Global Macro Trading

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2 - Trading Process, Sizing Trades, and Monitoring Performance

- Implicit risks are involved in any trading strategy
  - First rule of investing: **understand how much you stand to lose, rather than how much you stand to gain**
- The best traders maintain a stringent process
  - Systematic/algo trading removes human emotion and psychology
  - Performance should be evaluated objectively
- Bias in discretionary trading
  - Confirmation vs. availability vs. anchoring bias
  - Keep a journal to log trades and retroactively look for bias in trades
- Be disciplined with taking losses (e.g. use stop-losses)
  - Not immune to gap risk, but still a good limitation
    - **Gap risk**: price discontinuity between open/close prices
- Position sizing: sizes positions based on historical volatility
  - **Unit sizes**: used to measure stop losses
  - Assuming a normal distribution of a product's price, if N is the volatility of a 1 stdev move, use 2N to calculate stop
- **Risk/reward:** calculates bps at risk and estimates how much a trader believes they can make on the trade
  - Rule-of-thumb: 1:3 risk-to-reward ratio
    - Ex: risking 25bps means 75bps are expected to be made with a 1:3 ratio
- Be mindful of the correlation of the assets in your portfolio
- Thematic trades: trades based on bold statements
  - Ex: "Europe is done", "fiat money is over", etc.
  - Ideas may be right in the long-term but can lose significantly in the short-term
- **Sharpe ratio**: defined as $\frac{\mathbb{E}[R]-R_f}{\sigma}$, where R is return, R_f is risk-free rate, σ is stdev of returns
  - Risk (volatility)-adjusted measure of returns
  - Assumes normal distribution of returns
- **Sortino ratio**: defined as $\frac{\mathbb{E}[R]-R_f}{\sigma_d}$, where R is return, R_f is risk-free rate, and σ_d is stdev of *downside returns
  - Better assesses downside risk of portfolio
- **Drawdown**: diff between peak return to next trough
- **VaR**: value at risk, most widely used risk measure
  - Ex: using a 95% daily VaR, if a portfolio has a one-day 3% VaR, it is expected that 1/20 days the portfolio will lose 3% or more
- **Risk utilization percentage**: $\frac{\text{Portfolio VaR}}{\text{VaR Limit}}$
  - Generally, VaR should be adjusted based on a trader's portfolio performance
- Monitoring performance: aspects to consider
  - Product group (fixed income, FX, equities, commodities)

    - Conviction level
    - Type of trade (relative value, directional, tactical, thematic)
    - Holding period
- Trend analysis: look at short/long-term moving avgs and your trades to see whether you are long a trend or counter-trend

3 - Back-Tests, Queries, and Analogs

- Analyzing the past allows traders to make more educated decisions about the future
- **Querying**: observing a particular event and analyzing asset price changes over time
    - Understand false positives and cut losses when they occur
- **Analogs**: historical correlations of assets
    - Variables to consider:
        - Correlation with similar economic environment
        - Time (analog) period

4 - The Building Blocks of Global Macro Trading

- 4 product groups: currencies (FX), equities, fixed income, commodities
- Currencies
    - Generally viewed against USD
    - Commodity-based currency pairs: AUD/USD, NZD/USD, USD/CAD, etc.
        - Mix of emerging/developed commodity exporters
- Equities
    - S&P 500, Euro Stoxx 50 (50 largest blue chip companies in Eurozone), Nikkei
- Fixed Income
    - "Main drivers of global capitalism"
    - Trading against central banks is difficult ("don't fight the Fed")
- Commodities: includes energy, precious/industrial metals, agriculture, livestock
    - Basics: oil, gold, copper, corn
- Risk on/risk off
    - **Risk on** (**off**): assets that benefit from strong (weak) growth that what markets have priced in
    - Ex: S&P 500 relationship with Chinese equities
- Correlation
    - 100% correlation between A and B: if price of A moves by x%, B's price will also move by x%
    - Correlation of rising markets tends to be weaker than falling markets

5 - Technical Analysis

- Technical analysis: a means of examining past price moves and volume to help predict future moves in a particular market
- Strengths
    - Gives trader discipline to get in/out of trade via objective profit-taking/stop-loss levels
- Weaknesses
    - Goes against efficient market hypothesis, which states past prices are independent of future
    - Random walk hypothesis
    - Self-fulfilling prophecy
- Charts

    - Line chart: connects an asset's closing price points
    - Bar chart: shows an asset's high, low, open, and close points
    - Candlestick charts: similar to bar charts, but open/close are represented by a bar in between high/low prices
        - Can be indicative of bull/bear signals, but subject to human interpretation
    - Point and figure
        - Plots price changes, though x-axis does not represent time
        - Indicates market patterns and magnitude of moves
    - Logarithmic scale: uses log scale to plot price changes to represent percentage changes in asset prices
- Volume/Open interest
    - **Volume**: total amount of an asset traded
    - **Open interest**: only applies to futures, represents outstanding long/short positions
    - CFTC positioning
- Trend: direction of an asset's price move
    - Support/resistance levels: give lower/upper bounds (respectively) of an asset's price
- Moving averages
    - Give quantitative sense to long/short-term trends
    - Crossover points:
        - When short-term MA crosses over long-term, market may be bullish (and vice versa)
    - Exponentially-weighted MA: weights recent prices more heavily than older prices
- Bollinger bands: calculated using 2-stdev of of last 20-day MA (gives 95% confidence interval)
    - Price hits upper band may indicate overbought (and vice versa for lower band)
- Reversal patterns: aim to identify when trends may end and reverse
    - Head and shoulders
    - Trend lines
    - Triple tops/bottoms (rare)
- Continuation patterns: aim to identify when trends are moving sideways and when next breakout will occur
    - Triangles (symmetrical, ascending, descending)
        - Broadening tops: reversal patterns, often followed by large moves in opposite direction
    - Oscillators: indicate overbought/oversold when a local upper/lower extreme is reached
        - Crossing midpoint from above indicates a buy; crossing midpoint from below indicates a sell
        - Types of oscillators: MACD, RSI, stochastics, etc.
- Elliott Wave Theory
    - Five-wave pattern
    - Corrective patterns: occur in second/fourth position in Elliot Waves
        - Zigzags, flats, triangles
    - Fibonacci retracements: forecast magnitude of move in next wave
- Parabolics: moves resulting from herd/bubble-like mentality
    - "Always" mean revert (consider gold as a counterexample)
- Seasonals, cycles
    - Aims to measure factors that could result in a pattern
    - Kondratiev wave: economic cycles experience expansion, slowdown, and recession
    - Kuznets cycle: investment changes lead to economic waves of 10-20 years
    - Juglar cycle
    - Kitchin Inventory cycle: economic cycles emerge based on fixed capital and building of inventor
- Crowd psychology

6 - Systematic Trading

- Systematic trading: using predefined rules/models to create a portfolio
  - Goal: optimize performance, maximize Sharpe ratio, minimize drawdowns
- Steps to create systematic trading model
  1. Define asset groups
  2. Identify strategy style (value, carry, trend, fundamentals, etc.)
  3. Examine risk factors (cost of trading, tail risk, etc.)
- 2 strategies across FICC and equities: **directional** and **relative value**
- Strategy styles
  - **Value**: relative worth (differential of an asset compared to its peers)
    - Equity factors: price/book, price/earnings, price/free cash flow yield
    - FX factors: purchasing power parity, terms of trade
  - **Trend**: FICC/equities tend to mean revert over time, so it is important to catch the trend and exit at the peak
    - When long/short term indicators move in same direction, long the trend
    - Trend and value are negatively correlated
  - **Carry**
    - Ex: long high-yielding currencies and short lower-yielding currencies
    - Currency carry: SOFR differentials
    - Commodities carry: futures curve and seasonality
    - Equities: net buyback-adjusted dividend yield
  - **Fundamentals**: equity index vs. currency, credit risk in EM, GDP growth, industrial production inflation, UE, etc.
- Factors: given weights in systematic strategies
- Risk factors
  - Ex: inflation in fixed income, liquidity (modeled by bid/offer spread), etc.
  - Risk factors should be backtested before entered into a model to find optimal weights
- **Risk premia**: compensation for taking risks beyond market beta (in exchange for possible loss)
  - Advantages of risk premia strategies: liquidity/scalability, easily identifiable risks, additional excess return with positive expected Sharpe
- **Risk parity**: concept of portfolio diversification increasing Sharpe ratio
  - Benchmark: 60% S&P 500, 40% Barclays U.S. Aggregate Bond Index
  - Optimal RP portfolio: contains uncorrelated, low risk assets and maintains a fixed exposure to vol

7 - Foreign Exchange in Global Macro

- Foreign exchange (FX) value is always expressed relative to other currencies
  - FX is the most liquid and heavily traded
  - FX markets open at 8:15pm GMT on Sunday and close at 10pm GMT on Friday
- U.S. dollar (USD): accounts for 85% of FX transactions
  - Major reserve currency of global central banks
  - USD index: RV basket of currencies against the dollar, trades as an ETF and a futures contract
- Trading currencies
  - Spot: classic currency exchange
  - Forwards: OTC contracts giving right to buy/sell a currency at some future date
    - Nondeliverable forwards (NDFs): FX forwards used in countries that restrict FX trading
  - Swaps: similar to IRS, but parties exchange equivalent amount of money in different currencies
  - Options: typical call/put options on currencies

    - Futures: similar to futures for other product groups
        - Most futures contracts expire quarterly in H/M/U/Z
- Currency regimes
    - Regime: level of central bank intervention on currency
    - Classification groups: fixed floating (frequent intervention), floating (no intervention)
        - Bretton Woods: framework proposed in 1944 to maintain USD as global reserve currency; ended in 1971 after gold standard ended by Nixon
    - Peg: when a country holds the value of its currency constant against another currency
    - Special Drawing Rights (SDRs): basket of currencies able to be exchanged for spot currencies (USD, EUR, GBP, JPY)
- Valuation techniques
    - Fundamental factors
        - Equity index price performance, earnings forecasts, flows into equity markets
        - Credit (e.g. currency vs. CDS)
        - Sentiment (risk reversals)
        - Global trade
            - Current account, trade-weighted index
        - Economic activity
            - GDP growth, inflation, UE, consumption
        - Export partners, direct exports
            - Inter-country relationships (e.g. if GDP forecasts are revised in China, as Australia's biggest export partner, the Australian dollar will likely appreciate)
        - Debt to GDP ratio
        - Purchasing power parity
            - Economic theory stating that over time, prices for the same goods around the world will converge (one measure is the Big Mac Index)
        - GDP per capita
            - Balassa-Samuelson effect
    - Carry analysis
        - SOFR differentials
            - SOFR = Fed Funds Rate + (SOFR - FFR) = risk-free + credit (risk) component
        - Risk-adjusted carry
            - Carry trade adjusted for volatility, tends to outperform standard carry trades
            - Goal: maximize carry-to-risk ratio

8 - Equities

- Forms of equity trading: value investing, long/short, event-driven
- Equity indices: measure a country's equity performance with a specific basket of stocks
    - Indices can be constructed via price weights, market capitalization, etc.
- Top-down macro approach
    - Macro view, country, sector, companies
    - Stock baskets: give exposure to a sector and diversification
- Equity derivatives
    - Exchange traded funds (ETFs)
        - Track performance of assets
        - Formed using creation/redemption process

- American Depositary Receipts (ADRs)
  - Trade like stocks (depositary bank owns the non-US stock)
  - Subject to FX risk (shares are bought locally, then converted into USD)
- Volatility Index (VIX)
  - Uses S&P 500 as underlying reference
    - Calculated using option prices with 1 month out strike prices
  - Negatively correlated with S&P 500 (volatility rises when equities fall)
  - Can trade VIX futures/options (VIX options can be thought of volatility of volatility)
- Variance swaps
  - OTC swaps (fixed/floating payments depending on variance of underlying product price)
  - Subject to interest rate, dividend, and other risks (not only vol)
  - Priced with realized vol, while options are priced using implied vol
  - Convex, nonlinear payoff structure
- Measuring vol
  - Measured relative to $\sqrt{252} \approx 16$ trading days (16 vol = 1 percent daily move)
- Dividend swaps
  - OTC or exchange-traded swaps allowing investor to take a view on dividend payments of an index

- Valuation techniques
  - Price-to-book (P/B) ratio (P = price, B = book value)
    - Higher price (P) moves in relation to book (B), less value there is in stock market
    - P/B > 2.5x may indicate overbought, P/B < 1.5x may indicate oversold
  - Price-to-dividend ratio (price of stock/annual dividend)
  - Price-to-earnings (P/E) ratio (price/EPS, where EPS is earnings per share)
    - Most watched equity ratio
    - Reciprocal is earnings yield
    - Forward P/E ratio: equal to current price/expected EPS
  - Price-to-free cash flow
    - Free cash flow = cash flow from operations - capital expenditures (capex)
    - Reciprocal is free cash flow yield
  - Stock market capitalization as percentage of GDP
  - Commodity prices
    - Increasing commodity prices may indicate GDP growth, inflation, etc.
  - Purchasing Manager's Index (PMI)
    - Ex: when the ISM PMI goes below 50 in the US, a recession typically occurs
  - Dry Bulk Index
  - Trading (TRIN/ARMS) Index
    - May indicate whether market is overbought or oversold
  - Consumer Confidence
    - More optimism leads to higher indicator and vice versa
  - Australian Dollar vol
    - AUD is a major risk on currency
      - Australia is a major commodity exporter
      - AUD relies heavily on Asian markets
    - Often moves with equity prices
    - Highly correlated with VIX

9 - Fixed Income

- Structure of fixed income universe:
  - Players (banks, corporates, insurance, institutions, govts), Funding, Hedging
  - Don't forget about central banks
- Capital markets: buying and selling of equity and fixed-income securities
- Money markets: buying and selling of debt securities maturing in < 1 year
- Funding/money markets
  - Allow the flow of short-term capital between lenders and borrowers
  - Commercial paper
    - Short-term debt obligation used by corporations/banks, usually lower rates borrowing from banks
  - Treasury securities (T-bills)
    - Used by US Treasury to raise capital
    - Considered to be risk-free rate
    - Tenors: 3/6 months and 1 year
  - Treasury Inflation-Protected Securities (TIPS)
    - Tenors: 5/10/30 years
    - Interest paid every 6 months, indexed to CPI-U (urban CPI)
    - Nominal rate (UST) = real rate + implied inflation
    - Price floor (at maturity, owner gets max(100, inflation-adjusted principal))
    - Breakeven rate: product giving exposure to inflation rate alone by backing into(?) implied inflation rate from TIPS
  - Government agencies
    - Fannie Mae/Freddie Mac (housing), Sallie Mae (student lending
    - Municipal securities
      - Interest income exempt from federal taxes
      - Short-tern if maturity < 3 years
    - Banker's acceptance
      - Note issued by a firm to a bank in exchange for a short-term loan (usually 30-180 days)
      - Does not bear interest; trade at a discount and redeemed at maturity at a face value
    - Time deposits (certificates of deposit)
      - Bank deposits that cannot be withdrawn before a certain date without penalty
    - Interbank loans
      - Loaning of capital between banks; interest rate usually relies on SOFR/LIBOR
    - Repurchase agreements (repo)
      - Sale of securities with seller agreeing to buy back at a given date (buyer of securities is doing a reverse repo)
- **London Interbank Offered Rate** (LIBOR)
  - As of 2021, LIBOR has been replaced by SOFR
    - SOFR is (broadly) the cost of borrowing cash overnight collateralized by Treasury securities in the repo market
  - LIBOR: rate at which banks could borrow funds
    - Calculated daily by surveying 16 investment banks, removing upper/lower quartiles, and averaging remaining rates
  - Eurodollar futures
    - Time deposits (deposit with a preset maturity date) on three-month LIBOR in USD
    - Price: 100 - 3-month LIBOR yield; months: HMUZ, tick value: $25; cash-settled

        - SOFR futures are an analogue to Eurodollar futures
- **Interest rate swaps**:
    - Common form: fixed-for-floating (receive fixed and pay floating or vice versa)
        - Most traders use swaps to hedge interest rate exposure exchange-traded
- **Federal (Fed) Funds rate**
    - Unsecured loans of reserve balances made among institutions
    - Target for FFR set by Federal Open Market Committee (FOMC)
    - IOER: interest on excess reserves, paid by Fed
    - Fed Funds futures contract traded on CME, priced by 100 - expected FFR
- **Overnight indexed swaps (OIS)**
    - Fixed/floating interest swap indexed against Fed-effective overnight rate
    - Used to hedge/speculate central bank policy views
    - Overnight rates: Fed funds rate, Euro Overnight Index Average (EONIA), Sterling Overnight Index Average (SONIA), Tomorrow/Next OIS (TOIS)
    - LIBOR/OIS spread
        - Used to gauge market stress/crisis, widens during periods of crisis
- **Forward rate agreements**
    - Exchanged of prespecified reference rates (e.g. SOFR) with a fixed floating rate
    - More customizable than Eurodollars (e.g. not bound by IMM expiry dates)
- US fixed income futures
    - Standard futures contracts on UST (2yr, 5yr, 10yr, 30yr, ultra-long)
    - Front end (0-2 yr), belly (2-7/10 yr), back end (10+ yr)
        - Pricing in central bank action/monetary policy, inflation and expectations/risk premium
    - Physically settled, cheapest-to-deliver (most traders roll positions)
    - UST futures curve is in backwardation
    - Dirty price (adds accrued interest) vs. clean price (does not include accrued interest)
- UST fixed income futures trades
    - Flatteners/steepeners
        - Allow traders to take a view on the spread between two parts of curve, DV01-neutral
            - Ex: 2s10s (10yr-2yr)
        - Types: Bear/bull flattener/steepeners
        - Traders take into account carry (to ensure DV01 neutrality) and rolldown (to ensure contracts have same maturity as specified in the original trade idea)
- Sovereign credit
    - Inverted yield curve may signify default risk
- **Credit default swaps**
    - Parameters: reference obligation, notional amount, spread, maturity
    - Credit events: events that trigger CDS
        - Ex: failure to pay, restructuring
    - Credit risk
        - Short credit risk = paying spread, buying credit protection
        - Long credit risk = receiving spread, selling credit protection
    - Often used to hedge a long fixed income position
- **Exchange traded funds** (ETFs)
    - Fixed income ETFs: used to replicate an underlying bond index/category

10 - Commodities

- Def: "fungible goods that have little to no product differentiation"
  - Players are different from other product groups (includes producers)
  - Types: energy, precious metals, industrial metals, agricultural
  - Fundamental driver is supply and demand
- Supply drivers
  - Reserves (e.g. Saudi Arabia and oil, South Africa and gold, etc.)
  - Production (e.g. crude oil mining disturbed after Libya dictator overthrown)
  - Acreage (assigning land to more profitable crops)
  - Yield
  - Weather
- Demand drivers
  - Population growth
  - Standard of living
  - Alternative energy
- Ending stock: supply - demand = ending stock
- Futures curves
  - **Contango**: near-term futures trade at a discount to further-date futures
    - Due to storage/transportation costs (carry)
  - Backwardation: near-term futures trade at a premium to further-dated futures
    - Mainly due to supply shortages for commodities
  - Futures curves can exhibit both contango/backwardation
- CBR
  - Commodity Research Bureau index (contains 22 commodities)
- Volatility/returns
  - Commodities generally have higher return and vol than FX/equities/fixed income products
- Energy
  - Oil/coal/natural gas consist of most of the world's energy supply
  - Oil
    - Type of oil varies from regions
      - Most desired oil is light, sweet crude (least desired is the opposite)
        - Sweet oil = low sulfur content, sour oil = high sulfur content
      - WTI (West Texas Intermediate) oil is the most expensive
    - Producers
      - Largest producers: Saudi Arabia, Russia, US
      - Biggest consumers: US, China
    - National oil companies (NOCs): majority state-owned oil company
      - Biggest NOCs: Saudi Aramco, National Iranian Oil Company,
    - OPEC (Organization of the Petroleum Exporting Countries)
      - Accounts for ~35% of production and ~70% of global reserves
      - 12 member countries
      - Control most global oil, leading to unfair prices due to collusion
    - Benchmark crude oil
      - WTI crude oil
        - 1 futures contract = 1,000 barrels of oil

        - Trades on CME
    - Brent crude oil
        - Sourced from North Sea, averse to supply shocks due to issues in Middle East
        - 1 futures contract = 1,000 barrels of oil
        - Trades on ICE
    - WTI-Brent spread
        - Brent is usually given a premium to WTI
            - Shipped to emerging markets (China/India), no supply buildup like for WTI, affected more by supply shocks because of Middle Eastern tensions
- Crack spread
    - Crude oil is refined into usable products
    - Crack spread is the difference between crude and refined oil products
    - Ex: WTI Cushing/New York RBOB and heating oil spread
    - 3:2:1 crack spread: 3 crude oil futures vs. (2 gasoline futures + 1 heating oil future)
- Natural gas
    - Color/odorless hydrocarbon giving off energy when burned
    - Largest producers: US, Russia
    - Priced in USD per million British thermal unit (MMBtu)
        - Btu: quantity of heat required to raise temperature of 1lb water by 1 deg F
    - Natural gas futures trade on NYMEX (1 contract = 10,000 million Btu)
- Precious metals
    - Def: metals that are rare and have economic value
        - Useful for macro traders, since some metals (e.g. gold/silver) react to economic conditions and central bank policy
    - Gold
        - Central banks own significant (32k tons) amount of gold
        - Largest producers: China, South Africa, US
        - Largest consumer: India
        - Gold and real rates
            - Real rates negative leads to investors preferring gold over fiat money (and vice versa)
    - Silver
        - Largest producers: Mexico, China Peru, Australia, Russia
        - Largest consumers: US, China
    - Platinum
        - Heavier than gold, very rare
        - Futures are liquid, though ETF is not
    - Industrial metals
        - More abundant and less expensive than precious metals
        - Widely used, good indicator of economic growth
        - Copper
            - Considered a leading indicator (e.g. prices move with China's growth expectations)
            - Largest producers: Chile, China
            - Largest consumer: China
            - Traded on LME/NYMEX
        - Aluminum
            - Most abundant metal in world

        - Largest producer/consumer: China
        - Traded on LME
    - Agriculture
        - Largest producer/consumer: US
        - Products
            - Corn/maize
                - Ethanol
            - Wheat, trades on Chicago Board of Trade (CBOT)
            - Soybeans, trades on CBOT
            - Cotton, trades on Zhengzhou Commodity Exchange and ICE
            - Coffee, trades on ICE

11 - The Role of Central Banks in Global Macro

- Different central banks have different goals, but ensuring **price stability** and maintaining an inflation target is common
    - U.S. Federal Reserve: maximum employment, stable prices, moderate long-term interest rates
    - European Central Bank (ECB): maintain price stability, keep inflation around ~2%
    - Bank of England: monetary and financial stability (financial = financial systems)
    - Swiss National Bank: price stability and business cycle considerations, prioritizing price stability and act in best interests of entire country
    - No BoJ, Bank of Canada, etc.?
- Central bank actions
    - Reserve ratio (amount of reserves banks must hold as capital)
        - Raising = excess reserves can be lent, pro-growth and inflationary
        - Reducing = less reserves are lent, used to cool economy and combat inflation
        - Money multiplier: 1/reserve ratio (each lent dollar is spent elsewhere and so on)
    - Interest rates
        - Modifying target rate (rate at which banks lend to each other to meet reserve requirements)
        - Raising = trying to cool economy and inflation
        - Reducing = pro-growth and inflationary
    - Open market positions
        - Buying/selling government bonds in local currency
        - Buying = increasing reserves, pro-growth and inflationary
        - Selling = decreasing reserves/money supply, used to cool economy and combat inflation
        - Repos are a type of short-term open market position
    - Currency intervention
        - Buying/selling currency to control exchange rate
        - Sterilized vs. unsterilized (passive) intervention
        - Taylor Rule: provides guidelines on interest rates based on inflation target, economic growth, and short-term interest rate that would lead to max employment
- Impossible Trinity
    - It is impossible for a central bank to have 3/3 of {fixed exchange rate, independent monetary policy, free capital flows}
- Monetary base
    - Sum of monetary liabilities, currency in circulation, reserves (MB = C + R)
- Money supply

    - Quantity of Theory of Money: $M \cdot V = P \cdot Q$ (M = money, V = velocity of money, P = average price(?), Q = quantity of goods)
    - Changes in monetary supply is a strong predictor of changes in GDP/growth/inflation
- Reserves
    - Def: "external assets that are readily available to, and controlled by monetary authorities"
    - Advantage: allows a country to build wealth
    - Disadvantage: reduces purchasing power every year due to inflation (which is why countries like China/Japan buy lots of UST)
- Zero lower bound (ZLB)/liquidity trap
    - ZLB: target central bank rate at 0
    - Liquidity trap: central bank
- Quantitative easing
    - Central banks buying assets (e.g. govt debt) to increase money supply
        - QE mistakes have led to other countries (e.g. Japan) experiencing deflationary cycles
            - "Deflation: Making Sure It Does Not Happen" (Ben Bernanke, former Fed chair)
        - Operation Twist (1961, 2011): Fed selling shorter-term debt and buying long-dated debt to flatten yield curve
        - Effectiveness has diminished due to low 10yr yield (compared to 2008) and market pricing in QE
- Central bank communication
    - Statements
    - Hawks/Doves
        - Certain central bank officials will be labeled as hawkish/dovish, so making statements that align with their views will not move markets
    - Minutes
        - Important to know distribution of yes/no votes for target rate, QE, etc. related decisions (especially for new central bank governors)
- Central banks
    - Federal Reserve (Fed)
    - ECB
        - Established in 1988
        - Policy announced on first Thursday of each month
            - Governing Council meets twice a month to discuss
        - Longer-term refinancing operations (LTRO)
        - European debt problem
            - Irrespective of GFC, European countries were on an unsustainable path
        - European Financial Stability Facility
            - Mandate to safeguard financial stability
        - European Stability Mechanism
        - Securities Market Program
        - Outright Monetary Transactions
            - Founded by ECB after SMP closed
        - Covered bond purchase program
        - Emergency Liquidity Assistance (ELA)
    - National central banks
        - Bundesbank (Germany)
            - Objective: safeguard currency
            - After introduction of euro, control of monetary policy given to ECB

- Swiss National Bank
  - Objective: set target rate for three-month Swiss franc LIBOR
  - Switzerland experienced deflation at start of GFC
    - Bought euros, sold franc and lowered target rate to 0-0.25 (inflationary)
- Bank of England
  - Objective: maintaining inflation target at 2% and providing financial stability
  - Black Wednesday
    - Moral: countries are not always in sync; some may need inflation/growth/cutting cycles whereas others the opposite
    - George Soros' legendary shorting of GBP

12 - Economic Data Releases and Demographics

- Measuring growth
  - GDP
    - Nominal GDP: measure of economic activity in current prices
      - Formula:
        GDP = Consumption + Investment + Government Spending + Net Exports(Exports - Imports)
    - Real GDP: measure of economic activity in constant prices (adjusted for inflation)
  - Inflation
    - Growing economies have inflation, caused by supply shocks/demand pull
      - Supply shocks: higher prices due to increased cost of production
      - Demand pull: spending more than is available (because of overheating economy, increase in money supply, etc.)
    - Central banks follow inflation indicators
      - CPI, PPI, core PCE (urban population, excluding volatile food/energy prices)
  - Employment/Population
    - Data: nonfarm payrolls report (NFP), U6 (total num of unemployed + part-time workers), average hourly earned
    - Types of unemployment
      - Structural, frictional, seasonal
    - Population is a critical factor
  - Balance of payments
    - Def: **Current account** is equal to change in net foreign assets (net exports + net foreign investment + transfer payments)
      - Large current account deficit is likely because of low net exports
    - Exports and imports
    - Trade balance
      - Difference between (net) exports and imports
        - Trade balance deficit can be dealt with by currency weakening (exports will become more attractive, imports less so)
    - Terms of Trade (ToT)
      - Def: **Terms of trade** (ToT) is calculated by taking price of exportable goods divided by price of imported goods in an index of goods (indicates a country's exports by the number of imports it can purchase)
    - Reserves
      - Countries with large reserves intervene in FX market to affect trade somehow

- Government indicators
  - Budget balance
    - Surplus vs. deficit (calculated by subtracting revenue from spending)
  - Government debt/debt-to-GDP
- Consumption indicators
  - Savings rate
  - Consumer confidence
    - Data obtained via surveys
- Industry and Services Indicators
  - Business conditions
    - Purchasing Managers' Indices (PMIs)
  - Industrial production
    - Measures growth in manufacturing/utilities/mining
    - Viewed as leading GDP indicator, as industrial production is more sensitive to economic cycles than services
  - Building permits
  - Capacity utilization
- Demographics
  - Def: The **dependency ratio** is the proportion of a population in the workforce
    - Lower dependency ratio indicates a more vulnerable economy, negatively correlated with equity returns