# TREND DETECTION

Educational Piece

EMBASSY

## MOVING AVERAGES AND SLOPES IN CTA STRATEGIES

There are many different investing philosophies, but the two largest camps are probably value and growth. Value investors look to identify and buy cheap assets, i.e., where asset price is below fair value. The thesis is that asset price will eventually converge to its fair value, and the investor will earn a profit. Growth investors, on the other hand, are looking to identify and buy assets whose prices are expected to rise with increase in perceived fair value.

Both value and growth investing styles are related to concepts of human bias. In the case of value investing, cheap assets may be seen through the lens of loss aversion bias - the psychological tendency for people to prefer avoiding losses to acquiring equivalent gains, meaning the pain of losing is felt more intensely than the pleasure of winning. When an asset looks to be of low quality, fewer investors want to own it and its price falls. One way to look at value investing is that it is partly about overcoming loss aversion bias. In the case of growth investing, one driver of perceived fair value expansion can be the herd mentality bias. When the prospects for an asset's value are exciting and well-publicized, for example, the fear of missing out may lead more investors to want to own it and its price rises. One way to look at growth investing is that it is partly about identifying when herd mentality bias is prevalent.

To identify when herd mentality bias exists it can be helpful to look at how professional investors identify when a market is trending. Commodity Trading Advisors (CTAs), managed futures managers and other trend-following investors often rely on Simple Moving Averages (SMAs) and their slopes to identify longer-term trends in prices, yields, or other assets. The approach, often referred to as Moving Average Convergence Divergence (MACD) analysis, is a cornerstone of many trend-following systems due to its simplicity and effectiveness across various asset classes.

## TREND IDENTIFICATION BASICS

SMAs smooth price data over periods (e.g., weeks) to filter noise. Using two SMAs, like a shorter (26-week) period and longer (40-week) period, creates crossover signals. The shorter SMA crossing above the longer SMA signals an uptrend. The shorter SMA crossing below the longer SMA signals a downtrend.

## ADDING SLOPE FOR NUANCE

The slope of the SMA measures trend strength, positive slope for rising, negative for falling, near-zero for flat. Slopes add a dynamic layer, helping filter false signals in choppy markets and can help classify regimes more robustly.

## IMPLICATIONS

Systematic signals can help to reduce emotional decisions with crossovers and slopes triggering entries and exits automatically. For interest rates, these tools can help investors to identify rising (inflationary), falling (deflationary), or flat (stable) rate environments, thus aiding bond or duration strategies. "A 26-week SMA crossing above the 40-week with a positive slope flags a rising rates regime, which is like spotting a wave before it builds."

# TREND DETECTION

Educational Piece

EMBASSY

## THE METHOD BEHIND IT

Calculate shorter- and longer-term SMAs $$SMA_t = \frac{1}{n}\sum_{i=0}^{n-1} P_{t-i}$$

Crossover: Buy when shorter-term SMA > longer-term SMA and sell when shorter-term SMA < longer-term SMA

Slope for uptrends $$m = (SMA_1 - SMA_0) > 0$$

Slope for downtrends $$m = (SMA_1 - SMA_0) < 0$$

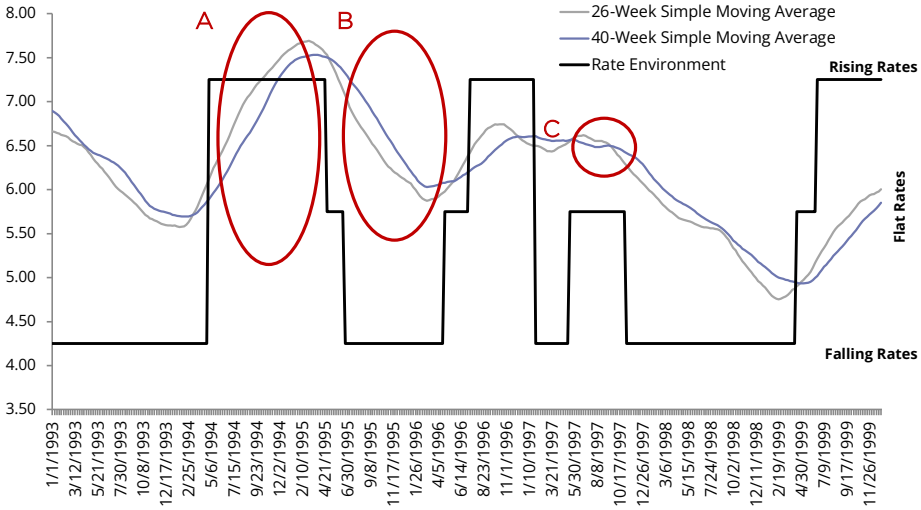
For yields: Can be combined with changes in the steepness of the yield curve for added rate regime identification accuracy

## RATE REGIMES[1]

**A.** Rising Rate Regime: 26-week SMA > 40-week SMA with a positive 26-week slope or steepening yield curve.

**B.** Falling Rate Regime: 26-week SMA < 40-week SMA with a negative 26-week slope or flattening/inverting curve.

**C.** Flat Rate Regime: SMAs close with a near-zero 26-week slope and stable yield curve.




This MACD-like framework (focusing on divergence and momentum) helps predict regime persistence.

## KEY TAKEAWAY

Layering trend detection tools like moving averages into a portfolio can cut through the noise and avoid emotional decision-making, helping to position more effectively for shifts in interest rates or markets. This systematic edge can help protect portfolios when conditions change and capture opportunities when trends persist.

[1] Source: Bloomberg, Embassy calculations as of 06/30/2025

# TREND DETECTION

Educational Piece

## IMPORTANT DISCLOSURES

### FINANCIAL EDUCATION DISCLOSURE STATEMENT

This financial education material is intended for informational and educational purposes only. It is not intended to serve as personalized financial, investment, legal, accounting, or tax advice. The content is designed to enhance your understanding of financial concepts and strategies but should not be construed as a recommendation to buy, sell, or hold any financial product or service.

### NO FIDUCIARY RELATIONSHIP

Participation in this educational program does not create a fiduciary relationship between you and the provider. Decisions based on this material should be made in consultation with your financial advisor or other qualified professionals.

### ACCURACY AND TIMELINESS

While we strive to ensure the accuracy and relevance of the information presented, financial markets and regulations are subject to change. We do not guarantee the completeness or timeliness of the content and disclaim any liability for decisions made based on this material.

### CONFIDENTIALITY AND USE

This material may not be reproduced, distributed, or shared outside of this context without prior written consent. All proprietary content remains the intellectual property of the provider.