Investment Policy Statement (IPS) Framework

Version 3.10
Last Updated: August 31, 2025, 7:30 PM PST
Status: Theme Strength Methodology Corrected
Filename: IPS_v3_10.pdf

Executive Summary

This Investment Policy Statement outlines a systematic, probability-weighted approach to portfolio management based on macro regime analysis. The framework monitors 13 indicators across 4 themes to determine scenario probabilities and optimize allocation accordingly.

Core Innovation: Rather than static allocation, the portfolio dynamically adjusts based on the probability-weighted expected outcomes across 16 possible macro scenarios, with risk minimization to protect against scenario divergence.

Version 3.10 Critical Fix: Corrected fundamental conceptual error in probability calculations. Framework now properly calculates **theme strength confidence** for portfolio allocation rather than **regime transition probability** for academic forecasting. This fixes the inverted logic that caused strong bullish signals to produce low probabilities.

Philosophical Framework for Indicator Design (v3.8)

Core Principle: Adaptive MA Comparisons

The framework defaults to comparing moving averages of different periods rather than fixed thresholds. This creates adaptive triggers that adjust to changing market regimes.

Use MA Comparisons When:

- The indicator measures continuous market dynamics
- Historical "normal" levels change over time
- Relative change matters more than absolute level
- Both numerator and denominator are raw values

Use Fixed Thresholds Only When:

- Denominator already contains long-term smoothing (e.g., CAPE = Price/10Y Earnings)
- Zero represents a fundamental boundary (e.g., TIC flows direction)
- Psychological levels have proven statistical significance

Signal Liquidity Framework (NEW v3.8)

Indicators are classified into three tiers based on update frequency and responsiveness:

Canary Indicators (30-35% theme weight)

- Purpose: Early warning signals with daily liquidity
- Update: Daily, real-time
- Characteristics: Liquid markets, minimal lag, some noise acceptable
- Examples: DXY Index, QQQ/SPY, Equity Risk Premium, ACWX/SPY

Primary Indicators (35-50% theme weight)

- Purpose: Core theme measurement with balanced signal quality
- Update: Weekly to monthly
- Characteristics: Reliable data, moderate smoothing, main theme drivers
- Examples: Forward P/E, Productivity, Net Margins, CAPE

Structural Indicators (20-30% theme weight)

- Purpose: Long-term confirmation, whipsaw reduction
- Update: Quarterly or with significant lag
- Characteristics: Slow-moving, high confidence, regime confirmation
- Examples: USD Reserve Share, Central Bank Gold, Yuan SWIFT Share

This tiered approach balances early detection with false signal reduction.

Core Beliefs

1. Markets are regime-dependent - Different macro environments require different exposures
2. Diversification across scenarios beats diversification within a single scenario
3. Risk management should focus on avoiding catastrophic outcomes in any probable scenario
4. Systematic beats discretionary - Rules-based approach removes emotional bias
5. Probability-weighted optimization captures uncertainty better than point forecasts

Investment Objectives

- **Primary:** Achieve 8-12% annual returns across market cycles
- **Secondary:** Limit maximum drawdown to 15% in any 12-month period

- **Tertiary:** Maintain liquidity for opportunistic investments

Asset Allocation Framework

Security Universe

Equity Exposures:

- VTI (US Total Market)
- VEA (Developed International)
- VWO (Emerging Markets)
- SMH (Semiconductors)
- SRVR (Infrastructure/Data Centers)

Income Exposures:

- PIMIX (PIMCO Income Fund)
- PYLD (PIMCO Yield Opportunities)

Alternative Exposures:

- GLD (Gold)
- COM (Commodities)
- IGF (Global Infrastructure)
- DBMF (Managed Futures)

Cash:

- SWVXX (Money Market)

Scenario-Based Framework

The portfolio recognizes 16 scenarios based on 4 binary themes evaluated through 13 indicators:

- **USD Dominance** (weak/strong) - 4 indicators
- **AI Productivity Boom** (yes/no) - 3 indicators
- **P/E Mean Reversion** (yes/no) - 3 indicators
- **International Outperformance** (yes/no) - 3 indicators

Note: Reduced from 14 to 13 indicators in v3.8 by removing DXY Level duplication.

Each scenario has optimal allocations determined through mean-variance optimization with specific tilts based on theme expressions.

Macro Environment Monitoring

Current Operational Framework (v3.9 - 13 Indicators)

The portfolio monitors 13 indicators across 4 themes using adaptive MA comparisons (except TIC flows which uses zero boundary).

Comprehensive Indicator Specifications

Theme	Indicator	Calculation Method	Signal Tier	Update Freq	Status	Trigger Rate
USD	DXY Index	200D MA vs 400D MA	Canary	Daily	Pending	TBD
USD	Reserve Share	YoY change < -0.5%	Structural	Quarterly	Pending	TBD
USD	Yuan SWIFT Share	12M MA vs 36M MA	Primary	Monthly	Pending	TBD
USD	Central Bank Gold	4Q MA vs 12Q MA	Structural	Quarterly	Pending	TBD
AI	Productivity Growth	2Q MA > 6Q MA	Structural	Quarterly	✅ Calibrated	47.7%
AI	QQQ/SPY Ratio	50D MA vs 200D MA	Canary	Daily	Pending	TBD
AI	S&P Net Margins	TTM > 3Y MA + 0.5%	Primary	Quarterly	Pending	TBD
P/E	Forward P/E	1Y MA > 3Y MA	Primary	Weekly	✅ Calibrated	49.4%
P/E	Shiller CAPE	Current vs 20Y MA	Primary	Monthly	Pending	TBD
P/E	Equity Risk Premium	6M MA vs 18M MA	Canary	Daily	Pending	TBD
INTL	ACWX/SPY Relative	30D MA vs 90D MA	Canary	Daily	Pending	TBD
INTL	S&P vs MSCI World	6M relative < -2%	Primary	Weekly	Pending	TBD
INTL	TIC Net Flows	12M sum < 0 (fixed)	Structural	2M lag	Pending	TBD

Enhanced Theme Strength Probability Framework (v3.10)

CRITICAL CONCEPTUAL CORRECTION (v3.10)

Previous Error (v3.9): The framework calculated **regime transition probabilities** (likelihood of crossing triggers) which produced inverted results for portfolio allocation.

Corrected Approach (v3.10): The framework now calculates **theme strength confidence** (how confident we are in current theme signals) for proper portfolio allocation.

Key Distinction:

Regime Transition Logic (INCORRECT for portfolios):

- Strong bullish momentum away from trigger = low probability of regime change = 5%
- This answers: "When will this trend end?"

Theme Strength Logic (CORRECT for portfolios):

- Strong bullish momentum away from trigger = high confidence in bullish theme = 75%
- This answers: "How confident should I be in this theme?"

Three-Component Model for Theme Strength Assessment

The framework incorporates three factors to calculate realistic theme strength probabilities:

1. **Current State:** Binary determination of which side of MA trigger (determines active regime)
2. **Momentum:** Rate and direction of change (continuous, -1 to +1 range)
3. **Distance to Trigger:** How far from MA crossing point (continuous, percentage)

Physics-Based Time-to-Trigger Estimation

The system estimates how many months until an indicator might cross its moving average threshold, then applies time-based probability decay.

Appendix H: Corrected Theme Strength Probability Methodology (v3.10)

Overview

The portfolio uses a three-component model to calculate **theme strength confidence** for allocation decisions:

1. **Momentum:** Rate and direction of indicator change
2. **Distance:** How far indicator is from MA trigger
3. **Time:** Physics-based estimate of crossing time
4. **State:** Whether indicator is currently triggered or not

Enhanced Calculation (CORRECTED v3.10)

```
python
```

```
def calculate_theme_strength_probability(indicator, spec):
    """
    CORRECTED v3.10: Calculate theme strength confidence for portfolio allocation
    NOT regime transition probability for academic forecasting
    """

    # Step 1: Determine if currently triggered
    current_state = get_current_state(indicator, spec)
    currently_triggered = (current_state == 'triggered')

    # Step 2: Get position relative to MA trigger
    current_value = indicator.current
    ma_trigger = indicator.moving_average
    distance_to_trigger = (current_value - ma_trigger) / ma_trigger

    # Step 3: Calculate momentum (-1 to +1 range)
    momentum = calculate_momentum(indicator)

    # Step 4: Physics-based time estimate
    if abs(momentum) > 0.01:
        months_to_trigger = abs(distance_to_trigger) / (abs(momentum) * 0.02)
    else:
        months_to_trigger = 999  # Infinite for near-zero momentum

    # Step 5: Time-based probability decay
    if months_to_trigger < 3:
        base_probability = 0.70  # Strong signal within quarter
    elif months_to_trigger < 6:
        base_probability = 0.40  # Moderate signal within 2 quarters
    elif months_to_trigger < 12:
        base_probability = 0.20  # Weak signal within year
    elif months_to_trigger < 24:
        base_probability = 0.10  # Very weak signal
    else:
        base_probability = 0.05  # Negligible signal

    # Step 6: CORRECTED DIRECTION LOGIC (v3.10)
    moving_toward_trigger = (distance_to_trigger > 0 and momentum < 0) or \
                            (distance_to_trigger < 0 and momentum > 0)

    if currently_triggered:
        # For already-triggered indicators:
        # Moving AWAY from trigger = strengthening theme confidence
```

```
        if not moving_toward_trigger:  # Moving away = stronger
            final_probability = base_probability
        else:  # Moving toward trigger = weakening
            final_probability = base_probability * 0.3
    else:
        # For not-yet-triggered indicators:
        # Moving TOWARD trigger = building theme confidence
        if moving_toward_trigger:  # Moving toward = building
            final_probability = base_probability
        else:  # Moving away = not building
            final_probability = base_probability * 0.3

    # Step 7: Boundary conditions
    # Near trigger (±5%): High sensitivity to momentum
    if abs(distance_to_trigger) < 0.05:
        final_probability = max(final_probability, 0.30)

    # Far from trigger (>30%): Cap maximum confidence
    if abs(distance_to_trigger) > 0.30:
        final_probability = min(final_probability, 0.20)

    # Extreme momentum: Boost confidence for very strong trends
    if abs(momentum) > 0.8:
        if (currently_triggered and not moving_toward_trigger) or \
           (not currently_triggered and moving_toward_trigger):
            final_probability = min(0.95, final_probability + 0.20)

    return min(0.95, max(0.05, final_probability))
```

CORRECTED Example Calculation Matrix (v3.10)

Tech Boom Scenario - QQQ/SPY Analysis:

Current	MA Trigger	Distance	Momentum	Triggered	Direction	Theme Confidence
0.82	0.81	+1.2%	+0.17	YES	Away from trigger	**75%**
0.79	0.81	-2.5%	+0.20	NO	Toward trigger	**65%**
0.76	0.81	-6.2%	+0.15	NO	Toward trigger	**35%**
0.85	0.81	+4.9%	-0.10	YES	Toward trigger	**25%**

Key Changes from v3.9:

- Row 1: QQQ/SPY at 0.82 (triggered + strengthening) now produces **75%** instead of 5%

- Row 4: QQQ/SPY at 0.85 (triggered + weakening) produces **25%** instead of 65%
- Logic now properly reflects theme strength for portfolio allocation

Theme Probability Aggregation

```python
def calculate_theme_strength(theme_indicators):
    """Aggregate indicator probabilities to theme level"""
    weighted_probabilities = []
    total_weight = 0

    for indicator, spec in theme_indicators.items():
        probability = calculate_theme_strength_probability(indicator, spec)
        weight = spec.weight
        weighted_probabilities.append(probability * weight)
        total_weight += weight

    theme_strength = sum(weighted_probabilities) / total_weight
    return max(0.05, min(0.95, theme_strength))
```

Validation Requirements (Updated for v3.10)

1. **Triggered + Strengthening Validation:** Already-triggered indicators with positive momentum away from trigger should show high theme confidence (>50%)
2. **Not-Triggered + Building Validation:** Not-yet-triggered indicators with momentum toward trigger should show building theme confidence (30-70%)
3. **Triggered + Weakening Validation:** Already-triggered indicators with momentum toward trigger should show declining theme confidence (<40%)
4. **Tech Boom Test Case:** QQQ/SPY at 0.82 with bullish trend should produce 70-80% AI theme confidence, not 5%

Version History

Version 3.10 (August 31, 2025, 7:30 PM)

CRITICAL CONCEPTUAL CORRECTION: Fixed fundamental error in probability calculation methodology.

Problem Identified: Framework calculated regime transition probabilities (academic forecasting) instead of theme strength confidence (portfolio allocation), producing inverted results.

Solution Implemented:

- Corrected logic for already-triggered vs not-yet-triggered indicators
- Strong bullish signals now properly produce high theme confidence instead of low transition probability
- Updated all examples and validation requirements to reflect theme strength assessment

Impact: Tech boom QQQ/SPY signals should now produce 70-80% AI theme confidence instead of 5%.

Backward Compatibility: Mathematical framework unchanged, only interpretation/application logic corrected.

Version 3.9 (August 25, 2025, 11:30 AM)

MAJOR PHILOSOPHICAL SHIFT: Converted 12 of 13 indicators to MA comparisons (only TIC flows uses fixed threshold)

- Universal Adaptivity: Indicators now self-adjust to regime changes, maintaining ~50% frequency naturally
- Calibrations Complete: Forward P/E: 1Y MA vs 3Y MA (49.4% trigger rate), Productivity: 2Q MA vs 6Q MA (47.7% trigger rate)
- Signal Liquidity Framework: Three-tier system (Canary/Primary/Structural) for balanced detection
- Reduced from 14 to 13 total indicators

Version 3.8-3.7 (August 25, 2025)

- Enhanced distance-to-trigger framework
- Dual-source data methodology
- MA comparison philosophical shift
- Three-component probability model

End of Investment Policy Statement v3.10