Module 2 - Market Structures

MSc in Quantitative Finance (MQF), 2024

Market Participants

Securities markets are marketplaces where assets are bought and sold between buyers and sellers:

- Sell sides (liquidity providers aka market makers)
  - Financial institutions
  - Brokers
  - Dealers
- Buy sides (liquidity takers)
  - Asset managers
  - Hedge funds
  - Treasuries
  - Retail investors

Securities Markets

There are many types of marketplaces, with different structures and trading mechanism such as accessibility criteria, governance/regulations, price setting, the kind of order types participants can place, matching rules etcs:

- Primary vs secondary markets
- Over-the-counter (OTC) markets vs streaming markets
- Manual vs electronic markets
- Dear vs quote-driven markets
- Auction markets (e.g. Singapore Bonds & Bills)
- Open-outcry markets (e.g. NYSE)

Limit order markets and Dealer Markets

Most trading mechanism can be viewed as a variation of these two main types, or a hybrid of both (e.g. LOB for liquid securities, dealers to support illiquid ones):

- In limit order market, market participants show their interests by submitting buy and sell orders. Bids (limit buy) and offers (limit sell) are aggregated into a central limit order book (CLOB), and a matching engine by the trading platform will match the orders between buyers and sellers (aka crossing).
- In a dealer market, a professional intermediary will quote offers and bids prices at which other participants can buy and sell from them. Dealers have no obligation to post a two-way quotes continuously, so brokers/investors may have to ask a few dealers to get the best prices. These are often the OTC markets.

Trading Exchanges

Financial institutions, hedge funds, asset managers are connected to the largest global trading exchanges to trade electronically. Here's some of the major exchanges in different asset classes:

- Equities - NYSE, LSE, Euronext, HKEX, SGX, JPX
- Fixed Incomes - Brokertec
- Commodities, Equities & Interest Rates Futures/Options - CME, ICE, Eurex
- Forex Exchanges - EBS, Reuters, Currenex, Euronext FX, FXAll, LMAX, CBOE
- Cryptocurrencies - Binance, OKX etc.

US equity markets are the largest in the world, with 16 exchanges, >30 alternative trading systems (ATS), and multiple over-the-counter (OTC) venues. See here for a report of the market structure.

Why Market Structure Matter

A transparent securities market is crucial for investors and firms to execute their portfolios, and to determine prices to guide capital allocations:

- Market structure plays a key role in determining market efficiency by reducing [financial market frictions' costs](#)
- A transparent structure will facilitate faster dissemination of price information (e.g. fast order book update), improving quality of price discovery (speed and accuracy)
- Participants will pay lower transaction cost (bid/ask spreads, trading fees) and is able to execute reliably throughout trading session without disruption
- Trading is governed by a set of rules, regulations and real-time monitoring that are open and aims at fostering competition, avoiding collusion that will hurt price formation
- Deep market liquidity that comes from many participants and resilient, allowing investor to trade large sizes quickly with minimal market impact
- Technologies, automation, ultra-fast algorithmic trading are key enablers in the evolution of market structure

FX Market Microstructure
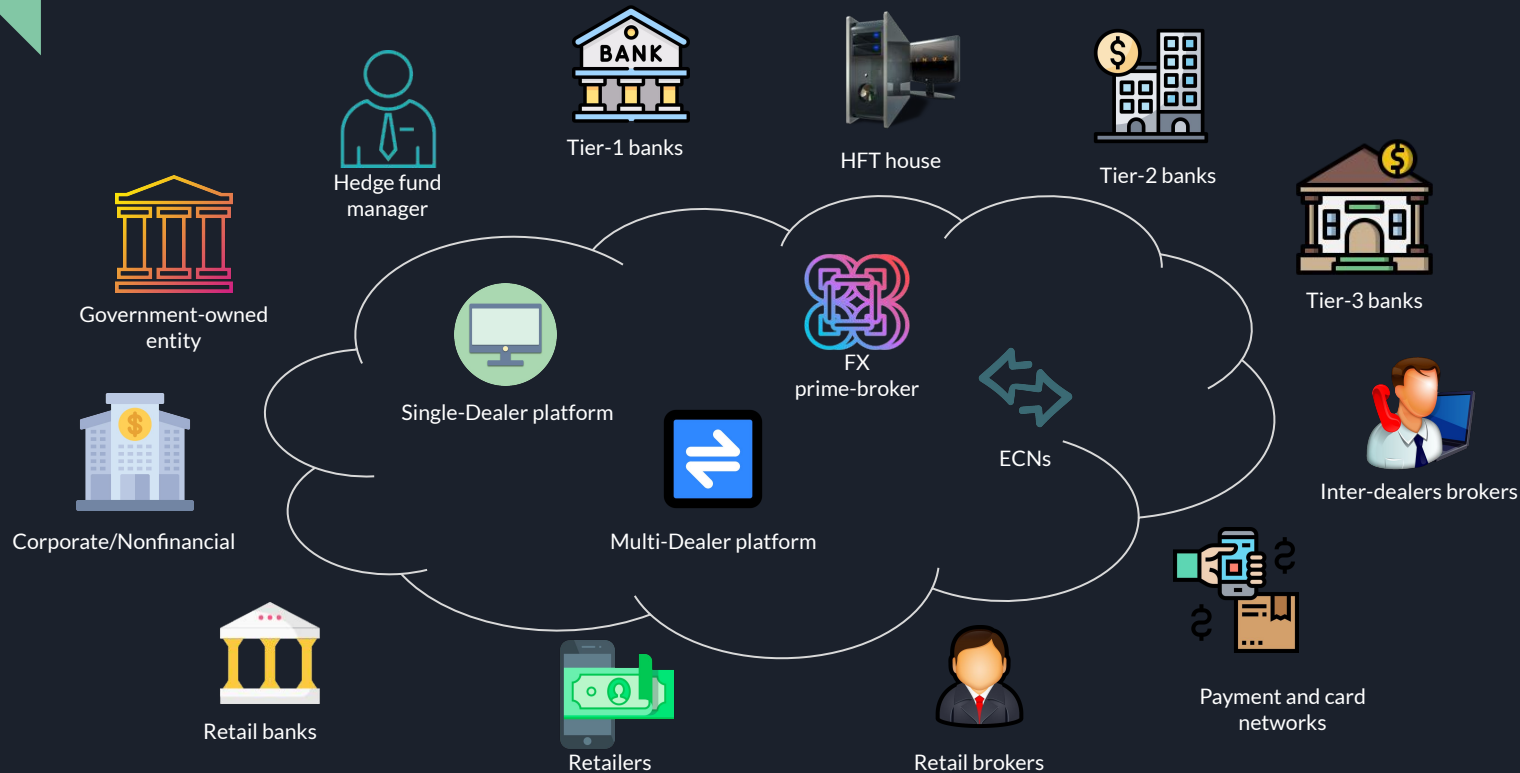
Classroom exercises: week_02

- Timestamp using epoch time
- while-loop and sleep to form a simple program
- Logging module
- Program with main-method
- REST call
- REST call with query parameter
- Get an order book from exchange
- A simple real-time application using polling technique

Programming Notes - Postman

Postman is a great tool for calling REST APIs - download from https://www.postman.com/