

## Thornburg Investment Management

2300 North Ridgetop Road  
Santa Fe, New Mexico 87506

Style: Emerging Market Equities  
Sub-Style: Blend  
Firm AUM: \$35.1 billion<sup>^</sup>  
Firm Strategy AUM: \$21.3 million

Year Founded: 1982  
GIMA Status: Approved  
Firm Ownership: Privately-Owned  
Professional-Staff: 34<sup>^</sup>

### PRODUCT OVERVIEW

The strategy invests in ADRs or dollar-denominated securities that are, in Thornburg's opinion, tied economically to one or more developing countries. The strategy seeks long-term capital appreciation by investing in American Depositary Receipts (ADRs) or other U.S. dollar-denominated common stocks that are economically tied to developing country issuers. The strategy will invest at least 80% of assets in securities of developing country issuers under normal market circumstances. Within the investment guidelines there is a 25% industry limit, a 50% country limit, and a 5% limit on securities of any one issuer at initial purchase. Cash is limited to 10% under normal market conditions. This strategy can invest across market capitalization; however, target liquidity requirements of \$10M/day means it is primarily exposed to mid- and large-cap companies. Product inception date 11/01/2018

### TARGET PORTFOLIO CHARACTERISTICS

Number of stock holdings:	40 to 60
P/E ratio:	Similar to/Below the S&P 500
Cash level over market cycle:	0 to 10%
Risk (standard deviation):	Above the S&P 500
Average turnover rate:	39.00
Use ADRs:	0 to 100%
Capitalization:	Mega, Large and Medium companies

### PORTFOLIO'S EQUITY SECTOR WEIGHTINGS <sup>+</sup>

Sector	-----06/20-----		12/19
	Thornburg	Index***	Thornburg
Energy	2.29	5.95	6.30
Materials	2.03	6.86	1.80
Industrials	0.00	4.69	5.57
Consumer Discretionary	21.46	17.38	19.25
Consumer Staples	3.48	6.48	4.08
Health Care	0.00	4.30	0.33
Financials	28.12	19.07	31.89
Information Technology	21.08	16.93	16.72
Communication Services	13.79	13.50	9.16
Utilities	2.08	2.27	1.58
Miscellaneous	0.00	0.00	0.00
Real Estate/REITs	0.00	2.58	0.00
Cash/Cash Equivalents	5.66	0.00	3.34

### PORTFOLIO STATISTICS

	-----06/20-----		12/19
	Thornburg	Index***	Thornburg
Number of stock holdings	43	1,385	41
Dividend Yield	1.9%	2.6%	1.7%
Distribution Rate	—	—	—
Wtd avg P/E ratio <sup>1</sup>	16.61x	14.90x	17.54x
Wtd avg portfolio beta	1.13	—	1.03
Mega capitalization <sup>+</sup>	0.0%	27.4%	0.0%
Large capitalization <sup>+</sup>	0.0%	41.5%	0.0%
Medium capitalization <sup>+</sup>	0.0%	27.9%	0.0%
Small capitalization <sup>+</sup>	0.0%	3.3%	0.0%
Micro capitalization <sup>+</sup>	0.0%	0.0%	0.0%

### PORTFOLIO'S TOP FIVE EQUITY HOLDINGS

	%
TENCENT HOLDINGS LTD-UNS ADR	9.4
ALIBABA GROUP HOLDING-SP ADR	9.0
TAIWAN SEMICONDUCTOR-SP ADR	6.4
HDFC BANK LTD-ADR	5.5
ASML HOLDING NV-NY REG SHS	4.4

### % PROCESS BASED ON

- 0 Asset allocation - cash vs. stock
- 0 Industry or sector weighting
- 0 Stock Selection

### MANAGER'S INVESTMENT STRATEGY

- Top-down / portfolio structures based on economic trends
- Bottom-up / portfolio structure based on individual securities

<sup>^</sup>As of 03/31/2020. Information as of 06/30/2020 is not yet available.

\*\*\*Index : MSCI EM

<sup>1</sup>The P/E used here is calculated by the harmonic mean.

<sup>+</sup>Total may not equal 100% due to rounding.

**MANAGER'S INVESTMENT PROCESS**

- We narrow the investment universe through our qualitative screening process, which is meant to assess the durability of the corporate franchise across the economic cycle. We are particularly focused on the following company characteristics: high quality management team, robust corporate governance, strong position in its market(s), ability to fund its own growth, and a conservative capital structure. Through this process, the universe shrinks to about 400 stocks, or about 10% of the prospective universe.
- From the narrowed universe, we consider a stock for inclusion in the portfolio when the stock may be trading at a discount to intrinsic value. To estimate fair value, we analyze the company's earnings power. While evaluating the company's earnings potential, we also define its "path to success" based on financial or operational milestones. We believe that achievement of these milestones will change the market's perception of the earnings power of the company and may push the stock towards our estimate of fair value.
- Portfolio managers construct a portfolio of 40-60 securities to maximize the impact of security selection based on our bottom-up, research process. We believe we can better achieve our performance goals by making larger investments in a smaller group of companies.
- We believe that securities exposed to either the value or growth styles can become correlated across countries and sectors, and therefore style risk is a particularly important source of benchmark-relative risk. Consequently, our primary focus in portfolio construction is to balance value and growth investment styles relative to the emerging market universe using our three-basket portfolio construction process. The three baskets include: basic value, consistent earner, and emerging franchise.

**RISK CONSIDERATIONS**

Investing in securities entails risks, including: International investing should be considered one component of a complete and diversified investment program. Investing in foreign markets entails greater risks than those normally associated with domestic markets such as foreign political, currency, economic and market risks. In addition, the securities markets of many emerging markets are substantially smaller, less developed, less liquid and more volatile than the securities of the U.S. and other more developed countries. Equity securities' prices may fluctuate in response to specific situations for each company, industry, market conditions and general economic environment. Companies paying dividends can reduce or cut payouts at any time. Strategies that invest a large percentage of assets in only one industry sector (or in only a few sectors) are more vulnerable to price fluctuation than portfolios that diversify among a broad range of sectors. Growth investing does not guarantee a profit or eliminate risk. The stocks of these companies can have relatively high valuations. Because of these high valuations, an investment in a growth stock can be more risky than an investment in a company with more modest growth expectations. Value investing does not guarantee a profit or eliminate risk. Not all companies whose stocks are considered to be value stocks are able to turn their business around or successfully employ corrective strategies which would result in stock prices that do not rise as initially expected. Bonds rated below investment grade may have speculative characteristics and present significant risks beyond those of other securities, including greater credit risk and price volatility in the secondary market. Investors should be careful to consider these risks alongside their individual circumstances, objectives and risk tolerance before investing in high-yield bonds. If a strategy expects to hold a concentrated portfolio of a limited number of securities, it should be noted that a decline in the value of these investments would cause the portfolio's overall value to decline to a greater degree than that of a less concentrated portfolio.

**PORTFOLIO'S ALLOCATION HISTORY (%)<sup>+</sup>**

	06/20	03/20	12/19	09/19
U.S. Stocks	6	0	6	0
Non-U.S. Stocks	0	0	14	0
ADRs	0	83	76	0
ADRs/Non-U.S. Stocks	89	0	0	0
Ordinaries	0	11	0	0
Cash/Cash Equivalents	5	7	3	0

<sup>^</sup>As of 03/31/2020. Information as of 06/30/2020 is not yet available.

<sup>\*\*\*</sup>Index : MSCI EM

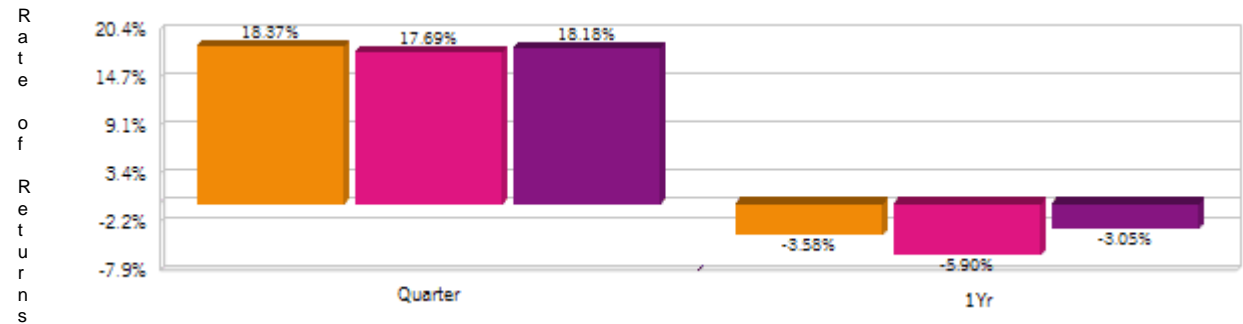
<sup>†</sup>The P/E used here is calculated by the harmonic mean.

<sup>+</sup>Total may not equal 100% due to rounding.

RISK/RETURN ANALYSIS - 3 YEARS ENDING 06/30/20

Unable to produce graph. Insufficient track record

AVERAGE ANNUAL TOTAL RETURN (%) - PERIODS ENDING 06/30/20

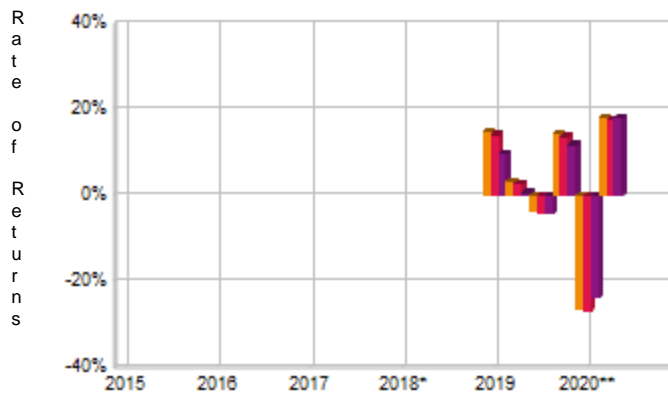


	STD	ROR
Thornburg (Gross)		
Thornburg (Net)		
MSCI EM		
90-Day T-Bills		

INVESTMENT RESULTS	Annual Rates of Return (%)		1 Year - Ending 06/30/20
	2019*	Annual	Std. Dev.
Thornburg (Gross)	31.14	-3.58	0.00
Thornburg (Net)	28.05	-5.90	0.00
MSCI EM	18.88	-3.05	0.00

\*11/01/2018-12/31/2018

RISK VOLATILITY (%)



\*11/01/2018-12/31/2018 \*\*01/01/20-06/30/20

PORTFOLIO'S QUARTERLY RETURNS (%)

	Quarter1		Quarter2		Quarter3		Quarter4	
	Gross	Net	Gross	Net	Gross	Net	Gross	Net
2019	14.91	14.27	3.37	2.75	-3.57	-4.17	14.49	13.82
2020	-26.22	-26.69	18.37	17.69				

Legend:  Related  Select UMA

PORTFOLIO'S RISK STATISTICS -€<sup>1</sup> PERIODS ENDING 06/30/20 <sup>1 2</sup>

	3 Year	5 Year
Standard Deviation	N/A	N/A
Standard Deviation of Primary Benchmark	N/A	N/A
Sharpe Ratio	N/A	N/A
Sharpe Ratio of Primary Benchmark	N/A	N/A
Alpha	N/A	N/A
Beta	N/A	N/A
Downside Risk	N/A	N/A
R-Squared	N/A	N/A
Tracking Error	N/A	N/A
Information Ratio	N/A	N/A

	Number Of	Up Qtrs.	Down Qtrs.
Thornburg (Gross)		4	2
Thornburg (Net)		4	2
MSCI EM		4	2

PORTFOLIO DIVERSIFICATION - R<sup>2</sup>(INCEPTION THROUGH 12/14)+

Thornburg vs. MSCI EM	R <sup>2</sup> N/A
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+Statistics are calculated using gross of fee performance only.

1. Statistics are calculated using gross of fee performance only.
2. MSCI EM was used as the primary benchmark and the 90-Day T-Bills Index as the risk-free benchmark.

See important notes and disclosures pages for a discussion of the sources of the performance data used to calculate the performance results and related analyses shown above.

## IMPORTANT NOTES AND DISCLOSURES

## COMPOSITE DISCLOSURES

**The disclosures provided below apply to performance information in this profile, if any. Past performance is not a guarantee of future results. Actual individual account results may differ from the performance shown in this profile. There is no guarantee that this investment strategy will achieve its intended results under all market conditions. Do not rely upon this profile as the sole basis for your investment decisions.**

Performance results in this profile are calculated assuming reinvestment of dividends and income. Returns for more than one calendar year are annualized and based on quarterly data. Returns for periods of less than a calendar year show the total return for the period and are not annualized. No representation is being made that any portfolio will or is likely to achieve profits or losses similar to those shown. Returns will fluctuate and an investment upon redemption may be worth more or less than its original value. Performance shown does not reflect the impact of fees and expenses of the underlying mutual fund and ETFs, as applicable.

**Sources of Performance Results and Other Data:** The performance data and certain other information for this strategy (including the data on page 1 of this profile) may include one or more of the following: (i) the performance results of a composite of Morgan Stanley accounts managed by the third party investment manager, (ii) the performance results for accounts and investment products managed by the third party investment manager, in the same or a substantially similar investment strategy outside of the applicable Morgan Stanley program, and/or (iii) in the case of Model Portfolio Strategies, the Model Portfolio Provider's results in managing accounts outside of the Morgan Stanley Select UMA program prior to Model Portfolio Strategy's inception in the Morgan Stanley Select UMA program. For periods through June 2012, the Fiduciary Services program operated through two channels – the Morgan Stanley channel and the Smith Barney channel and any performance and other data relating to Fiduciary Services accounts shown here for these periods is calculated using accounts in only one of the these channels.) Please note that the Fiduciary Services program was closed on January 2, 2018. Although the Fiduciary Services and Select UMA programs are both Morgan Stanley managed account programs, the performance results and other features of similar investment strategies in the two programs may differ due to investment and operational differences. Performance in one program is not indicative of potential performance in the other. For example, the individual investment strategies in Select UMA program accounts may contain fewer securities, which would lead to a more concentrated portfolio. The automatic rebalancing, wash sale loss and tax harvesting features of the Select UMA program, which are not available in Fiduciary Services, also could cause differences in performance. In addition, any performance results included in this profile that are based on a third party investment manager's accounts that are not part of the Morgan Stanley program accounts or institutional accounts that are part of the Model Portfolio strategy may differ due to investment and operational differences as well. As such, performance results of the third party investment manager's composites and the third party Model Portfolio Strategies may differ from those of Select UMA accounts managed in the same or a substantially similar investment strategy. For example, in the case of Model Portfolio Strategies, Morgan Stanley, as the investment manager, may deviate from the Third Party Model Portfolios.

With respect to those accounts that are subject to the Employee Retirement Income Security Act of 1974 and/or Section 4975 of the Internal Revenue Code of 1986, as amended, and are invested in an investment strategy managed by a Sub-Manager that is an affiliate of MSSB, the Sub-Manager fees will be reduced to 0.00%

**Related Performance:**

Performance data for the Emerging Markets ADR Strategy Wrap is from the Emerging Markets ADR Wrap Composite, inception date of November 1, 2018. The Emerging Markets ADR Wrap Composite includes broker-sponsored discretionary accounts invested in the Emerging Markets ADR strategy. The composite includes broker-sponsored accounts including those that may pay transactions costs that are not included in a bundled fee. Returns are calculated using a time-weighted and asset-weighted calculation including reinvestment of dividends and income. Returns are annualized for periods greater than one year. Individual account performance will vary. The performance data quoted represents past performance; it does not guarantee future results. "Pure" Gross returns do not reflect the deduction of any expenses, including trading costs and are supplemental to net returns. Net returns reflect the deduction of the maximum total wrap fee which is currently 3% per annum. Net returns are derived from subtracting 1/12th of 3% from each account's monthly gross return. The total wrap fee includes all charges for the trading costs, portfolio management, custody and other administrative fees. The standard fee schedule currently in effect is: 1% to 3% on all assets. Fees may be negotiated in lieu of the standard fee schedule. Actual fees may vary depending on, among other things, the applicable fee schedule and portfolio size. The firm's fees are available upon request and also may be found in Part II of its Form ADV.

**Morgan Stanley Performance:**

**Gross Performance:** Thornburg's gross results do not reflect a deduction of any investment advisory fees or program fees, charged by Thornburg or Morgan Stanley, but are net of commissions charged on securities transactions.

**Net Performance for all Periods:** Net performance results reflect a deduction of 0.6175% quarterly. This consists of three components: 0.5% maximum quarterly MS Advisory Fee and 0.0175% maximum quarterly Program Overlay Fee (which, together cover the services provided by Morgan Stanley), plus 0.1% quarterly SMA Manager Fees (being the fee currently charged by Thornburg to new clients for managing their assets in the Select UMA program). The SMA Manager Fees may differ from manager to manager, and managers may change their fee to new clients from time to time. If you select this manager for your account, check the SMA Manager Fees specified in the written client agreement, in case these have changed since you received this profile. Historical net fees reflect the Advisory Fee Schedule as of October 1, 2018.

Morgan Stanley program fees are usually deducted quarterly, and have a compounding effect on performance. The Morgan Stanley program fee, which differs among programs and clients, is described in the applicable Morgan Stanley ADV brochure, which is available at [www.morganstanley.com/ADV](http://www.morganstanley.com/ADV) or on request from your Financial Advisor or Private Wealth Advisor.

Document approval date 12/2019. #CRC 2761463

**Focus List, Approved List, and Watch Status:**

Global Investment Manager Analysis ("GIMA") uses two methods to evaluate investment products in applicable advisory programs. In general, strategies that have passed a more thorough evaluation may be placed on the "Focus List", while strategies that have passed through a different and less comprehensive evaluation process may be placed on the "Approved List". Sometimes an investment product may be evaluated using the Focus List process but then placed on the Approved List instead of the Focus List.

Investment products may move from the Focus List to the Approved List, or vice versa. GIMA may also determine that an investment product no longer meets the criteria under either evaluation process and will no longer be recommended in investment advisory programs (in which case the investment product is given a "Not Approved" status).

GIMA has a "Watch" policy and may describe a Focus List or Approved List investment product as being on "Watch" if GIMA identifies specific areas that (a) merit further evaluation by GIMA and (b) may, but are not certain to, result in the investment product becoming "Not Approved". The Watch period depends on the length of time needed for GIMA to conduct its evaluation and for the investment manager to address any concerns. GIMA may, but is not obligated to, note the Watch status in this report with a "W" or "Watch" on the cover page.

For more information on the Focus List, Approved List, and Watch processes, please see the applicable Morgan Stanley ADV brochure ([www.ms.com/adv](http://www.ms.com/adv)). Your Financial Advisor or Private Wealth Advisor can provide on request a copy of a paper entitled "GIMA: At A Glance".

#### ADDITIONAL DISCLOSURES

The information about a representative account is for illustrative purposes only. Actual account holdings, performance and other data will vary depending on the size of an account, cash flows within an account, and restrictions on an account. Holdings are subject to change daily. The information in this profile is not a recommendation to buy, hold or sell securities.

Actual portfolio statistics may vary from target portfolio characteristics.

The Model Portfolio Provider or Investment Manager may use the same or substantially similar investment strategies, and may hold similar portfolios of investments, in other portfolios or products it manages (including mutual funds). These may be available at Morgan Stanley or elsewhere, and may cost an investor more or less than this strategy in Morgan Stanley's Select UMA program.

Overlay Managers or Executing Sub-Managers ("managers") in some of Morgan Stanley's Separately Managed Account ("SMA") programs may affect transactions through broker-dealers other than Morgan Stanley or our affiliates. If your manager trades with another firm, you may be assessed costs by the other firm in addition to Morgan Stanley's fees. Those costs will be included in the net price of the security, not separately reported on trade confirmations or account statements. Certain managers have historically directed most, if not all, of their trades to outside firms. Information provided by managers concerning trade execution away from Morgan Stanley is summarized at: [www.morganstanley.com/wealth/investmentsolutions/pdfs/adv/sotresponse.pdf](http://www.morganstanley.com/wealth/investmentsolutions/pdfs/adv/sotresponse.pdf). For more information on trading and costs, please refer to the ADV Brochure for your program(s), available at [www.morganstanley.com/ADV](http://www.morganstanley.com/ADV), or contact your Financial Advisor/Private Wealth Advisor.

The portfolio may, at times, invest in exchange-traded funds (ETFs), which are a form of equity security in seeking to maintain continued full exposure to the broad equity market.

Morgan Stanley investment advisory programs may require a minimum asset level and, depending on your specific investment objectives and financial position, may not be suitable for you. Investment advisory program accounts are opened pursuant to a written client agreement.

The investment manager acts independently of, and is not an affiliate of, Morgan Stanley Smith Barney LLC.

Diversification does not guarantee a profit or protect against a loss.

#### *No obligation to notify*

Morgan Stanley has no obligation to notify you when information in this profile changes.

#### *Sources of information*

Material in this profile has been obtained from sources that we believe to be reliable, but we do not guarantee its accuracy, completeness or timeliness. Third party data providers make no warranties or representations relating to the accuracy, completeness or timeliness of the data they provide and are not liable for any damages relating to this data.

#### *No tax advice*

Morgan Stanley and its affiliates do not render advice on legal, tax and/or tax accounting matters to clients. Each client should consult his/her personal tax and/or legal advisor to learn about any potential tax or other implications that may result from acting on a particular recommendation.

#### *Not an ERISA fiduciary*

Morgan Stanley is not acting as a fiduciary under either the Employee Retirement Income Security Act of 1974, as amended, or under section 4975 of the Internal Revenue Code of 1986, as amended, in providing the information in this profile.

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#### INDEX DESCRIPTIONS

##### 90-Day T-Bills

The 90-Day Treasury Bill is a short-term obligation issued by the United States government. T-bills are purchased at a discount to the full face value, and the investor receives the full value when they mature. The difference of discount is the interest earned. T-bills are issued in denominations of \$10,000 auction and \$1,000 increments thereafter.

##### MSCI EM

The MSCI Emerging Markets Index is a free float-adjusted market capitalization index that is designed to measure equity market performance of emerging markets. The MSCI Emerging Markets Index consists of the following 23 emerging market country indexes: Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, Philippines, Poland, Qatar, Russia, South Africa, Taiwan, Thailand, Turkey, and United Arab Emirates (as of June 2014).

**S&P 500**

The S&P 500 Total Return has been widely regarded as the best single gauge of the large cap U.S. equities market since the index was first published in 1957. The index has over \$5.58 trillion benchmarked, with index assets comprising approximately \$1.31 trillion of this total. The index includes 500 leading companies in leading industries of the U.S. economy, capturing 75% coverage of U.S. equities. This index includes dividend reinvestment.

**Indices are unmanaged and have no expenses. You cannot invest directly in an index.**

**GLOSSARY OF TERMS**

**Alpha** is a mathematical estimate of risk-adjusted return expected from a portfolio above and beyond the benchmark return at any point in time.

**American Depositary Receipts (ADRs)** are receipts for shares of a foreign-based corporation held in the vault of a U.S. bank.

**Average Portfolio Beta** is a measure of the sensitivity of a benchmark or portfolio's rates of return to changes against a market return. The market return is the S&P 500 Index. It is the coefficient measuring a stock or a portfolio's relative volatility.

**Beta** is a measure of the sensitivity of a portfolio's rates of return to changes in the market return. It is the coefficient measuring a stock or a portfolio's relative volatility.

**Bottom-Up Stock Selection** Emphasis primarily on individual stock selection. Considerations of economic and industry factors are of secondary importance in the investment decision-making process.

**Capitalization** is defined as the following: Mega (Above \$100 billion), Large (\$12 to \$100 billion), Medium (\$2.5 - \$12 billion), Small (\$.50 - \$2.5 billion) and Micro (below \$.50 billion).

**Distribution Rate** is defined as the most recent distribution paid, annualized, and then divided by the current market price. Distribution rate may consist of investment income, short-term capital gains, long-term capital gains, and /or returns of capital.

**Dividend** a portion of a company's profit paid to common and preferred shareholders.

**Dividend Yield** annual dividend per share divided by price per share. Dividend Yield for the portfolio is a weighted average of the results for the individual stocks in the portfolio.

**Downside Risk** is a measure of the risk associated with achieving a specific target return. This statistic separates portfolio volatility into downside risk and upside uncertainty. The downside considers all returns below the target return, while the upside considers all returns equal to or above the target return.

**Duration** is a measure of price sensitivity expressed in years.

**High Grade Corporate Bonds** corporate bonds from issuers with credit ratings of AA or AAA.

**Information Ratio** is a measure of the investment manager's skill to add active value against a given benchmark relative to how stable that active return has been. Essentially, the information ratio explains how significant a manager's alpha is. Therefore, the higher the information ratio, the more significant the alpha.

**Investment Grade Bonds** are those rated by Standard & Poor's AAA (highest rated), AA, A or BBB (or equivalent rating by other rating agencies or, in the case of securities not rated, by the investment manager).

**Price/Book Ratio (P/B)** weighted average of the stocks' price divided by book value per share. Book value per share is defined as common equity, including intangibles, divided by shares outstanding times the adjustment factor.

**Price/Cash Flow Ratio** a ratio used to compare a company's market value to its cash flow. It is calculated by dividing the company's market cap by the company' operating cash flow in the most recent fiscal year (or the most recent four fiscal quarters); or, equivalently, divide the per-share stock price by the per-share operating cash flow.

**Price/Earnings Ratio (P/E Ratio)** shows the multiple of earnings at which a stock sells. Determined by dividing current stock price by current earnings per share (adjusted for stock splits). Earnings per share for the P/E ratio are determined by dividing earnings for past 12 months by the number of common shares outstanding. The P/E ratio shown here is calculated by the harmonic mean.

**Price/Sales Ratio** determined by dividing current stock price by revenue per share (adjusted for stock splits). Revenue per share for the P/S ratio is determined by dividing revenue for past 12 months by number of shares outstanding.

**R2 (R-Squared)/Portfolio Diversification** indicates the proportion of a security's total variance that is benchmark-related or is explained by variations in the benchmark.

**Sharpe Ratio** measures the efficiency, or excess return per unit of volatility, of a manager's returns. It evaluates managers' performance on a volatility-adjusted basis.

**Standard Deviation** is a statistical measure of historical variability or spread of returns around a mathematical average return that was produced by the investment manager over a given measurement period. The higher the standard deviation, the greater the variability in the investment manager's returns relative to its average return.

**Top-Down/Economic Analysis** Emphasis primarily on macroeconomic trends as opposed to bottom-up stock selection.

**Tracking Error** represents the standard deviation of the difference between the performance of the investment strategy and the benchmark. This provides a historical measure of the variability of the investment strategy's returns relative to its benchmark.

**U.S. Treasury Bonds** a marketable, fixed interest U.S. government debt security with a maturity of more than 10 years. Treasury bonds make interest payments semi-annually and the income that holders receive is only taxed at the federal level.

**Volatility** a measure of risk based on the standard deviation of the asset return. Volatility is a variable that appears in option pricing formulas, where it denotes the volatility of the underlying asset return from now to the expiration of the option. There are volatility indexes. Such as a scale of 1-9; a higher rating means higher risk.