# LIMITS OF ARBITRAGE

## WHAT WILL YOU LEARN?

- What is an arbitrage?
- What are limits to arbitrage?

# WHAT IS AN ARBITRAGE?

- An arbitrage is a zero-risk zero-net investment strategy that generates profits.
- In efficient markets, there is no arbitrage opportunities!

# EXAMPLE

- Suppose a share of Ford stock is worth $20.
- Suppose a group of excessively pessimist traders push the price to $15.
  - Buying opportunity for the rational arbitrageur!
  - Buy and short a 'substitute' security (say GM with similar cash flows) to hedge.
- Buying pressure should correct the mispricing.

## LIMITS TO ARBITRAGE

- FUNDAMENTAL RISK
  - What if a piece of bad news causes the Ford stock price to fall even further?
  - No substitute is perfect.

## LIMITS OF ARBITRAGE

- NOISE TRADER RISK
  - What if pessimist traders grow more pessimistic?
- "Markets can remain irrational longer than you can remain solvent."

## LIMITS OF ARBITRAGE

- IMPLEMENTATION COSTS
  - Transaction costs such as commissions, bid-ask spreads, or price impact may make it less attractive to exploit the mispricing.
  - Short sales constraints.

## SUMMARY

- There exist LIMITS TO ARBITRAGE.
- Anomalies are risky arbitrage opportunities.
  - In practice, you can't hedge all risks.
- Transaction costs
- Short-selling constraints
- Money managers or individuals may have *short horizons*.