Introduction to Financial Market Data

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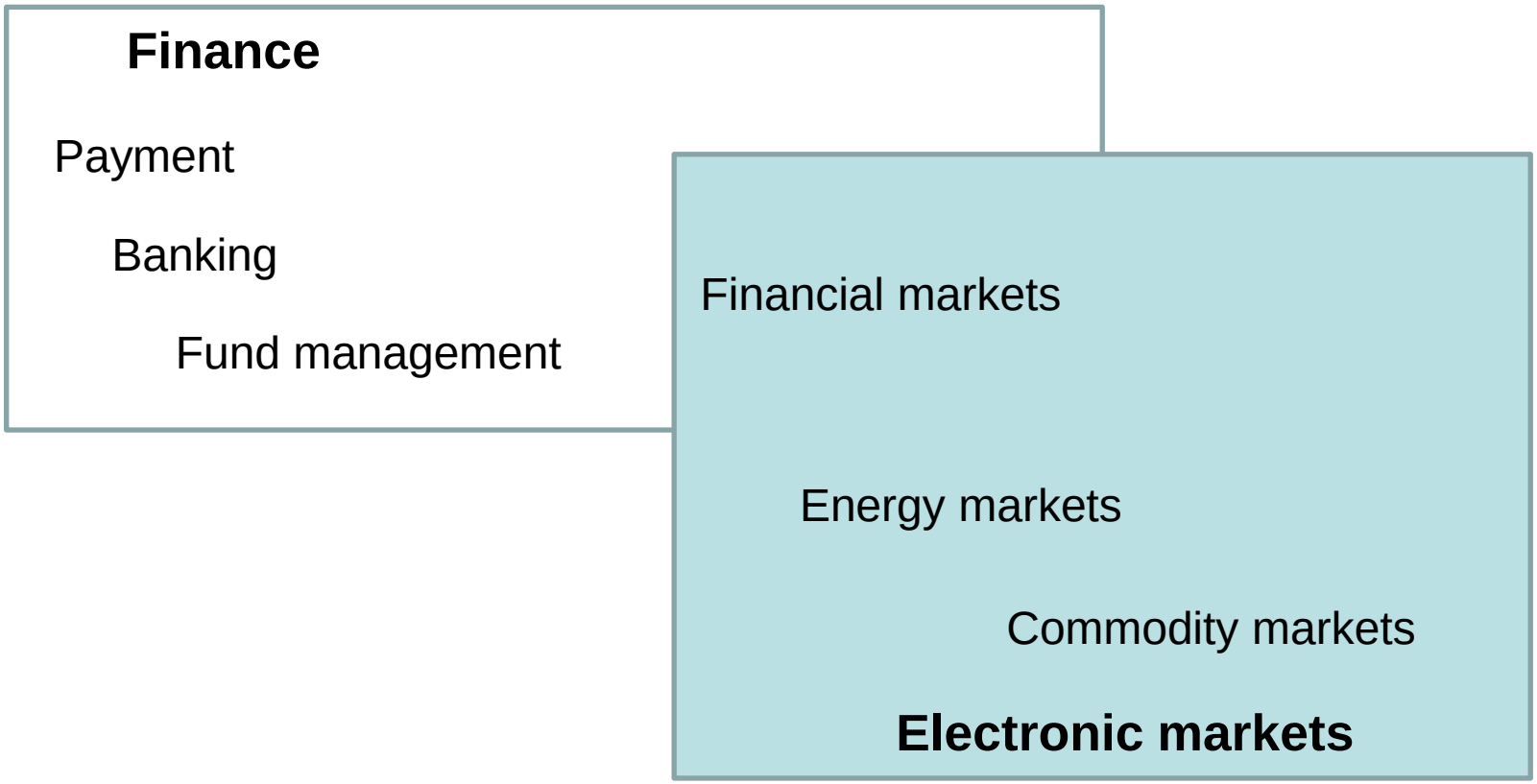
Preliminaries

- Purpose of lecture
  - Define “financial market data”
  - Look at characteristics of a financial market dataset
  - Differentiate financial market data providers
- Before that, we need to:
  - Understand the concepts behind the data
  - Understand the processes and context in which data was generated

Domains involved



Part 1: Finance

Basic concepts:

Assets

Money, credit, investment etc.

Instruments/securities

Valuation, return, risk

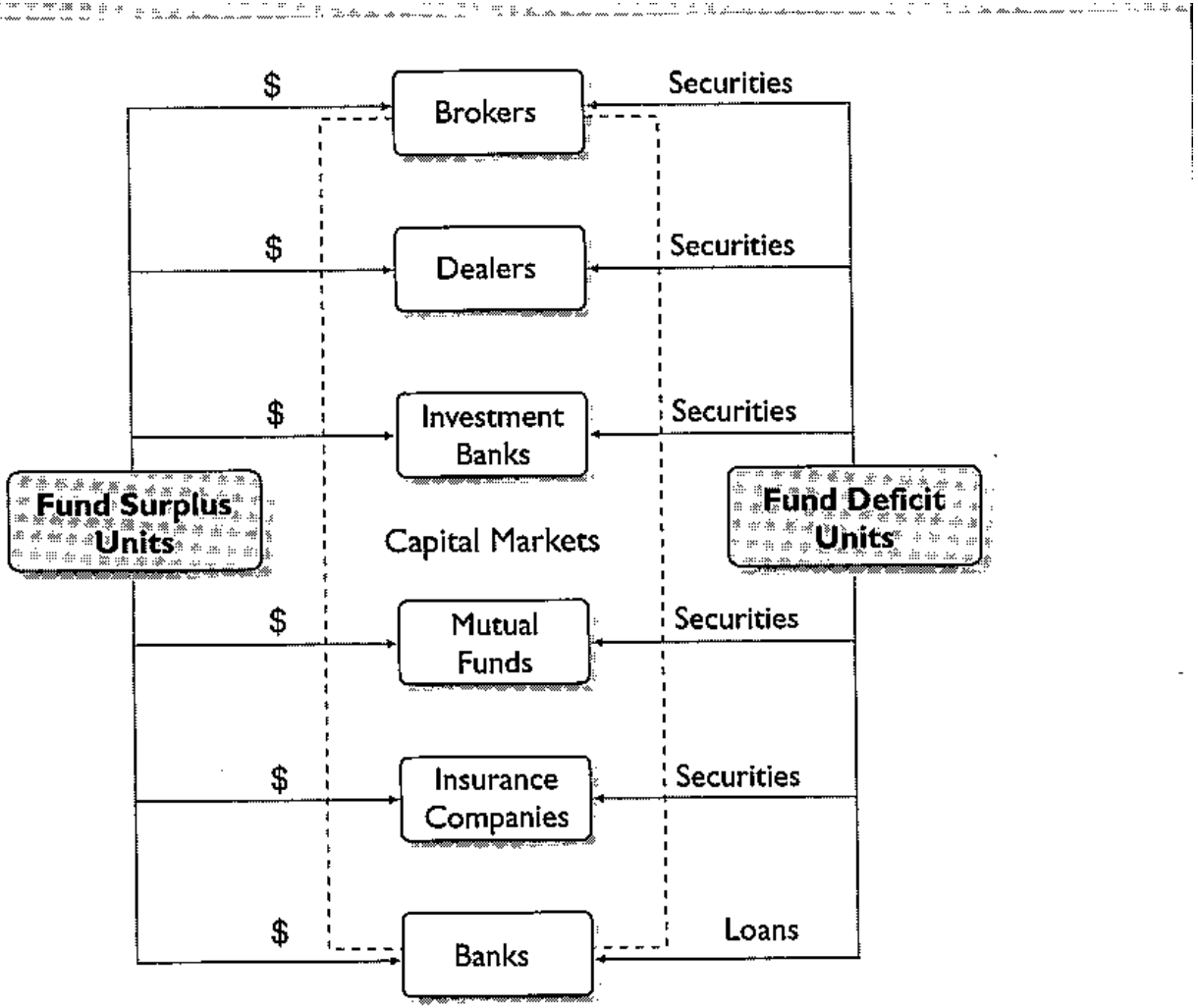
Context

Public, corporate, personal

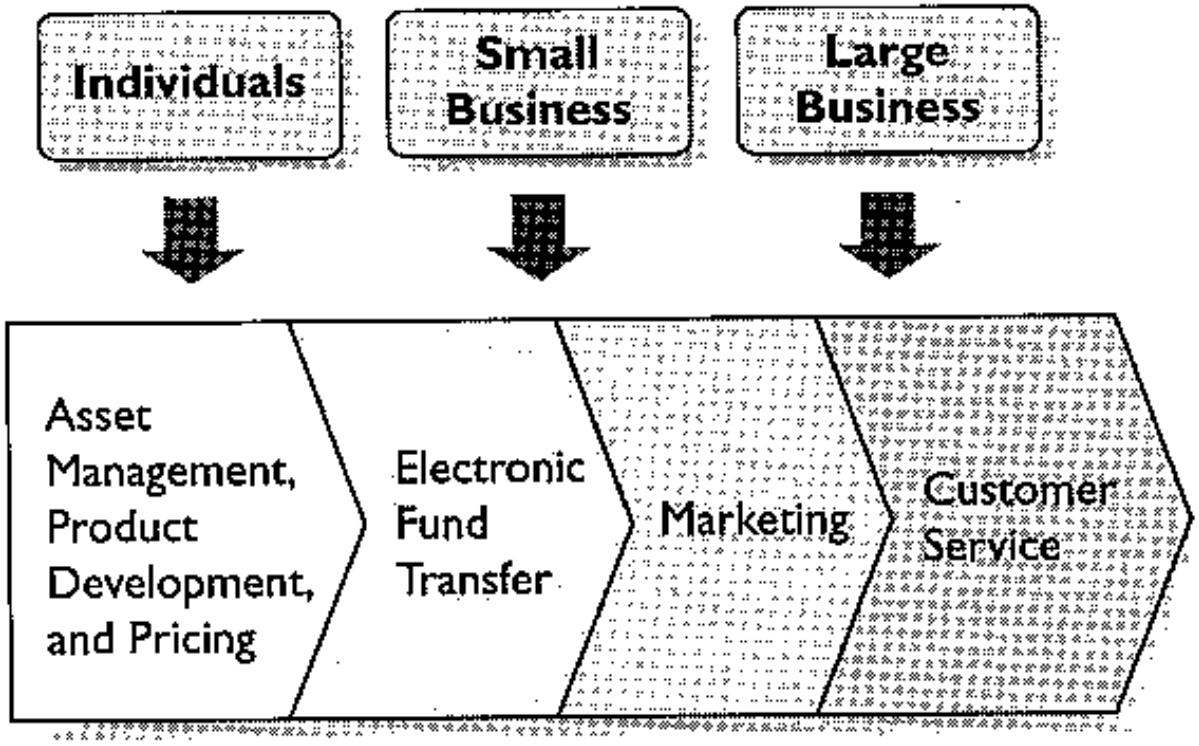
Systems

Banking, Insurance, Investment, Fund Management

Financial systems



Value chain for commercial banks



Part 2: Electronic markets

Basic concepts:

trading community

A community of sellers and buyers for particular products or services

e-marketplace

A platform that allows a community to trade electronically

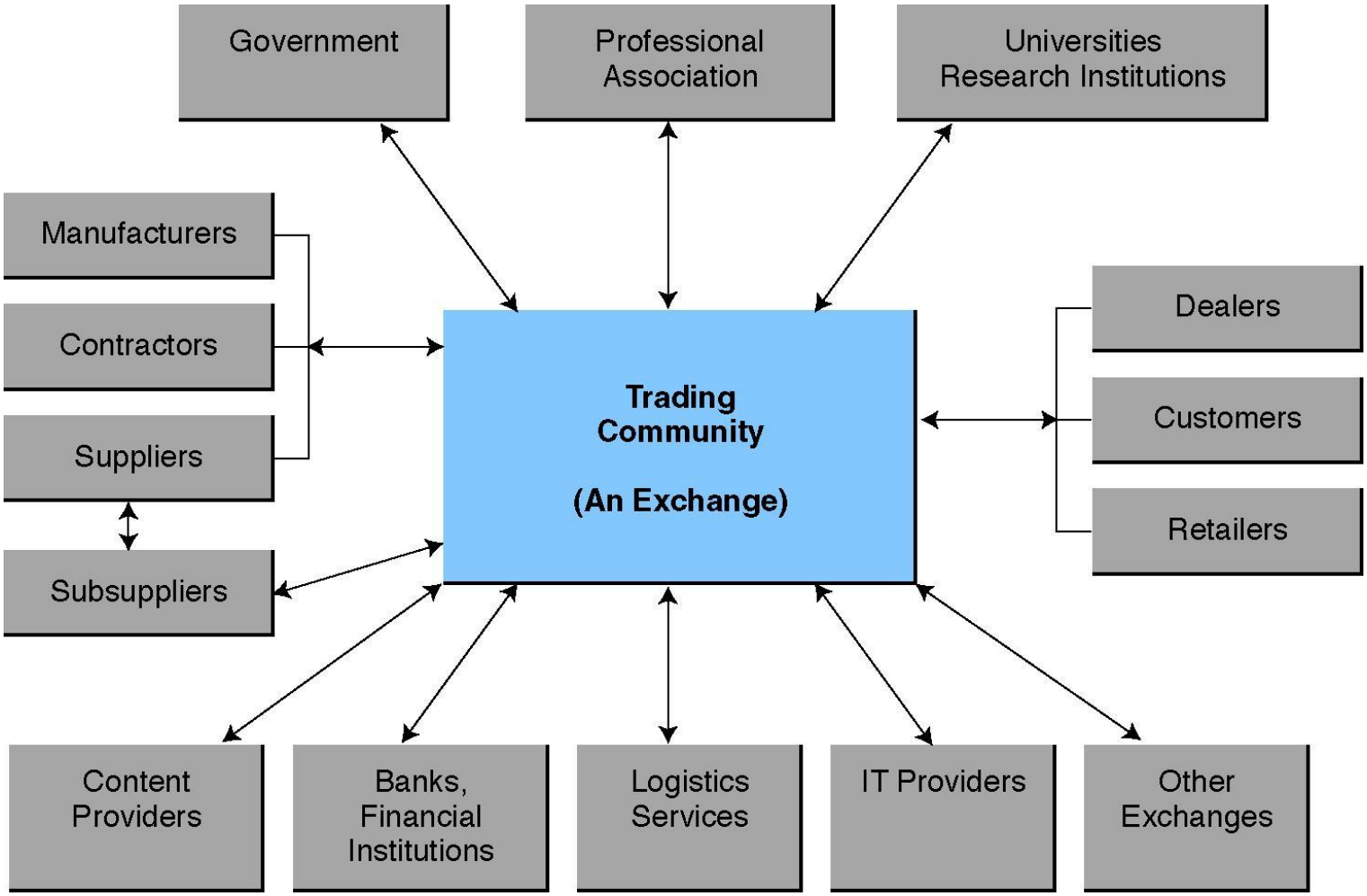
exchange

A many-to-many e-marketplace. Also known as *e-market,* or *trading exchange*

market maker

The third-party that operates an exchange (and in many cases, also owns the exchange)

Trading Systems



Dynamic Trading: Matching and Auctions

Exchange trading that occurs in situations when prices are being determined by supply and demand (e.g., in auctions)

- Matching—Buyers place their bids and sellers list their asking prices, the market makers conduct the matching
- Auctions—Exchanges offer members the ability to conduct auctions or reverse auctions in *private trading rooms*

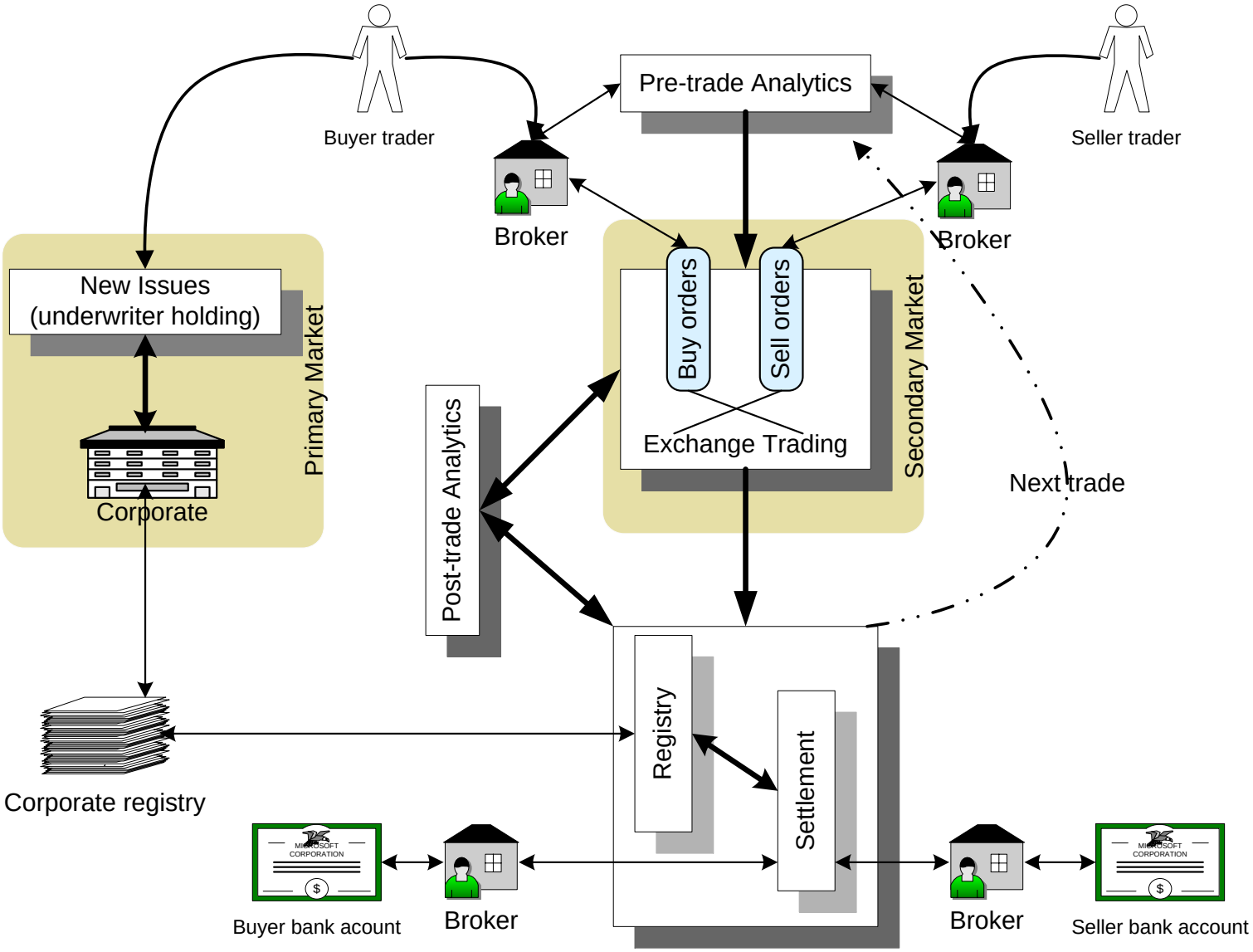
Electronic Exchanges

- Functions of Exchanges
  1. Matching buyers and sellers
  2. Facilitating transactions
  3. Maintaining exchange policies and infrastructure
- Operations of Exchanges
  - Trading engine
  - User interfaces
  - Data standards and communication protocols
  - Interfaces with external systems

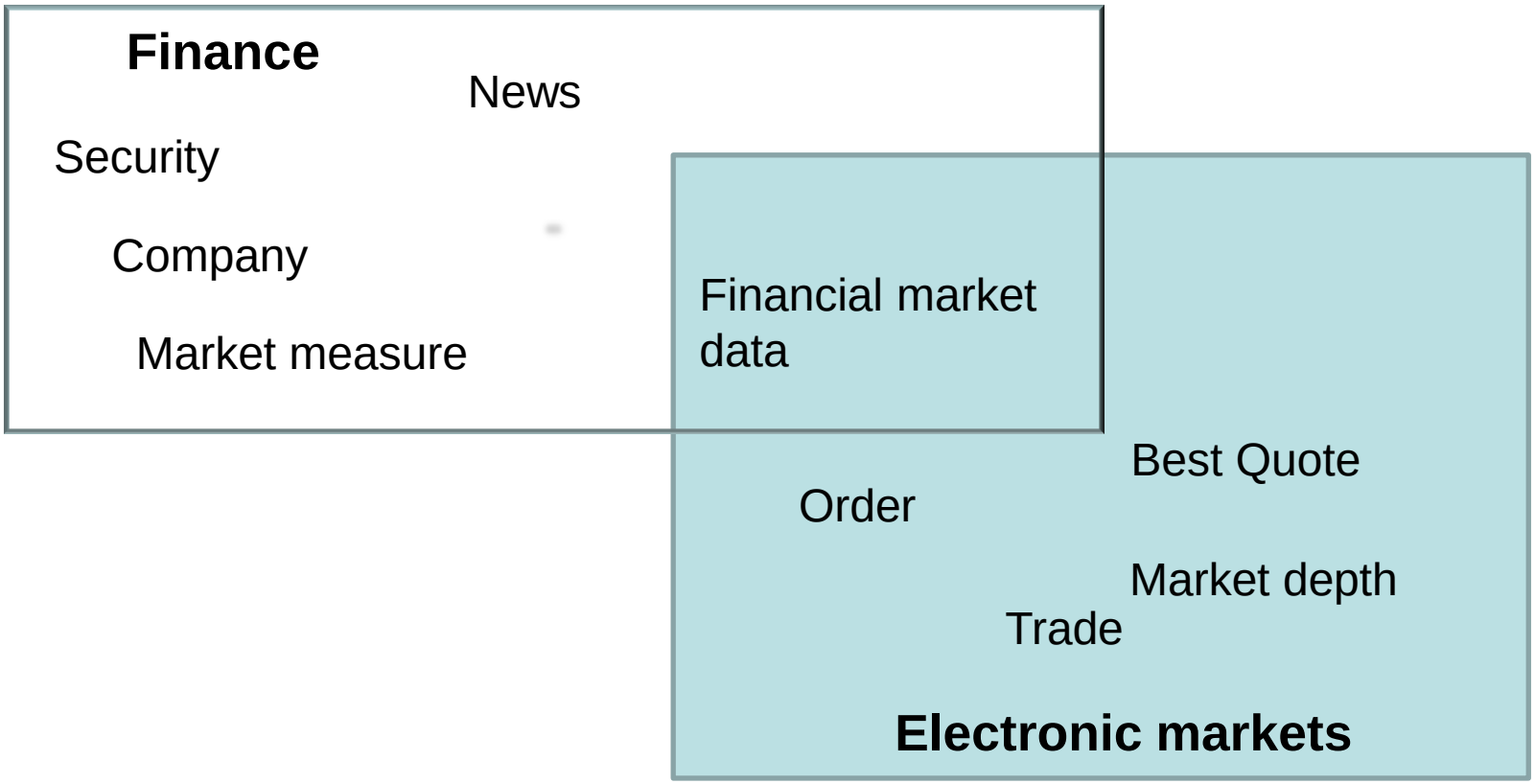
Part 3: Financial markets

- Characteristics
  - Allow the buying and selling of financial instruments
  - Divided into money markets and capital markets
  - Most capital markets trading occurs through electronic exchanges
- Capital market trading cycle
  - Pre-trade analytics
  - Trading
  - Post-trade analytics
  - Settlement and Registry

Capital Market Systems (CMSs)



Financial market data



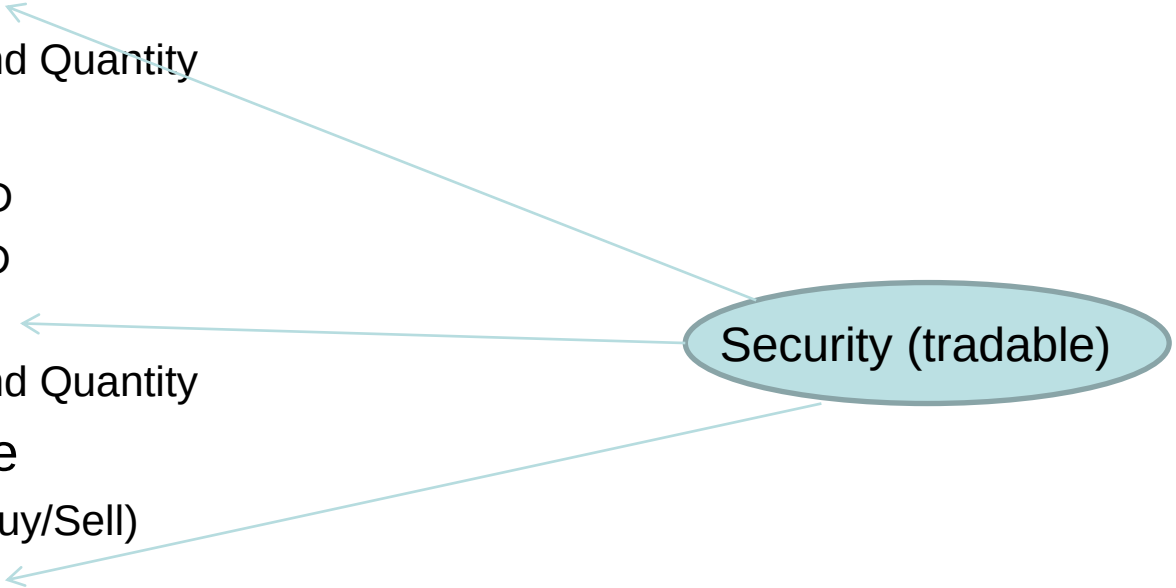
Finance Entities

- Company
  - Name
  - Country
  - Date listed
- Security
  - Type (e.g. equity, option, future, index, interest rate…)
- Market Measure
  - Type (return, volatility, liquidity)
- News
  - Type (corporate announcement, general news)

Market entities

- Order
  - Type: Buy/Sell
  - Party ID
  - Product
  - Price and Quantity
- Trade
  - Buyer ID
  - Seller ID
  - Product
  - Price and Quantity
- Best quote
  - Type (Buy/Sell)
  - Product
  - Price and Quantity
- Market depth
  - All quotes up to a specific price level

LINK WITH FINANCE ?



Financial market data

- Adding time dimension
  - Entities evolve through time (creation, modification, deletion)
  - Evolution represented via Events
- In summary
  - Entities can be from Finance or Electronic Market domains
  - Events represent changes to these entities
- Examples
  - BHP Trade at $2.00 at 11:56:09.876
  - Dividends for BHP issued on 15 March 2009

Processing financial market data

- Financial market data is a source of knowledge about
  - Trading behaviour, strategies and patterns
  - Market design, operations and efficiency
  - Products being traded
  - Financial news
- Examples of financial market providers
  - Real-time
    - Thomson Reuters
    - Bloomberg
  - Historical
    - SIRCA (Australian markets and Thomson Reuters Trades and quotes)
    - WRDS - Wharton Research Data Services (mostly US data)
    - Datastream
    - COMPUSTAT
  - Each provider can maintain multiple *datasets*

Essential characteristics of financial market dataset

- Instrument naming scheme
  - Info provider specific (Thomson Reuters/Bloomberg)
  - Exchange specific
  - International standard (e.g. ISIN)
- Asset classes
  - Equities / Derivatives / Fixed Income
  - Indices / Exchange Rates / Interest Rates
  - Exchange / OTC data
- Coverage
  - Attributes
  - Dates
  - Frequency

Sirca datasets

Sirca maintains the following datasets, offered using separate systems:

1. Aus Equities Tick History(AETH)
2. Thomson Reuters Tick History (TRTH)
3. Australian Corporate Announcements (ACA)
4. Global News (GN)

In each system, subscribers are allowed to:

- Search for securities
- Preview data
- Download data

1. Aus EquitiesTick History (AETH)

- Instrument naming scheme
  - ASX Code (3 letter code)
- Asset classes
  - Australian Securities Exchange (ASX) only
  - Equities / Options / Futures / Warrants
- Events
  - Orders / Trades / Quotes / Market Depth
- Coverage
  - Intraday updates
  - Millisecond accuracy for intraday
  - From 1 January 1996 until 2 days before
- Available from ausequities.sirca.org.au

2. Thomson Reuters Tick History (TRTH)

- Instrument naming scheme
  - Reuters Instrument Code (RIC)
- Asset classes
  - Extensive coverage
  - All worldwide exchanges
  - Some OTC data (restricted)
- Events
  - Orders / Trades / Quotes / Market Depth
- Coverage
  - End of day and intraday updates
  - Millisecond accuracy for intraday
  - From 1 January 1996 until yesterday
- Available from https://tickhistory.thomsonreuters.com

Purpose of this workshop

- Learning a new domain
  - Financial trading process and how exchange works
  - Financial market data
  - Automatic (algorithmic trading)
  - Matched orders generate *trades*
- Software development
  - All team have AETH market data available
  - Building an automatic trading platform
  - Requirements will be given incrementally (Week 2)
  - Teams will follow an Agile process (Week 3)