Factor Models of Returns

Oden Petersen

October 18, 2025

About Me

Outline

1. Securities Markets
2. Trading
3. Portfolio Management
4. Options Trading

Securities Markets

Spot Transactions

If I give you q units of some asset A, and you give me \$$p$, then:

- I have **sold** q units of A to you at $\frac{\$p}{q}$
- You have **bought** q units of A from me for $\frac{\$p}{q}$

Buying and selling are collectively called ‘trading’.

Securities Markets and Exchanges

The **market** is the collective activity of all traders. When we don't care who we trade with, we can just 'trade with the market'.

A **securities market** for some asset A, open at a time t, is any standardised way for traders to reach agreements to buy or sell A at a specified **settlement time** $T \geq t$.

Securities Markets and Exchanges

The **market** is the collective activity of all traders. When we don't care who we trade with, we can just 'trade with the market'.

A **securities market** for some asset A, open at a time t, is any standardised way for traders to reach agreements to buy or sell A at a specified **settlement time** $T \geq t$.

For example, $T = \ldots$

- t ('spot', e.g. blockchain)
- $t+1, t+2, \ldots$ ('clearing', e.g. equities)
- Last Thursday of month ('futures')

Securities Markets and Exchanges

The **market** is the collective activity of all traders. When we don't care who we trade with, we can just 'trade with the market'.

A **securities market** for some asset A, open at a time t, is any standardised way for traders to reach agreements to buy or sell A at a specified **settlement time** $T \geq t$.

For example, $T = \ldots$

- t ('spot', e.g. blockchain)
- $t+1, t+2, \ldots$ ('clearing', e.g. equities)
- Last Thursday of month ('futures')

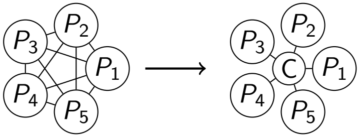
If you agree to give something to someone, you have an **obligation**. If someone agrees to give you something, you have a **right**.

Counterparty Risk

If I have an agreement with P_1 to buy 10 units for $\$p_1$ at T, and an agreement with P_2 to sell 10 units at $\$p_2$ at T, and no further rights/obligations, am I guaranteed to meet my obligations?

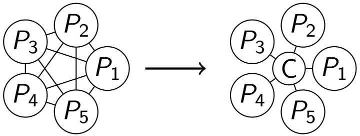
Settlement and Clearing

A **securities exchange** is a centralised venue serving a securities market for **exchange participants** (e.g. ASX, NYSE, TSE, HKEX, LME).



Settlement and Clearing

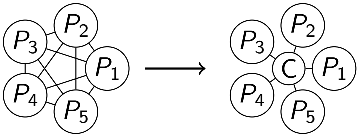
A **securities exchange** is a centralised venue serving a securities market for **exchange participants** (e.g. ASX, NYSE, TSE, HKEX, LME).



Netting

Centralisation allows for **netting** of rights and obligations. For any settlement time T, I only need to keep track of the difference between money owed to and by me, and units owed to and by me.

A **securities exchange** is a centralised venue serving a securities market for **exchange participants** (e.g. ASX, NYSE, TSE, HKEX, LME).



Netting

Centralisation allows for **netting** of rights and obligations. For any settlement time T, I only need to keep track of the difference between money owed to and by me, and units owed to and by me.

Collateralisation

At certain intermediate times t' ($t \leq t' \leq T$), participants may be required to physically give ('post') something to the exchange to **collateralise** their obligations.

1. Money ('margin')
2. Assets ('locate'/'borrow')

If an agreement made on the exchange gives you rights to money or assets, this is typically as good as posting actual money or assets.

Summary

1. **Trading** is swapping money and assets
2. A **market** is whatever you use to trade
3. A **securities market** is a standardised way to agree to trades
4. Agreements consist of **rights** and **obligations**
5. A **securities exchange** is a centralised trading venue
6. After trades are agreed to, they will be **settled** in some standardised way
7. Traders may be obligated to post assets ('locate') or money ('margin')

Trading

Trade Formation

Market Data & Market Prices

Valuation

Portfolio Capitalisation

Because of collateralisation requirements, **the amount you can trade (and therefore your potential profits) are constrained by how much money you have at the exchange.**

Transaction Costs

Uncertainty

Decision-Making

Portfolio Management

Risk

Decision Theory

Capital Asset Pricing Model

Factor Models

Statistical Arbitrage

Options Trading