



Investment Strategies, Inc.

P.O. Box 1189
(719) 481-4502

Monument, CO 80132
Toll Free (800) 284-5034

Fax (719) 481-4388



Modern Portfolio Theory (MPT) Analysis

Modern Portfolio Theory (MPT) statistics measure diversification, risk and risk-adjusted rate of return. The various MPT statistics are based upon linear regression over the most recent 36-month period and cumulative for the entire account history. The dependent variable is the account's monthly return reduced by the risk-free return of Treasury bills expressed in continuously compounded form. The independent variable is the monthly return for the S&P 500 (including income) reduced by the treasury-bill return, also expressed in continuously compounded form.

The explanation for the individual MPT statistics follow:

R2 = R-squared, known statistically as the coefficient of determination, is an indication of the account's diversification. It measures the percentage of the account's performance variation which can be traced to the overall market. R-squared ranges between 0 and 100. An account with an R2 of 85, is 85% as diversified as the S&P 500; 85% of the account's risk is market related and 15% is attributable to other factors.

BETA = Beta measures the account's volatility relative to the S&P 500 index. Statistically, it is the regression coefficient, or slope of the regression line. If an account's beta is 1.00, it means that the account is about as volatile as the S&P. If the S&P gains 10%, the account will also gain 10% and vice-versa. If the account's beta is 1.50, it means that the account is 50% more volatile compared to the S&P; while a .50 beta means that the account is 50% less volatile than the S&P 500. Beta reflects only market-related risk, compared to standard deviation, which reflects total risk (both market-related and unique). Beta and SD can be used together to reduce an account's unique risk by diversification of overall assets to other investments with different betas.

ALPHA = Alpha measures risk-adjusted return. It is the difference between the account's actual performance and the performance anticipated in light of the account's risk and the market's behavior. Alpha is expressed in percentage terms compared to the S&P 500 (which has a zero alpha). A positive alpha means that the account has performed above expectations and a negative alpha means that results are below expectations. To illustrate, suppose the S&P was up 15%, risk-free T-bills earned 9%, and the account advanced 14%. Suppose further that the account has a .50 beta. Thus, the account has 50% less market-risk than the S&P and is not expected to out-perform the S&P in absolute terms. In determining risk-adjusted performance, or alpha, in this illustration the S&P gained 6% more than a risk-free return in T-bills (i.e., 15% for S&P less 9% for T-bills). The S&P's "risk premium" was 6% and the account's risk premium should have been 3% (.50 x 6 = 3%). The account's performance was 5% better than risk-free T-bills (14% for the account vs. 9% for T-bills). Accordingly, the account did 2.0 points better than expected. This would result in an risk-adjusted return (alpha) of + 2.0%.

In sum, sophisticated investment analysis involves absolute rate of return comparisons and risk-adjusted performance comparisons to other investment managers, mutual funds and market indexes. Monitoring services, such as CDA Investment Technologies, Inc., provide reports that rank performance in both areas. The table below lists MPT statistics, with comparisons, for the last 36 months, from your account's inception and from the inception of our Equity Managed Account Service (EMAS) in May 1982.

PERIOD & ITEM	R2	BETA	ALPHA Rank	
Last 36 Months (1/91 to 12/93):				
Account	70	0.72	6.1	25
CDA Balanced Fund Index	94	0.56	3.9	56
Cumulative from Account Inception (9/82):				
Account (136 months)	25	0.32	5.8	na
CDA Balanced Fund Index	92	0.57	1.3	na
Cumulative from EMAS Inception (5/82):				
EMAS Composite (140 months)	27	0.32	5.2	na
CDA Balanced Fund Index	92	0.57	1.5	na

Incorporated 1981 — SEC registered investment advisor since March 1982

Copyright © 1981-1994, Investment Strategies, Inc. All rights reserved. Satellite Office in Frisco, Colorado.