

PEP for Windows
Rising and Declining Periods

Rising/declining periods refer to the sub-asset class cycles vis-à-vis the broader asset class. This is determined by evaluating the cumulative relative sub-asset class index performance to that of the broader asset class index. For example, to determine the growth equity cycle, the S&P 500 Growth Index (sub-asset class) performance is compared to that of the S&P 500 (broader asset class). The table below lists the rising/declining types and the corresponding indexes used for analysis.

Rising/Declining Type	Sub-Asset Class Index	Broader Asset Class Index
Large Cap Equity	Russell 1000 Index	Russell 3000 Index
Small Cap Equity	Russell 2000 Index	Russell 3000 Index
Growth Equity	S&P 500 Growth Index	S&P 500 Index
Value Equity	S&P 500 Value Index	S&P 500 Index
Short Term Fixed Income	Lehman Govt. 1-3 Year Index	Lehman Govt./Credit Index
Long Term Fixed Income	Lehman Govt./Credit Long Index	Lehman Govt./Credit Index
High Yield	Lehman High Yield Index	Lehman Credit Index
Pacific Rim Equity	MSCI Pacific ex Japan Index	MSCI EAFE Index
Pacific Basin Equity	MSCI Pacific Index	MSCI EAFE Index
European Equity	MSCI Europe Index	MSCI EAFE Index
Emerging	MSCI Emerging Free Index	MSCI EAFE Index

The actual analysis involves determining if a significant “cycle reversal” has occurred over the period in question. A priori, the period of cycle reversal is unknown. To determine this, a period involving the most recent quarters is selected, and for this period, cumulative relative return is computed; long-term standard deviation of the cumulative relative returns is also calculated.

If the magnitude of the cumulative relative return is greater than one standard deviation (of cumulative relative returns measured over all the periods), and the number of periods is four or more quarters, a significant reversal has occurred. For periods less than 4 quarters, a two standard deviation rule is applied. This process is repeated until all the different combinations of recent periods have been evaluated, and a break point determined. Even though, this process is fairly straight forward, there is always an element of qualitative judgement overlaid on the quantitative analysis.

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For the broad asset class rising/declining types (Domestic Equity, Domestic Fixed Income, International Equity, International Fixed Income, and the CPI) no single index is used and the methodology is much more qualitative in nature. In general, though, it takes two consecutive quarters in the opposite direction to reverse the trend. Exceptions, though, are sometimes made as in the case of International Equity in the first quarter of 1998. In this instance, the rise in the first quarter of 1998 completely overwhelmed the decline of the previous two quarters. If we went by the standard rule we would have been in the awkward position of calling a three-quarter period with a positive return a declining market period.

Rising/Declining Type	Index
Domestic Equity	S&P 500
Domestic Fixed Income	LB Govt/Credit
International Equity	MSCI EAFE
International Fixed Income	Citigroup Non-US Hedged
CPI	CPI

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