



## Portfolio Model Indicators & Methods

### Asset-Class Ranking Methodology

The Portfolio Model Indicators are constructed by measuring performance characteristics of the candidates, aggregating the measurements, and then ranking the candidates in descending order of aggregate measurements. The performance characteristics measured include price performance over four timeframes (the past 30, 60, 120 and 240 market days), performance on "market-up" days vs. performance on "market-down" days, nearness to 52-week highs, and several other performance-based measurements. The specific measurements have been chosen to highlight those performance characteristics that are likely to persist for at least several months. These performance-based measurements are classified as "momentum" types of measurements in the academic literature, and the ranking that results from them is called a "relative strength" ordering in academic studies. The higher-ranked candidates are typically selected for inclusion in portfolios, while lower-ranked candidates are removed from portfolios, at intervals usually ranging from 1 to 4 months between such selections.

---

### Bull-Bear Indicator

The Bull-Bear Indicator is constructed from measurements of market internals and is intended to reveal the relationship of supply and demand at the longer-term timeframe of months to years. The measurements are ratios of supply and demand factors, normalized to a scale of 0 to 100. For example, the ratio of up-volume to (up volume + down volume) will always be in the range of 0 to 100, where the higher readings indicate a preponderance of demand (larger up volume) and lower readings indicate a preponderance of supply (larger down volume). Other examples of ratios of supply and demand are advancers to (advancers + decliners) and new 52-wk highs to (new 52-wk highs + new 52-wk lows). There are seven ratios in total. These ratios are then weighted, and combined into a single, statistically smoothed final Bull-Bear Indicator. When the Bull-Bear Indicator is in a Bull Market mode and then pierces the Bear Market Threshold, a new Bear Market is signaled. When the Bull-Bear Indicator is in a Bear Market mode and then pierces the Bull Market Threshold, a new Bull Market is signaled. Once a mode (Bull or Bear) is established, it is considered to remain in place until the Bull-Bear Indicator eventually pierces the opposite threshold.

---

### Quarterly Trend Indicator

Designed to act only at quarterly intervals, it is a quarter-by-quarter look at the probable risk environment of each quarter, using the trend status of US and International equities. The trend labeling is derived from the slope of a tangent to a curvilinear regression line going through the last "n" data points of a statistically-smoothed closing price data series; stated more compactly, it's based on direction of the regression line through a smoothed price series, and the 'prices' referred to are the Russell 3000 for the US, and the MSCI Ex-US for International. If either the US or International equities are in an uptrend, a lower-risk quarter is indicated; if neither the US nor International equities are in an uptrend, a higher-risk quarter is indicated.

## Portfolio Model Indicators & Methods, cont.

### Intermediate-Term Indicator

The Intermediate-term Indicator is constructed from measurements of market internals within 36 sectors of the US equities market, and is intended to reveal the relationship of supply and demand at the intermediate-term timeframe of weeks to months. Each sector is defined by a basket of stocks. Each stock within each basket is ranked as being in supply mode or demand mode, based on recent price and volume activity. If the majority of stocks within a basket are deemed to be in demand mode, the sector is deemed to be in demand mode; if the majority of stocks within a basket are deemed to be in supply mode, the sector is deemed to be in supply mode. Each sector in demand mode is assigned the value of 1, each sector in supply mode is assigned the value of 0. The Indicator value is then the statistically-smoothed sum of these 36 assignments, which can therefore range from 0 to 36. A sum of 0 indicates all sectors are in supply mode and a sum of 36 indicates all sectors are in demand mode. Changes in the overall intermediate-term market outlook occur when the Intermediate-term Indicator changes direction after reaching at least the half-way point of 18 (one half of 36). After reaching at least the half-way point, a reversal by 20% causes a change in labeling and color. When the Intermediate-term Indicator is headed up, it is labeled as "Positive" and colored green; when the Intermediate-term Indicator is headed down, it is labeled as "Negative" and colored red. A change from green ("Positive") to red ("Negative") occurs upon a reversal downward of at least 20% of the highest value reached. For example, a reversal from green to red after a move up that peaks at 30, will occur at 24 (20% less than 30). Similarly, a change from red to green occurs upon a reversal upward of at least 20% of the lowest value reached. For example, a reversal from red to green after a move that bottoms at 5, will occur at 6 (20% more than 5).

---

### The Trend-Strength Indicator

The Trend-Strength Indicator, used by the Gold Risk-Managed Model and the Energy Risk-Managed Model, utilizes price action as its sole input. The strength of the trend is determined by the deviation of price action from the calculated forward trajectory of the current up-trend or down-trend. A positive deviation above the trend trajectory results in a higher trend strength, and a negative deviation below the trend trajectory results in a lower trend strength. A change in trend occurs when the trend strength value rises enough to cross the zero line from negative to positive (establishing a new positive trend), or falls enough to cross the zero line from positive to negative (establishing a new negative trend). A trend change in the indicator - from up to down, or down to up - is calculated on a weekly-close basis.

---