

# Investment Methodology

## White Paper



An Independent Member of



THE BAM ALLIANCE

## OUR INVESTMENT PROCESS

A critical component of your experience with our firm is the formation of a robust investment plan to guide you and us as we build and maintain your portfolio. In this supporting white paper, we discuss our methodology for helping you pursue your goals. Our broad process consists of five steps:

### **Step One: Assessing your goals and circumstances.**

The investment planning process begins during the “Discovery Meeting” with a discussion of your financial values and goals, key relationships, existing assets, other professional advisors, preferred process and important interests. “Discovery” will be an ongoing part of our relationship with you.

### **Step Two: Risk assessment.**

Before recommending a particular portfolio strategy, we help you assess your ability, willingness, and need to take risk as well as your comfort owning a portfolio that will behave differently from the U.S. stock market.

### **Step Three: Understanding the investment strategy.**

We want you to understand the investment philosophy that we are recommending to you and use for our personal assets as well. We practice “Evidence-Based Investing” (EBI) and will discuss EBI in greater detail in this white paper.

### **Step Four: Building your portfolio.**

Once we have completed discovery, helped you assess various aspects of risk and explained our approach to investing, we will implement your investment portfolio. Portfolios are typically composed of U.S., international and emerging markets stock funds; high-quality bonds held individually or through bond funds; and, in some cases, alternative investment strategies, which we will discuss in more detail. As part of implementation, we will focus on proper asset location, which is the process of locating tax-inefficient asset classes in tax-advantaged accounts like IRAs, Roth IRAs and 401k accounts.

### **Step Five: Ongoing maintenance.**

After the portfolio is implemented, we will periodically rebalance the portfolio to ensure the asset allocation remains close to the one agreed upon. In addition, through periodic meetings we will continue the discovery process to make sure that we have an ongoing understanding of all aspects of your life, in particular being sensitive to whether your investment goals and objectives have changed from the original implementation of the portfolio.

## STEP ONE: ASSESSING YOUR GOALS AND CIRCUMSTANCES

Long-term investment success means different things to different people. The best investment plan for you depends on your specific circumstances and objectives. That is why we begin the investment planning process in the Discovery Meeting with a conversation about your values, goals, relationships, assets, types of accounts, advisors, preferred processes and interests.

While everyone's situation is unique, certain factors should be considered in creating any investment plan. These factors include the purpose of the portfolio, its size, specific funding sources, how and when you plan to use the funds, and the degree of uncertainty or risk you are willing to accept in pursuit of your objectives. As we establish a clear vision of your goals and circumstances, together we can build the foundation of an investment plan that best matches your needs as well as the realities of the financial markets.

## STEP TWO: RISK ASSESSMENT

For many investors, their most important long-term goal is achieving financial independence. But most of us also have intermediate-term goals, such as funding college education, travel or vacation homes. Achieving these goals commonly requires some measure of risk since most investors need returns in excess of inflation to meet their goals. Risk, however, is multifaceted, which is why we focus on four different aspects of risk in helping guide the asset allocation discussion.

### Part One: Ability to Take Risk

Your ability to take risk is most commonly a function of (1) the time horizon(s) of your investment objective(s), (2) whether you are working or retired, and (3) the stability of your job. Longer time horizons argue for more aggressive asset allocation strategies, since a long time horizon gives the portfolio more time to recover after periods of poor performance. If you are still working, you may be able to be more aggressive since the portfolio is likely not needed to support spending needs. Investors in more stable jobs (e.g., a university professor) generally have greater ability to take risk compared to investors with jobs that are more sensitive to the performance of the economy.

### Part Two: Willingness to Take Risk

Willingness to take risk measures your tolerance for risk. Specifically, we measure the amount of portfolio loss you are capable of experiencing without it significantly affecting your quality of life or causing you to change portfolio strategy. This is a crucially important aspect of risk since changing portfolio strategy *after* you experience risk is something your portfolio may not recover from.

### Part Three: Need to Take Risk

Need to take risk is directly tied to your rate-of-return objective. If you need relatively high returns to achieve your goals, your need to take risk is high. But this will require a more aggressive asset allocation, which could be in conflict with your ability or willingness to take risk. Need to take risk is typically relatively high for investors that expect to withdraw (or are withdrawing) a relatively high proportion (e.g., a withdrawal rate in excess of 3 percent) of their investment portfolios to fund living expenses.

### Part Four: Tracking Error Risk

Some investors are sensitive to how their portfolio performs relative to well-known U.S. stock indexes like the S&P 500. While we encourage you not to constantly compare portfolio returns to benchmark returns since it can lead to counterproductive, returns-chasing behavior, we nevertheless cannot ignore the tendency for some investors to make this comparison. The two sources of tracking error in the portfolios we customarily build for clients are allocations to international and emerging market stocks and tilts toward small-cap and value oriented stocks. Investors who are highly sensitive to underperformance of indexes like the S&P 500 might want to consider less exposure to international stocks and less tilt toward small-cap and value stocks. We caution, though, that these portfolios will have less diversification and less expected return compared to the portfolios we would typically otherwise recommend.

## STEP THREE: UNDERSTANDING THE INVESTMENT STRATEGY

We are big advocates of client education. More educated clients have a better understanding of why we make the investment strategy recommendations we do and most importantly are more likely to remain disciplined with their investment strategy approach, which increases the likelihood of achieving the goals they set out to accomplish. While client education can happen over time, there are basic elements of our approach that we want clients to understand from the outset.

We practice an evidence-based approach to investing. The focus of our firm's Investment Policy Committee (IPC) is understanding the investment best practices and body of knowledge defined by the last 50-plus years of academic and practitioner research. This research is ongoing and will continue to inform the recommendations we make to our clients. Importantly, our investment strategy guidance is not defined by what any member of the IPC "thinks" markets, the economy or interest rates are going to do. This approach to investing, typically referred to as "active management," has been shown to be counterproductive and a highly unreliable way to achieve financial goals. We believe there are six key tenets associated with evidence-based investing (EBI).

- 1. Outperforming the market is difficult.** While we do believe there are ways to build portfolios with higher expected returns than the stock market through strategic allocation decisions informed by academic evidence, we never lose sight of the fact that outperforming the market is not easy. Given this fact, we recommend low-cost, tax-efficient portfolios to our clients. We generally like to keep the weighted average expense ratio of the total portfolio at 0.50 percent or less and see that the funds we use distribute minimal short-term capital gains.
- 2. Size, value and momentum tilts can increase expected return.** There is abundant academic evidence showing that small-cap stocks have generated higher long-term returns than large-cap stocks, that value stocks — which are stocks with low prices relative to earnings — have outperformed growth stocks and that positive momentum stocks — which are stocks with high returns over the last year — have outperformed negative momentum stocks. We try to capture these long-term return premiums through the stock and alternatives funds we use to give our clients the best possible chance of generating returns equal to or better than the overall market.
- 3. Global stock market diversification is the starting point.** The academic evidence shows that investors should own U.S., international and emerging markets stocks, not concentrating solely on U.S. companies. This research shows that diversification across countries makes sense in the same way that diversification across companies does. We have no way of knowing which particular country will generate the highest long-term returns (and we do not believe anyone else does either), so diversification is the right strategy. Further, approximately half of the world's stock market value is located in non-U.S. companies, which is one other argument for global diversification.
- 4. The primary role of fixed income is to reduce portfolio volatility.** We believe that academic and practitioner evidence shows that the most efficient way to build portfolios is by taking risk through the stock and alternatives portion of the portfolio and using fixed income to reduce portfolio risk. This means that our fixed income recommendations primarily emphasize U.S. government-backed securities and high-quality municipal bonds since these securities tend to provide the most effective diversification of stock and alternative market risks.
- 5. Academic evidence supports modest use of alternative investment strategies.** While we are generally skeptical of most alternative investment strategies, we believe there are a few alternative strategies accessed in mutual fund form that can enhance portfolio expected return and/or reduce portfolio volatility. Allocations here, however, should be relatively modest since some of these strategies have relatively high expense ratios and may be tax inefficient.
- 6. EBI slowly evolves over time.** Importantly, EBI is not static. Our investment strategy recommendations will evolve as academic and practitioner evidence evolves.

While we cannot cover all aspects of our investment strategy in this white paper and will supplement with additional education over time, understanding these six concepts will go a long way toward helping you understand the portfolio recommendations that we make.

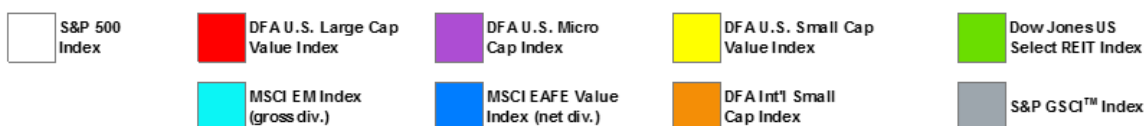
Once we better understand you as a client, have assessed various aspects of risk and spent time educating you about our evidence-based approach, this step concludes with developing your Investment Plan and Investment Policy Statement (IPS). There's a saying that those who fail to plan, plan to fail. It is very difficult to make rational decisions about investments without a plan. The Investment Plan and IPS show the target asset allocation for the portfolio we have identified as the one most suited for helping you achieve your goals. It also shows guidelines that indicate when the portfolio has drifted too far from its target and it is time to rebalance. These guidelines help provide the discipline necessary for a successful investment strategy.

## STEP FOUR: BUILDING YOUR PORTFOLIO

One question we commonly get asked is whether the portfolio should be implemented all at once or implemented over time through dollar-cost averaging (DCA). Research shows that DCA is generally counterproductive since markets tend to go up over time and delaying investment through DCA will therefore typically reduce the returns you earn. Yet another question we get asked is whether investments in certain portions of the portfolio (e.g., emerging markets stocks) should be delayed as a result of current events or past performance. We are big believers in the notion that short-term performance results are virtually unpredictable. The “quilt chart” below makes this point.

Asset Class Returns<sup>1</sup>  
1992–2016

1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
34.8	74.8	12.8	41.0	37.1	38.5	28.6	66.4	49.7	28.5	32.1	67.9	34.3	34.5	36.0	39.8	-36.8	79.0	31.1	9.4	20.4	46.7	32.0	6.0	37.5
26.4	39.9	11.0	37.6	33.9	38.0	47.7	40.9	31.0	24.2	3.6	63.6	33.2	25.6	32.6	32.7	-37.0	51.5	28.7	2.1	18.6	42.0	13.7	4.5	29.5
17.3	31.2	5.3	33.1	27.0	33.4	10.7	27.4	19.8	12.3	-1.6	60.7	26.0	24.6	30.4	6.1	-34.4	48.0	28.1	-1.2	18.6	39.4	8.2	1.4	24.3
15.1	25.9	2.7	31.5	25.6	30.9	8.2	24.1	12.5	2.7	-6.0	56.3	24.3	13.8	23.9	6.0	-39.2	41.4	22.1	-2.7	17.9	32.4	3.4	-4.4	12.0
11.4	21.9	2.6	20.3	23.5	19.7	-5.5	22.1	8.1	-2.4	-8.4	45.3	24.0	13.8	22.2	5.5	-43.2	34.2	20.4	-6.6	17.7	26.5	1.6	-5.6	11.6
7.6	21.6	2.6	12.2	23.0	1.5	-6.0	21.0	-3.1	-11.9	-11.9	37.2	22.7	9.8	21.6	-7.6	-44.1	29.4	19.2	-6.7	17.1	23.0	-1.8	-5.7	11.4
4.4	15.1	1.3	11.3	8.8	-11.2	-17.0	8.3	-9.1	-12.6	-12.5	36.2	19.4	7.4	21.3	-8.3	-46.5	28.5	15.1	-12.2	16.7	1.2	-5.4	-8.3	6.7
-11.2	10.1	0.4	2.6	6.0	-11.6	-25.3	8.2	-9.3	-18.5	-15.9	28.7	17.3	6.7	15.8	-11.7	-46.5	26.5	9.0	-15.5	16.0	-1.2	-5.6	-14.6	6.3
-19.2	-12.3	-7.3	-5.2	5.6	-14.1	-35.7	-2.6	-30.6	-31.9	-22.1	20.7	10.9	4.9	-15.1	-17.6	-53.2	13.5	3.3	-18.2	0.1	-2.3	-33.1	-32.9	5.0



<sup>1</sup> Data supplied by Dimensional Fund Advisors. Indices are not available for direct investment. Their performance does not reflect the expenses associated with the management of an actual portfolio nor do indices represent results of actual trading. Information from sources deemed reliable, but its accuracy cannot be guaranteed. Performance is historical and does not guarantee future results. Total return includes reinvestment of dividends. See Sources and Descriptions of Data Appendix.

This chart shows the year-by-year returns of various asset classes like U.S. large-cap stocks (S&P 500 Index), U.S. small-cap value stocks and real estate investment trusts (REITs). As you can see, it is hard to see any pattern in the year-by-year results. Performance is difficult to predict and we think that, once we have identified an overall portfolio that helps achieve your goals, implementing all the asset classes in that portfolio is the right approach. Beyond these two points, here are five other things to understand about our general approach to building your portfolio.

- 1. We use low-cost, evidence-based funds to implement the stock allocation.** We are big believers that costs matter and that investors should avoid using actively managed funds where an individual person or management team is attempting to outperform the market based upon their belief about whether the market is overvalued or not or concentrating in small number of stocks they believe to be their “best picks.” Instead, we use low-cost funds that try to capture the dimensions of return identified by decades’ worth of academic research. These funds are rules based and not reliant on an individual person or management team’s beliefs about the overall market or individual stocks.
- 2. We use either low-cost bond funds or individual bonds to implement the fixed income allocation.** Since we recommend high quality, government-backed securities for the fixed income portion of client portfolios, using either bond funds or individual bonds can make sense. This is true because the need for diversification across bonds is not as relevant as it is for stock investing where the fact that a particular company could go bankrupt or face serious financial difficulties increases the importance of diversification.
- 3. We may use alternative strategies for a modest portion of the overall allocation.** As previously mentioned, academic research has uncovered the benefits that some alternative strategies (style premium, REIT and commodity strategies in particular) can add by either enhancing portfolio diversification or improving expected return. The alternative investment strategies we use are held in mutual fund — and not hedge fund — form. We also do recommend modest allocations since these strategies have higher expenses and are typically less tax efficient.
- 4. Proper asset location is important.** We will look to place less tax-efficient asset classes like alternatives and fixed income in tax-advantaged accounts. Over time, this should help reduce your tax burden and consequently improve after-tax return. It also means that each account will not be allocated the same since some asset classes may be held in one account but not in others. Focusing on achieving the *overall allocation* in a tax-efficient manner is the reason for this approach.
- 5. We look for other ways to improve the tax efficiency of your portfolio like use of core funds, tax-managed funds and municipal bonds when appropriate.** Since our portfolios tend to be tilted toward small-cap and value stocks, for a portion of the portfolio we like to use “core funds” that hold stocks across all size and valuation ranges but have higher weights in small-cap and value stocks when compared to the overall market. In addition, we may use tax-managed funds and municipal bonds in taxable accounts. Tax-managed funds are mutual funds that explicitly look to harvest capital losses and defer gains to improve tax efficiency.

The end result of our overall process is a low-cost, tax efficient and globally diversified portfolio suited to help you achieve your goals while being cognizant of risk.

## STEP FIVE: ONGOING MAINTENANCE

Ongoing maintenance takes many forms. One of the more important aspects is portfolio rebalancing. We set target allocations for each asset class held in your portfolio and periodically review the portfolio to make sure that the actual allocation to each asset class has not strayed too far from the target. If it has, we will then sell asset classes that are over their target weights by a significant amount and purchase asset classes that are under their target weights.

Importantly, we set “no-trading bands” around each asset class’s target allocation to ensure the weight must move by a significant amount before rebalancing would be called for. This helps reduce trading costs and, potentially, taxes, while insuring that rebalancing will occur when weights deviate significantly from the target weights.

Ongoing maintenance also includes tax efficient management of the portfolio. We will proactively look to harvest capital losses when investments decline in taxable accounts so that these capital losses can be used to offset future capital gains. Your federal and state tax rates may also change over time, which can influence the investment strategies that we use in taxable accounts. In particular, municipal bonds may be the best holding at relatively high federal income tax rates but may not make sense at lower federal income tax rates. For clients in the withdrawal phase, we also help with a tax efficient approach to spending out of the portfolio since withdrawals from various account types can have significantly different tax implications.

Discovery continues for the length of our relationship with a client. As life progresses, your financial goals, health and values will likely change. These changes can have implications for what asset allocation strategy makes the most sense, the size of withdrawals needed from your portfolio and other aspects of your financial well-being. As we meet with our clients, we strive to stay on top of these changes and help you understand the impact of these changes from a financial perspective.

We conclude with why our firm has adopted an evidence-based investing approach. We believe our approach fosters a relationship grounded in fiduciary obligation, while effectively incorporating academic evidence on how markets can be used to pursue your financial independence. Just as asset allocation should be among the first steps toward building a long-term portfolio to meet your unique goals, selecting an advisor who espouses an evidence-based approach can be among the first steps toward building a long-term trusted advisor relationship.

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# SOURCES AND DESCRIPTIONS OF DATA

## U.S. Equities

### S&P 500 Index

Courtesy of Roger G. Ibbotson and Rex A. Sinquefeld, *Stocks, Bonds, Bills and Inflation: The Past and the Future*, Dow Jones, 1989. Ibbotson Associates, Chicago, annually updates work by Roger G. Ibbotson and Rex A. Sinquefeld. Used with permission. All rights reserved.

### CRSP Deciles 9–10 Index

Courtesy of Center for Research in Security Prices (CRSP), University of Chicago. Small company universe returns (Deciles 9–10) — all exchanges.

January 1926–June 1962: NYSE, rebalanced semiannually.  
 July 1962–December 1972: CRSP Database, NYSE and AMEX, rebalanced quarterly.  
 January 1973–September 1988: CRSP Database, NYSE, AMEX and OTC, rebalanced quarterly.  
 October 1988–Present: CRSP Index (NYSE, AMEX and OTC)

### CRSP Deciles 6–10 Index

Courtesy of CRSP, University of Chicago. Small company universe returns (Deciles 6–10) — all exchanges.

January 1926–June 1962: NYSE, rebalanced semiannually.  
 July 1962–December 1972: CRSP Database, NYSE and AMEX, rebalanced quarterly.  
 January 1973–September 1988: CRSP Database, NYSE, AMEX and OTC, rebalanced quarterly.  
 October 1988–present: CRSP Index (NYSE, AMEX and OTC).

### CRSP Deciles 1–10 Index (market)

Courtesy of CRSP, University of Chicago.

January 1926–June 1962: NYSE, rebalanced semiannually.  
 July 1962–present: CRSP deciles 1–10 cap-based (market) portfolio, rebalanced quarterly.

### Fama-French US Large Growth Index (excluding utilities),

### Fama-French US Large Cap Index,

### Fama-French US Large Cap Value Index (excluding utilities),

### Fama-French US Small Growth Index (excluding utilities),

### Fama-French US Small Cap Index and

### Fama-French US Small Cap Value Index (excluding utilities)

January 1927–present: Courtesy of Fama-French and CRSP. Upper-half market cap, upper 30 percent book-to-market. Buy range-only, no simulated hold range or estimated trading costs, rebalanced quarterly.  
 Composition:

U.S. operating companies trading on the NYSE, AMEX or Nasdaq NMS. Maximum weight of any security in a portfolio is 4 percent.

Exclusions:

ADRs, investment companies, tracking stocks before 1993, non-U.S. incorporated companies, closed-end funds and certificates.

Sources:

CRSP databases for returns and market capitalization: 1926–present.

Compustat and hand-collected book values: 1926–1992.

CRSP links to Compustat and hand-collected links: 1926–present.

Book-to-market ratios provided by Dimensional Fund Advisors (DFA): 1993–present.

Breakpoints:

Before June 1996, the small-cap portfolios contain firms with market capitalization below the 55th percentile of all eligible NYSE firms, and the large-cap portfolios contain firms with market caps above the 50th percentile. From June 1996 to December 2000, the size breakpoint for all portfolios is the market cap of the median eligible NYSE firm. The book-to-market breakpoints for 1926 to 2000 split the eligible NYSE firms with positive book equity into three categories: the top 30 percent are in value and the bottom 30 percent are in growth.

Starting in January 2001, the size breakpoints are defined by cumulative market cap percentile rules. Small-cap is the bottom 8 percent of the overall stock market and large-cap is the top 90 percent. The book-to-market breakpoints are defined by the firms in the relevant size range.

The breakpoints for small-cap value (high book-to-market) and small-cap growth (low book-to-market) assign 25 percent of the total market cap in the small-cap size range to each portfolio. The book-to-market breakpoints for large-cap assign 10 percent of the market equity of large firms to the large-cap

value portfolio and 20 percent to the large-cap growth portfolio.

Rebalancing:

Annual (at the end of June): 1926–1992. Quarterly: 1993–present.

### Dimensional US Micro Cap Index

Courtesy of CRSP and Compustat.

June 1927–present:

Dimensional US Micro Cap Index.

Composition: Market-capitalization-weighted index of securities of the smallest U.S. companies whose market capitalization falls in the lowest 4 percent of the total market capitalization of the eligible market. The eligible market is composed of securities of U.S. companies traded on the NYSE, AMEX and Nasdaq Global Market.

### Dimensional US Small Cap Value Index

Courtesy of CRSP and Compustat.

June 1927–present:

Dimensional US Small Cap Value Index.

Composition: Companies whose book-to-market ratio falls in the top 25 percent of U.S. small-cap companies after the exclusion of utilities, companies lacking financial data and companies with negative book-to-market ratio. The eligible market is composed of securities of U.S. companies traded on the NYSE, AMEX and Nasdaq Global Market.

### Dimensional US Large Cap Value Index

Courtesy of CRSP and Compustat.

June 1927–present:

Dimensional US Large Cap Value Index.

Composition: Companies whose book-to-market ratio falls in the top 20 percent of U.S. large-cap companies after the exclusion of utilities, companies lacking financial data and companies with negative book-to-market ratio. The eligible market is composed of securities of U.S. companies traded on the NYSE, AMEX and Nasdaq Global Market.

### US Market Equity — Risk Targets 2 and 3

Courtesy of DFA.

January 1973–present:

DFA US Adjusted Market 2 Index.

### US Large Cap Value

Courtesy of DFA.

January 1973–present:

DFA US Large Cap Value Index.

### US Small Cap Value

Courtesy of DFA.

January 1973–present:

DFA US Small Value Index.

## International Equities

### Fama-French International Value Index

Courtesy of Morgan Stanley Capital International (MSCI) and Fama-French.

January 1973–December 1974:

Data provided by MSCI EAFE Index (net dividends).

January 1975–present:

Data provided by Fama-French from MSCI securities data. Simulated strategy of MSCI EAFE countries in the upper 30 percent book-to-market range.

### Dimensional International Small Cap Index

Courtesy of DFA.

January 1970–June 1981:

50 percent Hoare Govett Small Companies Index.

July 1981–present:

50 percent Nomura Small Companies Index.

Simulated by DFA from Style Research securities data.

Includes securities of MSCI EAFE countries in the bottom 10 percent of market capitalization, excluding the bottom 1 percent.

Sources and descriptions of data supplied by Dimensional Fund Advisors.

Information from sources deemed reliable, but its accuracy cannot be guaranteed.



# SOURCES AND DESCRIPTIONS OF DATA

## International Market Equity

Courtesy of MSCI, DFA and Fama-French.

January 1973–December 1974:	50 percent MSCI EAFE (net dividends). 50 percent DFA International Small Cap Index.
January 1975–June 1981:	35 percent MSCI EAFE (net dividends). 28 percent Fama-French International Value Index. 37 percent DFA International Small Cap Index.
July 1981–present:	35 percent MSCI EAFE (net dividends). 28 percent Fama-French International Value Index. 32 percent DFA International Small Cap Index. 5 percent DFA International Small Cap Value Index.

## International Large Value

Courtesy of MSCI, DFA and Fama-French.

January 1973–December 1974:	50 percent MSCI EAFE (net dividends). 50 percent DFA International Small Cap Index.
January 1975–present:	Fama-French International Value Index.

## International Small Value

Courtesy of DFA.

January 1973–June 1981:	DFA International Small Cap Index.
July 1981–present:	DFA International Small Cap Value Index.

## Emerging Market Equity

Courtesy of MSCI, DFA and Fama-French.

January 1973–December 1974:	25 percent MSCI EAFE (net dividends). 75 percent DFA International Small Cap Index.
January 1975–December 1987:	50 percent Fama-French International Value Index. 50 percent DFA International Small Cap Index.
January 1988–December 1988:	MSCI Emerging Markets Index (gross).
January 1989–present:	50 percent MSCI Emerging Markets Index (gross). 25 percent Fama-French Emerging Markets Small Cap Index. 25 percent Fama-French Emerging Markets Value Index.

## Fixed Income

### Barclays Capital Government/Credit Bond Index

Range 1–30+ years. Courtesy of Barclays Capital.

### Barclays Capital Intermediate Government Credit Bond Index

Range 1–10 years. Courtesy of Barclays Capital.

### Six-Month Treasury Bills

Courtesy of CRSP and Bank of America Merrill Lynch.

January 1964–December 1977:	CRSP.
January 1978–present:	Bank of America Merrill Lynch G002 Index.

### One-Year Treasury Note Index

Courtesy of CRSP, DFA and Bank of America Merrill Lynch.

July 1963–May 1991:	CRSP/DFA.
June 1991–June 2000:	Bank of America Merrill Lynch One-Year US Treasury Bill Index.
July 2000–present:	Bank of America Merrill Lynch One-Year US Treasury Note Index (GC03 Index).

### One-Month Treasury Bills (Average maturity: 30 days), Five-Year Treasury Notes, Long-Term Government Bonds (Average maturity: 20 years) and Long-Term Corporate Bonds

Courtesy of Roger G. Ibbotson and Rex A. Sinquefeld, *Stocks, Bonds, Bills and Inflation: The Past and the Future*, Dow Jones, 1989. Ibbotson Associates, Chicago, annually updates work by Roger G. Ibbotson and Rex A. Sinquefeld. Used with permission. All rights reserved.

### One-Month Certificate of Deposit

Courtesy of Federal Reserve Bank.

January 1966–present:	One-Month Certificate of Deposit Index.
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### Three-Month Certificate of Deposit

Courtesy of Federal Reserve Bank.

January 1988–present:	Three-Month Certificate of Deposit Index.
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## Six-Month Certificate of Deposit

Courtesy of Federal Reserve Bank.

January 1988–present:	Six-Month Certificate of Deposit Index.
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## Bank of America Merrill Lynch Three-Month US Treasury Bill Index

Courtesy of Bank of America Merrill Lynch.

January 1978–present:	Bank of America Merrill Lynch Three-Month US Treasury Bill Index.
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## Barclays Capital US Government Bond Index (Intermediate)

Courtesy of Barclays Capital.

January 1973–present:	Barclays Capital Intermediate Government Bond Index.
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## Barclays Capital Treasury Bond Index (Intermediate)

Courtesy of Barclays Capital.

January 1973–present:	Barclays Capital Intermediate Treasury Bond Index.
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## Barclays Capital Credit Bond Index (Intermediate)

Range 1–10 years. Courtesy of Barclays Capital.

January 1973–present:	Barclays Capital Intermediate Credit Bond Index.
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## Barclays Capital Treasury Bond Index

Range 1–30+ years. Courtesy of Barclays Capital.

January 1973–present:	Barclays Capital Treasury Bond Index.
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## Barclays Capital US Government Bond Index

Range 1–30+ years. Courtesy of Barclays Capital.

January 1973–present:	Barclays Capital Government Bond Index.
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## CSFB High Yield Index

Courtesy of Morningstar.

January 1988–present:	CSFB High Yield Index.
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## Fixed Income for Risk Target 3 Indexes

Courtesy of Bank of America Merrill Lynch, Citigroup and Barclays Capital.

January 1964–December 1975:	Bank of America Merrill Lynch One-Year US Treasury Note Index.
January 1976–December 1989:	Barclays Capital Treasury Bond Index 1–5 Years.
January 1990–February 1997:	Citigroup World Government Bond Index 1–5 Years (hedged).
March 1997–present:	50 percent Citigroup World Government Bond Index 1–5 Years (hedged). 50 percent Barclays Capital US TIPS Index.

## Fixed Income Allocation for Simulated Strategies

January 1997–December 2006:	100 percent DFA Two-Year Global (DFGF).
January 2007–December 2009:	50 percent DFA Two-Year Global (DFGF). 50 percent DFA Inflation-Protected Securities (DIPSX).
January 2010–present:	80-20 allocation: 50 percent DFA Five-Year Global (DFGBX). 50 percent DFA Inflation-Protected Securities (DIPSX). All other allocations: 50 percent DFA Two-Year Global (DFGF). 50 percent DFA Inflation-Protected Securities (DIPSX).

## Hard Assets

### Dow Jones Wilshire REIT Index

Courtesy of Dow Jones Wilshire.

January 1978–present:	Dow Jones Wilshire REIT Index.
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### S&P Goldman Sachs Commodities Index™

January 1970–present:	S&P Goldman Sachs Commodities Index™
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## Inflation

Courtesy of Roger G. Ibbotson and Rex A. Sinquefeld, *Stocks, Bonds, Bills and Inflation: The Past and the Future*, Dow Jones, 1989. Ibbotson Associates, Chicago, annual updates work by Roger G. Ibbotson and Rex A. Sinquefeld. Used with permission. All rights reserved.

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