

# Divergent Paths to Persistence: An Exhaustive Analysis of Cross-Sectional Momentum and Time-Series Trend Following Strategies

## Executive Summary

In the architecture of modern quantitative finance, few anomalies are as empirically robust, yet conceptually conflated, as Momentum and Trend Following. While both strategies capitalize on the serial autocorrelation of asset prices—the tendency for past performance to influence future returns—they operate through fundamentally distinct mechanisms, exploit different behavioral inefficiencies, and exhibit divergent risk profiles during periods of market stress. This report provides a comprehensive, expert-level examination of the structural, theoretical, and practical differences between Cross-Sectional Momentum (often simply termed "Momentum") and Time-Series Momentum (commonly referred to as "Trend Following" or "Managed Futures").

The analysis draws upon over a century of data and a breadth of academic literature to delineate the boundaries between these two risk premia. We explore the mathematical construction of signal generation, distinguishing between the relative ranking systems of equity momentum and the absolute directional filters of macro trend following. Furthermore, we scrutinize the behavioral rationales underpinning their persistence, contrasting the "underreaction" and "disposition effect" drivers of cross-sectional spreads with the "herding" and "feedback loop" mechanics of time-series trends.

Crucially, this report addresses the implications for portfolio construction, particularly the asymmetry of returns. While Momentum strategies offer high potential upside through stock selection, they are prone to "Momentum Crashes"—sudden, sharp drawdowns during market reversals. Conversely, Trend Following strategies exhibit "Crisis Alpha," often delivering their strongest performance during prolonged equity bear markets, thereby serving as a convex hedge. By integrating insights on "Dual Momentum," volatility scaling, and the "speed" of signals, this document aims to equip institutional allocators with the nuanced understanding required to effectively deploy these complementary strategies within a diversified investment framework.

## 1. Ontological Foundations: Defining the Factors

To navigate the complexities of systematic investing, one must first establish a precise taxonomy. In industry parlance, "momentum" is often used as a catch-all term for any strategy

that buys strength. However, precise factor definitions reveal that Cross-Sectional Momentum and Time-Series Momentum refer to disparate data generating processes with unique statistical properties.

## 1.1 Cross-Sectional Momentum (Relative Strength)

Cross-Sectional Momentum (CSM), frequently referred to in academic literature simply as "Momentum" or "Relative Strength," is a phenomenon predicated on the *relative* performance of assets within a defined universe.<sup>1</sup> The central premise is not whether an asset is rising or falling in absolute terms, but rather how it is performing compared to its peers.

The strategy, formalized in the equity markets by Jegadeesh and Titman (1993), involves ranking a universe of securities—typically individual stocks—based on their cumulative returns over a formation period, usually the past 12 months excluding the most recent month.<sup>3</sup> The portfolio is then constructed by taking a long position in the top quantile (the "Winners") and a short position in the bottom quantile (the "Losers").

The critical distinction here is the market-neutral nature of the construction. A pure Cross-Sectional Momentum strategy is designed to isolate the "spread" return—the outperformance of winners over losers—from the market beta.<sup>5</sup> Consequently, in a bear market where the entire equity universe is declining, a CSM strategy will technically be long assets with negative returns. However, providing the "Winners" (perhaps defensive stocks down 5%) decline less than the "Losers" (perhaps high-beta stocks down 20%), the strategy generates a positive payoff. The driver of return is dispersion, not direction.

## 1.2 Time-Series Momentum (Trend Following)

Time-Series Momentum (TSM), or "Absolute Momentum," focuses exclusively on an asset's own past history. It asks a singular, binary question for each instrument in the portfolio: "Is the asset trending up or down?".<sup>1</sup> This approach essentially treats each asset as an independent island, ignoring the performance of other assets in the universe.

This methodology forms the theoretical backbone of the Commodity Trading Advisor (CTA) and Managed Futures industry. Moskowitz, Ooi, and Pedersen (2012) provided the seminal academic framework for this strategy, terming it "Time Series Momentum" and demonstrating its efficacy across 58 liquid instrument contracts including equities, currencies, commodities, and bonds.<sup>6</sup> Unlike CSM, TSM is explicitly *not* market neutral. It is directionally dynamic.

In a universal bull market, a TSM strategy may be net long every asset class. In a global liquidity crisis where all asset correlations converge to one on the downside, a TSM strategy may pivot to be net short everything. This dynamic exposure allows Trend Following to act as a form of "Crisis Alpha," engaging in "divergent" trading that profits from the extension of price moves away from equilibrium.<sup>8</sup>

Feature	Cross-Sectional Momentum (CSM)	Time-Series Momentum (Trend)
<b>Primary Metric</b>	Relative Performance (Rank vs. Peers)	Absolute Performance (History vs. Self)
<b>Portfolio Stance</b>	Typically Dollar/Market Neutral (Long/Short Spread)	Directional (Net Long or Net Short)
<b>Universe</b>	Individual Equities (Single Stocks)	Macro Assets (Futures, Currencies, Bonds, Indices)
<b>Comparison</b>	"Is Stock A better than Stock B?"	"Is Asset A going up or down?"
<b>Risk Source</b>	Dispersion (Spread between winners/losers)	Directional Persistence (Serial Auto-correlation)
<b>Industry Vehicle</b>	Factor ETFs, Equity Market Neutral Funds	CTAs, Managed Futures, Macro Funds

### 1.3 The Correlation Conundrum

Despite these structural differences, the two factors are not entirely orthogonal. Two Sigma research indicates a positive long-term correlation of approximately 0.3 between the Momentum equity style factor and the Trend Following macro style factor.<sup>5</sup> This correlation arises because, in many market environments, the assets that are outperforming their peers (Relative Winners) are also the assets that are trending upwards in absolute terms.

However, a correlation of 0.3 implies that while they share common DNA—likely related to behavioral underreaction and overreaction—they are distinct enough to be considered separate drivers of portfolio risk and return. The divergence becomes most apparent during market turning points. For instance, in a sharp market recovery, relative momentum can suffer broadly while trend following might still be profitable in other asset classes like bonds or commodities, or vice versa.<sup>5</sup>

## 2. Theoretical Underpinnings and Behavioral Drivers

The persistence of both Momentum and Trend Following defies the strict definition of the

Efficient Market Hypothesis (EMH), which posits that past price information should not predict future returns. To explain why these strategies have generated excess returns over centuries, we must turn to behavioral finance and the structural limits of arbitrage. While both strategies exploit inefficiencies, they tap into slightly different psychological and structural veins.

## 2.1 Underreaction and Anchoring Bias

A foundational driver for both strategies is the human tendency to underreact to new information. This phenomenon, often linked to the "Anchoring and Adjustment" heuristic, suggests that investors anchor their valuation of an asset to a previous price level or a prior belief and update their views too slowly in response to fundamental news.<sup>11</sup>

In the context of Trend Following (TSM), this underreaction creates a gradual adjustment in prices rather than an instantaneous jump. When a central bank shifts interest rate policy or a supply shock hits the oil market, market participants—uncertain about the permanence of the change—adjust their positions incrementally. This creates a sustained trend that TSM strategies exploit. As Moskowitz et al. (2012) argue, time-series momentum is consistent with sentiment theories of initial underreaction followed by delayed overreaction.<sup>6</sup>

For Cross-Sectional Momentum (CSM), underreaction manifests in the slow incorporation of firm-specific news, such as earnings surprises. When a company announces better-than-expected earnings, the stock price typically jumps, but often not enough to fully reflect the new fundamental reality. This leads to a "post-earnings announcement drift," where the stock continues to outperform its peers for months as the market gradually digests the implications of the news.<sup>13</sup>

## 2.2 Overreaction and Herding Behavior

Once a trend is established, a second phase of behavioral bias often takes over: overreaction. This is driven by "herding" behavior, the "bandwagon effect," and positive feedback loops.<sup>12</sup>

For Trend Following, as a price trend becomes obvious, more capital chases the asset. This can drive prices significantly beyond fair value, creating "fat tails" in the return distribution. CTAs and trend followers essentially harvest these fat tails. The mechanism is supported by the behavior of non-profit-seeking actors in the futures markets, such as corporate hedgers or central banks, whose actions (e.g., currency intervention or large-scale hedging programs) can create and sustain price pressure independent of fundamental value.<sup>4</sup>

In Cross-Sectional Momentum, overreaction is particularly dangerous. It can lead to the overvaluation of "Winner" stocks and the undervaluation of "Loser" stocks to sustainable levels. When this overreaction inevitably corrects, it leads to mean reversion. This is why CSM strategies often face significant risks during market reversals—the "rubber band" effect snaps back, causing the winners to crash and the losers to rally violently.<sup>15</sup>

## 2.3 The Disposition Effect: A Critical Distinction

The Disposition Effect—the tendency of investors to sell winning positions too early to "lock in gains" and hold losing positions too long to "avoid realizing losses"—is a critical driver, particularly for Cross-Sectional Momentum.<sup>3</sup>

The mechanics of the Disposition Effect create a specific distortion in the cross-section of returns. When investors sell winners early, they create artificial selling pressure that suppresses the price of the winning stock, preventing it from immediately reaching its fundamental value. This ensures that the positive return is realized slowly over time, fueling momentum. Conversely, by holding losers, investors delay the selling pressure, causing the price to drift downward slowly rather than correcting instantly.

Grinblatt and Han (2002) present a model where the disposition effect drives the market clearing price, creating a wedge between the fundamental value and the market price.<sup>13</sup> This wedge is what the CSM strategy captures. While this effect is present in all markets, it is most pronounced in the equity cross-section where individual retail participation and idiosyncratic biases are highest. Trend following, dealing with macro aggregates like the S&P 500 futures or 10-Year Treasuries, is arguably less driven by the disposition effect of individual holders and more by macro-flow imbalances.<sup>3</sup>

## 2.4 Structural Limits to Arbitrage

If these strategies are known and profitable, why are they not arbitraged away? The persistence of these premiums suggests robust limits to arbitrage.

1. **Risk-Based Explanations:** Some academics argue that Momentum returns are simply compensation for crash risk. Momentum strategies (CSM) have high negative skewness; they collect small gains frequently but suffer massive drawdowns during sharp reversals. Investors require a premium to bear this "tail risk".<sup>16</sup>
2. **Capacity and Constraints:** Implementing these strategies requires leverage (especially for TSM in low-volatility assets like bonds) and shorting (for CSM). Many institutional mandates restrict leverage and shorting, leaving the premiums available for those who can access them. Furthermore, shorting individual small-cap losers in a CSM strategy can be prohibitively expensive or impossible due to lack of borrow, preventing arbitrageurs from fully closing the pricing gap.<sup>4</sup>

# 3. Mathematical and Structural Mechanics

To fully appreciate the divergence between the two strategies, one must examine the specific algorithms and rules used to construct the portfolios. The differences in lookback periods, signal generation, and rebalancing schedules profoundly impact performance characteristics.

## 3.1 Signal Generation and Lookback Periods

### Cross-Sectional Momentum Construction:

Standard academic CSM portfolios are constructed using a relative ranking methodology. The most common specification is the "12-1" momentum.

- **Method:** Rank all stocks in the universe based on their returns from month  $t - 12$  to  $t - 1$ .
- **The "Skip Month":** The most recent month ( $t - 1$ ) is explicitly excluded. This is done to disentangle the momentum effect from the "short-term reversal" effect (documented by Jegadeesh and Titman, 1993, and Fama, 1965). Over very short horizons (1 month), stocks tend to mean-revert due to liquidity provision and market microstructure noise.<sup>5</sup>
- **Ranking:** The portfolio typically goes long the top decile or quintile (Winners) and shorts the bottom decile or quintile (Losers).
- **Weighting:** Positions are often equal-weighted or value-weighted within the deciles.

### Trend Following Construction:

Trend following signals are absolute and do not involve cross-sectional comparison. The signal for Asset A is independent of Asset B.

- **Time-Series Momentum (TSMOM):** The simplest form, as defined by Moskowitz et al. (2012), takes a position determined by the sign of the past 12-month return:

$$\text{Position}_t = \text{sign}(R_{t-12,t})$$

If the return is positive, the strategy is long; if negative, it is short.<sup>6</sup>

- **Moving Average Crossover:** A more common practitioner approach involves Moving Averages (MA). A strategy might go long if the short-term MA (e.g., 50-day) is above the long-term MA (e.g., 200-day). This smoothes the signal and reduces turnover compared to raw price returns.<sup>22</sup>
- **Donchian Channels (Breakouts):** Popularized by the "Turtle Traders," this method buys when the price breaks above the highest high of the past  $N$  days (e.g., 20 or 55 days) and sells when it breaks below the lowest low.<sup>22</sup>

### Speed of Trend:

A critical variable in Trend Following is "speed"—the length of the lookback period.

- **Fast Trend (1-3 months):** Reacts quickly to market turns. It captures shorter moves but suffers from high transaction costs and frequent "false alarms" (whipsaws).<sup>26</sup>
- **Slow Trend (6-12 months):** More robust to noise and captures major macro moves, but is slow to react to reversals, leading to late entries and exits.
- **Hybrid Approaches:** Most modern CTAs run an ensemble of speeds (e.g., blending 1-month, 3-month, and 12-month signals) to diversify "parameter risk" and balance

responsiveness with stability.<sup>23</sup>

### 3.2 Volatility Scaling: A Key Differentiator

A defining feature of modern Trend Following (TSM) is volatility targeting or scaling. Because TSM operates across diverse asset classes—from low-volatility sovereign bonds to high-volatility energy futures—position sizing based on notional value would lead to a portfolio dominated by the most volatile assets.

- **Risk Parity Approach:** TSM managers scale positions inversely to their volatility. A position in Japanese Government Bonds (JGBs) might be leveraged 5x, while a position in Crude Oil might be held at 0.5x, ensuring that each trend contributes an equal amount of risk to the portfolio.<sup>27</sup>
- **CSM Contrast:** Standard Cross-Sectional Momentum strategies in equities rarely use volatility scaling at the individual stock level. They typically equal-weight or cap-weight the winners. This implies that the risk of the CSM portfolio fluctuates with the volatility of the underlying stock market and the specific beta of the winner/loser cohorts.<sup>5</sup>

### 3.3 Portfolio Construction and Constraints

**Equity-Centric Momentum (CSM):** CSM is predominantly an equity phenomenon. The universe comprises thousands of individual stocks (e.g., Apple, Microsoft, Tesla).<sup>5</sup> The large cross-section is necessary to generate a smooth spread between winners and losers and to diversify idiosyncratic risk.

- *Implementation Constraint:* Implementing pure long-short CSM requires a robust securities lending market to short individual losing stocks. This can be costly or impossible for small-cap equities, leading many practitioners to implement "Long-Only Momentum" (Smart Beta), which simply overweights winners and excludes losers relative to a benchmark.<sup>30</sup>

**Macro-Centric Trend (TSM):** Trend Following is a "Macro Style" factor. It utilizes liquid derivatives: futures, forwards, and swaps.<sup>5</sup>

- **Universe:** The investment universe is typically smaller in number (50-100 markets) but broader in economic scope, covering Equity Indices (S&P 500, Nikkei), Sovereign Bonds (US Treasuries, Bunds), Currencies (EUR/USD, JPY/USD), and Commodities (Gold, Oil, Corn).<sup>7</sup>
- **Diversification Source:** Because these assets have low fundamental correlation to each other (e.g., the trend in Gold is often independent of the trend in the Yen), TSM portfolios achieve diversification through asset class breadth rather than security selection.<sup>6</sup>

## 4. Asset Class Implementation and Universes

The practical application of these strategies reveals further divergence. While the

mathematical concepts can theoretically be applied anywhere, liquidity and market structure dictate where they flourish.

## 4.1 The Equity Domain of CSM

Cross-Sectional Momentum is inextricably linked to the equity markets. The sheer number of investable securities (thousands of stocks) provides the statistical breadth required to rank performance effectively. In a universe of only 10 assets, ranking the "top 10%" implies buying just one asset, which introduces massive idiosyncratic risk. In a universe of 2,000 stocks, the top 10% is a diversified basket of 200 names.

Furthermore, the behavioral biases that drive CSM—such as the disposition effect among retail investors and the gradual diffusion of information among analysts—are most prevalent in the idiosyncratic stories of individual companies. While CSM has been tested in other asset classes (e.g., ranking currencies or commodities), the results are often less robust or are subsumed by the "Carry" factor.<sup>5</sup>

## 4.2 The Managed Futures Domain of TSM

Trend Following is the domain of the Managed Futures industry. The use of futures contracts is essential for two reasons:

1. **Ease of Shorting:** Futures make going short as easy as going long. There is no "borrow cost" or "uptick rule" as in equities. This is crucial for a strategy that must seamlessly flip from long to short to capture downtrends.<sup>5</sup>
2. **Leverage Efficiency:** Futures allow for implicit leverage through margin. This enables the volatility scaling discussed in Section 3.2, allowing a portfolio to target a specific risk level (e.g., 15% annualized volatility) regardless of the current market environment.<sup>4</sup>

## 4.3 Capacity and Turnover

- **Momentum (CSM):** High turnover is a hallmark of CSM. Winners can become losers quickly. Rebalancing is typically monthly or quarterly. Transaction costs are a significant drag on CSM performance. Studies have shown that a significant portion of the theoretical CSM premium can be eroded by trading costs, especially if the strategy drifts into less liquid small-cap stocks.<sup>15</sup>
- **Trend (TSM):** Turnover is variable and regime-dependent. In a sustained bull or bear market, a Trend strategy might hold a position for months or even years without trading (low turnover). In a choppy, sideways market ("whipsaw" environment), turnover spikes as the strategy repeatedly enters and exits positions. However, because TSM trades highly liquid macro instruments (like S&P 500 futures), the market impact and transaction costs are generally lower per dollar of risk than in single-stock CSM.<sup>26</sup>

# 5. Risk Profiles, Skewness, and Crisis Alpha

Perhaps the most consequential distinction for asset allocators lies in the shape of the return distribution and how these strategies behave during periods of extreme market stress. While both are "active" strategies, their correlation to equity markets during crashes differs fundamentally.

## 5.1 The "CTA Smile": Positive Convexity

Trend Following exhibits **positive skewness** (convexity). Its return profile resembles a "long straddle" option position: it makes money in extreme up markets (bull trends) and extreme down markets (bear trends).<sup>10</sup>

This payoff profile is often visualized as the "CTA Smile." If one plots the returns of Trend Following strategies (Y-axis) against the returns of the S&P 500 (X-axis), the result is a U-shaped curve.

- **Center of the Smile:** Small equity moves (noise) typically result in small losses for Trend strategies due to whipsaw costs.
- **Tails of the Smile:** Large equity moves—whether positive or negative—result in large gains for Trend. This is because the strategy aligns with the direction of the market movement.

## 5.2 Momentum Crashes: Negative Skewness

Cross-Sectional Momentum exhibits **negative skewness**. It acts like a "short call option" on the dispersion spread. It collects a premium most of the time (steady gains) but suffers from rare, devastating "Momentum Crashes".<sup>16</sup>

### The Anatomy of a Momentum Crash:

Momentum crashes typically occur in the transition from a deep bear market to a new bull market (e.g., 1932, 2009).

1. **The Setup:** In a deep bear market, the "Losers" are typically companies with high leverage, poor balance sheets, or high sensitivity to the economic cycle (High Beta/Junk). The "Winners" are defensive, low-volatility stocks (Utilities, Consumer Staples) that have fallen less than the market.
2. **The Positioning:** A CSM strategy essentially becomes Long Defensive / Short High Beta. It is implicitly betting against a market recovery.
3. **The Reversal:** Suddenly, market sentiment shifts (e.g., a massive stimulus package or Fed bailout). The market rallies violently.
4. **The Crash:** In a "dash for trash" rally, the High Beta "junk" stocks (the shorts) rally the hardest and fastest (e.g., up 50% in a week). The defensive stocks (the longs) lag. The short side of the CSM portfolio explodes upwards (generating massive losses), while the long side barely moves. The strategy suffers a massive drawdown precisely when the broader market is recovering.<sup>15</sup>

## 5.3 Crisis Alpha: The Trend Following Superpower

"Crisis Alpha" refers to strategies that generate positive returns specifically when broad equity markets collapse. Trend Following is widely regarded as a reliable source of Crisis Alpha.<sup>8</sup>

### Mechanism of Crisis Alpha:

In a protracted crisis (e.g., the 2008 Global Financial Crisis), trends become clear and persistent:

- **Equities:** Trend down.
- **Bonds:** Trend up (flight to quality).
- **Commodities:** Trend down (demand destruction).

A TSM strategy will naturally pivot to short equities, long bonds, and short commodities. Unlike a put option which has a cost (premium), TSM can often carry this protection at a profit or neutral cost during normal times, and then profit massively from the crisis itself.<sup>4</sup>

**CSM in Crisis:** In contrast, a market-neutral CSM strategy might remain neutral or lose money if the volatility triggers a reversal. It does not inherently benefit from the market going down; it only benefits if Winners continue to beat Losers. As seen in 2008, CSM did provide some protection relative to long-only equity (by being short the worst banks), but it did not provide the massive windfall gains seen in Trend Following.<sup>8</sup>

## 6. Advanced Variations and Hybrid Models

Given the strengths and weaknesses of both, practitioners have developed hybrid methodologies that attempt to synthesize the best attributes of selection and direction.

### 6.1 Dual Momentum

Proposed by Gary Antonacci, "Dual Momentum" is a robust framework that explicitly combines Relative (CSM) and Absolute (TSM) momentum.<sup>35</sup>

#### The Logic of Global Equities Momentum (GEM):

1. **Relative Step (Selection):** Compare assets (e.g., US Equities vs. International Equities). Identify the winner over the last 12 months. This captures the CSM premium by ensuring the portfolio is in the strongest geography.
2. **Absolute Step (Direction):** Check if the winner is trending up (e.g., is its return  $>$  Risk-Free Rate or is it above its moving average?). This is the TSM filter.
3. **Action:**
  - If the winner is trending up, buy it.
  - If the winner is trending down, the "Winner" is essentially the "best of a bad bunch."

In this case, the strategy moves to safety (Aggregate Bonds or Cash).

**Benefit:** This integrates the "Crisis Alpha" of Trend (by moving to safety in bear markets) with the upside capture of Relative Momentum (by picking the best asset in bull markets). Historical backtests suggest this approach significantly reduces drawdowns compared to pure equity holding while maintaining or exceeding returns.<sup>35</sup>

## 6.2 Fundamental Momentum

Another hybrid approach attempts to mitigate the risk of Momentum Crashes by incorporating fundamental data. "Fundamental Momentum" or "Quality Momentum" strategies look for stocks that have strong price momentum *supported* by improving fundamentals (e.g., earnings growth, revenue surprises).<sup>39</sup>

The rationale is that price momentum driven by hype (overreaction) is fragile and prone to reversal. Price momentum driven by fundamental improvement is more durable. By filtering the CSM universe for high-quality earnings, these strategies attempt to avoid shorting the "junk" stocks that might rally violently in a recovery, thereby softening the blow of momentum crashes.

# 7. Performance Evaluation and Manager Selection

For institutional allocators, distinguishing between these strategies is critical for manager selection and benchmarking.

## 7.1 Benchmarking and Style Drift

- **Benchmarking CSM:** Cross-Sectional Momentum strategies should be benchmarked against standard Factor Indices (e.g., MSCI USA Momentum Index). The key metric is Information Ratio—the active return per unit of active risk relative to the factor index.
- **Benchmarking TSM:** Trend Following strategies are typically benchmarked against CTA indices like the **SG Trend Index** or the **BarclayHedge CTA Index**.<sup>41</sup> Because TSM is an absolute return strategy, it is also often compared to a cash hurdle (Risk-Free Rate + Spread).

**Style Drift Warning:** A common issue in manager selection is style drift. A "Multi-Strategy" manager might claim to offer diversified alpha but may be heavily loaded on simple Trend Following beta. By using factor analysis tools (like the Two Sigma Factor Lens), allocators can regress manager returns against generic Momentum and Trend factors to see if the manager is generating true "residual" alpha or just charging high fees for generic trend exposure.<sup>5</sup>

## 7.2 Role in a 60/40 Portfolio

- **Trend Following:** Its primary role is **diversification** and **tail hedging**. Adding a 10-20% allocation to Trend Following in a traditional 60/40 (Equity/Bond) portfolio has historically

improved the Sharpe Ratio and reduced maximum drawdowns, thanks to the non-correlation/crisis alpha properties.<sup>41</sup>

- **Momentum (CSM):** Its primary role is **return enhancement**. It is typically used within the equity sleeve to boost returns. It does not significantly reduce portfolio drawdown risk (and may increase it during reversals), but it raises the expected return ceiling.<sup>5</sup>

## 8. Conclusion: Synergies in a Diversified Portfolio

The question "What is the difference?" ultimately resolves into a strategic decision: "Which function does the portfolio need?"

**Cross-Sectional Momentum** is a **selection engine**. It answers the question, "What should I own?" by identifying the strongest assets relative to the pack. It is an aggressive, equity-focused factor designed to harvest the premium associated with the continued outperformance of winning companies. It is a powerful tool for generating alpha within an asset class, but it is vulnerable to sudden market reversals and liquidity shocks.

**Time-Series Trend Following** is a **macro asset allocation engine**. It answers the question, "Should I be invested?" by identifying the absolute direction of prices. It is a defensive, macro-focused strategy designed to profit from sustained moves—up or down—across the global investment landscape. It acts as a convex hedge, providing valuable returns when traditional assets falter.

For the sophisticated investor, these are not competing strategies but complementary tools. The data suggests that a robust portfolio should utilize Trend Following to manage macro risk and provide crisis alpha, while employing Cross-Sectional Momentum to drive excess returns within the risk assets it chooses to hold. By harnessing the distinct powers of both "The Trend" and "The Spread," investors can build portfolios resilient to the vagaries of market cycles.

## 9. Historical Evidence: A Century of Data

To validate the persistence of these strategies, one must look beyond the recent decades of computerized trading. The work of AQR Capital Management, specifically the paper "A Century of Evidence on Trend-Following Investing," provides a crucial historical lens.<sup>7</sup>

### 9.1 The Long-Term Robustness of Trend

Hurst, Ooi, and Pedersen (2017) constructed a Time-Series Momentum strategy extending back to 1880. Their findings are profound:

- **Consistency:** The strategy delivered positive average returns in every decade for over a century. This includes the Great Depression, the stagflation of the 1970s, and the tech boom of the 1990s.

- **1930s Performance:** During the Great Depression, while equities lost nearly 90% of their value, the Trend Following proxy strategy generated substantial profits. It captured the short equity trend and the long bond trend (deflation), effectively capitalizing on the economic collapse.<sup>16</sup>
- **Inflationary Environments:** In the 1970s, when stocks and bonds both struggled due to soaring inflation, Trend Following profited from long positions in commodities (which surged) and short positions in bonds (which collapsed as yields rose). This highlights TSM's ability to adapt to different economic regimes—deflationary or inflationary—provided there is a trend.<sup>11</sup>

## 9.2 The Ubiquity of Momentum

Similarly, Cross-Sectional Momentum has been documented back to the Victorian era. Chabot et al. (2014) found robust momentum profits in Victorian-era London stock data. Geczy and Samonov (2013) extended the data back over 200 years, finding that the momentum premium is pervasive across history.

However, the historical record also confirms the "Crash" risk of CSM. The 1932 market rebound (following the 1929 crash) stands out as one of the most painful periods for CSM on record, mirroring the dynamics of 2009. This reinforces the structural reality that CSM's negative skew is a feature, not a bug, of the strategy.<sup>16</sup>

## 10. Quantitative Comparison of Risk Metrics

A direct quantitative comparison elucidates the trade-offs involved.

Metric	Cross-Sectional Momentum	Time-Series Trend Following
<b>Sharpe Ratio (Long-Term)</b>	~0.4 - 0.6	~0.5 - 0.7
<b>Correlation to Equities</b>	~0.0 (if Market Neutral) to 0.9 (Long Only)	Dynamic (Positive in Bull, Negative in Bear)
<b>Skewness</b>	Negative (Left Tail Risk)	Positive (Right Tail Potential)
<b>Max Drawdown Character</b>	Sharp, V-shaped "Crashes" (Reversals)	Slow, grinding "Whipsaws" (Choppy Markets)

<b>Liquidity Capacity</b>	Moderate (constrained by single-stock shorts)	High (deep futures markets)
<b>Volatility Profile</b>	Variable (driven by market vol)	Constant (typically vol-targeted)

This table highlights why TSM is often preferred for "tail risk hedging," while CSM is preferred for "alpha generation".<sup>5</sup>

## 11. Implementation Challenges and Nuances

The bridge between theory and practice is paved with transaction costs and implementation hurdles.

### 11.1 Transaction Costs

Both strategies are turnover-intensive.

- **CSM:** Rebalancing a portfolio of hundreds of stocks monthly generates significant commissions and bid-ask spread costs. Studies suggest that for large funds, transaction costs can erode 20-40% of the gross momentum premium. This has led to "smart momentum" implementations that trade less frequently or use optimization to reduce turnover.<sup>15</sup>
- **TSM:** While futures are cheaper to trade, the "roll yield" (cost of rolling expiring contracts) can be a drag, particularly in contango markets (where future prices are higher than spot prices). A naive trend strategy in commodities can lose money even if spot prices rise, due to the negative roll yield.<sup>5</sup>

### 11.2 The "Skip Month" Nuance

In CSM, the exclusion of the most recent month ( $t - 1$ ) is standard practice.

- **Rationale:** Short-term reversals (1-month) are driven by liquidity provision. Market makers buy when others sell, pushing prices temporarily away from equilibrium. These prices revert quickly. If a CSM strategy included the last month, it would inadvertently buy stocks that had just spiked due to noise (and are about to revert) and short stocks that had just dipped.
- **TSM Contrast:** TSM does not typically exclude the most recent month in the same way, although the use of Moving Averages naturally smooths out very recent noise. The logic of TSM is that the *current* price is the best indicator of the trend, whereas CSM is looking for *intermediate* relative strength.<sup>20</sup>

## 11.3 Liquidity and Capacity

- **Capacity:** TSM strategies in deep markets (S&P 500 futures, US Treasuries) have massive capacity, estimated in the hundreds of billions.
- **Constraint:** CSM strategies are constrained by the liquidity of the "Losers." Shorting small-cap, illiquid stocks is difficult. As assets under management (AUM) grow, CSM managers are often forced to move up the market cap spectrum, where the momentum premium is historically weaker (though still present).<sup>4</sup>

## 12. Conclusion: The Grand Synthesis

The distinction between Momentum and Trend Following is not merely academic; it is the difference between specific security selection and broad macro navigation.

**Cross-Sectional Momentum** is the sniper rifle. It targets specific assets within a class that are displaying superior strength, aiming to capture the dispersion between the best and the worst. It thrives in stable bull markets where leadership is narrow and distinct but is fragile when the market regime shifts violently.

**Time-Series Trend Following** is the ocean liner. It navigates the broad currents of the global economy, indifferent to which specific stock is winning, but highly sensitive to the overall direction of asset classes. It thrives in prolonged moves—up or down—and offers a structural hedge against the chaos of market collapses.

In the final analysis, the "Momentum vs. Trend" debate is a false dichotomy. They are two distinct expressions of the same underlying truth: that market participants are not perfectly rational, that prices adjust gradually to new information, and that trends, once established, tend to persist. For the investor seeking robust, long-term performance, the optimal strategy is rarely one or the other, but an intelligent integration of both.

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