

Lesson 23

Arbitrage betting

Arbitrage: General idea

Buy low in one market.

Sell high in another market.

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Example 1. Argentina peso historically has high inflation.



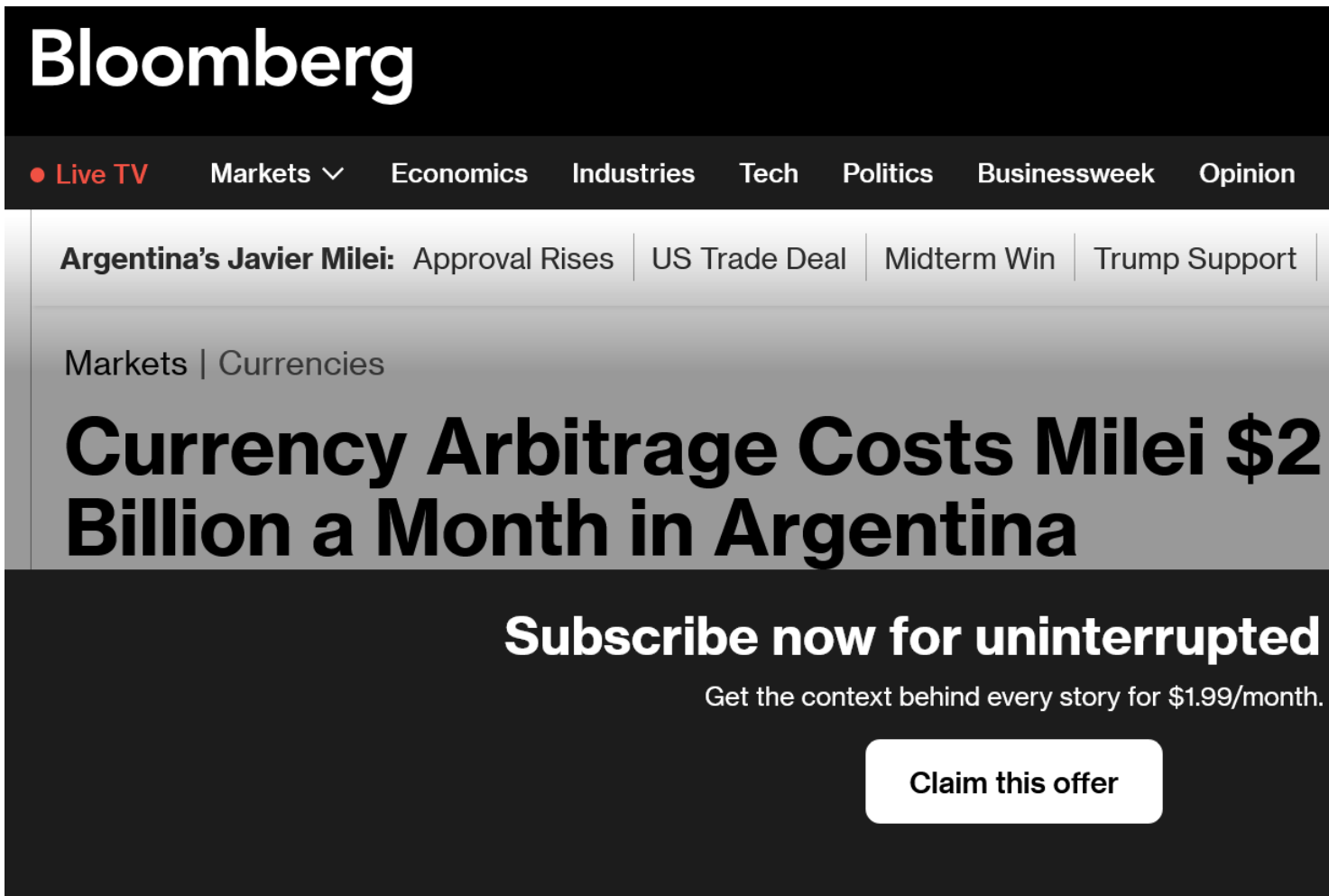
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Example 1. To stop this,
Milei artificially props up
the peso:

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



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

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

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Step 3: ???

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Step 3: ???

Step 4: Profit

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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.

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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 \times Bet = Payout (includes your stake)

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

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

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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.

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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

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

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				0.167+0.667

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				$0.167 + 0.667 < 1$

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				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:

$\frac{0.167}{0.834} = 20\%$ 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.

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Three assignments will be dropped.

This meeting (now)

Course survey (15 minutes) first, then homework questions

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

