

46.20	22.40	11.91	23.74
42.13	20.41	10.84	21.79
37.97	18.41	9.77	19.84
33.72	16.38	8.71	17.88

Cedarwinds Quarterly

Performance Updates and Market Commentary for Long-Term Investors

Vol. 3 Q2-07

Asset Class % Returns*

	6/30/07		Annualized Returns**	
	YTD	2006	3 Years	5 Years
Bonds				
Short-Term	2.64	4.78	2.64	2.69
Two-Year	2.47	4.46	2.36	2.85
Five-Year	2.48	4.51	2.66	4.43
Intermediate	2.16	3.89	2.83	4.33
Domestic Stocks				
Large Market	6.93	15.71	10.33	6.06
Large Value	8.90	20.18	16.14	12.37
Small Cap	6.66	16.61	13.40	12.30
Small Value	7.08	21.55	18.00	18.90
Micro Cap	6.09	16.16	13.27	15.16
Real Estate	-6.30	35.26	26.44	23.35
International Stocks				
Int'l Large Value	13.24	34.15	25.82	22.26
Int'l Small	13.82	24.88	25.86	26.40
Int'l Small Value	13.96	28.39	28.72	30.30
Emg Mkts	20.37	29.17	29.65	25.88
Emg Mkts Value	28.33	37.93	36.04	34.25
Emg Mkts Small	28.44	37.31	30.56	30.87
Continental Small	17.50	45.83	32.46	30.78
Japanese Small	3.32	-12.07	16.61	20.00
Asia Pacific Small	33.83	39.31	23.14	26.95
UK Small	6.24	45.60	27.81	23.67

Description of DFA Index Funds	TICKER
Short-Term Bonds	1-Year Fixed Fund DFIHK
Two-Year Bonds	2-Year Global Fixed Fund DFGFX
Five-Year Bonds	5-Year Government Fund DFFGX
Intermediate Bonds	5-Year Global Fixed Fund DFGBX
Large Market	Large Company Fund DFLCX
Large Value	US Large Value Fund DFLVX
Small Cap	Small Cap Fund DFSTX
Small Value	US Small Value Fund DFSVX
Micro Cap	US Micro Cap Fund DFSCX
Real Estate	Real Estate Fund DFREX
Int'l Large Value	International Value Fund DFIVX
Int'l Small	International Small Fund DFISX
Int'l Small Value	International Small Value Fund DISVX
Emg Mkts	Emerging Markets Fund DFEMX
Emg Mkts Value	Emerging Markets Value Fund DFEVX
Emg Mkts Small	Emerging Markets Small Fund DEMEX
Continental Small	Continental Small Company Fund DFCSX
Japanese Small	Japanese Small Company Fund DFJSX
Asia Pacific Small	Asia Pacific Small Company Fund DFRSX
UK Small	United Kingdom Small Company Fund DFUKX

*Source: Dimensional Fund Advisors (www.dfaus.com)

The information contained herein is obtained from sources we believe are reliable, but we cannot guarantee its accuracy.

** Calculated based on calendar year results.

Past performance does not guarantee future returns.

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THE RISK - RETURN RELATIONSHIP

Part 4: Managing Expectations

"Fear of harm ought to be proportionate not merely to the gravity of the harm, but also to the probability of the event."

Logic, or the Art of Thinking (published in 1662)



Introduction

Our series on risk-return management has focused thus far on the investment concepts and analytical processes we use to create extremely tight patterns of risk-adjusted returns in our model portfolios. In our fourth installment, we address what is perhaps the most challenging assignment of all – *managing expectations*.

Managing expectations is really about managing behavior. It is a complicated topic, involving multiple intersections of human psychology and investment theory. It is part art and part science. The full range of issues spans an intricate and ever-changing web of interconnected disciplines: behavior and finance, emotions and mathematics, the certainty of the past and the inherently unknowable future. Because of the topic's complexity, we opt for simplicity, using a narrow lens for our review. Our focus is on connecting past investment performance with future expectations and the mathematical discipline we use to intelligently bridge the gap between the two.

The Fundamental Question: Not "If" but "When and How Much?"

As long term investors, let's assume we are comfortable with the notion that, over time, our model portfolios will replicate their historical pattern of adding incremental value consistent with the risk-return profile engineered into the design of each portfolio. The two unknowns we must still deal with are, how much value can we expect and over what time frame?

The underlying problem here is well illustrated by the current investment environment. In general, markets for the last eight years have been trending positive – indeed, some argue that current levels reflect irrational exuberance and that recent growth rates are unsustainable by historical standards. Clearly, there have been and will be sudden,

Continued on back . . .

unexpected jolts on the downside that create anxiety. Global markets can be volatile places where a lot can happen in either direction, upward or downward. However, we believe the worst thing to do is to get emotionally involved in markets and make investment decisions based on emotions or “market noise.”

The one thing we do know is that *over time*, stock markets have gone up, on the average, more than they have gone down. We use the mathematical relationships embedded in this upward bias to manage overall portfolio risk. Our structured index fund program is designed to create a process that distinguishes between measurable risk-return relationships from the kind of uncertainty that obliges active managers to guess what the future will bring. *We manage portfolio risk using historical fact-based relationships and probabilities.* Key to our process is how we compute these probabilities in order to achieve a representative range of possible investment outcomes. It is this mathematically-derived range of potential outcomes that allows investors to better understand and control their emotions and expectations.

Our Analytical Bias—Reversion to the Mean

Over the short run, studies indicate that the prices of individual securities tend to resemble a random walk where there is no discernible pattern of movement. Additionally, over short periods there may be a momentum factor at work where some asset classes seem to dominate over others. However, our experience suggests that longer-term historical asset class averages are the most effective indicators of future performance. The foundation of our model portfolio program is built on the belief that investment results tend to “revert to their mean” – that is, the returns tend to converge and resemble their longer-term historical average. Based on the analytical work used in the construction of our model portfolios, we find there is a tendency of the mean to reflect a *five year* average. However, we prefer to use *20 year* averages. Our reasoning is that long term data provide higher confidence levels with respect to the statistical validity of the overall performance attributes built into our portfolios.

Analytical Limitations

Reversion to the mean motivates almost every variety of risk-taking and forecasting. However, there are three reasons why reversion to the mean can cause frustration with respect to investment decision-making and investor expectations. First, expected outcomes sometimes evolve at a very slow pace and a sudden market shock will disrupt the entire process. Second, market dynamics, i.e., stock price movements and volatility, may be so strong that averages may not come to rest once they appear to reach their “natural” mean. Rather, they fluctuate around the mean, with repeated, irregular deviations on either side. Finally, the mean itself may be unstable, so that yesterday’s normality may be supplanted today by new normality that we know nothing about. In other words, the mean can itself represent a kind of *dynamic equilibrium point*, causing averages to move around in unpredictable ways. So how do we get comfortable with these limitations?

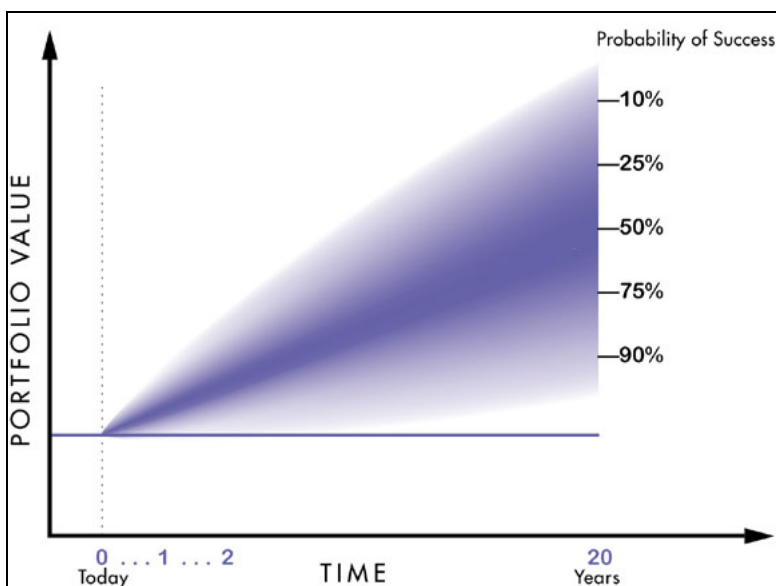
Monte Carlo Simulation—Creating “Degrees of Belief”

We employ a technique known as “Monte Carlo simulation” as a framework for projecting future portfolio values using historical performance averages and volatility measures. Monte Carlo simulation is the idea of using a large number of statistical trials to get an approximate solution to a problem. In simple terms, a random process is used to generate a broad range of hypothetical portfolio returns. Many observations are made so that the parameters of expected outcomes can be determined on an approximate basis. In our work we simulate over 5000 hypothetical outcomes through extrapolating historical risk-return combinations. In essence, we use Monte Carlo simulation to project future values for each of our model portfolios. The range of projected future values is further organized according to degrees of belief or “probability of success.” Although investors should be skeptical about the wisdom of extrapolating the future from the past, it is useful to use “degrees of belief” as a tool to help quantify the extent to which investors can feel more confident about the probability of future outcomes, despite uncertainties.

Monte Carlo Illustration

The chart and accompanying data table on the following page illustrate how we use Monte Carlo simulations to help manage investor expectations. Portrayed are three of our most popular model portfolios—the **Growth** model consisting of 80% equity index funds and 20% fixed income funds; our **Hybrid #2** model comprised of broad blend of 100% equity index funds; and our **Cedarstar** model consisting of a 100% concentrated blend of underlying equity index funds.

Monte Carlo Simulation*



MONTE CARLO SIMULATION MATRIX
Hypothetical \$1,000,000 Investment
5, 10 and 20 Year Projected Ending Values

Probability of Success	Model Portfolio		
	Growth	Hybrid #2	Cedarstar
5 Year Projected Ending Value			
95%	1,180,056	1,110,107	896,783
90%	1,287,399	1,244,958	1,054,104
75%	1,479,742	1,507,828	1,380,951
50%	1,731,815	1,865,476	1,864,238
25%	2,026,829	2,307,957	2,516,660
10%	2,335,089	2,795,276	3,297,003
10 Year Projected Ending Value			
95%	1,743,399	1,670,246	1,234,655
90%	1,965,331	1,964,239	1,551,738
75%	2,400,990	2,575,447	2,273,517
50%	2,999,184	3,480,002	3,475,385
25%	3,746,416	4,702,258	5,312,605
10%	4,576,891	6,165,450	7,783,725
20 Year Projected Ending Value			
95%	4,176,464	4,288,536	2,794,972
90%	4,947,693	5,393,730	3,861,623
75%	6,567,122	7,911,944	6,627,651
50%	8,995,107	12,110,944	12,078,299
25%	12,320,761	18,536,802	22,011,616
10%	16,353,470	27,191,227	37,778,230
20 Year Average Return*	12.83	15.56	17.84
Std. Dev.*	11.80	16.39	23.68

*Data reflects model portfolio performance for the period 1987 - 2006

A Framework for Looking at the Future

To make our analysis easy, we use a hypothetical portfolio amount of \$1 million in a non-taxable account. Using 20 year average return and standard deviation (risk) data for our three models, the projected ending values are tied to probability of success. For example, using a 50% probability of success factor, the 5 year projected ending value for each of our models is roughly the same. However, on a 20 year basis, the 50% probability is significantly lower for our Growth model (\$9 million) compared to Hybrid #2 and Cedarstar (\$12+ million). Further, by limiting the probability of success to only 10%, the 20 year projected ending value difference of our models diverges even further, from \$16.3 million for our Growth model to an enticingly high \$37.8 million in our Cedarstar model. What drives these differences in the range of ending values is the higher risk-return relationship associated with each of the model portfolios. It is impossible to predict with accuracy ending values; however, the analytical framework for projecting possible ending values is based on a proven, empirical methodology using Monte Carlo simulation. It is up to the individual investor to match this type of forward view with his or her own individual objectives, time horizon and tolerance for risk.

Summary

Successful investing requires an understanding that effective risk management is about managing expectations. The tools used in our program are designed to help clients limit the emotional element and leverage the science of investment decision-making based on facts and the mathematics of probability theory. Few people feel the same about risk every day of their lives and the facts may not be interpreted the same by everyone. Each of us tends to color the information we have in our own fashion. Even the most rational among us will often disagree about what the facts mean. As we grow older, wiser, richer, or poorer, our perception of what risk is and our appetite for taking risk will shift. We believe understanding one's tolerance for risk in our model portfolio selection process allows investors the opportunity to vastly increase their odds for investment success and effectively manage expectations.

***IMPORTANT NOTE:** The input parameters (average annual return, annual standard deviation) are based upon the performance of Cedarwinds' model portfolios. The projections generated by the Monte Carlo simulation returns regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results and are not guarantees of future results. The Monte Carlo tool only presents a range of possible outcomes and does not represent a forecast or prediction of actual expected investment returns. There are limitations inherent in model results. In particular, model results do not represent actual trading and may not reflect the impact that material economic or market factors may have on investment decision making. The performance and outcomes of the simulated portfolio results may vary with each use and over time. Past performance is not an indication of future results and there is always the risk that an investor may lose money. All materials presented are compiled from sources believed to be reliable, but accuracy cannot be guaranteed. This information is distributed solely for background purposes and is not intended for public use. Please contact Cedarwinds Investment Management (info@cedarwinds.com) for information concerning data sources and descriptions. Data source: Dimensional Fund Advisors (www.dfaus.com).