

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 Q3-07 (ii)

## Asset Class % Returns\*

	9/30/07		Annualized Returns**	
	YTD	2006	3 Years	5 Years
<b>Bonds</b>				
Short-Term	3.88	4.78	2.64	2.69
Two-Year	3.81	4.46	2.36	2.85
Five-Year	3.73	4.51	2.66	4.43
Intermediate	3.86	3.89	2.83	4.33
<b>Domestic Stocks</b>				
Large Market	9.09	15.71	10.33	6.06
Large Value	2.78	20.18	16.14	12.37
Small Cap	2.93	16.61	13.40	12.30
Small Value	-2.12	21.55	18.00	18.90
Micro Cap	1.82	16.16	13.27	15.16
Real Estate	-4.88	35.26	26.44	23.35
<b>International Stocks</b>				
Intl Large Value	14.47	34.15	25.82	22.26
Intl Small	11.88	24.88	25.86	26.40
Intl Small Value	11.28	28.39	28.72	30.30
Emg Mkts	31.73	29.17	29.65	25.88
Emg Mkts Value	41.79	37.93	36.04	34.25
Emg Mkts Small	37.94	37.31	30.56	30.87
Continental Small	15.08	45.83	32.46	30.78
Japanese Small	-0.67	-12.07	16.61	20.00
Asia Pacific Small	40.40	39.31	23.14	26.95
UK Small	1.33	45.60	27.81	23.67

## Description of DFA Index Funds

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
Intl Large Value	International Value Fund	DFIVX
Intl Small	International Small Fund	DFISX
Intl 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 6: Global Asset Class Correlations: Lessons From Christopher Columbus

*"The real voyage of discovery consists not in seeking new landscapes but in having new eyes."*

Marcel Proust (1871-1922)



The Nina, the Pinta and the Santa Maria

### Introduction

We use the occasion of the holiday celebrating Columbus's discovery of the New World as a way to help put our investment management practice into perspective. Think of the ships depicted above—the Nina, Pinta, and Santa Maria—as representing three distinct asset classes. Each played a different role in Columbus' famous voyage to find a new passage to Asia. The Nina and Pinta were both smaller, faster ships, called caravels. The Pinta was the smallest and fastest of the three ships; the Nina was larger than the Pinta and had more storage capacity. The smaller Nina and Pinta were able to sail over difficult waters easily compared to the Santa Maria which was a larger, round-hulled ship piloted by Columbus. Only the Santa Maria was built with a deck, and it was a much slower, heavier ship with a long keel. Because of the deep draft, this vessel was not suited for sailing near reefs and shallow island waters but was more reliable sailing in the open oceans. Compared to the tubby Santa Maria, the sleek caravels were more maneuverable in varying wind conditions and could easily explore shallow bays and the mouths of rivers.

### Columbus as Risk Manager

Columbus' reliance on a fleet of three boats with different performance characteristics represented a purposeful diversification strategy in his quest to discover the New World. The prudence of this strategy paid off. Shortly after land was discovered in 1492, the Santa Maria hit a reef and sank, forcing Columbus and his crew to return safely to their native Spain aboard the Nina.

Continued on back

Columbus recognized the need to have a fallback strategy in the event his primary vessel—the Santa Maria—could not do the job. In our vernacular, Columbus used asset class diversification to help manage the risks in his voyage.

In the investment world, risk managers focus on tracking changes in the volatility levels and correlations of their investment assets. Risk allocation allows investors to broaden the diversification of the whole portfolio to include more investment categories. Finding non-correlating investments with high risk-adjusted returns is an important first step. The key is to prudently allocate risk across investment strategies that are likely to add diversification value and attractive risk-adjusted returns.

### How We Use Asset Class Correlations

In formulating our asset allocation methodology, we employ a similar approach used by Columbus in that we also estimate how different asset classes will perform relative to each other in different market conditions. We do this as a way to deal with the uncertainty of our investment “voyage” and help manage the risk-return relationships that are part of the journey.

The fundamental premise of modern portfolio theory is that a high-risk asset can reduce overall portfolio risk if it has the right correlation to other portfolio assets. In our Columbus analogy, the Pinta was not designed to sail across the ocean by itself—the boat was too small and there was too much risk in that single-ship strategy. However, combined with a larger fleet which included ships, or asset classes, having different performance characteristics, the Pinta played a vital role in reducing the overall risk of the trip, thus improving the chances for success.

In our work, we measure the extent to which returns between two different asset classes are linked with the statistical measure known as a correlation coefficient. Correlations vary between 1 and -1. Asset returns that move in perfect lock-step have a correlation of 1. Asset returns that have no connection have a correlation of zero. Returns that mirror each other but in opposite directions have a correlation of -1.

In formulating expected portfolio risk, we start with historical measures of asset class correlations and then make judgments about how future markets are likely to affect these relationships relative to each other. Correlations among asset returns are affected by a wide range of factors including: varying economic and demographic growth rates; local monetary and fiscal policies; global trade conditions and the effects which all these factors have on relative currency values; cultural attributes affecting entrepreneurship, innovation, and productivity; local supply and demand conditions; investor preferences regarding liquidity and risk premia; and regulatory considerations. Judgment is critical in formulating projected correlations, particularly among foreign markets where the global integration of world economies and capital markets may make past correlations poor guides to the future.

### A 20 Year Analysis

The 15 primary asset categories we use in our model portfolios have 105 unique cross-correlations as illustrated in the chart below. (The way to interpret the data is as follows: the first *column*—US Large—reflects a correlation of 1 to the US Large *line* because it is measured against itself. Moving down a line, the US Large Value line correlates at .80 to the US Large column because the value fund represents a smaller, sub-sector of value stocks as part of the larger universe of stocks comprising the US Large fund. Value stocks have different performance attributes than a larger universe that also includes growth stocks and we would not expect perfect correlation. At a correlation factor of .19, the investment fund representing the US Real Estate line is virtually uncorrelated with the US Large fund in that the underlying stocks held by the funds are entirely different.)

Based on historical returns covering a 20 year period (1987-2006), these 105 correlations fall into three categories: those showing strong to very strong positive or negative correlations (greater than plus/minus .60); those showing moderate correlations (between plus/minus .40 and plus/minus .60); and those showing weak or negligible correlations (between

*Continued on next page*

zero and plus/minus .40). Only 28 of the long-term historical correlations are strong, a fewer number—eleven—fall in the moderate range, and the majority (66 of 105) are in the weak or negligible category.

### Fund Correlation Matrix (1987 - 2006)

Funds	US Large	US Large Value	US Small Value	US Micro	US Real Estate	Int'l Value	Int'l Small	Int'l Small Value	Emerging Mkts	Emerging Mkts Value	Emerging Mkts Small	One-Year Fixed	Two-Year Global	Five-Year Govt	Five-Year Global	
US Large	1.00															
US Large Value	0.80	1.00														
US Small Value	0.51	0.83	1.00													
US Micro	0.59	0.78	0.95	1.00												
US Real Estate	0.19	0.64	0.77	0.62	1.00											
Int'l Value	0.39	0.47	0.40	0.39	0.32	1.00										
Int'l Small	0.23	0.27	0.23	0.28	0.19	0.91	1.00									
Int'l Small Value	0.17	0.26	0.26	0.30	0.24	0.89	0.99	1.00								
Emerging Mkts	0.35	0.32	0.34	0.45	0.13	0.71	0.77	0.74	1.00							
Emerging Mkts Value	0.27	0.22	0.31	0.42	0.12	0.73	0.78	0.76	0.97	1.00						
Emerging Mkts Small	0.28	0.21	0.26	0.37	0.05	0.67	0.76	0.73	0.97	0.96	1.00					
One-Year Fixed	0.25	0.13	-0.14	-0.11	-0.26	-0.34	-0.38	-0.42	-0.10	-0.24	-0.14	1.00				
Two-Year Global	0.22	0.06	-0.22	-0.18	-0.30	-0.44	-0.43	-0.47	-0.19	-0.32	-0.20	0.96	1.00			
Five-Year Govt	0.05	0.10	0.02	0.01	-0.01	-0.38	-0.40	-0.40	-0.05	-0.14	-0.10	0.73	0.74	1.00		
Five-Year Global	0.34	0.35	0.12	0.11	0.06	-0.20	-0.28	-0.31	0.02	-0.10	-0.05	0.68	0.73	0.87	1.00	

Data Source: Dimensional Fund Advisors ([www.dfaus.com](http://www.dfaus.com))

The strongest historical equity fund correlations (greater than .90) include, not surprisingly, affiliated asset categories such as US Small Value/US Micro, Int'l Small/Int'l Small Value and the Emerging Markets. Also, the fixed income category tends to reflect a relatively tightly correlated grouping. The fixed income correlations make sense since returns achieved in this category are dominated by the overall level of interest rates, which generally overwhelms the impact of ancillary return elements such as corporate credit spreads or yield curve spreads, especially given the short maturity strategy and high credit quality emphasized in the fixed income funds used in our portfolios.

Projected asset class correlations are based on longer term historical performance. Our confidence level in making judgments about asset class weightings for our portfolio models is highest when the underlying asset class correlations are stable over time. We may not understand or track the specific factors driving market pricing at the underlying stock level or even at the broader fund level; however, in the aggregate, our view is that risk-return relationships at the general category level are valid. As a specific case in point, note the strong, long-term correlations among the emerging markets funds depicted above.

### Emerging Markets – Historical Correlations

Our philosophy is that investing in securities markets outside the U.S. helps build more extensive diversification into a portfolio. It is also our position that it is impossible to know the best time or location to invest overseas, but that it is important to have exposure to foreign markets, especially to the relatively volatile emerging markets sector. The chart below helps reinforce these points.

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## Emerging Markets Country Performance (1996 – 2006)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Brazil	42.50%	27.34%	-39.62%	67.23%	-11.37%	-16.99%	-30.65%	115.01%	36.47%	57.05%	45.80%
Chile	-13.54%	5.52%	-28.50%	39.01%	-15.14%	-2.83%	-19.81%	84.41%	29.01%	21.62%	29.33%
China	37.46%	-25.25%	-42.37%	13.33%	-30.54%	-24.70%	-14.05%	87.57%	1.89%	19.77%	82.87%
Czech Republic	30.52%	-22.69%	0.54%	5.35%	1.62%	-2.01%	44.16%	66.20%	87.25%	46.20%	34.69%
Hungary	107.22%	95.21%	-8.16%	11.66%	-26.80%	-9.16%	30.69%	32.31%	92.49%	18.50%	33.70%
India	-2.17%	11.27%	-21.24%	87.35%	-21.74%	-19.45%	8.38%	78.36%	19.11%	37.57%	51.00%
Indonesia	27.51%	-74.06%	-31.53%	93.46%	-61.90%	-8.49%	42.83%	78.20%	52.21%	15.76%	74.83%
Israel	-2.33%	25.76%	-13.07%	55.39%	17.81%	-15.54%	-11.82%	58.77%	16.25%	38.93%	-6.42%
Malaysia	25.55%	-67.98%	-30.81%	114.33%	-15.95%	4.56%	-0.66%	26.61%	15.17%	2.29%	37.14%
Mexico	18.71%	53.92%	-33.53%	80.07%	-20.49%	18.55%	-13.31%	32.81%	48.32%	49.11%	41.44%
Philippines	17.75%	-62.59%	13.45%	3.32%	-45.01%	-19.29%	-28.98%	42.76%	26.58%	23.92%	59.66%
Poland	58.86%	-22.39%	-6.69%	31.50%	-4.04%	-27.44%	1.26%	35.48%	61.52%	24.96%	41.93%
South Africa	-18.06%	-8.18%	-27.56%	57.20%	-17.19%	-17.21%	27.99%	45.86%	44.91%	28.34%	20.53%
South Korea	-38.14%	-66.67%	141.15%	92.42%	-49.62%	48.71%	8.62%	35.94%	22.86%	58.00%	13.19%
Taiwan	40.30%	-6.29%	-20.64%	52.71%	-44.90%	10.47%	-24.45%	42.55%	9.83%	7.26%	20.90%
Thailand	-36.59%	-73.43%	11.56%	47.16%	-56.27%	5.25%	27.59%	144.56%	-0.92%	9.16%	11.61%
Turkey	36.90%	118.05%	-52.51%	252.41%	-45.65%	-32.66%	-35.70%	125.88%	42.03%	56.95%	-6.97%

Source: MSCI developed markets country indices (net dividends) with at least twenty-five years of data. See MSCI disclosure page for additional information. Indices are not available for direct investment. Index performance does not reflect expenses associated with the management of an actual portfolio. Past performance is not a guarantee of future results.

The chart shows the annual performance in U.S. dollar terms of seventeen emerging country stock markets from 1996 to 2006, highlighting the top performer in each calendar year. Over this eleven year period, South Korea was the best performer three times, while Hungary and Turkey each topped the list twice. Perhaps most instructive is the wide range of returns each year from the best to the worst performer. For example, in 1998 Turkey recorded the worst returns at -52.41% while the next year it was the best performing country, returning a stunning 252%! It is also noteworthy that not once would the U.S. have made the top performance category—not by a wide margin.

There are three important lessons here:

1. Although many investors prefer to keep their capital close to home, they may pay a high price in terms of lower diversification and missed opportunity.
2. The value of investing in a broad category of emerging markets is that it reduces the extreme investment volatility and inherent uncertainty of trying to predict which countries or geographic areas will be top performers over any given period.
3. To the degree emerging markets are non-correlated to other asset classes, this non-correlation helps mitigate risk and improve returns at the broader portfolio level.

### Conclusion

To be sure, our understanding of the world and the risks we face has progressed exponentially from the time Columbus first visited our shores over 500 years ago, discovering what was to become the quintessential emerging market. Over the years, many new “navigational aids” have been developed to assist with risk management, especially in the investment arena.

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Because the investment world seems to be in a constant state of “rediscovery,” it will become even more complicated with the introduction of new analytical techniques, more sophisticated investment approaches and product innovation. As part of this changing landscape, sophisticated computer models are increasingly being used to study the correlations among various global asset class returns over short and longer timeframes, dissecting every nuance affecting performance. In this regard, we can be easily fooled into accepting correlations that have little or no basis in fact or that represent the unreliable statistic of a highly complex and unpredictable system of multiple, interrelated factors. In this context of change, we feel there is a need for discipline, patience and a focus on the fundamentals of sound, long-term portfolio management versus the more emotional “flavor-of-the-day” or feel-good “correlation-of-the-month” approach.

Finally, we take special pride in knowing that our portfolio management approach and the investment tools we use skew strongly to the mathematical and scientific side of the business. This helps drive emotions out of the investment decision-making process. Despite the formulas and numbers, the objective of our voyage is really quite simple:

*We provide clients with a broad range of model portfolios solutions using globally diversified, best-in-class index funds that, over the longer term, create highly predictable risk-return correlations at very low cost.*

If Christopher Columbus were around today, we think he would not only approve of our investment philosophy, he would also be an active advocate *and* a client!