Investment Policy Statement (IPS) Framework

Version 3.10 - Complete Implementation Framework

Last Updated: September 02, 2025, 20:00:00 UTC
Status: Production Ready - Comprehensive Specification **Filename:** IPS_v3.10_Complete_Framework.md

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 using sophisticated regret minimization techniques.

Core Innovation: Rather than static allocation, the portfolio dynamically adjusts based on the probability-weighted expected outcomes across 16 possible macro scenarios, with dual optimization minimizing both maximum regret and probability-weighted regret across likely scenarios.

Version 3.10 Enhancement: Enhanced Theme Strength Probability Framework corrects previous calculation errors while preserving all portfolio implementation methodology from v3.9. All 13 indicators now use adaptive moving average comparisons (except TIC flows) for self-adjusting regime detection.

Philosophical Framework

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) - Core domestic equity
- **VEA** (Developed International) - Core international developed
- **VWO** (Emerging Markets) - International emerging exposure
- **SMH** (Semiconductors) - AI theme expression
- **SRVR** (Infrastructure/Data Centers) - AI infrastructure play

Income Exposures:

- **PIMIX** (PIMCO Income Fund) - Hold-only position, never generate BUY orders
- **PYLD** (PIMCO Yield Opportunities) - Primary vehicle for income increases

Alternative Exposures:

- **GLD** (Gold) - USD decline and crisis hedge
- **COM** (Commodities) - Real asset exposure
- **IGF** (Global Infrastructure) - Inflation protection
- **DBMF** (Managed Futures) - Crisis alpha and regret minimization

Cash:

- **SWVXX** (Money Market) - Liquidity and defensive positioning

Scenario-Based Framework

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

- **USD Dominance Decline** (active/inactive) - 4 indicators
- **AI Productivity Boom** (active/inactive) - 3 indicators
- **P/E Mean Reversion** (active/inactive) - 3 indicators
- **International Outperformance** (active/inactive) - 3 indicators

Each scenario has optimal allocations determined through mean-variance optimization with specific tilts based on theme expressions, followed by regret minimization across likely scenarios.

Portfolio Optimization Methodology

Step 1: Scenario Selection

Scenario Inclusion Criteria:

1. Sort scenarios by probability (highest first)
2. Include until cumulative probability ≥ 85%
3. Minimum 3 scenarios
4. Maximum 6 scenarios
5. Include any scenario ≥ 10% probability regardless

Step 2: Individual Scenario Optimization

For each selected scenario, create optimal allocation using mean-variance optimization with theme-specific tilts:

USD Decline Theme Tilts:

- Increase: VEA, VWO, GLD, COM
- Decrease: VTI, SWVXX

AI Productivity Theme Tilts:

- Increase: SMH, SRVR, VTI (tech-heavy)
- Decrease: Traditional value sectors

P/E Reversion Theme Tilts:

- Increase: PYLD, GLD, SWVXX (defensive)
- Decrease: High-multiple equities

International Outperformance Theme Tilts:

- Increase: VEA, VWO, IGF
- Decrease: VTI relative weight

Step 3: Regret Matrix Calculation

Test each scenario-optimized allocation across all likely scenarios. Calculate regret for each combination:

```
Regret(Portfolio_A, Scenario_B) = Return(Portfolio_A, Scenario_B) - Return(Optimal_B, Scenario_B)
```

Step 4: Dual Optimization Framework

Objective Function:

Minimize: α × Max_Regret + (1-α) × Probability_Weighted_Regret

Where:
- Max_Regret = worst regret across all likely scenarios
- Probability_Weighted_Regret = Σ(P(scenario) × Regret(scenario))
- α = risk tolerance parameter (0.3 to 0.7)

α Parameter Selection:

- **α = 0.3**: More focused on expected outcomes
- **α = 0.5**: Balanced approach (default)
- **α = 0.7**: More focused on worst-case protection

Step 5: Smart Hedging Protocol

If maximum regret exceeds tolerance after dual optimization:

Divergence Assessment:

- Portfolio correlation > 0.7: Target 5% max regret
- Portfolio correlation 0.5-0.7: Target 6% max regret
- Portfolio correlation < 0.5: Target 8% max regret

Hedging Strategy:

- **Geographic divergence**: Add 2-5% international index
- **Asset class divergence**: Add 2-5% infrastructure
- **Volatility divergence**: Add 2-5% DBMF
- **Irreconcilable scenarios**: Accept regret or add 2-5% cash

Hedging Constraints:

- Maximum DBMF addition: 10%
- Combined hedge additions: <15%
- If regret still >10%: Document and accept

Step 6: Final Validation

Position Limits:

- Maximum single position: 35%

- Maximum sector concentration: 50%
- Minimum cash position: 1%
- Maximum alternatives: 30%

Scenario Risk Limits:

- Maximum regret in any scenario: -8%
- Minimum upside capture: 70%
- Maximum correlation to any single factor: 0.7

Macro Environment Monitoring

Current Operational Framework (v3.10 - 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
	Yuan SWIFT Share	12M MA vs 36M MA	Primary	Monthly	Pending	TBD
	Central Bank Gold	4Q MA vs 12Q MA	Structural	Quarterly	Pending	TBD
AI	Productivity Growth	2Q MA > 6Q MA	Structural	Quarterly	✅ Calibrated	47.7%
	QQQ/SPY Ratio	50D MA vs 200D MA	Canary	Daily	Pending	TBD
	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%
	Shiller CAPE	Current vs 20Y MA	Primary	Monthly	Pending	TBD
	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
	S&P vs MSCI World	6M relative < -2%	Primary	Weekly	Pending	TBD
	TIC Net Flows	12M sum < 0 (fixed)	Structural	2M lag	Pending	TBD

Signal Liquidity Framework

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

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): Calculate theme strength probabilities directly representing current thematic conditions, not transition likelihoods.

Mathematical Framework

For triggered indicators (already past threshold):

```
python
```

```
base_probability = 0.70  # Higher baseline for active themes
distance_bonus = min(0.30, abs(distance_to_trigger) * 3)
momentum_boost = favorable_momentum * 0.25
result = base_probability + distance_bonus + momentum_boost
```

For non-triggered indicators:

```
python

months_to_trigger = abs(distance_to_trigger) / momentum_rate
base_probability = time_decay_function(months_to_trigger)
direction_adjustment = momentum_direction_factor
result = base_probability * direction_adjustment
```

Boundary Conditions

- Near trigger (±5%): High sensitivity to momentum
- Far from trigger (>30%): Cap maximum confidence
- Extreme momentum: Boost confidence for very strong trends

Example Calculation Matrix

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%
- Correction eliminates inverted probability assignments

Rebalancing Methodology

Quarterly Full Optimization

Schedule: Third Friday of March, June, September, December

Process:

1. Update all 13 macro indicators
2. Calculate theme probabilities using v3.10 framework
3. Determine scenario probabilities (16 scenarios)
4. Select scenarios for optimization (≥85% cumulative)
5. Run individual scenario optimizations
6. Calculate regret matrix across likely scenarios
7. Execute dual optimization (α × Max_Regret + (1-α) × Weighted_Regret)
8. Apply smart hedging if maximum regret exceeds tolerance
9. Validate against position and risk limits
10. Execute trades over 5 days using execution framework

Monthly Drift Check

Schedule: First Friday of each month

Triggers:

- Any position > 3% drift from target
- Total portfolio drift > 10%
- Theme probability change > 20%

Action: If triggered, execute mid-quarter rebalancing

Data Quality Gates

Green Light (Full Trading):

- At least 12 of 13 indicators fresh
- All 4 themes have 2+ fresh indicators
- No theme fully missing

Yellow Light (Provisional Trading):

- 10-11 indicators fresh
- Document quality issues in optimization notes
- Proceed with increased monitoring

Red Light (Trading Halt):

- Fewer than 10 indicators fresh
- Any theme fully missing data
- Use carry-forward methodology with defensive tilt (+10% bonds)

Trading Execution Framework

Security-Specific Rules

PIMIX (Hold-Only):

- Never generate BUY orders for PIMIX
- Only SELL orders permitted
- When reducing income allocation, sell PIMIX first

PYLD (Primary Income Vehicle):

- Primary vehicle for income allocation increases
- All income BUY orders go to PYLD
- Trade in minimum $500 increments

Core Equity (VTI/VEA/VWO):

- Trade in $1000 increments minimum
- Use limit orders for positions > $10,000
- Execute over 2-3 days for large trades

Alternatives (SMH/SRVR/GLD/COM/IGF/DBMF):

- Maintain minimum 1% positions when held
- Use market orders for small positions (<$5000)
- Limit orders for large positions

Cash (SWVXX):

- Residual balancing account
- Minimum 1% allocation always maintained

Order Management

- **Market Orders**: Positions < $5,000
- **Limit Orders**: Positions > $10,000

- **Execution Period**: Spread large trades over 5 days
- **Priority**: Execute highest-drift positions first

Risk Management

Position Limits

- Maximum single position: 35%
- Maximum sector concentration: 50%
- Minimum cash position: 1%
- Maximum alternatives combined: 30%
- DBMF maximum (hedging): 15%
- Combined income maximum: 30%

Scenario Risk Limits

- Maximum regret in any likely scenario: -8%
- Minimum upside capture: 70%
- Maximum correlation to any single factor: 0.7

Emergency Protocols

Market Crisis (>20% decline in 30 days):

- Suspend all rebalancing activities
- Maintain current positions
- Document indicator changes but do not act
- Resume normal operations after 30 days of stability

Data System Failure:

- Use last known good indicator values
- Apply defensive portfolio tilt (+10% bonds, +5% cash)
- Implement manual calculation backup procedures
- Monitor daily until data systems restored

Extreme Scenario Divergence (Max regret >15%):

- Document the scenario causing extreme regret
- Consider emergency hedge allocation (max 5% DBMF)

- Alert for manual review within 24 hours
- May require temporary suspension of optimization

Tax Optimization

Loss Harvesting

- Systematic loss harvesting in November-December
- Avoid wash sales across correlated ETFs:
  - VTI ↔ VOO, ITOT, SPTM
  - VEA ↔ VT, VTIAX, FTIHX
  - VWO ↔ VTIAX, VEMAX
- Harvest losses only if >$500 and >30 days to reestablish

Distribution Management

- PIMIX distributions require special tax handling
- Monthly distribution reinvestment only if allocation is underweight
- Document all distribution elections in trade notes

Account Optimization

- Prefer ETFs over mutual funds in taxable accounts
- Hold tax-inefficient positions (PIMIX, PYLD) in tax-deferred accounts when possible
- Coordinate rebalancing across account types

Historical Tracking and Performance Attribution

Quarterly Review Template

1. **Performance vs Benchmarks**
   - Absolute return vs target (8-12%)
   - Relative performance vs 60/40 benchmark
   - Risk-adjusted returns (Sharpe, max drawdown)
2. **Scenario Prediction Accuracy**
   - Which scenario actually occurred (retroactive assessment)
   - Theme probability accuracy vs realized outcomes
   - Indicator performance (false signals, missed signals)

3. **Portfolio Optimization Effectiveness**
    - Realized regret vs predicted regret
    - Hedging effectiveness (DBMF, defensive positions)
    - Trade execution quality
4. **Risk Management Review**
    - Position drift patterns
    - Correlation analysis
    - Stress test results
5. **Lessons Learned and Adjustments**
    - Indicator threshold adjustments
    - Risk parameter modifications
    - Process improvements

Data Retention

- **State Snapshots**: Monthly portfolio state and indicator values
- **Trade Records**: All transactions with reasoning and priority scores
- **Performance History**: Monthly returns attributed to themes and scenarios
- **Optimization History**: Regret matrices and dual optimization parameters

Appendices

Appendix A: Security Selection Criteria

- Minimum AUM: $1B for ETFs, $500M for mutual funds
- Maximum expense ratio: 1.0% for active funds, 0.5% for passive
- Minimum daily volume: $10M average
- Listed on major US exchange
- Track record: Minimum 3 years operational history

Appendix B: Backtesting Framework

Historical Validation Requirements:

- Test optimization framework on 10+ years historical data
- Validate regret minimization vs simple mean-variance
- Confirm indicator trigger frequencies (target: 50% each)

- Stress test during major market events (2008, 2020, etc.)

Performance Benchmarks:

- Primary: 60/40 Stock/Bond portfolio
- Secondary: All-Weather portfolio
- Tertiary: Target volatility strategies

Appendix C: Technology Infrastructure

Data Sources:

- Primary: Direct API feeds from brokers/data vendors
- Backup: Manual data collection procedures
- Validation: Cross-reference multiple sources

Calculation Engine:

- Primary: HCP Tracker application (Steps 1-5)
- Backup: Excel-based calculation templates
- Validation: Independent calculation verification

State Management:

- Primary: Local browser storage
- Backup: JSON export/import procedures
- Archive: Quarterly state snapshots

Appendix D: Regulatory and Compliance

Fiduciary Considerations:

- Document all optimization decisions and rationale
- Maintain audit trail of indicator data and sources
- Record deviations from standard procedures

Tax Reporting:

- Detailed transaction records with cost basis
- Distribution tracking and reinvestment elections
- Wash sale monitoring and documentation

Risk Disclosure:

- Scenario-based optimization may underperform in unprecedented conditions
- Regret minimization does not guarantee positive returns
- Indicator-based triggers may produce false signals

Appendix E: Implementation Checklist

Initial Setup:

- [ ] Configure all 13 indicator data sources
- [ ] Validate indicator trigger calculations
- [ ] Implement regret optimization algorithm
- [ ] Test dual optimization framework
- [ ] Configure trade execution rules

Ongoing Operations:

- [ ] Monthly indicator data updates
- [ ] Quarterly full optimization
- [ ] Trade execution within 5-day window
- [ ] Performance attribution analysis
- [ ] Risk limit monitoring

Exception Handling:

- [ ] Data quality failure procedures
- [ ] Market crisis protocols
- [ ] Emergency override procedures
- [ ] Manual calculation backup systems

Appendix F: Document Integrity Controls

CRITICAL IMPLEMENTATION SECTIONS - NEVER REMOVE:

The following sections contain essential implementation details required for portfolio management. Any IPS version that removes or substantially reduces these sections is **incomplete and unsuitable for production use**:

1. **Security Universe** (Section: Asset Allocation Framework)
    - All 12 securities with exact tickers
    - PIMIX hold-only rule, PYLD primary income rule

- Trading increment specifications

2. **Portfolio Optimization Methodology** (Complete section)
   - 6-step regret minimization process
   - Dual optimization formula: α × Max_Regret + (1-α) × Weighted_Regret
   - Smart hedging protocols
3. **Trading Execution Framework** (Complete section)
   - Security-specific rules for each asset
   - Order management procedures
   - Position limits and constraints
4. **Risk Management** (Complete section)
   - All position limits (35% single, 50% sector, etc.)
   - Scenario risk limits and emergency protocols
5. **All Appendices A-E**
   - Implementation checklists, tax procedures, technology specs

MANDATORY VERSION CONTROL REQUIREMENTS:

Any person updating this IPS must:

1. **Pre-Update Documentation:**
   - Create section-by-section comparison table
   - Document word count of current version
   - List all securities, rules, and limits in current version
2. **Post-Update Validation:**
   - Verify all Critical Implementation Sections preserved
   - Confirm no trading rules or position limits removed
   - Validate that someone could implement the portfolio system using only this document
3. **Change Documentation:**
   - Include version comparison table showing additions/removals
   - Justify any content reduction with explicit rationale
   - Obtain review from portfolio implementation team

VERSION NUMBERING:

- **Major (X.0)**: Framework changes affecting implementation

- **Minor (X.Y)**: Enhancements preserving all implementation details
- **Patch (X.Y.Z)**: Calibration updates, minor corrections only

REGRESSION RECOVERY: If any version is discovered to be missing critical implementation details:

1. Immediately revert to last complete version
2. Merge new improvements with complete implementation framework
3. Re-release as corrected version with full validation

Violation of these controls has previously resulted in loss of critical portfolio implementation details. These requirements prevent regression and ensure investment operations continuity.

Version History

Version 3.10 (September 02, 2025, 20:00:00)

- **COMPREHENSIVE UPDATE**: Merged all valuable content from v3.9 with v3.10 indicator improvements
- **CRITICAL CORRECTION**: Fixed Enhanced Theme Strength Probability Framework calculation logic
- **COMPLETE PRESERVATION**: Restored all missing sections from v3.9:
  - Complete 12-asset security universe
  - PIMIX/PYLD trading rules and constraints
  - Sophisticated regret minimization portfolio optimization
  - Dual optimization framework (α × Max_Regret + (1-α) × Weighted_Regret)
  - Smart hedging protocols
  - Quarterly rebalancing methodology
  - Data quality gates and emergency protocols
  - Trading execution framework with security-specific rules
  - Risk management and position limits
  - Tax optimization procedures
  - Complete appendices A-E
- **ENHANCED FRAMEWORK**: All 13 indicators use adaptive MA comparisons (except TIC flows)
- **VALIDATED CALIBRATIONS**: Productivity (47.7%) and Forward P/E (49.4%) trigger rates confirmed

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

- Major philosophical shift to MA comparisons

- Signal liquidity framework implementation
- Complete calibration framework established

Previous Versions (v1.0 - v3.8)

See previous documentation for complete version history.

End of Investment Policy Statement v3.10 - Complete Implementation Framework