Class 3: Macro Drivers, Tokenization & Applied Trading Signals

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Class 3

- **Macro Drivers, Tokenization & Applied Trading Signals**
- Understanding how traditional markets drive crypto prices
- Exploring the tokenization revolution (RWAs)
- Implementing practical trading signals
- Building real trading strategies with backtesting
- Duration: 3 hours (with 15-minute break)

Today's Agenda

- Part 1: Introduction & Context (15 min)
- Real-world scenario: Fed rate hikes and crypto crash
- Why macro matters for crypto traders
- Part 2: Macro Drivers (60 min)
- Federal Reserve policy and interest rates
- DXY dollar strength and inverse correlation
- S&P 500 correlation (risk appetite)

Class 2 Recap

- **What we learned last class:**
- Stablecoin mechanics and risk (USDT, USDC, DAI)
- DeFi yield strategies and impermanent loss
- Perpetual futures and funding rates
- Portfolio optimization and diversification
- Key Takeaway: Crypto offers multiple income streams beyond spot trading

Real Scenario - Fed Rate Hikes & BTC Crash

- **March 2022: The Fed Pivot**
- Fed announces aggressive rate hikes (0% → 5.5%)
- Goal: Combat 40-year high inflation (9.1% CPI)
- Market reaction: BTC crashes from $69K to $15K (-78%)
- **Why did this happen?**
- Higher rates = money becomes expensive
- Investors sell risk assets (crypto, tech stocks)

Why Macro Matters for Crypto

- **Crypto used to be "uncorrelated"**
- 2013-2019: BTC moved independently
- "Digital gold" narrative
- Safe haven during crises
- **Now crypto is CORRELATED (0.7-0.8)**
- Trades like tech stocks
- Sensitive to Fed policy

The Big Picture - Macro Variables

- **Key Macro Drivers:**
- 1. Interest Rates (Federal Funds Rate)
- Higher rates = bearish for crypto
- Lower rates = bullish for crypto
- 2. Dollar Strength (DXY Index)
- Stronger dollar = bearish for crypto
- Weaker dollar = bullish for crypto

Class Roadmap

- **By the end of today, you will:**
- Calculate 30-day rolling correlation between BTC and S&P 500
- Understand how Fed policy impacts crypto prices
- Identify what tokenization is and why it matters
- Backtest a moving average crossover strategy on ETH
- Monitor perpetual funding rates for arbitrage opportunities
- Evaluate an RWA project for trading viability

PART 1: MACRO DRIVERS

Section Overview - Macro Drivers

- **What we'll cover:**
- 1. Federal Reserve & Interest Rates
- How the Fed influences markets
- Rate hike cycles and crypto crashes
- QE/QT mechanics
- 2. Liquidity & DXY
- Global liquidity theory

The Federal Reserve - Who They Are

- **What is the Federal Reserve?**
- Central bank of the United States
- Created in 1913
- Independent agency (but accountable to Congress)
- **The Fed's Dual Mandate:**
- 1. Maximum Employment (low unemployment)
- 2. Price Stability (2% inflation target)

Federal Reserve Policy Tools

- **1. Federal Funds Rate**
- Interest rate banks charge each other for overnight loans
- Fed's primary tool for controlling economy
- Raised to cool inflation, lowered to stimulate growth
- **2. Quantitative Easing (QE)**
- Fed buys bonds → injects liquidity into system
- "Money printer go brrr"

Interest Rate Cycles - Historical Context

- **Low Rate Era (2008-2021)**
- Post-financial crisis: Rates near 0%
- QE programs: $4.5 trillion printed
- Result: Massive bull market in stocks and crypto
- **Rate Hike Cycle (2022-2023)**
- March 2022: Fed starts hiking (0% → 5.5%)
- Fastest hike cycle in 40 years

Case Study - 2022 Rate Hikes

- **Timeline:**
- March 2022: First rate hike (+0.25%)
- BTC: $45,000 → Starts declining
- May 2022: +0.50% hike (largest since 2000)
- BTC: $30,000 → Accelerates down
- November 2022: 6th consecutive hike
- BTC: $15,500 (bottom)

QE vs QT - The Liquidity Cycle

- **Quantitative Easing (QE) = Bullish**
- Fed buys bonds
- Money supply increases
- Asset prices inflate
- Example: 2020 COVID QE → BTC $10K to $69K
- **Quantitative Tightening (QT) = Bearish**
- Fed sells bonds

Fed Pivot Indicators - What to Watch

- **Leading Indicators of Fed Policy Changes:**
- 1. Inflation Data (CPI, PCE)
- If inflation falls → Fed may cut rates (bullish)
- If inflation rises → Fed may hike more (bearish)
- 2. Employment Data (Non-Farm Payrolls)
- Strong jobs → Fed keeps rates high
- Weak jobs → Fed may cut to stimulate

Global Liquidity Theory

- **The Thesis:**
- Asset prices (including crypto) driven by global liquidity
- Liquidity = available capital in financial system
- More liquidity → higher prices
- Less liquidity → lower prices
- **Measuring Liquidity:**
- 1. M2 Money Supply (US)

DXY - The Dollar Index

- **What is DXY?**
- US Dollar Index
- Measures dollar strength vs basket of 6 currencies:
- Euro (57.6%)
- Japanese Yen (13.6%)
- British Pound (11.9%)
- Canadian Dollar (9.1%)

DXY Historical Relationship with BTC

- **2020-2021: Dollar Weakness**
- DXY: 103 → 89 (-13%)
- BTC: $10K → $69K (+590%)
- Fed printing money (QE) weakened dollar
- **2022: Dollar Strength**
- DXY: 89 → 114 (+28%)
- BTC: $45K → $15K (-67%)

S&P 500 Correlation - The Risk-On Trade

- **BTC vs S&P 500: Rising Correlation**
- **Historical Correlation:**
- 2013-2019: 0.1-0.3 (mostly uncorrelated)
- 2020-2021: 0.4-0.6 (moderate correlation)
- 2022-2024: 0.7-0.9 (high correlation)
- **What This Means:**
- Crypto now trades as "risk-on" asset

BTC vs NASDAQ - Tech Stock Correlation

- **Even Stronger Correlation with Tech Stocks**
- **NASDAQ Correlation:**
- Often 0.8-0.9 (stronger than S&P 500)
- BTC trades like "leveraged tech stock"
- **Why NASDAQ?**
- Similar investor base (growth/risk seekers)
- Both sensitive to interest rates

BTC vs Gold - The "Digital Gold" Debate

- **The Original Narrative:**
- BTC as "digital gold"
- Store of value
- Inflation hedge
- Uncorrelated to stocks
- **Reality Check:**
- Correlation: 0.2-0.4 (low to moderate)

Correlation Regime Analysis

- **High Correlation Regime (0.7+)**
- Characteristics: Stable markets, institutional dominance
- Trading: Follow stock market trends
- Risk: Crypto offers little diversification
- **Medium Correlation Regime (0.4-0.7)**
- Characteristics: Mixed signals, transitional periods
- Trading: Use multiple indicators

Putting It All Together - The Macro Dashboard

- **Your Macro Checklist for Crypto Trading:**
- **Fed Policy:**
- Next FOMC meeting date?
- Expected rate change?
- QE or QT active?
- **Dollar Strength:**
- DXY level and trend?

LIVE DEMO A - Macro Correlations Notebook

- **What we'll see in Notebook A:**
- 1. Fetch macro data:
- S&P 500, NASDAQ, Gold, DXY
- Federal Funds Rate
- BTC and ETH prices
- 2. Calculate 30-day rolling correlation (BTC vs S&P 500)
- 3. Identify correlation regimes:

Key Findings from Notebook A

- **30-Day Rolling Correlation Results:**
- Average Correlation: ~0.75 (high correlation regime)
- Peak Correlation: 0.85+ during Fed hiking cycle
- Lowest Correlation: 0.3-0.4 during crypto-specific events
- **Insights:**
- 1. Correlation has steadily increased since 2020
- 2. Fed policy changes drive correlation spikes

PART 2: TOKENIZATION FUNDAMENTALS

What is Tokenization?

- **Definition:**
- > Tokenization = Converting real-world assets (RWAs) into digital tokens on a blockchain
- **Examples:**
- US Treasury bonds → OUSG (Ondo Finance)
- Physical gold → PAXG (Paxos Gold)
- Real estate → RIO (Realio)
- Corporate bonds → Tokenized bonds

Why Tokenization Matters

- **The Opportunity:**
- Total Addressable Market: $16 trillion by 2030 (BCG estimate)
- **Assets Being Tokenized:**
- Real estate: $11.5 trillion
- Bonds: $130 trillion
- Commodities: $21 trillion
- Private equity: $10 trillion

RWA Token Categories

- **1. Treasury & Fixed Income**
- Examples: OUSG, USDY (Ondo), BENJI (Franklin Templeton)
- Yield: 4-5% (risk-free rate)
- Use Case: Earn tradfi yield in DeFi
- **2. Tokenized Gold**
- Examples: PAXG (Paxos), XAUT (Tether Gold)
- Backing: 1:1 physical gold in vaults

Deep Dive - Ondo Finance (ONDO)

- **What is Ondo Finance?**
- Tokenized US Treasury bills and bonds
- Institutional-grade RWA platform
- Founded 2021, backed by Coinbase Ventures
- **Products:**
- OUSG (US Government Bonds)
- Backed by short-term T-bills

Deep Dive - Paxos Gold (PAXG)

- **What is PAXG?**
- 1 PAXG token = 1 **troy** oz of physical gold
- Gold stored in Paxos Trust Company vaults (London)
- Regulated by NY Department of Financial Services
- **Key Features:**
- Redeemable: Can exchange for physical gold
- Audited: Regular third-party audits

Deep Dive - Realio (RIO)

- **What is Realio?**
- Real estate and securities tokenization platform
- Focus: Commercial real estate and private equity
- Network: Realio Network (Layer 1 blockchain)
- **How It Works:**
- 1. Real estate property identified
- 2. SPV (Special Purpose Vehicle) created

Deep Dive - Centrifuge (CFG)

- **What is Centrifuge?**
- DeFi protocol for real-world asset financing
- Focus: Supply chain finance, invoices, real estate
- Built on Polkadot ecosystem
- **How It Works:**
- 1. Asset Originators (businesses with invoices/assets)
- Submit real-world assets to Centrifuge

Deep Dive - Maple Finance (MPL)

- **What is Maple Finance?**
- Institutional capital markets infrastructure
- Focus: Uncollateralized lending to verified borrowers
- Launched 2021
- **How It Works:**
- 1. Lending Pools
- Pool Delegates (credit experts) manage pools

Deep Dive - TrueFi (TRU)

- **What is TrueFi?**
- Uncollateralized lending protocol
- Credit lines to verified institutions
- Launched by TrustToken (creators of TUSD stablecoin)
- **How It Works:**
- 1. Credit Assessment
- Borrowers submit financial info

RWA Sector Performance

- **Sector Growth:**
- 2021: $1 billion TVL
- 2022: $2 billion (bear market resilience)
- 2023: $5 billion
- 2024: $8+ billion
- 2025 target: $15+ billion

PART 3: APPLIED TRADING SIGNALS

Section Overview - Trading Signals

- **What we'll cover:**
- 1. Momentum Signals
- Moving average crossovers
- Golden Cross and Death Cross
- Backtesting on ETH
- 2. Mean Reversion Signals
- RSI divergences

Moving Averages - Foundation

- **What is a Moving Average?**
- Average price over a specific period
- Smooths out short-term noise
- Identifies trend direction
- **Types:**
- **Simple Moving Average (SMA)**
- Equal weight to all data points

Golden Cross vs Death Cross

- **Golden Cross (Bullish)**
- 50-day MA crosses ABOVE 200-day MA
- Signal: Long-term uptrend starting
- Action: BUY signal
- **Death Cross (Bearish)**
- 50-day MA crosses BELOW 200-day MA
- Signal: Long-term downtrend starting

MA Crossover Strategy - Setup

- **Strategy Rules:**
- **Entry Signal (Buy):**
- 50-day MA crosses above 200-day MA (Golden Cross)
- Enter long position (100% of capital)
- **Exit Signal (Sell):**
- 50-day MA crosses below 200-day MA (Death Cross)
- Exit long position (move to cash)

Backtest Methodology

- **Backtest Components:**
- **1. Historical Data**
- Asset: ETH/USD
- Period: 2+ years (need 200+ days for MA calculation)
- Frequency: Daily close prices
- Source: CoinGecko, Yahoo Finance
- **2. Signal Generation**

LIVE DEMO B - MA Crossover Backtest

- **What we'll see in Notebook B:**
- 1. Fetch 2+ years of ETH historical data
- 2. Calculate 50-day and 200-day moving averages
- 3. Generate Golden Cross and Death Cross signals
- 4. Backtest strategy:
- Simulate trades
- Calculate returns

Typical Backtest Results

- **Example Results (2021-2023):**
- **Strategy Performance:**
- Total Return: +45%
- Sharpe Ratio: 0.85
- Max Drawdown: -32%
- Win Rate: 54%
- Market Exposure: 65%

Pros and Cons of MA Crossover

- **Advantages:**
- **Simple to implement**
- Easy to understand and execute
- No complex calculations
- **Trend following**
- Captures major trends
- Avoids significant drawdowns

RSI - Relative Strength Index

- **What is RSI?**
- Momentum oscillator (0-100 scale)
- Measures speed and magnitude of price changes
- Created by J. Welles Wilder (1978)
- **Formula:**
- ```
- RSI = 100 - [100 / (1 + RS)]

RSI Trading Strategy

- **Strategy 1: Overbought/Oversold**
- **Buy Signal:**
- RSI crosses below 30 (oversold)
- Wait for RSI to cross back above 30 (confirmation)
- **Sell Signal:**
- RSI crosses above 70 (overbought)
- Wait for RSI to cross back below 70 (confirmation)

Volume Analysis

- **Why Volume Matters:**
- Confirms price moves
- High volume = strong conviction
- Low volume = weak move (likely to reverse)
- **Volume Patterns:**
- **1. Volume Surge on Breakout**
- Price breaks resistance + high volume = valid breakout

Combining Indicators - Multi-Factor Approach

- **The Problem with Single Indicators:**
- Each indicator has weaknesses
- False signals in isolation
- Need confirmation

Perpetual Futures Funding Rates - Recap

- **What are Perpetual Futures?**
- Futures contracts with no expiry
- Can hold position indefinitely
- Used for leverage and speculation
- **What is Funding Rate?**
- Periodic payment between longs and shorts
- Keeps perp price close to spot price

Cash-and-Carry Arbitrage Explained

- **The Strategy:**
- **Setup:**
- 1. Buy 1 BTC on spot market (e.g., Binance Spot)
- 2. Short 1 BTC on perpetual futures (e.g., Binance Futures)
- 3. Position is delta-neutral (no price risk)
- **When Funding is Positive (+0.05%):**
- You receive funding payment every 8 hours

Funding Rate Arbitrage - Cost Analysis

- **Entry Costs:**
- **Spot Trading Fee:**
- Binance: 0.1% (maker/taker)
- Cost: $10,000 * 0.1% = $10
- **Futures Trading Fee:**
- Binance: 0.02% (maker), 0.04% (taker)
- Cost: $10,000 * 0.04% = $4

When Funding Arbitrage Works

- **Ideal Conditions:**
- **High Positive Funding (>0.05% per 8H)**
- Strong bull market
- Retail FOMO
- Leverage demand high
- **Stable Funding**
- Persistent positive rates

When to AVOID Funding Arbitrage

- **Red Flags:**
- **Negative or Near-Zero Funding**
- You'd be paying instead of receiving
- No arbitrage opportunity
- **High Volatility**
- Risk of liquidation on futures
- Slippage on entry/exit

LIVE DEMO C - Funding Rate Analysis

- **What we'll see in Notebook C:**
- 1. Fetch Current Funding Rates
- Binance: BTC, ETH
- Bybit: BTC, ETH
- Compare across exchanges
- 2. Historical Funding Rates (30 days)
- Time series chart

Funding Rate Key Findings

- **Typical Results:**
- **Current Funding Rates (Example):**
- BTC Binance: +0.03% per 8H (32% APR)
- BTC Bybit: +0.028% per 8H (30% APR)
- ETH Binance: +0.04% per 8H (44% APR)
- ETH Bybit: +0.038% per 8H (42% APR)
- **30-Day Analysis:**

LIVE DEMO D - RWA Project Evaluation

- **What we'll see in Notebook D:**
- 1. Fetch RWA Token Data
- ONDO, PAXG, RIO, CFG, MPL, TRU
- Prices, market caps, volume
- 2. Fetch TVL Data (DeFiLlama)
- Protocol TVL
- 90-day growth

RWA Analysis - Typical Results

- **Investment Scores (Example):**
- **Rank 1: ONDO Finance**
- Score: 82/100
- Recommendation: STRONG BUY
- Highlights: High volume ($100M+), Fair valuation (MC/TVL 1.5), Growing TVL (+45% QoQ)
- **Rank 2: PAXG (Paxos Gold)**
- Score: 75/100

RWA Investment Thesis Summary

- **Why Invest in RWA Tokens?**
- **Bullish Factors:**
- Massive TAM ($16T opportunity)
- Growing institutional interest
- Regulatory clarity improving
- Real yields in bear markets
- Technology maturation

DCA vs Tactical Entry Strategies

- **Dollar-Cost Averaging (DCA)**
- **What is DCA?**
- Invest fixed amount at regular intervals
- Example: $100 every Monday for 52 weeks = $5,200
- **Advantages:**
- Removes emotion (no timing decisions)
- Averages entry price

- **Tactical Entry (Timing the Market)**
- **What is Tactical Entry?**
- Wait for specific signals to enter
- Examples: Golden Cross, RSI oversold, funding rate spike
- **Advantages:**
- Potentially better returns
- Enter at better prices

- **Hybrid Approach (Best of Both)**
- **Strategy:**
- 70% DCA (core position)
- 30% tactical (opportunistic buys)
- **Example:**
- DCA: $700/month into BTC/ETH automatically
- Tactical: Keep $300/month for dips (e.g., RSI < 30, Death Cross bounces)

Risk Management - Position Sizing

- **The 1-2% Rule**
- **Never risk more than 1-2% of portfolio on a single trade**
- **Example:**
- Portfolio: $10,000
- Max risk per trade: $200 (2%)
- Entry: $50,000 BTC
- Stop loss: 8% below entry = $46,000

- **Kelly Criterion (Advanced)**
- **Formula:**
- Kelly % = W - [(1-W) / R]
- W = Win rate
- R = Average win / Average loss

Key Takeaways - Class 3 Summary

- **Macro Drivers:**
- Crypto is now highly correlated (0.7-0.8) with S&P 500
- Fed policy (rates, QE/QT) drives crypto prices
- DXY has inverse relationship with crypto
- Monitor: Fed meetings, CPI, employment data
- **Tokenization:**
- RWA sector: $16T opportunity (currently $10B)