

# Home Bias and International Betting Markets: *Can Institutional Constraints and Behavioral Biases Lead to Arbitrage Profits?*

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# Outline

- I. Introduction and Motivation**
- II. Data**
- III. Results**
- IV. Issues and Discussion**
- V. Conclusion**



# I. Introduction and Motivation

- 7-year old kids at the Amusement Park







# I. Introduction and Motivation

- Young lad in Italy – Grandma's 200,000 Lire



Note: Tennis Ball only fits in the Center Cup!





# I. Introduction and Motivation

- NFL Betting (Rosenfeld & Hausman)





# I. Introduction and Motivation

- World Cup and Germany-Mexico







# I. Introduction and Motivation

- Caribbean Gambling (Craps, Blackjack, Poker) – Card counting in Basel





# I. Introduction and Motivation

*I believe that this nation should commit itself to achieving the goal before this decade is out of landing a man on the moon and returning him safely to the earth. No single space project will be more impressive to mankind, or more important for the long-range exploration of space. And none will be so difficult or expensive to accomplish.*

--- John F Kennedy (May 25, 1961)





# I. Introduction and Motivation

- London's Organized Betting Organizations offered
- **100-1** (Ladbroke's) and **1000-1** (William-Hill) from the early 1960s until 1969.

*I suppose people born in the 1920s and 1930s could just not fathom a man-on-the-moon. The odds did not change much throughout the 1960s, despite the amazing progress NASA was making.*

**--- Paraphrase of Ron Pollard, ex-PR  
Director of Ladbroke's of phone  
conversation with LBC**



# I. Introduction and Motivation

- Other Fun Stuff:
  - Beckham and Spice (20 – 1 of not divorce)
  - Political Elections
  - MIT Bridge Club and the Blackjack Geniuses (*Bringing Down the House*)
  - Students and Texas Hold Em' (*free option that people fail to exercise*)



# I. Introduction and Motivation

- Example:
- 
- Frank Bruno (England) vs. Mike Tyson (USA) for WBC Heavyweight title.
- March 16, 1996 Las Vegas
- 
- Las Vegas Odds: 20-1 for Mike Tyson
- British Betting Organizations: 1-1
- 
- Home Bias? Arbitrage Opportunity?





# I. Introduction and Motivation

- **Idea**: Gambling houses wish to balance books and for the most part limit their exposures.
- US Gambling House: Clientele mainly US gamblers. British Gambling House: Clientele mainly British
- If gambling house balances books and gamblers favor own team either due to “loyalty bias” or “informational bias”, then odds in Britain will favor Bruno, odds in US will favor Tyson more.



# I. Introduction and Motivation

- These odds will be different from the actual objective true odds due to the biases.
- In this case, an investor could have had an account in Britain and gone to Las Vegas.
- **Question:** What's the strategy?



# I. Introduction and Motivation

- Strategy:
- Buy Bruno in Las Vegas and Sell him in England.
- For \$1000, if Bruno wins: Payoff = \$19,000 (20-1)
- For \$1000, if Bruno loses: Payoff = \$0 (1-1)
- [*Note:* Can reorganize to divide up gains.]





# I. Introduction and Motivation

- Other Reasons to expect arbitrage:
- (1) New markets with relatively inexperienced clientele.
- (2) Liquidity limitations keep away smart money.
- (3) Lots of complicated, non-traditional bets.



# I. Introduction and Motivation

- The 2000 Presidential Election
- Bush bet for popular vote (Bought REP at 61, Shorted DEM at 48)
- The evening of election day, it was clear Gore had got popular vote.
- A bright analyst, positive attitude, and turning loss into profit.



# I. Introduction and Motivation

- The 2000 Presidential Election
- Question: What happened?





# I. Introduction and Motivation

- The 2000 Presidential Election
- Professor Strumpf who studies the manipulation of these markets believes that:
  - (a) we're too kind to the limit order story – people in these markets are uninformed
  - (b) after studying the data he believes that our trades restored the market to equilibrium – we were Walras in the flesh – the arbitrageur.

<sup>12</sup>Democrat shares expired at \$1 when the market closed as scheduled three days after the election. At that time it was still possible to buy a Democrat share for \$0.969. The large price correction at 8:30AM on 11/8 was due to a single trader, who sent use copies of his official trading records.

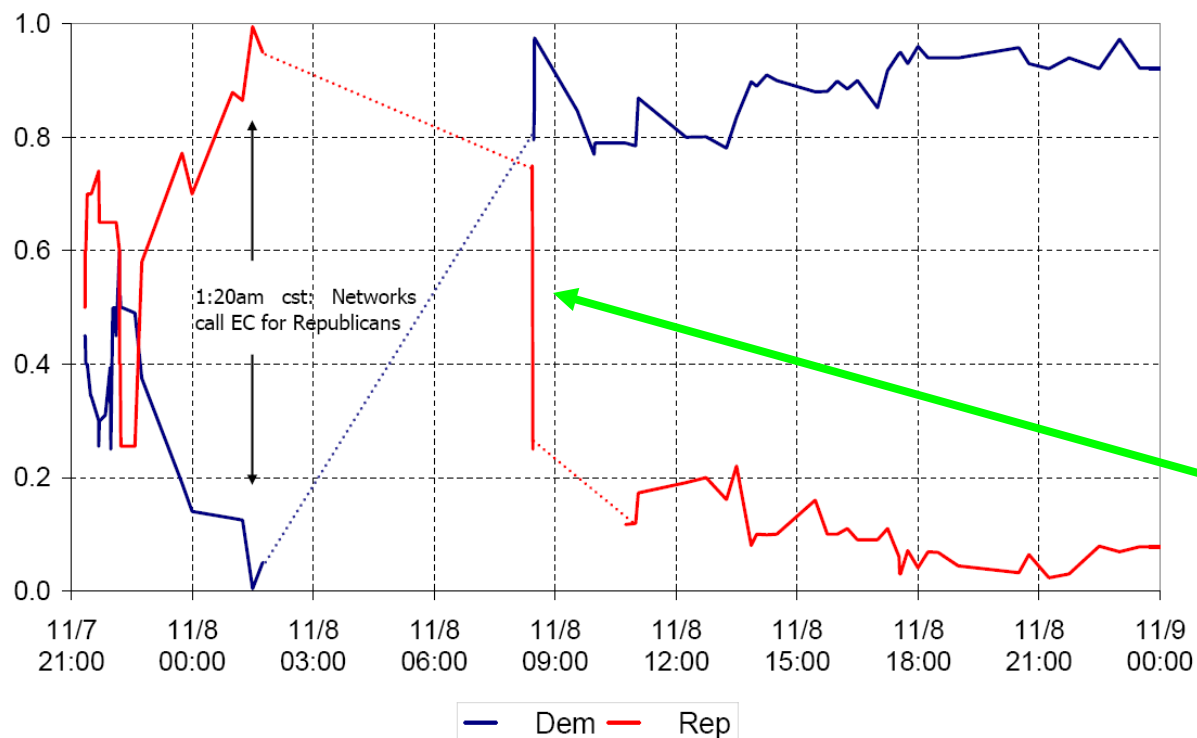


# I. Introduction and Motivation

## • The 2000 Presidential Election

Figure 1: IEM 2000 WTA Market: Day After Election (CST)

Expiration values: Dem=1, Rep=0



One  
Trader's  
Arbitrage



## II. Data

- Obtain data on odds of various matches involving nationals of different countries and determine whether there is a more general home bias and whether arbitrage profits or riskless position could be taken.
- Types of Sporting Events:
  - Boxing
  - Tennis
  - Golf
  - Soccer (Football)





## II. Data

- Key: To find betting houses whose clientele is predominantly from a particular country.
- Preliminary Online Websites:
  1. Australia: [www.acttab.com](http://www.acttab.com) [provides gambling odds for Casino Canberra and other Australian casinos on sports betting]
  2. England: [www.betfair.com](http://www.betfair.com) [many other websites in England, like [sportindex.com](http://sportindex.com), [tradesports.com](http://tradesports.com), [willhill.com](http://willhill.com), etc]



## II. Data

- Preliminary Online Websites:
  3. Denmark: [www.danskespil.dk](http://www.danskespil.dk)
  4. USA: [www.vegasinsider.com](http://www.vegasinsider.com) [provides odds for many Las Vegas casinos]
  5. Austria: [www.bwin.ag](http://www.bwin.ag) [providers of information sportradar.ag]
  6. Sweden: [www.unibet.com](http://www.unibet.com) [not clear if the clientele is Swedish, location is Malta]
  7. South Africa: [www.casasa.org](http://www.casasa.org)
  8. Netherlands: [www.ciga.an](http://www.ciga.an)



## II. Data

- Preliminary Online Websites:
  9. Switzerland: [www.swisslos.ch](http://www.swisslos.ch)
  10. Germany: [www.digibet.com](http://www.digibet.com)
  11. Various: [www.tip-ex.com](http://www.tip-ex.com) [May have data on various sites comparing the best odds]
- General Information Sites
  1. [www.igwb.com](http://www.igwb.com) [International Gaming and Wagering Business]
  2. American Gaming Association
  3. World Lottery Association





## II. Data

- Data Gathering
- It was extremely difficult to get these websites to give me their historical odds data on sporting events. I wrote numerous emails, made many phone calls.
- A couple of sites finally gave me some limited historical data.



## II. Data

- Only Data Available at this stage
- 2008 US Open Golf
- 2008 US Open Tennis
- 2008 PGA Championship
- 2008 European Cup
- Very limited and insufficient



# III. Results

- Question 1: Is there home bias in betting?
- Question 2: Can this be arbitrated?



# III. Results

- **Question 1:** Is there home bias in betting?

Method: Take odds on outright winner and determine whether odds are higher on players of the country of the betting house.





# III. Results

**Table 2: Home Bias Evidence from Various International Sporting Events**

Country	Home Payoff	Average Foreign Payoff	Difference	Nobs
<b>Golf: PGA Championship 2008</b>				
Australia	\$25,800.00	\$27,150.00	\$(1,350.00)	4
England	\$26,675.00	\$30,900.00	\$(4,225.00)	5
Ireland	\$5,000.00	\$6,037.50	\$(1,037.50)	2
Sweden	\$60,000.00	\$65,300.00	\$(5,300.00)	3
United States	\$10,512.50	\$10,911.65	\$(399.15)	32
<b>Golf: US Open 2008</b>				
Australia	\$8,416.67	\$9,213.89	\$(797.22)	6
England	\$7,900.00	\$5,991.67	\$1,908.33	5
Sweden	\$6,500.00	\$6,825.00	\$(325.00)	1
United States	\$3,713.33	\$6,229.95	\$(2,516.62)	9
<b>Tennis: US Open 2008</b>				
England	\$900.00	\$1,037.00	\$(137.00)	1
United States	\$5,700.00	\$14,233.11	\$(8,533.11)	3
Australia	\$10,100.00	\$11,364.00	\$(1,264.00)	1
<b>Football: European Cup 2008</b>				
Austria	\$336.67	\$537.50	\$(200.83)	3
Sweden	\$250.00	\$312.33	\$(62.33)	1



# III. Results

- Question 2: Is there an arbitrage?
- Cannot test with the golf and tennis outright winner.  
*Can't short players in gambling markets for this event.*
- Can only test in head-to-head matches, like Euro Cup



# III. Results

- Recent Olympic 2008 Soccer Match
- Sweden vs. Germany
- Odds at Unibet: 2 1.28 1.18
- Odds at Digibet: 6 3.80 1.53
- Clearly, a home bias. Can it be arbitrated?



# III. Results

**Strategy:** Short in home market, go long in foreign market and hedge draw possibility.

$$\text{Net Payoff} = \begin{cases} w_1 F_1 - w_1 - w_2 - w_X & \text{if Homewins,} \\ w_X \psi_X - w_1 - w_2 - w_X & \text{if Draw,} \\ w_2 H_2 - w_1 - w_2 - w_X & \text{if Foreignwins.} \end{cases}$$

an arbitrage opportunity. That is, a combination of weights such that the product of the three outcomes is maximized and there is no loss in any outcome of the football match.<sup>8</sup> In addition to this, we must constrain all weights to be positive, since these are all bets for one of the events to occur. Thus,  $w_i \geq 0 \quad \forall i$ .





# III. Results

- **Bottom Line:** An arbitrage position cannot be created with these odds.



## IV. Issues and Discussion

- One or two examples not enough.
- Need to retrieve more data, but difficult without cooperation of gambling houses.



# IV. Issues and Discussion

## Type of Data

- Historical odds on variety of sporting events where nationality of contestants can be uniquely determined (at least 10 years of data)
- Information on the dollars bet at various houses and percentage of clientele from that particular country
- Volume information. Some of these markets may not allow arbitrage on a large scale due to limits on liquidity



# IV. Issues and Discussion

## Type of Data

- More details on the commission structure (if any) at various gambling houses
- More understanding on the ability to sign up for accounts and transact at these different venues
- Acquiring more websites, more companies in more countries





# V. Conclusion

- Home Bias in sports betting markets seems to be present in a very small sample of data
- Arbitrage possibilities might be possible, although in our small sample there were no obvious candidates
- Need to gather more data and examine these possibilities in greater detail (*research requires perseverance*)
- There is a paper here for those who are eager.



# V. Conclusion

**Questions?**

**Questions?**  
**Comments?**