

## Notes from Lecture 1

Today's discussion was wide-ranging on the concept of arbitrage. It's going to be a fun semester. See some notes and links below for your general interest (some of which we will delve deeper into later).

Most lectures following will be much more focused, but if you at all you'll be able to get me off track!

### Arbitrage

- Wikipedia on arbitrage
- An example of Kirznerian Arbitrage
- Two intellectual giants discuss arbitrage and complexity

### Morality & Arbitrage

- My own humble take: <https://broughtj.github.io/Morality-of-Arbitrage/morality-slides.html#1>
- Richard Swinburne tries to use arbitrage (in the form of a Dutch book) to prove the existence of God
- Colin Howson tries to use arbitrage to prove the non-existence of God
- Q: what is the arbitrage? They can't both be right, can they?!
- Stephen Unwin calculates the probability of God to be precisely 78%!
- C.S. Lewis had a lot to say about morality (does what he writes/says have anything to do with arbitrage?)
  - [https://www.amazon.com/Mere-Christianity-C-S-Lewis/dp/0060652926/ref=sr\\_1\\_2?ie=UTF8&qid=2&keywords=mere+christianity](https://www.amazon.com/Mere-Christianity-C-S-Lewis/dp/0060652926/ref=sr_1_2?ie=UTF8&qid=2&keywords=mere+christianity) (see chapters 1 - 5 in particular)
  - <https://youtu.be/tX5e6eSkaMc>
  - <https://youtu.be/Lgcd6jvsCFs>
  - He even had some thoughts about economics and political economy
- Folks at The Rolling Stone think that capitalism and arbitrage are a great vampire squid

### Information Systems

- According to Hayek markets are in fact information systems!
- What does Hayek have to do with Management of Information Systems anyway?
- Utah's Overstock CEO Patrick Byrne is an Austrian Businessman

Marketing is about arbitrage and market microstructure? Wha?!

- [https://en.wikipedia.org/wiki/Ad\\_exchange](https://en.wikipedia.org/wiki/Ad_exchange)
- <http://digiday.com/platforms/what-is-an-ad-exchange/>
- Is Google just a stock exchange for advertisements? Wha?!  
<https://www.doubleclickbygoogle.com/solutions/revenue-management/ad-exchange/>
- Can we apply market microstructure research to trading in ads?  
<https://pdfs.semanticscholar.org/a9ff/c6f690c0159ac3266b4386ec9cbdfa6f2f9a.pdf>
- <http://wnzhang.net/share/rtb-papers/yield-opt-adx.pdf>

Is Computer Science about arbitrage too?

Come on, Brough? Is the internet really all just about arbitrage?! Anybody want to do a Plan B on the subject to find out?

### **Mathematics and its effectiveness**

- Mathematics is deeply mysterious. When I saw that these three seemingly disparate parameters - each totally weird in their own right - had such crazy deep connections to each other my mind exploded!
- The Unreasonable Effectiveness of Mathematics in the Natural Sciences:
  - <https://youtu.be/ZBkzqLJPkmM>
  - [https://youtu.be/ESyqh1M\\_kf0](https://youtu.be/ESyqh1M_kf0)
  - <https://youtu.be/NlZYxvcJapA>
- Hayek on the Pretense of Knowledge
- Hayek on Complexity

### **Machine Learning, Software, Signals Processing, etc**

- Statistical natural language processing can detect from writing samples the writer's gender
- Nvidia has made a highly specialized computer together with powerful software that can drive cars autonomously
- Otto is an artificially intelligent truck that goes on beer runs.

Want a job in options trading? Learn some machine learning (and some programming!):

- At Jump Trading
- At Optiver
- At lots of places! Just type in “machine learning” and see for yourself!

Others

- Amazon is hiring quants & economists

- So does Facebook
- Google has a Chief Economist. Why?! I thought they were a tech company!
- What's an FPGA, and how is it used for trading?
- See page 11: <https://engineering.wustl.edu/our-school/leadership/offices/marketing-communications/magazine/Documents/Engineering%20Momentum%20Spring%202008.pdf>
- Why would Amazon put them on their AWS Cloud?

### **Names you heard today**

- Friedrich Hayek
- James Buchanan See his paper that I mentioned
- Israel Kirzner
- Robert Nau
- Bruno de Finetti
- Thomas Bayes
- Fischer Black and his revolutionary idea