appropriate cornerstone of their financial plan. For those who are more likely to utilize disciplined harvesting rules and avoid emotional decision making under an approach that makes asset and liability matching more transparent, time segmentation may offer significant advantages.

Case Studies

In this section, the time-segmented asset allocation approach is compared with two possible and realistic alternatives. The first alternative is the "systematic-withdrawal" approach—in which an investor utilizes a single portfolio that is regularly rebalanced to its target allocation as a way to adjust for the effects of market action and portfolio distributions. The target allocation under this scenario is set to average the same asset allocation, on a dollar-weighted basis, as the time-segmented approach to assure that the risk-return characteristics of the time-segmented and systematic-withdrawal methodologies are comparable over the full time period.

The second alternative is a "buy-and-hold" approach, in which a single portfolio is also set to match the average allocation of the time-segmented approach, the key difference being that the investor will not rebalance assets throughout the period—meaning the portfolio's asset allocation is allowed to *drift* with the effect of market action.

To analyze the pros and cons of each approach across a wide range of possible outcomes, 5,000 Monte Carlo simulations were applied to each of the three methodologies[1] for three investor cases (Fig. 2). Case 1 is a 50-year-old, moderate-risk couple with $1 million in investable assets and an investment horizon of 40 years. Case 2 involves a 65-year-old investor who is less conservative than the 50-year-old couple, with investable assets of $3 million and an investment horizon of 30 years. Finally, Case 3 is a $100 million educational endowment fund with a similar risk profile as the 65-year-old investor but with a longer targeted investment horizon of 50 years. In each case, income sources are ignored.

Figure 2. Case Studies

Case 1	A 50-year-old couple with $1 million in investable assets and an investment horizon of 40 years
Case 2	A 65-year-old investor with $3 million in investable assets and an investment horizon of 30 years
Case 3	A $100 million educational endowment with an investment horizon of 50 years

For illustrative purposes only
Source: Morgan Stanley Smith Barney Investment Strategy

1 Monte Carlo simulations are used in finance to value and analyze complex instruments, portfolios and investments by simulating the various sources of uncertainty affecting their value and then determining their average value over the range of resultant outcomes. To be effective in accurately representing a full range of possible outcomes, a large number of simulations is usually necessary. For this analysis, we ran 5,000 simulations for each variation of methodology and case.

For each case in the time-segmented approach, five Global Investment Committee (GIC) model portfolios[2] were selected to fill four time segments and the legacy fund. The GIC maintains strategic and tactical portfolios for eight investor risk profiles—with model one being the most conservative and model eight being the most aggressive. In this analysis, the strategic portfolios were utilized without any active management overlay from tactical shifts or active manager contributions. The first four model portfolios were assigned to segments of similar length[3]. As illustrated below (Fig. 3), the 50-year-old couple in Case 1 with a 40-year investment horizon would have four 10-year time segments plus a legacy fund[4]. Likewise, the 65-year-old investor with a 30-year horizon would utilize four seven-and-a-half-year segments while the college endowment with a 50-year horizon would deploy four 12.5-year segments.

The analysis involves the following 10 key assumptions and decision rules:

1) The GIC's strategic assumptions represent reasonably accurate and unbiased estimates of future returns, volatility and correlations of asset classes over the entire investment horizon[5].

2) Withdrawal rates grow at the rate of inflation to maintain purchasing power[6].

3) Returns are normally distributed and are assumed to be independent from one period to another.

4) Costs related to transactions or taxes are not considered in the analysis.

5) The composition of GIC model portfolios remains constant. Tactical, or opportunistic, adjustments are not made to any of the portfolios.

6) Rebalancing, where required, is conducted on a quarterly basis.

7) In the time-segmented approach, if a segment depletes before the time horizon it was meant to cover ends, funds are drawn from segment four to cover withdrawals. If segment four is also depleted, the legacy fund will be drawn upon. Conversely, if excess funds remain at the end of a segment's time period, these funds will be allocated to the legacy fund.

8) In the systematic-withdrawal approach, withdrawals are funded by all asset classes in approximately the same proportions as the initial portfolio. This is done to ensure quarterly rebalancing to the initial weightings.

Figure 3. Time-Segmented Portfolio Selections as Applied to Case Studies

	HORIZON (SEGMENTS 1-4)	SEGMENT 1	SEGMENT 2	SEGMENT 3	SEGMENT 4	LEGACY FUND
Case 1	10 Years Each	GIC Model 1	GIC Model 2	GIC Model 3	GIC Model 5	GIC Model 7
Case 2	7.5 Years Each	GIC Model 1	GIC Model 3	GIC Model 5	GIC Model 7	GIC Model 7
Case 3	12.5 Years Each	GIC Model 1	GIC Model 3	GIC Model 5	GIC Model 7	GIC Model 7

For illustrative purposes only
Source: Morgan Stanley Smith Barney Investment Strategy

2 Please see Appendix 1 for the composition of GIC model portfolios. In our analysis, we use a simplified version of these portfolios with only three asset classes: cash, global bonds and global equities. For the purpose of the analysis we will proxy REITs and commodities with global equities, and TIPs with global bonds.
3 Our research suggests that the time-segmented approach is most effective when the four segments are of similar or same length.
4 Please note that the time-segmented approach does not include an investor-suitability condition. Investors, in conjunction with their Financial Advisors, should ensure that the aggregate portfolio (combining all segments and the legacy fund) is consistent with the investor's investment objectives and circumstances at all times.
5 For more information, see our annual "Strategic Asset Allocation: Return, Risk and Correlation Estimates" whitepaper.
6 We assumed a 2.3% annual inflation rate over the entire length of the analysis.

9) In the buy-and-hold approach, withdrawals are funded in exact proportion to the portfolio at any given time, so that the asset allocation is not affected by withdrawals.

10) The share of the initial portfolio assigned to each time segment is derived by discounting the future funding required to generate the targeted payments for each sequential period using the weighted-average expected return of the GIC model portfolio asset allocations for each time segment.

Applying the assumptions and decision rules described above, the aggregated portfolios resulted in the initial and time-weighted average asset allocations shown in the table below (Fig. 4). First, the 50-year-old couple utilized an initial equities-bonds-cash asset allocation of 20%, 60% and 20%, respectively, in the time-segmented approach but, because the more conservative portfolios were depleted first, the average asset allocation during the 40-year holding period was a more moderate 55%, 34% and 11%, respectively. The systematic-withdrawal approach had initial and average allocations equal to the average of the time-segmented method. The buy-and-hold strategy started with the same initial 55%, 34%, 11% equities-bonds-cash asset allocation as the systematic-withdrawal example. However, because the portfolio is allowed to drift with market effects and the GIC's return assumptions are higher for equities than they are for bonds and cash, the average allocation drifted to 65% equities, 28% bonds and 7% cash.

For the 65-year-old investor (Case 2), a less conservative profile than that of the 50-year-old couple (Case 1) led to higher equity allocations and lower bond and cash allocations throughout the analysis. This comparatively shorter 30-year investment period in Case 2 also reduced the average drift by asset class in the buy-and-hold example. Conversely, the average asset allocation drift increased for the educational endowment (Case 3) due to the assumption of a longer 50-year holding period.

The Envelope Please

The tables on pages six and seven (Figs. 5 and 6) display the outcomes from the simulations. For each case, the "success rate" is defined as the percentage of simulations for which the portfolio was not fully depleted by the

Figure 4. Overall Portfolio Holdings as Applied to Case Studies

	TIME-SEGMENTED INITIAL	TIME-SEGMENTED AVERAGE	SYSTEMATIC-WITHDRAWAL INITIAL	SYSTEMATIC-WITHDRAWAL AVERAGE	BUY-AND-HOLD INITIAL	BUY-AND-HOLD AVERAGE
Equities Case 1	20%	55%	55%	55%	55%	65%
Bonds Case 1	60%	34%	34%	34%	34%	28%
Cash Case 1	20%	11%	11%	11%	11%	7%
Equities Case 2	34%	63%	63%	63%	63%	70%
Bonds Case 2	50%	28%	28%	28%	28%	23%
Cash Case 2	16%	9%	9%	9%	9%	7%
Equities Case 3	25%	64%	64%	64%	64%	75%
Bonds Case 3	56%	27%	27%	27%	27%	20%
Cash Case 3	19%	9%	9%	9%	9%	5%

Source: Morgan Stanley Smith Barney Investment Strategy

Figure 5. Case-Study Success Rates and Average Ending Values at Different Confidence Levels

	TIME SEGMENTED	SYSTEMATIC WITHDRAWAL	BUY-AND-HOLD
Case 1			
99%	3.4%	2.7%	2.9%
Ending Value	$7.48 million	$11.13 million	$13.85 million
95%	3.8%	3.5%	3.4%
Ending Value	$5.98 million	$8.01 million	$11.89 million
90%	4.1%	4.0%	3.9%
Ending Value	$4.69 million	$5.93 million	$9.47 million
Case 2			
99%	3.5%	3.2%	3.3%
Ending Value	$14.10 million	$16.47 million	$18.50 million
95%	4.2%	4.0%	4.0%
Ending Value	$10.86 million	$12.50 million	$15.15 million
90%	4.6%	4.5%	4.4%
Ending Value	$9.06 million	$9.91 million	$12.65 million
Case 3			
99%	2.8%	2.4%	2.5%
Ending Value	$2.28 billion	$2.90 billion	$3.93 billion
95%	3.3%	3.0%	3.0%
Ending Value	$1.77 billion	$2.35 billion	$3.47 billion
90%	3.7%	3.5%	3.4%
Ending Value	$1.39 billion	$1.80 billion	$3.12 billion

Source: Morgan Stanley Smith Barney Investment Strategy

end of the investment horizon or sufficient to meet the present value of future expected payments[7]. In the table to the left (Fig. 5), the withdrawal rates commensurate with 99%, 95% and 90% success-rate thresholds were calculated. Of course, a higher required success rate corresponded with a lower matching withdrawal rate, and vice-versa. The average ending values—which are a measure of the remaining funds at the end of the investment horizon—are also shown. These ending values tend to be quite significant for two reasons: The first is the requirement of a high success rate, meaning the average simulation outcome resulted in the investor having money to spare; and the second is the effect of compounding over long investment horizons.

In the table on page seven (Fig. 6), the information is reorganized so that the withdrawal rate is set to a constant consistent with a 95% success rate under the time-segmented approach. Other statistics present the average ending values, volatility and percentile ending values.

Several observations emerge from the analysis. First, the time-segmented approach allows greater withdrawal rates, especially when higher success rates are required. In the case of the 50-year-old couple, the table to the left (Fig. 5) shows a 95% success rate was achieved alongside a 3.8% withdrawal rate under a time-segmented approach versus respective 3.5% and 3.4% withdrawal rates under the systematic-withdrawal and buy-and-hold approaches. The table on page seven (Fig. 6) reveals that under the same withdrawal requirement, the time-segmented approach has a better chance of protecting investments in the worst-case scenarios (fifth percentile) under the time-segmented approach. To us, this combination represents a crucial advantage. Many investors seek to maximize the cash flows that will support their lifestyles. For such investors, the ending value is a secondary consideration, as long as it meets future needs. The reason for the higher successful withdrawal rate in the time-segmented approach and lower chance of incurring negative ending values lies in

7 The discount rate used at the end of the investment is the expected return for segment one.

the way assets evolve over time. On average, the aggregate portfolio derived by combining all of the individual segments grows riskier over time, as the most conservative segments are depleted first. This, relative to other methodologies, helps limit the devastating effects of the greatest threat to success: bear markets in the early years of the plan. While the time-segmented approach requires the monitoring of multiple segments, it is also very intuitive, easily understood, disciplined and widely accepted.

Second, the systematic-withdrawal approach offers different trade-offs. For the same levels of success rates, the systematic-withdrawal rates are lower relative to the time-segmented approach, but not considerably so—particularly when the required success rate is lower. The advantage, though, is slightly higher ending values. Looking again at the 50-year-old couple (Case 1) at the 95% threshold in the table on page six (Fig. 5), the average ending value of $8.01 million under the systematic-withdrawal methodology is higher than that of the corresponding time-segmented ending value of $5.98 million. As the table to the right reveals (Fig. 6), this entails the risk of negative balances at the fifth percentile rather than positive ones as in the case of the time-segmented approach. Like the time-segmented approach, the systematic-withdrawal approach is widely accepted, sound and disciplined. Its main drawbacks are: a need for more frequent rebalancing and a relatively greater vulnerability to low market returns early on—which could test investor resolve and threaten a plan's ultimate success.

The buy-and-hold approach, meanwhile, generally provides the best upside and average ending values, but that is primarily because the lack of rebalancing allows the riskiest assets with

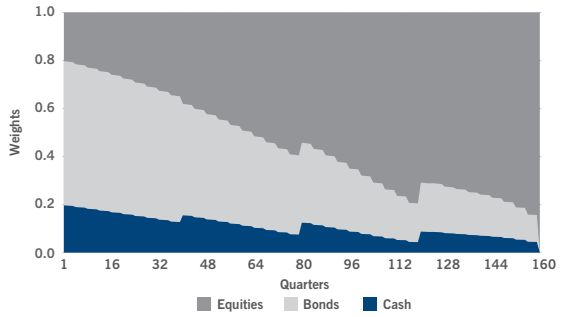
Figure 6. Case-Study Statistics of Initial Withdrawal Rates at 95% Confidence

	TIME SEGMENTED	SYSTEMATIC WITHDRAWAL	BUY-AND-HOLD
Case 1, Withdrawal Rate = 3.8%			
Probability of Success	95.4%	92.8%	91.9%
Expected Ending Value	$5.98 million	$6.68 million	$9.30 million
Volatility*	$6.35 million	$6.86 million	$13.58 million
5th Percentile	$0.07 million	($0.36 million)	($0.40 million)
50th Percentile	$4.08 million	$5.01 million	$5.07 million
95th Percentile	$18.26 million	$19.06 million	$33.59 million
Case 2, Withdrawal Rate = 4.2%			
Probability of Success	95.7%	93.5%	93.2%
Expected Ending Value	$10.86 million	$11.62 million	$14.41 million
Volatility*	$10.86 million	$11.52 million	$19.58 million
5th Percentile	$0.20 million	($0.42 million)	($0.44 million)
50th Percentile	$8.00 million	$8.70 million	$8.54 million
95th Percentile	$30.70 million	$32.83 million	$48.80 million
Case 3, Withdrawal Rate = 3.3%			
Probability of Success	96.6%	93.3%	92.2%
Expected Ending Value	$1.77 billion	$2.03 billion	$3.10 billion
Volatility*	$2.15 billion	$2.44 billion	$5.46 billion
5th Percentile	$0.03 billion	($0.06 billion)	($0.09 billion)
50th Percentile	$1.14 billion	$1.34 billion	$1.36 billion
95th Percentile	$5.68 billion	$6.48 billion	$11.69 billion

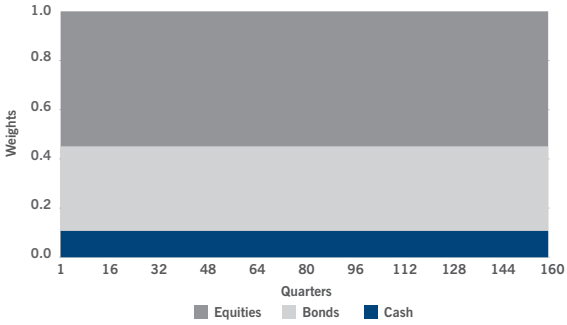
*Volatility is the standard deviation of the ending value.
Source: Morgan Stanley Smith Barney Investment Strategy

Figure 7. Case-Study Asset Allocation Splits

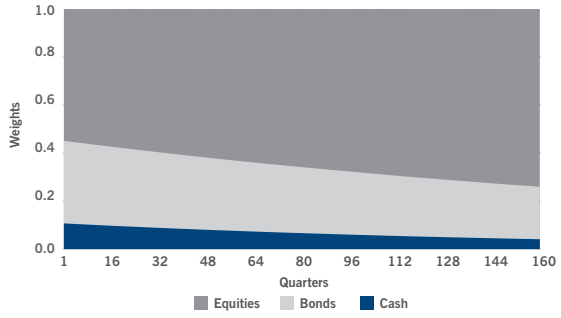
Asset Split Under a Time-Segmented Approach



Asset Split Under a Systematic-Withdrawal Approach



Asset Split Under a Buy-and-Hold Approach



Source: Morgan Stanley Smith Barney Investment Strategy

higher expected returns to outgrow safer assets over time without the offset of relatively conservative allocations at the beginning of the horizon (Fig. 7). The result is that, over time, the typical asset allocation tends to drift into a more aggressive stance. The implementation is very easy given the absence of periodic rebalancing activity, but there are two significant shortcomings. First, the buy-and-hold approach is only suitable to the most aggressive investors, especially at the end of the investment horizon when many portfolios in our simulation tended to be dominated by equities. Second, rising equity volatility significantly lowers the probability of success as compared with both the time-segmented and systematic-withdrawal approaches.

Thus, while there are advantages and disadvantages to all three methodologies, time segmentation and systematic withdrawal seem to hold a clear advantage over buy-and-hold for those who place a high emphasis on not running out of income or principal before a predetermined target date. That said, we prefer the time-segmented approach because of the attractive trade-off between success and withdrawal rates, as well as the disciplined and transparent asset-liability matching inherent in the methodology.

Harvesting, Fear and Greed

To the degree that a time-segmented approach encourages investors to stay on plan, there are two additional advantages for the conservative investor to consider. First, the approach lends itself to disciplined harvesting—in which the investor converts excess funds generated from better-than-expected early portfolio performance into the conservative segment-one account. This tends to improve the probability of success in achieving future income security[8]. The second benefit occurs by tempering emotional decision making. In the hypothetical "emotional-reaction" portfolio we analyzed, the investor was influenced by the fear and greed induced by market movements. The emotional-reaction portfolio was converted to cash following an equity market downturn of 10% or more, and the initial weightings of

8 In our simulation, harvesting occurs immediately after any segment's value is greater than or equal to the discounted value of expected future payments from it, using segment one's expected return as the discount rate.

the portfolio were not re-established until after a 20% recovery from the time the portfolio was converted to cash transpired. The findings from the Monte Carlo simulation (Fig. 8) show that both the harvesting and the emotional-reaction strategies led to more conservatively weighted average allocations to equities than in the case of the basic time-segmented approach. For the 50-year-old couple, the average equity allocation is 55% for the time-segmented approach, versus 7% when the harvesting discipline is incorporated and 29% when the emotional-reaction strategy is followed. However, profound differences arise in the simulated investment results.

The disciplined harvesting strategy improves success rates but incurs the cost of much reduced ending values and more frequent rebalancing activity (Fig. 9, page 10). In the case of the 50-year-old couple (Case 1), harvesting improved the withdrawal rate at the 95% success-rate threshold to 3.9% from 3.8% in the base case. However, the average ending balance fell to $1.21 million from $5.98 million. Harvesting contributed a more noticeable benefit at the 99% success-rate threshold where it improved the withdrawal rate to 3.7% from 3.4%—perhaps allowing a meaningful difference in lifestyle. Of course, harvesting does not need to be implemented in a systematic way over the full investment horizon. In our opinion, harvesting should be considered by investors who are inherently conservative or place a very high value on income security and not fully depleting their principal.

The emotional-reaction strategy should be avoided, in our view. It combines lower success rates and lower ending values. For the same withdrawal rates, the probabilities of success are not only considerably worse than the basic time-segmented approach or harvesting options, but they are also much worse than the systematic-withdrawal or buy-and-hold strategies analyzed previously. This results from poor timing, under

Figure 8. Case-Study Averages for Time-Segmented, Harvesting and Emotional-Reaction Strategies

	TIME-SEGMENTED INITIAL ALLOCATION	TIME-SEGMENTED BASIC AVERAGE	TIME-SEGMENTED HARVESTING AVERAGE	TIME-SEGMENTED EMOTIONAL-REACTION AVERAGE
Equities Case 1	20%	55%	7%	29%
Bonds Case 1	60%	34%	67%	22%
Cash Case 1	20%	11%	26%	49%
Equities Case 2	34%	63%	7%	35%
Bonds Case 2	50%	28%	66%	17%
Cash Case 2	16%	9%	27%	48%
Equities Case 3	25%	64%	7%	35%
Bonds Case 3	56%	27%	67%	16%
Cash Case 3	19%	9%	26%	49%

Source: Morgan Stanley Smith Barney Investment Strategy

which the investor all too often cuts down on risk near market bottoms and adds to risk near market tops. In the case of the 50-year-old couple (Case 1) at the 95% success-rate threshold, the table to the right (Fig. 9) shows the corresponding withdrawal rate fell to 3.4% from the base case of 3.8%, and the average ending value declined to $3.16 million from $5.98 million when the emotional-reaction strategy was employed. Figure 10 (page 11) reveals that emotional decision making led to lower ending values in all cases and, at the fifth percentile, significant negative ending balances were realized. The poor performance of the emotional-reaction strategy is further illustrated in Figures 9 through 11 on pages 10 and 11.

Figure 9. Case-Study Success Rates and Ending Values at Different Confidence Levels

	BASIC	HARVESTING	EMOTIONAL REACTION
Case 1			
99%	3.4%	3.7%	3.0%
Ending Value	$7.48 million	$1.47 million	$4.23 million
95%	3.8%	3.9%	3.4%
Ending Value	$5.98 million	$1.21 million	$3.16 million
90%	4.1%	4.1%	3.6%
Ending Value	$4.69 million	$0.94 million	$2.70 million
Case 2			
99%	3.5%	4.3%	3.5%
Ending Value	$14.10 million	$2.95 million	$7.80 million
95%	4.2%	4.6%	3.9%
Ending Value	$10.86 million	$2.33 million	$6.37 million
90%	4.6%	4.8%	4.2%
Ending Value	$9.06 million	$1.92 million	$5.36 million
Case 3			
99%	2.8%	3.2%	2.6%
Ending Value	$2.28 billion	$0.31 billion	$0.99 billion
95%	3.3%	3.5%	2.9%
Ending Value	$1.77 billion	$0.24 billion	$0.82 billion
90%	3.7%	3.7%	3.1%
Ending Value	$1.39 billion	$0.18 billion	$0.71 billion

Source: Morgan Stanley Smith Barney Investment Strategy

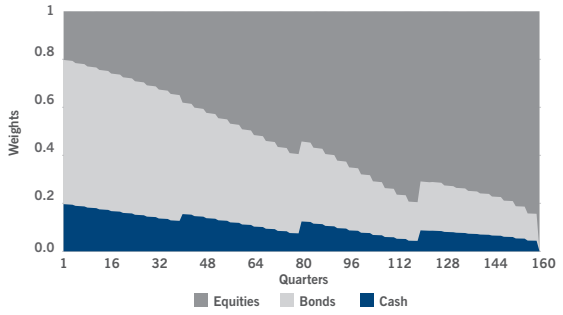
Figure 10. Case-Study Statistics of Initial Withdrawal Rates at 95% Confidence

	BASIC	HARVESTNG	EMOTIONAL REACTION
Case 1, Withdrawal Rate = 3.8%			
Probability of Success	95.4%	98.2%	85.4%
Expected Ending Value	$5.98 million	$1.34 million	$2.19 million
Volatility*	$6.35 million	$0.67 million	$2.97 million
5th Percentile	$0.07 million	$0.91 million	($0.47 million)
50th Percentile	$4.08 million	$1.88 million	$1.37 million
95th Percentile	$18.26 million	$3.09 million	$7.35 million
Case 2, Withdrawal Rate = 4.2%			
Probability of Success	95.7%	99.6%	90.5%
Expected Ending Value	$10.86 million	$3.20 million	$5.36 million
Volatility*	$10.86 million	$1.18 million	$6.33 million
5th Percentile	$0.20 million	$1.27 million	($0.48 million)
50th Percentile	$8.00 million	$3.16 million	$3.66 million
95th Percentile	$30.70 million	$5.17 million	$17.02 million
Case 3, Withdrawal Rate = 3.3%			
Probability of Success	96.6%	98.7%	86.2%
Expected Ending Value	$1.77 billion	$0.29 billion	$0.59 billion
Volatility*	$2.15 billion	$0.13 billion	$0.87 billion
5th Percentile	$0.03 billion	$0.08 billion	($0.09 billion)
50th Percentile	$1.14 billion	$0.28 billion	$0.33 billion
95th Percentile	$5.68 billion	$0.51 billion	$2.08 billion

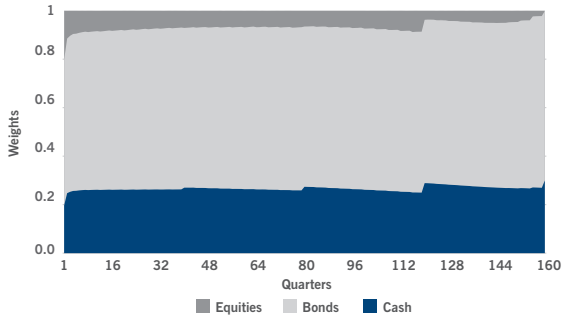
*Volatility is the standard deviation of the ending value.
Source: Morgan Stanley Smith Barney Investment Strategy

Figure 11. Case-Study Asset Allocation Splits

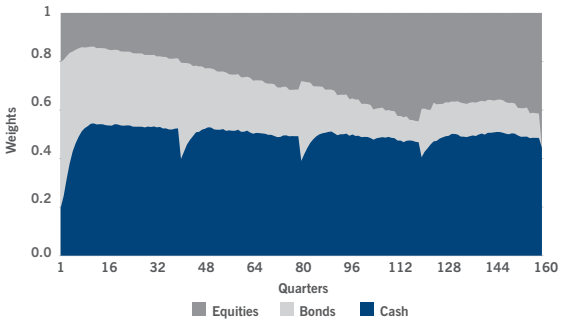
Asset Split Under a Basic Time-Segmented Approach



Asset Split Under a Harvesting Approach



Asset Split Under an Emotional-Reaction Approach



Source: Morgan Stanley Smith Barney Investment Strategy

Historical Back Testing

The analysis so far has centered on Monte Carlo simulations and shed light on possible future outcomes but, given the volatility of recent years, how would the time-segmented, systematic-withdrawal and buy-and-hold methodologies have performed over different periods in the actual past? Three periods with challenging starting points were selected to answer this question: the 37-year period from January 1973 to December 2009, the 10-year period from January 2000 to December 2009 and the shorter two-year period from January 2008 to December 2009[9].

For these specific sample periods, the historical back test is consistent with our initial assessment from the Monte Carlo simulation: The time-segmented approach generally allowed an investor to withdraw greater amounts for the same success rates (Fig. 12). In fact, the historical analysis displays an even greater advantage for the time-segmented methodology than observed in the Monte Carlo simulation. In all cases and over all three periods, the time-segmented approach led to greater ending values than the other two methods. Also of note, the time-segmented methodology was the only one in which all three of our hypothetical cases showed a positive ending value over the 1973 to 2009 back-test period, which is critical because this test illustrates what would happen close to the end of the target investment horizon. During this time frame, both systematic-withdrawal and buy-and-hold portfolios showed ending values in negative territory in Case 1 and Case 2 (Fig. 13, page 13).

Figure 12. Case-Study Back-Tested Maximum Withdrawal Rates

	TIME SEGMENTED	SYSTEMATIC WITHDRAWAL	BUY-AND-HOLD
Case 1			
Jan 73 - Dec 09	3.4%	2.8%	2.8%
Jan 00 - Dec 09	3.2%	2.5%	2.6%
Jan 08 - Dec 09	4.3%	4.0%	4.0%
Case 2			
Jan 73 - Dec 02	3.9%	3.4%	3.4%
Jan 00 - Dec 09	3.7%	2.9%	2.9%
Jan 08 - Dec 09	5.2%	4.6%	4.6%
Case 3			
Jan 73 - Dec 09	3.0%	2.2%	2.1%
Jan 00 - Dec 09	3.1%	2.3%	2.3%
Jan 08 - Dec 09	4.4%	3.8%	3.8%

Past performance does not guarantee future results.
Source: Bloomberg, Barclays Live, Morgan Stanley Smith Barney Investment Strategy as of Dec. 31,2009

9 The year 1973 was selected as a starting point for the longest period in an attempt to fully capture the bear market and high-inflation environment experienced in the 1970s. The starting point of the second period was selected to include the post-tech-bubble bear market. The most recent and shortest period includes the post-financial-crisis bear market.

Figure 13. Case-Study Back-Tested Ending Values

	TIME SEGMENTED	SYSTEMATIC WITHDRAWAL	BUY-AND-HOLD
Case 1, Withdrawal Rate = 3.4%			
Jan 73 - Dec 09	$0.67 million	($0.46 million)	($0.65 million)
Jan 00 - Dec 09	$0.83 million	$0.64 million	$0.64 million
Jan 08 - Dec 09	$0.91 million	$0.82 million	$0.82 million
Case 2, Withdrawal Rate = 3.9%			
Jan 73 - Dec 02	$0.11 million	($2.84 million)	($3.47 million)
Jan 00 - Dec 09	$2.00 million	$1.57 million	$1.60 million
Jan 08 - Dec 09	$2.58 million	$2.35 million	$2.34 million
Case 3, Withdrawal Rate = 2.9%			
Jan 73 - Dec 09	$0.24 billion	$0.08 billion	$0.05 billion
Jan 00 - Dec 09	$0.09 billion	$0.06 billion	$0.06 billion
Jan 08 - Dec 09	$0.09 billion	$0.08 billion	$0.08 billion

Past performance does not guarantee future results.
Source: Bloomberg, Barclays Live, Morgan Stanley Smith Barney Investment Strategy as of Dec. 31,2009

Conclusion

We would caution that history may not be a reliable predictor of future outcomes. In addition, the Global Investment Committee's asset class return, volatility and correlation estimates reflect our best thinking but may not reflect actual results. Each crisis or bear market is unique in nature, as are each recovery and bull market. Nonetheless, we believe that our analysis supports the value of the time-segmented approach in navigating difficult markets and helping investors stay the course on a well-thought-out investment plan.

Appendix 1
Global Investment Committee Asset Allocation Models
For Investors With Less Than $1 Million in Investable Assets (Level 1)

	Global Bonds and Inflation-linked Securities	Global Bonds, Global Equities and Alternative/Absolute Return Investments					Global Equities and Alternative/Absolute Return Investments	
Model Portfolios Strategic Allocations	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Global Cash	30%	15%	10%	8%	5%	3%	-	-
Global Bonds								
Investment Grade	60%	55%	42%	30%	21%	6%	-	-
Short Duration	15%	15%	10%	7%	5%	2%	-	-
Government/ Government Related	29%	25%	21%	15%	10%	2%	-	-
Corporate & Securitized	16%	15%	11%	8%	6%	2%	-	-
High Yield	-	2%	3%	5%	6%	8%	-	-
Emerging Markets	-	-	2%	4%	5%	6%	-	-
Total Bonds	60%	57%	47%	39%	32%	20%	-	-
Total Cash and Short Duration Bonds	45%	30%	20%	15%	10%	5%	-	-
Global Equities								
Developed Market Large and Mid Cap	-	16%	28%	36%	43%	52%	70%	60%
United States Large	-	6%	12%	16%	18%	22%	30%	24%
Growth	-	3%	6%	8%	9%	11%	15%	12%
Value	-	3%	6%	8%	9%	11%	15%	12%
United States Mid	-	2%	2%	2%	4%	4%	4%	4%
Growth	-	1%	1%	1%	2%	2%	2%	2%
Value	-	1%	1%	1%	2%	2%	2%	2%
Canada	-	1%	1%	2%	2%	2%	3%	3%
Europe	-	4%	9%	10%	12%	15%	21%	18%
Europe ex UK	-	3%	6%	7%	8%	10%	14%	12%
UK	-	1%	3%	3%	4%	5%	7%	6%
Developed Asia	-	3%	4%	6%	7%	9%	12%	11%
Japan	-	2%	3%	4%	5%	6%	8%	7%
Asia Pacific ex Japan	-	1%	1%	2%	2%	3%	4%	4%
Developed Market Small Cap	-	3%	4%	4%	5%	8%	9%	14%
United States Small	-	2%	2%	2%	2%	4%	4%	6%
Growth	-	1%	1%	1%	1%	2%	2%	3%
Value	-	1%	1%	1%	1%	2%	2%	3%
World ex US Small	-	1%	2%	2%	3%	4%	5%	8%
Emerging Markets	-	2%	4%	5%	6%	8%	11%	16%
Total Equity	-	21%	36%	45%	54%	68%	90%	90%
Total US Equity	-	10%	16%	20%	24%	30%	38%	34%
Total Developed ex US Equity	-	9%	16%	20%	24%	30%	41%	40%
Total Emerging Market Equity	-	2%	4%	5%	6%	8%	11%	16%
Global Alternative/Absolute Return Investments								
REITS	-	2%	2%	3%	4%	4%	5%	5%
Commodities	-	2%	2%	2%	2%	3%	5%	5%
Inflation-Linked Securities	10%	3%	3%	3%	3%	2%	-	-
Managed Futures	-	-	-	-	-	-	-	-
Hedge Funds	-	-	-	-	-	-	-	-
Private Real Estate	-	-	-	-	-	-	-	-
Private Equity	-	-	-	-	-	-	-	-
Total Alternative/Absolute Return Investments	10%	7%	7%	8%	9%	9%	10%	10%

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