

# The intraday market at Bolsa de Valores de Colombia

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# How do we buy and sell liquid securities in organized exchanges?

Call Auctions (open, close the market, mid day, volatility), for around 30 stocks.

- Coordinated orders (batched together)
- multi-lateral.
- simultaneous execution
- single price (sharpen the accuracy of price discovery process).
- BVC: close (14 : 55 – 15 : 00) (15 : 55 – 16 : 00).

Continuous trading (the intraday market) for around 40 stocks.

- orders are matched according to sequence of arrival.
- bi-lateral
- transaction prices distributed over wide range of prices (in brief time intervals). Prices more likely to reflect transitory noise.
- BVC: (8 : 30 – 14 : 55) (9 : 30 – 15 : 55).

# Why should we study the intraday market?

## Trading of financial assets in electronic markets

- Optimize trading strategies (high frequency trading).
- Market microstructure: the study of price formation as an outcome to the complex interaction among market participants.
- Analyse market quality and understand the underlying economic forces.

## Sample of research

- Measuring the effectiveness of volatility auctions.
- Market quality and structural changes in the trading system: The case of X-Stream on the Colombian stock.
- Market quality in the intraday market for the Colombian Stock Exchange.
- Volatility and Jump activity in the Colombian sovereign bond market.

# How do we study the intraday market?

With theory and data (lots of data).

- Market orders: aggressive orders that execute immediately in electronic markets.
- Limit orders: passive orders that indicate a desired price and amount.
- Order management.
  - Matching engine: price-time priority.
  - Limit order book (LOB): keeps track of incoming and outgoing orders.
- Trade and Quote data: top of the book or best bid and ask (first-level of LOB).

# Structure of LOB

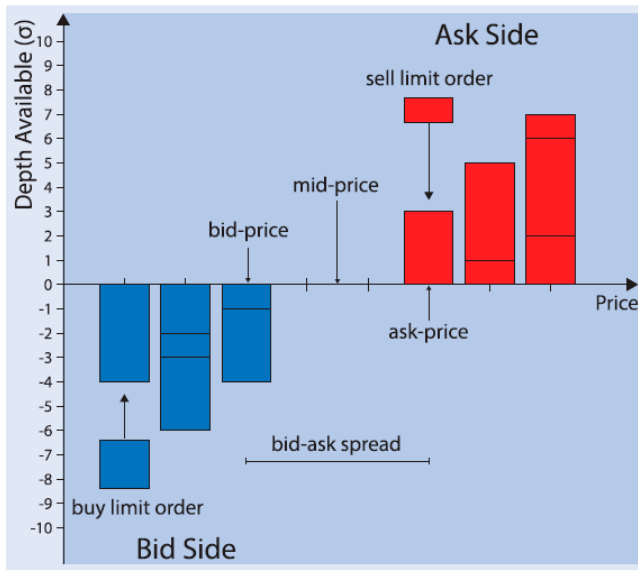


Figure: Gould, et al (2013), Limit order books, Quantitative Finance, vol 13(11), 1711



# Snapshot of three-levels of LOB

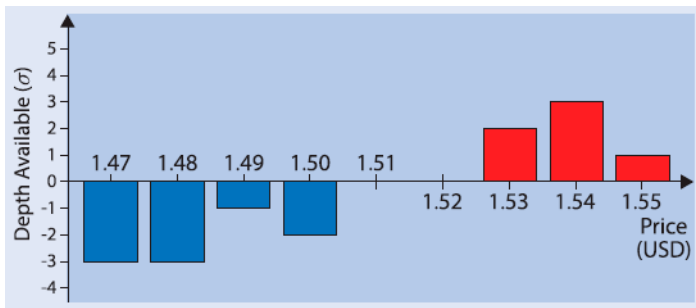


Figure: Gould, et al (2013), Limit order books, Quantitative Finance, vol 13(11), 1712.

# Data sources for financial research

- Wharton Research Data Services: NYSE Trade and Quote (TAQ) database, intraday level (to the microsecond), covering roughly 8,000 stock issues listed on major American exchanges since 1993.
- LOBSTER: Limit order book reconstruction system. NASDAQ traded stocks since 2007. Customized levels of the LOB.
- Bloomberg TAQ (API).
- Thomson Reuters Tick History is a historical market data service, offering global intraday Time and Sales, Quotes, and Market Depth content dating back to January 1996 (API).

# Colombian TAQ data and Market Quality

We use a sample of the Bloomberg TAQ data (five stocks over a 6 month period), Python and Jupyter notebooks to analyze the local intraday market.

- Measure and Visualize market quality (intraday)
  - Trading activity (volume traded, interarrival times).
  - Volatility
  - Liquidity (bid-ask spread, market depth).
- Estimate daily price impact (for trading strategies).
- Estimate daily volatility and jump activity (for risk management).

A more ambitious project with Diego Agudelo at EAFIT is to reconstruct the LOB with the support of BVC.