# Topic Ten: Equity Capital Markets

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# This lecture

› In this lecture, we will cover the following:

- Discuss the process of trading equity securities
- Understand the participants in the trading process
- Explain different types of orders
- Examine key features of equity markets

# Trading Processes

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# Process of trading shares

1. Investor contacts a stockbroker, who opens an account for the investor to deposits funds into

2. Investor places an order with the stockbroker by phone or internet (or trade initiated by an algorithm)
   - Most equity markets allow for two main types of orders – limit orders and market orders

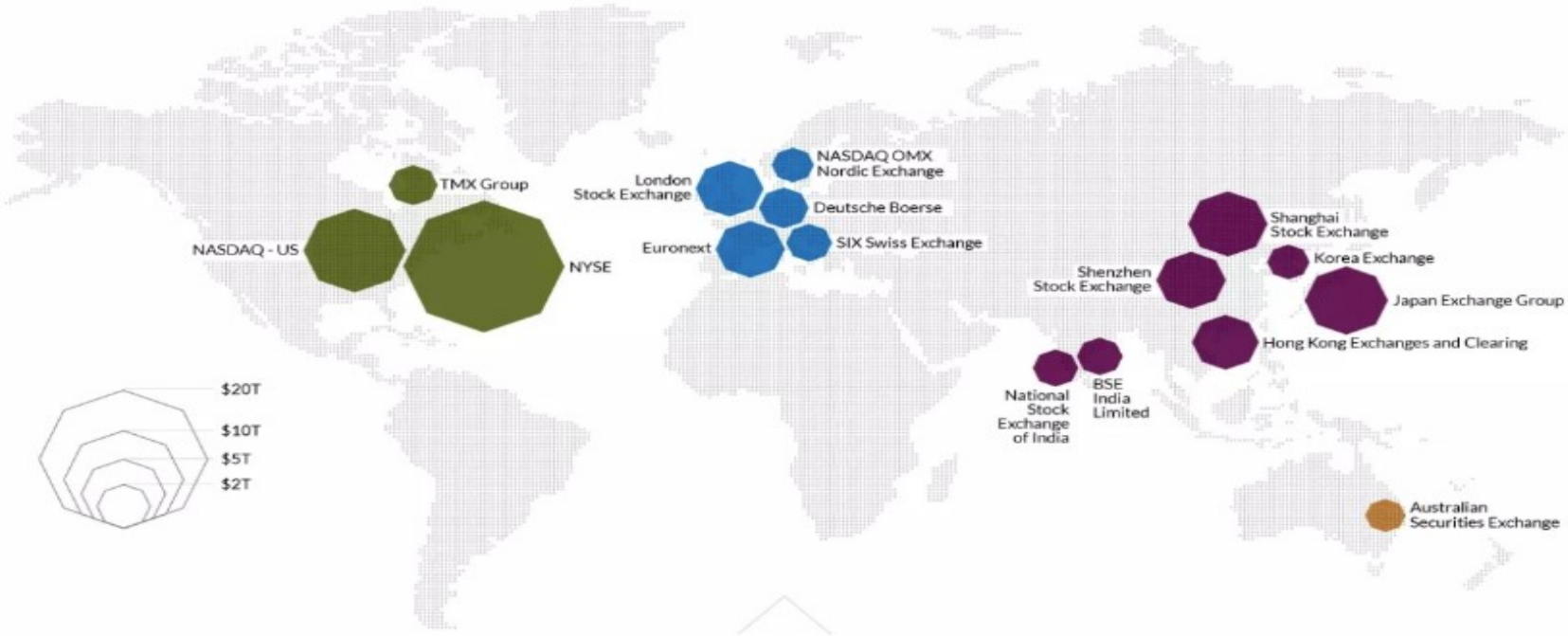
3. The stockbroker attempts to execute the order via a counterparty

4. Settlement takes place, where the ownership of shares is transferred in exchange for a transfer of cash

# Market participants

› The major participants involved in share trading are:

- The buying and selling parties, who could be individuals, institutions or fund managers
- The stockbroker, who provides trading services
- The securities exchange, which provides the facilities for trading and acts as a self-regulatory body



# Market participants

- A **stockbroker** may be either a conduit to the market or they may act as the client's agent.

- Therefore, brokers carry out two types of trading:
  - **Agency trading** – business transacted on behalf of clients
  - **Principal trading** – business transacted on the broker's own account
    - Facilitation – the broker takes the opposite side of a trade to a client to complete a transaction
    - House trading – the broker buys and sells shares for their own investment purposes

ANZ
Bank of Melbourne
BellDirect
Capital 19
CMC Markets
CommSec
HSBC
IG Share Trading
IronFX
Macquarie
nabtrade
Pepperstone
Phillip Capital
Raiz Invest
Saxo Capital Markets
SelfWealth
Sharesight
Spaceship
TradeDirect365
Westpac

# Market participants

- A **fund manager** is an organisation that invests funds on behalf of their clients.

- There are two types of fund managers:
  - **Active** – typically invest superannuation contributions sourced from companies
  - **Retail** – obtain cash by issuing savings policies or selling “units” direct to the public

- Investors are charged investment management fees to cover expenses incurred in the investment process.

# Market participants

› A **fund manager** is an organisation that invests funds on behalf of their clients.

› The main types of funds are:

- **Passive** – funds are used to earn a return similar to the market index
- **Active** – funds are used to outperform the market index

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STATE STREET
For Everything You Invest In℠

BRIDGEWATER

Vanguard®

Fidelity®
INVESTMENTS

# Types of Orders

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# Types of orders

- Generally, there two main types of orders that can be placed on an equities exchange. These are **limit orders** or **market orders**.

- In addition, there are other types of special orders that can be placed:
  - Stop loss
  - Time-in-force
  - Immediate-or-cancel
  - All-or-nothing
  - Hidden orders
  - Iceberg orders

# Types of orders – limit orders

- **Limit order:** an order that specifies a direction, quantity and acceptable price

- Each new limit order that enters the market is compared to the existing limit orders to see if there is a match. If there is a match, a trade will occur. If not, then the order enters the **limit order book**.

- A market might have multiple limit order books, each managed by a different broker or entity. When trading occurs on a single limit order book the market is said to be organised as a **consolidated limit order book (CLOB)**.

- Sequencing of orders in the limit order book is usually governed by **price** then **time**.

# Types of orders – limit orders

## Typical limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 3500 | 10.01 | 10.02 | 156611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| 632 | 52116 | 9.98 | 10.05 | 22551 | 251 |
| 954 | 1547 | 9.98 | 10.05 | 555 | 551 |
| 545 | 6988 | 9.98 | 10.05 | 454 | 587 |
| 175 | 488 | 9.98 | 10.06 | 71545 | 564 |
| 142 | 778 | 9.97 | 10.09 | 52245 | 541 |
| 585 | 54555 | 9.96 | 10.10 | 4545 | 442 |
| 544 | 95654 | 9.95 | 10.10 | 5474 | 884 |

# Types of orders – limit orders

*Example*

Suppose that broker 111 placed an order to purchase 2000 shares at $9.99, what would happen?

---

- **Price priority** – the new order is **lower** than $10.01 and $10.00; hence, it will rank behind those orders but it is **higher** than $9.98, $9.97, $9.95…and so it will rank above them

- **Time priority** – there is already an existing order at $9.99 and hence the new order will rank **behind** this one

# Types of orders – limit orders

## Post-order limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 3500 | 10.01 | 10.02 | 156611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| New order 111 | 2000 | 9.99 | 10.05 | 22551 | 251 |
| 632 | 52116 | 9.98 | 10.05 | 555 | 551 |
| 954 | 1547 | 9.98 | 10.05 | 454 | 587 |
| 545 | 6988 | 9.98 | 10.06 | 71545 | 564 |
| 175 | 488 | 9.98 | 10.09 | 52245 | 541 |
| 142 | 778 | 9.97 | 10.10 | 4545 | 442 |
| 585 | 54555 | 9.96 | 10.10 | 5474 | 884 |

Orders move down

# Types of orders – limit orders

*Example*

Suppose that broker 111 placed an order to purchase 2000 shares at $10.02, what would happen?

---

- **Price priority** – the new order is **higher** than all of the existing buy limit orders and it matches the best available sell limit order. Hence, a trade would occur at $10.02

- The buyer would be broker 111 and the seller would be broker 355. Broker 355's remaining limit order after selling 2000 shares would remain in the limit order book awaiting execution. The new volume associated with the order would be (156611 – 2000) = 154611

# Types of orders – limit orders

## Typical limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 3500 | 10.01 | 10.02 | 156611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| 632 | 52116 | 9.98 | 10.05 | 22551 | 251 |
| 954 | 1547 | 9.98 | 10.05 | 555 | 551 |
| 545 | 6988 | 9.98 | 10.05 | 454 | 587 |
| 175 | 488 | 9.98 | 10.06 | 71545 | 564 |
| 142 | 778 | 9.97 | 10.09 | 52245 | 541 |
| 585 | 54555 | 9.96 | 10.10 | 4545 | 442 |
| 544 | 95654 | 9.95 | 10.10 | 5474 | 884 |

# Types of orders – limit orders

## Post-order limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 3500 | 10.01 | 10.02 | 154611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| 632 | 52116 | 9.98 | 10.05 | 22551 | 251 |
| 954 | 1547 | 9.98 | 10.05 | 555 | 551 |
| 545 | 6988 | 9.98 | 10.05 | 454 | 587 |
| 175 | 488 | 9.98 | 10.06 | 71545 | 564 |
| 142 | 778 | 9.97 | 10.09 | 52245 | 541 |
| 585 | 54555 | 9.96 | 10.10 | 4545 | 442 |
| 544 | 95654 | 9.95 | 10.10 | 5474 | 884 |

New volume

# Types of orders – limit orders

*Example*

Suppose that broker 111 placed an order to purchase 2000 shares at $10.08, what would happen?

---

- **Price priority** – the new order is **higher** than all of the existing buy limit orders and **higher** than the best available sell limit order

- Because orders must be filled in the order they appear in the limit order book then the new order would execute against broker 355‘s existing limit order at a price of $10.02. This trade has the same effect as the previous example

# Types of orders – limit orders

## Typical limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 3500 | 10.01 | 10.02 | 156611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| 632 | 52116 | 9.98 | 10.05 | 22551 | 251 |
| 954 | 1547 | 9.98 | 10.05 | 555 | 551 |
| 545 | 6988 | 9.98 | 10.05 | 454 | 587 |
| 175 | 488 | 9.98 | 10.06 | 71545 | 564 |
| 142 | 778 | 9.97 | 10.09 | 52245 | 541 |
| 585 | 54555 | 9.96 | 10.10 | 4545 | 442 |
| 544 | 95654 | 9.95 | 10.10 | 5474 | 884 |

# Types of orders – limit orders

## Post-order limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 3500 | 10.01 | 10.02 | 154611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| 632 | 52116 | 9.98 | 10.05 | 22551 | 251 |
| 954 | 1547 | 9.98 | 10.05 | 555 | 551 |
| 545 | 6988 | 9.98 | 10.05 | 454 | 587 |
| 175 | 488 | 9.98 | 10.06 | 71545 | 564 |
| 142 | 778 | 9.97 | 10.09 | 52245 | 541 |
| 585 | 54555 | 9.96 | 10.10 | 4545 | 442 |
| 544 | 95654 | 9.95 | 10.10 | 5474 | 884 |

New volume

# Types of orders – market orders

- **Market order:** an order to purchase or sell securities at the best available price in the market place

- If the order involves a larger quantity than is available at the best available price, the order might be executed at multiple prices. This is known as "**walking the book**".

- Some markets prevent this from happening.

# Types of orders – market orders

*Example*

Suppose that broker 111 placed an order to sell 3000 shares at the best available price, what would happen?

---

- Since broker 111 is selling then the other market participant must be buying. The **best available bid price** is $10.01 and there is sufficient volume at that price to meet the order
- Therefore, the trade of 3000 shares would occur at $10.01. The buyer would be broker 528 and the seller would be broker 111

# Types of orders – market orders

## Typical limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 3500 | 10.01 | 10.02 | 156611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| 632 | 52116 | 9.98 | 10.05 | 22551 | 251 |
| 954 | 1547 | 9.98 | 10.05 | 555 | 551 |
| 545 | 6988 | 9.98 | 10.05 | 454 | 587 |
| 175 | 488 | 9.98 | 10.06 | 71545 | 564 |
| 142 | 778 | 9.97 | 10.09 | 52245 | 541 |
| 585 | 54555 | 9.96 | 10.10 | 4545 | 442 |
| 544 | 95654 | 9.95 | 10.10 | 5474 | 884 |

# Types of orders – market orders

## Post-order limit order book

New volume

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 500 | 10.01 | 10.02 | 156611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| 632 | 52116 | 9.98 | 10.05 | 22551 | 251 |
| 954 | 1547 | 9.98 | 10.05 | 555 | 551 |
| 545 | 6988 | 9.98 | 10.05 | 454 | 587 |
| 175 | 488 | 9.98 | 10.06 | 71545 | 564 |
| 142 | 778 | 9.97 | 10.09 | 52245 | 541 |
| 585 | 54555 | 9.96 | 10.10 | 4545 | 442 |
| 544 | 95654 | 9.95 | 10.10 | 5474 | 884 |

# Types of orders – market orders

*Example*

Suppose that broker 111 placed an order to sell 105,000 shares at the best available price, what would happen?

---

- Since broker 111 is selling then the other market participant must be buying. The **best available bid price** is $10.01 and there is **insufficient volume** at that price to meet the order
- Therefore, the trade would continue to execute against each limit buy order until the entire order is filled. It would "**walk the book**"

# Types of orders – market orders

## Typical limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 3500 | 10.01 | 10.02 | 156611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| 632 | 52116 | 9.98 | 10.05 | 22551 | 251 |
| 954 | 1547 | 9.98 | 10.05 | 555 | 551 |
| 545 | 6988 | 9.98 | 10.05 | 454 | 587 |
| 175 | 488 | 9.98 | 10.06 | 71545 | 564 |
| 142 | 778 | 9.97 | 10.09 | 52245 | 541 |
| 585 | 54555 | 9.96 | 10.10 | 4545 | 442 |
| 544 | 95654 | 9.95 | 10.10 | 5474 | 884 |

# Types of orders – market orders

*Example*

The trades would be:

- Sell 3,500 shares at $10.01
- Sell 22,480 shares at $10.00
- Sell 2,500 shares at $10.00
- Sell 21,140 shares at $10.00
- Sell 988 shares at $9.99
- Sell 52,116 shares at $9.98
- Sell 1,547 shares at $9.98
- Sell the remaining 729 shares at $9.98

This gives an average trade price of $\frac{\$1{,}048{,}937.28}{105{,}000} = \$9.98988$

This is **below** the best available price

The difference is known as a market impact cost $= \$0.02\ (0.2\%)$

# Types of orders – market orders

## Post-order limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 528 | 3500 | 10.01 | 10.02 | 156611 | 355 |
| 244 | 22480 | 10.00 | 10.02 | 1161 | 718 |
| 264 | 2500 | 10.00 | 10.02 | 5254 | 454 |
| 585 | 21140 | 10.00 | 10.03 | 45211 | 747 |
| 565 | 988 | 9.99 | 10.04 | 44212 | 585 |
| 632 | 52116 | 9.98 | 10.05 | 22551 | 251 |
| 954 | 1547 | 9.98 | 10.05 | 555 | 551 |
| 545 | (729) 6988 | 9.98 | 10.05 | 454 | 587 |
| 175 | 488 | 9.98 | 10.06 | 71545 | 564 |
| 142 | 778 | 9.97 | 10.09 | 52245 | 541 |
| 585 | 54555 | 9.96 | 10.10 | 4545 | 442 |
| 544 | 95654 | 9.95 | 10.10 | 5474 | 884 |

Executed Trades

# Types of orders – market orders

## Post-order limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 545 | 6259 | 9.98 | 10.02 | 156611 | 355 |
| 175 | 488 | 9.98 | 10.02 | 1161 | 718 |
| 142 | 778 | 9.97 | 10.02 | 5254 | 454 |
| 585 | 54555 | 9.96 | 10.03 | 45211 | 747 |
| 544 | 95654 | 9.95 | 10.04 | 44212 | 585 |
| | | | 10.05 | 22551 | 251 |
| | | | 10.05 | 555 | 551 |
| | | | 10.05 | 454 | 587 |
| | | | 10.06 | 71545 | 564 |
| | | | 10.09 | 52245 | 541 |
| | | | 10.10 | 4545 | 442 |
| | | | 10.10 | 5474 | 884 |

New volume

Other orders would move up to fill these slots

# Types of orders – specialised orders

› There are also a number of **specialised orders** that can be placed. In the US, there are over 100 different order types allowed.

- **Stop loss**: a conditional market order that is triggered if the price falls to a pre-specified level
- **Time-in-force**: specifies how long the order is considered to be active
- **Immediate-or-cancel**: never enters the limit order book. If it cannot be executed, it leaves no visible trace
- **All-or-nothing**: this order is executed in its entirety or not at all
- **Hidden orders**: if this order cannot be executed then it is added to the limit order book but display none of the quantity. The hidden order is available for execution against incoming orders. These orders usually lose priority to visible orders to encourage transparency
- **Iceberg orders**: orders that display a fraction of the quantity and once this executes, the order automatically replenishes the visible posted volume

# Types of Market Structures

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# Types of market structures

- **Limit order market** is the dominant market structure for trading stocks.
  - The limit order book maintains a list of all unexecuted limit orders
  - Investors submit market and limit orders to interact with other orders existing in the limit order book

- **Dealer market** is quote driven because dealer post quotes then traders decide whether to trade, which direction and with which dealer.
  - Investors cannot trade with each other, only via the dealer
  - Dealers compete with each other based on their quotes
  - Dealers may have exclusive trading rights in a particular security ('specialists') or they may compete for customers with other dealers
  - Often physically dispersed, connected with telephones and computers

- Some equity markets act as a **hybrid market**, which have dealers competing with a limit order book.

# Types of market structures

- **Upstairs markets** refers to brokers/dealers that negotiate trades directly with other broker/dealers then report the trade to the stock exchange.
  - A broker may contact other brokers to try and find a counterparty
  - Often used for large block trades that would otherwise have large price impact on the market
  - Very opaque process
  - Typically reported to the exchange immediately after the trade is complete

- **Downstairs markets** refers to the limit order book.
  - It is the on-exchange market

# Types of market structures

› **Floor markets** trading is carried out by market participants on an actual trading floor.

- Trades negotiated with shouting and hand signals
- Trading interest is consolidated in one location
- Disputes and errors can be resolved quickly

› **Electronic market** trading occurs on computers and servers.

- The rise of electronic trading systems has meant that most venues have closed their trading floors or those that have not have witnessed a significant decline in the volume of trading carried out on the floor
- Some markets still have a floor where some transactions take place in addition to an electronic platform

# Features of The ASX

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# Brief history of the ASX

- **1987**: The Australian Stock Exchange Limited (ASX) was formed on 1 April 1987. The formation of this national stock exchange involved the amalgamation of the six independent stock exchanges that had operated in the states' capital cities.
- **1990**: ASX trading floors closed and trading became fully automated.
- **1998**: ASX became a listed company. It was the first exchange in the world to demutualise and list on its own market, a trend that has been imitated by several other exchanges over the years.
- **2006**: The ASX and the Sydney Futures Exchange merged to become the Australian Securities Exchange. The combined entity became the 9th largest listed exchange group globally and represented an important milestone in the development of Australia’s capital markets.
- **2011**: The ASX monopoly in trading services ended. Chi-X Australia started trading ASX listed securities.

# Exchange trading hours

- Most equity exchanges are only open for normal trading during certain hours.
  - Australian Securities Exchange (ASX): 10am to 4pm
  - New York Stock Exchange (NYSE): 9:30am to 4pm
  - Tokyo Stock Exchange (TSE): 9am to 11:30am and 12:30pm to 3pm

- Opening hours are usually limited for equities but some other markets operate 24 hours a day. Why?

# Exchange trading hours

ASX

Equity market phases (Sydney times)

| | |
|---|---|
| 7am - 10am | Pre-open |
| 10am* | Open |
| 10am - 4pm | Normal Trading |
| 4pm - 4:10pm | Pre CSPA |
| 4:10pm - 4:12pm | Closing Single Price Auction |
| 4:12pm - 4:42pm | Adjust |
| 4:42pm - 6:50pm | Adjust ON |
| 6:50pm - 6:59pm | Purge Orders |
| 6:59pm - 7pm | System Maintenance |
| 7pm - 7:30pm | Close |
| 7:30pm - 2:25am | System Unavailable |
| 2:25am - 7:00am | Close |

*Random +/- 15 secs

# Opening and closing call auctions

- Single priced double-sided call auctions are often used to open trading sessions. Some exchanges also use them to close the trading session.

- In such an auction, supply and demand curves are constructed by ranking bids and offers. Prices and quantities are usually determined to maximise the feasible trading volume. All ‘overlapping’ trades are then executed at a single price.

- The advantage of a call auction is that it facilitates trading in periods of high demand without excessive volatility.

# Opening and closing call auctions

*Example*

Suppose that the opening call auction for a particular market was known to commence at exactly 10:00:00 every day. The stock closed trading yesterday at $1.30 per share. Examination of the limit order book for a particular stock at 9:45:00 today looks as follows:

# Opening and closing call auctions

## Pre-opening limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 128 | 50000000 | 1.80 | 1.24 | 48000 | 455 |
| 548 | 2000 | 1.41 | 1.26 | 4133 | 238 |
| 546 | 1551 | 1.40 | 1.28 | 6474 | 234 |
| 853 | 1555 | 1.39 | 1.28 | 450 | 767 |
| 535 | 844 | 1.39 | 1.28 | 5516 | 885 |
| 332 | 2510 | 1.38 | 1.29 | 2566 | 876 |
| 554 | 4665 | 1.32 | 1.29 | 1520 | 532 |
| 845 | 6466 | 1.30 | 1.30 | 2200 | 787 |
| 675 | 484 | 1.30 | 1.30 | 66200 | 324 |
| 152 | 78489 | 1.30 | 1.30 | 6000 | 641 |
| 555 | 54787 | 1.29 | 1.30 | 6620 | 632 |
| 444 | 75615 | 1.29 | 1.30 | 9000 | 664 |

# Opening and closing call auctions

- A close examination of the limit order book shows that broker 128's order of 50,000,000 shares at $1.80 is very unusual. Why might such an order have been placed?

- With the aim of having a chance of a successful trade, the order would need to go above the broker 128's order. If enough traders did this the limit order book might change to as follows just before the opening call auction:

# Opening and closing call auctions

## Pre-opening limit order book

New orders

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 752 | 51100 | 1.91 | 1.24 | 48000 | 455 |
| 658 | 564100 | 1.90 | 1.26 | 4133 | 238 |
| 854 | 44610 | 1.88 | 1.28 | 6474 | 234 |
| 798 | 4000000 | 1.84 | 1.28 | 450 | 767 |
| 476 | 654000 | 1.83 | 1.28 | 5516 | 885 |
| 564 | 564600 | 1.82 | 1.29 | 2566 | 876 |
| 544 | 8222000 | 1.81 | 1.29 | 1520 | 532 |
| 128 | 50000000 | 1.80 | 1.30 | 2200 | 787 |
| 548 | 2000 | 1.41 | 1.30 | 66200 | 324 |
| 546 | 1551 | 1.40 | 1.30 | 6000 | 641 |
| 853 | 1555 | 1.39 | 1.30 | 6620 | 632 |
| 535 | 844 | 1.39 | 1.30 | 9000 | 664 |

# Opening and closing call auctions

- At 9:59:58, broker 128 deletes their limit buy order and places a limit sell order for 50,000,000 shares at a price of $1.23.

- When the market call auction ends, broker 128 will have been able to sell a large volume of shares at a much better price than they were going to achieve due to the fact they induced other market participants to enter higher prices into the market then they would otherwise have done.

- This is an example of market manipulation and it is illegal but would be possible if the participants knew exactly when market opened. **Random opening times** make this more difficult.

# Opening and closing call auctions

## Pre-opening limit order book

| Broker No. | Bid Quantity | Bid Price | Ask Price | Ask Quantity | Broker No. |
|---|---|---|---|---|---|
| 752 | 51100 | 1.91 | 1.23 | 50000000 | 128 |
| 658 | 564100 | 1.90 | 1.24 | 48000 | 455 |
| 854 | 44610 | 1.88 | 1.26 | 4133 | 238 |
| 798 | 4000000 | 1.84 | 1.28 | 6474 | 234 |
| 476 | 654000 | 1.83 | 1.28 | 450 | 767 |
| 564 | 564600 | 1.82 | 1.28 | 5516 | 885 |
| 544 | 8222000 | 1.81 | 1.29 | 2566 | 876 |
| 548 | 2000 | 1.41 | 1.29 | 1520 | 532 |
| 546 | 1551 | 1.40 | 1.30 | 2200 | 787 |
| 853 | 1555 | 1.39 | 1.30 | 66200 | 324 |
| 535 | 844 | 1.39 | 1.30 | 6000 | 641 |
| 332 | 2510 | 1.38 | 1.30 | 6620 | 632 |

Broker 128's new order

# Other features of equity markets

## › Bid-ask Bounce

- The limit order book has an impact on the price of a security given that the current price is equal to the last traded price

- Examination of the limit order book for DEF Ltd looks as follows:

- What would have happened to the price if shortly after this time there had been a (1) market sell order, then (2) a market buy order and then (3) a market sell order of 1,000,000 shares each time?

# Limit order book for DEF Ltd

| No. of orders | Bid Quantity | Bid Price | Ask Price | Ask Quantity | No. of orders |
|---|---|---|---|---|---|
| 15 | 11384539 | 0.003 | 0.004 | 9140130 | 12 |
| 11 | 13204056 | 0.002 | 0.005 | 2824350 | 4 |
| 3 | 5650004 | 0.001 | 0.006 | 1500000 | 2 |
| | | | 0.007 | 300000 | 1 |
| | | | 0.008 | 336667 | 2 |
| | | | 0.009 | 1907781 | 1 |
| | | | 0.010 | 2379995 | 1 |
| | | | 0.015 | 2000000 | 1 |
| | | | 0.018 | 99997 | 1 |
| | | | 0.030 | 380000 | 1 |

# Other features of equity markets

## › Bid-ask Bounce

- The first market sell order would trade at a price of $0.003. The current price of DEF Ltd would be $0.003

- The second trade would occur at a price of $0.004. Thus, the current price would change to $0.004
  - This represents a **+33.33%** increase in the price

- The third trade would occur at a price of $0.003. Thus, the current price would again change to $0.003
  - This means a **-25%** decline in the price again

- This is known as **bid-ask bounce**

# Other features of equity markets

## › Minimum Price Increments

- Suppose that to avoid the bid-ask bounce effect an investor decided they really wanted to get to the top of the bid column of the limit order book to trade first without crossing the spread

- Due to price and time priority, the investor would need to enter a price higher than $0.003 for DEF Ltd
  - The investor decides to enter an order of $0.0030000000000000000000000001
  - Then another trader decided to follow by leapfrogging this order with $0.0030000000000000000000000011
  - Sellers also started by placing orders like $0.0039999999999999999999999999

# Limit order book for DEF Ltd

| No. of orders | Bid Quantity | Bid Price | Ask Price | Ask Quantity | No. of orders |
|---|---|---|---|---|---|
| 1 | 152220 | 0.0030000000000000000000000011 | $0.0039999999999999999999999999 | 4800000 | 1 |
| 1 | 100000 | 0.0030000000000000000000000001 | 0.004 | 9140130 | 12 |
| 15 | 11384539 | 0.003 | 0.005 | 2824350 | 4 |
| 11 | 13204056 | 0.002 | 0.006 | 1500000 | 2 |
| 3 | 5650004 | 0.001 | 0.007 | 300000 | 1 |
| | | | 0.008 | 336667 | 2 |

# Other features of equity markets

## › Minimum Price Increments

- If exchanges allowed this type of behaviour then trading would never occur. Therefore, exchanges typically maintain minimum increments that traders can raise and lower prices by to prevent these activities.

- On the ASX, the minimum price steps are:

| Market Price | Minimum Bid |
|---|---|
| Up to 10c | 0.1c |
| 10c up to $2.00 | 0.5c |
| $2.00 up to $99,999,990.00 | 1c |

# Other features of equity markets

## › Information Dissemination Procedures

- Stock exchanges usually maintain strict rules regarding the disclose of information to market participants

- In Australia, the disclosure requirements are specified in the ASX Listing Rules. Companies are required to notify the ASX of any information that could have ‘a material effect on the price or value of securities of the company’. If the information is deemed to be market-sensitive, a ‘trading halt’ on the stock is **immediately** instituted for a period of 10 minutes (except for takeover announcements that last 30 minutes)

# Other features of equity markets

## › Information Dissemination Procedures

- During a trading halt, new orders can be placed or cancelled, but overlapping orders are not executed. After a trading halt, the market resumes trading after a brief ‘opening phase’, which determines the new traded price

- Some exchanges do not require trading halts following the release of information. Instead they encourage companies to release information outside of trading hours

# Conclusion

- The process of trading equity securities
- The participants in the trading process
- Types of orders
  - Limit orders
  - Market orders
  - Special orders
- Key features of equity markets
  - Floor and dealer markets
  - Exchange trading hours
  - Opening and closing call auctions
  - Bid-ask bounce
  - Minimum price increments
  - Information dissemination procedures

# The End

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