

Lesson 23

Arbitrage betting

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Example 1. Argentina peso historically has high inflation.



Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Example 1. To stop this,
Milei artificially props up
the peso:

<https://archive.ph/7RHMG>

The image shows a screenshot of the Bloomberg news website. At the top, there is a dark navigation bar with the Bloomberg logo in white. Below the logo, there is a menu bar with several categories: 'Live TV' (in red), 'Markets' (with a dropdown arrow), 'Economics', 'Industries', 'Tech', 'Politics', 'Businessweek', and 'Opinion'. The main content area has a light gray background. At the top of this area, there is a horizontal line of text: 'Argentina's Javier Milei: Approval Rises | US Trade Deal | Midterm Win | Trump Support'. Below this, there is a section labeled 'Markets | Currencies'. The main headline in large, bold black text reads: 'Currency Arbitrage Costs Milei \$2 Billion a Month in Argentina'. At the bottom of the page, there is a black footer bar with white text. On the left side of the footer, it says 'Subscribe now for uninterrupted'. In the center, it says 'Get the context behind every story for \$1.99/month.' On the right side, there is a white button with the text 'Claim this offer'.

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Example 1. Strategy:

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Example 1. Strategy:

Step 1. Sell dollars on black market to buy “worthless” peso.

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Example 1. Strategy:

Step 1. Sell dollars on black market to buy “worthless” peso.

Step 2. Sell the still “worthy” peso at banks to buy dollars.

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Example 1. Strategy:

Step 1. Sell dollars on black market to buy “worthless” peso.

Step 2. Sell the still “worthy” peso at banks to buy dollars.

Step 3: ???

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Example 1. Strategy:

Step 1. Sell dollars on black market to buy “worthless” peso.

Step 2. Sell the still “worthy” peso at banks to buy dollars.

Step 3: ???

Step 4: Profit

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Example 2. Sports Betting: Eagles vs Chargers Game.

- Betting Site 1 underestimates Eagles and gives too-good-to-be-true payout. → You bet on this.
- Betting Site 2 underestimates Chargers and gives too-good-to-be-true payout. → You bet on this.

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

Example 2. Sports Betting: Eagles vs Chargers Game.

- Betting Site 1 underestimates Eagles and gives too-good-to-be-true payout. → You bet on this.
- Betting Site 2 underestimates Chargers and gives too-good-to-be-true payout. → You bet on this.
- Either Eagles or Chargers win → You win more than you pay in.

Sports betting: Decimal Odds

Decimal Odds × Bet = Payout (includes your stake)

Sports betting: Decimal Odds

Decimal Odds \times Bet = Payout (includes your stake)

Example. If you bet \$100 on a game with decimal odds of 3.00, then your payout is

$$\text{Payout} = 3.00 \times \$100 = \$300$$

Sports betting: Decimal Odds

Decimal Odds \times Bet = Payout (includes your stake)

Example. If you bet \$100 on a game with decimal odds of 3.00, then your payout is

$$\text{Payout} = 3.00 \times \$100 = \$300$$

$$\text{Your gain: } \$300 - \$100 = \$200$$

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00		
Betting Site 2	1.50	2.80		

Step 1. Find big odd & take both sides.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00		
Betting Site 2	1.50	2.80		

Step 1. Find big odd & take both sides.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00	6.00	
Betting Site 2	1.50	2.80	1.50	

Step 1. Find big odd & take both sides.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00	6.00	
Betting Site 2	1.50	2.80	1.50	

Step 1. Find big odd & take both sides.

Step 2. Invert odds to get probability the site thinks the outcome happens.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00	6.00	1/6.00
Betting Site 2	1.50	2.80	1.50	1/1.50

Step 1. Find big odd & take both sides.

Step 2. Invert odds to get probability the site thinks the outcome happens.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00	6.00	0.167
Betting Site 2	1.50	2.80	1.50	0.667

Step 1. Find big odd & take both sides.

Step 2. Invert odds to get probability the site thinks the outcome happens.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00	6.00	0.167
Betting Site 2	1.50	2.80	1.50	0.667

Step 1. Find big odd & take both sides.

Step 2. Invert odds to get probability the site thinks the outcome happens.

Step 3. Arbitrage if probabilities add to < 1 (Betting Sites collectively underestimate & undervalue chosen outcomes). Otherwise, don't bet.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00	6.00	0.167
Betting Site 2	1.50	2.80	1.50	0.667
				0.167+0.667

Step 1. Find big odd & take both sides.

Step 2. Invert odds to get probability the site thinks the outcome happens.

Step 3. Arbitrage if probabilities add to < 1 (Betting Sites collectively underestimate & undervalue chosen outcomes). Otherwise, don't bet.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00	6.00	0.167
Betting Site 2	1.50	2.80	1.50	0.667
				0.167+0.667 < 1

Step 1. Find big odd & take both sides.

Step 2. Invert odds to get probability the site thinks the outcome happens.

Step 3. Arbitrage if probabilities add to < 1 (Betting Sites collectively underestimate & undervalue chosen outcomes). Otherwise, don't bet.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00	6.00	0.167
Betting Site 2	1.50	2.80	1.50	0.667
				0.834 < 1

Step 1. Find big odd & take both sides.

Step 2. Invert odds to get probability the site thinks the outcome happens.

Step 3. Arbitrage if probabilities add to < 1 (Betting Sites collectively underestimate & undervalue chosen outcomes). Otherwise, don't bet.

Arbitrage: Math

	Eagles to Win	Chargers to Win	Best Odds	Implied Probability
Betting Site 1	1.20	6.00	6.00	0.167
Betting Site 2	1.50	2.80	1.50	0.667
				0.834 < 1

Step 1. Find big odd & take both sides.

Step 2. Invert odds to get probability the site thinks the outcome happens.

Step 3. Arbitrage if probabilities add to < 1.

Step 4. Bet:

$$\frac{0.167}{0.834} = 20\% \text{ of wealth on Chargers to Win on Betting Site 1, and}$$

80% of wealth on Eagles to Win on Betting Site 2.

Arbitrage Risks

- Sports betting websites (“sportsbooks”) limit your account if you are too successful. Your effective salary will then be less than minimum wage.
- Odds change before you respond.

Other logistics for today

Next meeting (December 8 or 9)

- Review for final exam aka quiz make-ups/retakes
- Go over more homework questions.

Next meeting (December 8 or 9)

- Review for final exam aka quiz make-ups/retakes
- Go over more homework questions.
- So don't come if you don't need either of the above.

Next meeting (December 8 or 9)

- Review for final exam aka quiz make-ups/retakes
- Go over more homework questions.
- So don't come if you don't need either of the above.

Three assignments will be dropped.

This meeting (now)

Course survey (15 minutes) first, then homework questions

<https://rowan.campuslabs.com/eval-home/>

