Market Structure, Efficiency and Arbitrage

What is a Securities Market?

- MARKET
  - ➢Group of entities in touch w/ each other to trade something
- FINANCIAL MARKET
  - ➢Market in which financial instruments are traded
- SECURITIES MARKETS
  - ➢Markets for specific financial obligations

Examples of Financial Markets

- Traditional
  - ➢New York Stock Exchange (NYSE)
  - ➢CBOT
  - ➢CME
- Electronic
  - ➢Arizona Stock Exchange (AZX)
  - ➢GLOBEX
  - ➢IEM

Example: The IEM

```
 Iowa Electronic Markets      Trader: trietz Cash: $ 4.294
     STOCK PRICE CHANGE          |           PORTFOLIO
Contract   Bid$    Ask$   Last$ | Holdings   #Bids   #Asks
MS090bH   0.335   0.354   0.354 |       15       1       2
MS090bL   0.635   0.665   0.635 |       12       1       2
```

- The “market” consists of all traders with accounts on the IEM

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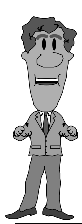
Goals of Financial Market Participants



- Borrow Funds
- Loan or Invest Funds
- Speculate on Interest Rate and Price Movements
- Hedge Positions
- Profit from Making the Markets Function

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Market Structure

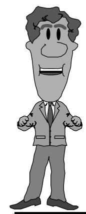
- Refers to the way trading is organized
- Primary: New securities issued
- Secondary: Previously issued securities
- Auction vs Continuous
- Central Exchange vs Over the Counter

Examples

- The NYSE is a
  CONTINUOUS,
  SECONDARY Market with a
  CENTRALIZED EXCHANGE.

- The IEM is both a
  PRIMARY and SECONDARY Market that is
  CONTINUOUS and operates on a
  CENTRALIZED EXCHANGE.

Some Market Terminology: Order Types



- Orders placed to trade shares
- Market Orders
  - ➢Immediate execution at the market price
- Limit Orders
  - ➢Executed only if you get the desired price
- Limit Orders that Convert to Market
  - ➢A limit order that changes to a market order of it has not been executed by a certain time

IEM Example

Iowa Electronic Markets — Trader: trietz Cash: $ 4.294

STOCK PRICE CHANGE				PORTFOLIO		
Contract	Bid$	Ask$	Last$	Holdings	#Bids	#Asks
MS090bH	0.335	0.354	0.354	15	1	2
MS090bL	0.635	0.665	0.635	12	1	2

- In the IEM market above, you can:
  - Place a market order to buy MS090bH by taking the ASK at $0.354.
  - Place a limit order to buy MS090bH by placing a bid above $0.335.
  - Place a market order to sell MS090bL by taking the BID at $0.635.
  - Place a limit order to sell MS090bL by placing an ASK below $0.665.
  - etc...

Some Market Terminology: Market Makers

- Brokers
  - ➢Serve as sources of market information and links to the markets.
  - ➢Arrange trades between others.

Some Market Terminology: Market Makers

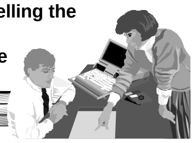
- Brokers
- Dealers
  - ➢Serve as brokers
  - ➢Also trade on their own account

Some Market Terminology: Market Makers

- Brokers
- Dealers
- Exchanges
  - ➢Serve as clearing houses
  - ➢Often take both sides of trades to guarantee performance

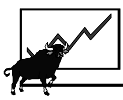
Some Market Terminology: Market Makers

- Brokers
- Dealers
- Exchanges
- Other Market Makers:
  - ➢Specialists
    - ⇨Manages a stock's purchases and sales
    - ⇨Keeps an inventory of the stock
    - ⇨Responsible for buying and selling the stock from the public.
    - ⇨All trades in a stock have to be reported to the specialist.

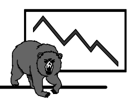


Market Structure and Security Prices

- Market structure has a tremendous short-run influence on stock prices
- Fundamental value
  - ➢The present value of its future cash flows
- Market Price
  - ➢Formed by demand and supply considerations in the short-run
- Trading organization determines
  - ➢Whether Market Prices reflect Fundamental Values at all
  - ➢How fast Market Prices reflect Fundamental Values



Information and Financial Markets

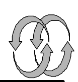


- Fundamental Values are determined by
  - ➢Expected future cashflows and
  - ➢Discount rates
- How are these determined?
- EFFICIENT MARKETS HYPOTHESIS (EMH)
  - ➢Prices of assets reflect all available information about future cashflows

Implications of the Efficient Markets Hypothesis (EMH)

- All past information, including past prices, are incorporated in current prices
- The EMH is weakened if:
  - ➢Information is hard to obtain
  - ➢Trading is difficult
  - ➢Trading is costly
  - ➢Prices are sticky
  - ➢Individuals over-react to information
- Market organization impacts stock prices and how quickly the incorporate information

Arbitrage



- Enforces efficiency
  - ➢Across markets
  - ➢Between related securities
- An arbitrage opportunity exists if
  - ➢Two transaction result in the same future cashflows
  - ➢They have different prices
- Arbitrageurs seeking profits
  - ➢“Exploit” arbitrage opportunities
  - ➢Force prices into line

IEM Example

- In the IEM, unit portfolios pay of $1 no matter what happens.
- There are two ways to buy unit portfolios:
  - ➢From the exchange for $1
  - ➢From the market at the sum of the Asks
- There are two ways to sell unit portfolios:
  - ➢To the exchange for $1
  - ➢To the market at the sum of the Bids
- If purchase and sale prices differ, arbitrage opportunities exist!

IEM Example

- Suppose the following IEM bids and offers exist:

```
Iowa Electronic Markets      Trader: trietz Cash: $ 4.294
     STOCK PRICE CHANGE         |            PORTFOLIO
Contract   Bid$    Ask$   Last$ | Holdings   #Bids   #Asks
MS090bH   0.352   0.354   0.354 |       15       1       2
MS090bL   0.661   0.665   0.635 |       12       1       2
```

- You can make an Arbitrage Profit by:
- Buying a P.1$ unit portfolio from the exchange for $1
- Selling that portfolio to the market for $0.352 and $0.661
- You profit by $0.352+$0.661-$1 = 1.3 cents

IEM Example

- Suppose the following IEM bids and offers exist:

```
Iowa Electronic Markets      Trader: trietz Cash: $ 4.294
     STOCK PRICE CHANGE         |            PORTFOLIO
Contract   Bid$    Ask$   Last$ | Holdings   #Bids   #Asks
MS090bH   0.456   0.458   0.456 |       15       1       2
MS090bL   0.525   0.530   0.525 |       12       1       2
```

- You can make an Arbitrage Profit by:
- Buying a P.MKT unit portfolio from the market for $0.458 and $0.530
- Selling that portfolio to the exchange for $1
- You profit by $1-$0.458-$0./530 = 1.2 cents