

# Brain Teaser

- With a 7-minute hourglass and an 11-minute hourglass, can you explain the quickest way to time a boiling egg for 15 minutes? How many times will you have to turn hourglasses? What would be the minimal required number of glass turns?
- Feel free to work with your friends

# Current Events

- Global Negative Bond Yields
  - Henkel and Sanofi
- The Federal Reserve & Interest Rates
  - September? December?
- New Tech Products
  - Apple (iOS 10, iPhone 7, Headphones)
  - Samsung (Galaxy Note 7)





Welcome to the  
**Quantitative Finance Club**

September 13, 2016



# Agenda

- I. Mission
- II. What is Quantitative Finance?
- III. Historical Context
- IV. Quant Career Paths
- V. Meeting Structure
- VI. Industry Speakers
- VII. Topics
- VIII. Optional Reading
- IX. Questions
- X. Speed Networking Session

# Mission Statement

We aim to expose Rutgers students to the field of Quantitative Finance through collaborative projects, workshops, and panels with financial professionals. Through these events and projects we hope to increase the number of Rutgers Quants on Wall Street.

# What is Quantitative Finance?

*The Rocket Scientists of Wall Street!*

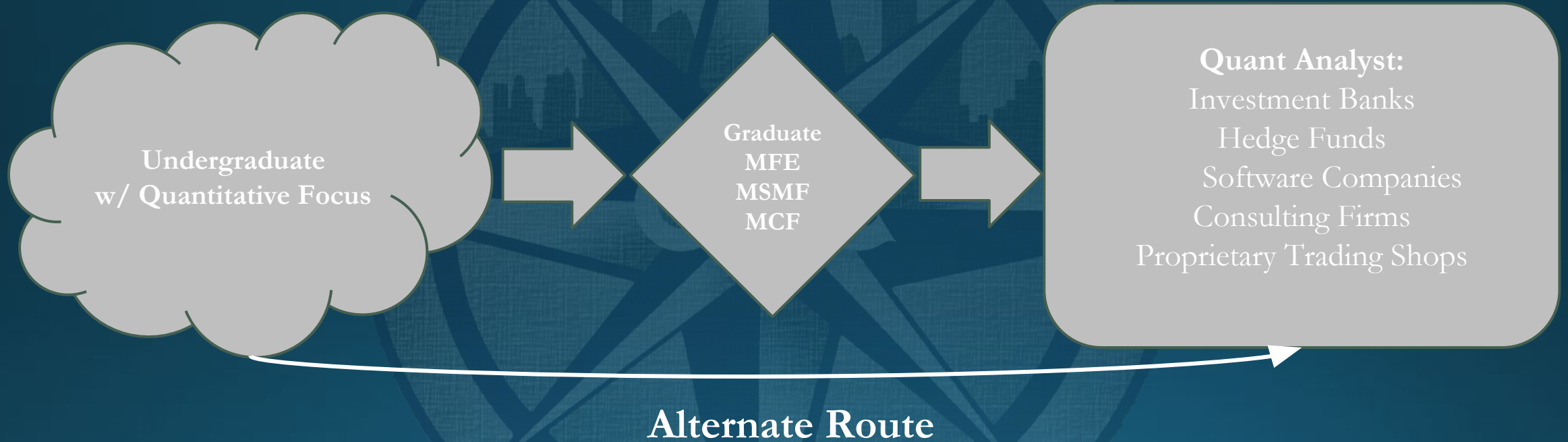
- Quantitative Finance is a field at the intersection of Finance, Computer Science, Mathematics, and Engineering
- Quants use mathematical models to price securities, reduce risk, and generate profit
- Examples of Quant Models
  - Using NLP to model the sentiment of articles
  - Using statistics to model expected value of a security
  - Using past returns to predict future stock trends

# Historical Context



- The Quant Revolution 60 years ago
  - Academic finance (i.e. applications of stochastic calculus and probability theory)
  - Visionaries such as Black, Scholes, Sharpe, and Markowitz
- Rise linked to technology advancements in the past 20 years
  - Rapid Innovation
  - Sophisticated Algorithms

# Quant Career Paths





# Quant Career Paths



## Career Paths:

- Quantitative Trader
- Modeling Quant
- Research Quant
- Quant Developer

# Meeting Structure



- Biweekly Meetings:

- Time: **Tuesday @ 9:45**
- Location: **Tillet Computer Labs (106 J1-J2)**

I. Quant Brain Teaser / Interview Question

II. Overview of Meeting

III. 1 Minute Current Events Overview

IV. Collaborative Workshop

# Industry Speakers



- Learn about different areas of Quantitative Finance
- Network with industry professionals
- Tap into a myriad of internship and full-time recruiting opportunities

# Topics

- Professionalism
- Financial Basics and Financial Instruments
- Programming
- Technical Trading Strategies (Algorithmic Trading)
  - Statistical Arbitrage
  - High Frequency Trading

```
FANG.py *
1 #####Jim Cramer's FANG Strategy
2 #####Implemented By Jon Joh
3 #####Rutgers QFC Spring 2016
4
5 def initialize(context):
6
7     #####Portfolio of Facebook, Amazon, Netflix, and Alphabet (GOOG) (FANG)
8     context.myPortfolio = [sid(42950), sid(16841), sid(23709), sid(46631)]
9     context.weight = 0.95/len(context.myPortfolio)
10
11 def handle_data(context, data):
12
13     for security in context.myPortfolio:
14         order_target_percent(security, context.weight)
```



# Professionalism

- Learn how to professionally present yourself through body language and appearance
- Gain the “soft” *interviewing skills* for Quant Finance interviews
- Refine your behavioral responses and techniques through our workshops
- Ascertain the *technical knowledge* interviewers expect
- Practice frequent brain teasers

# Financial Basics



- Develop business intuition to serve as a foundation for the rest of your career in Financial Services
- Learn Quantitative Finance from ...
  - Distinguished Rutgers *Professors & Alumni*
  - Current *Case Studies*
  - *Market* News & Examples

# Securities



- There are 3 main types of financial instruments
  - Debt Securities (ex. bonds)
  - Equity Securities (ex. stocks)
  - Derivatives (ex. options & futures)
- Alpha & Beta
- Technical & Fundamental Analysis

# Programming

- Learn fundamental programming concepts for the quantitative profession
  - Program basic *financial equations and models*
  - ***Back-test*** models against historical data to gauge PnL
  - Understand the basic applications of *scraping*
- Acquire and productively use the technical knowledge required for a quantitative role



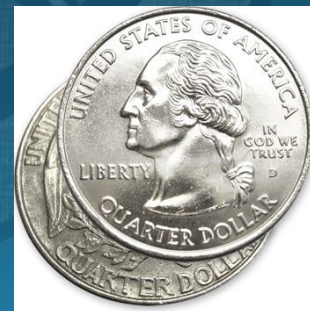
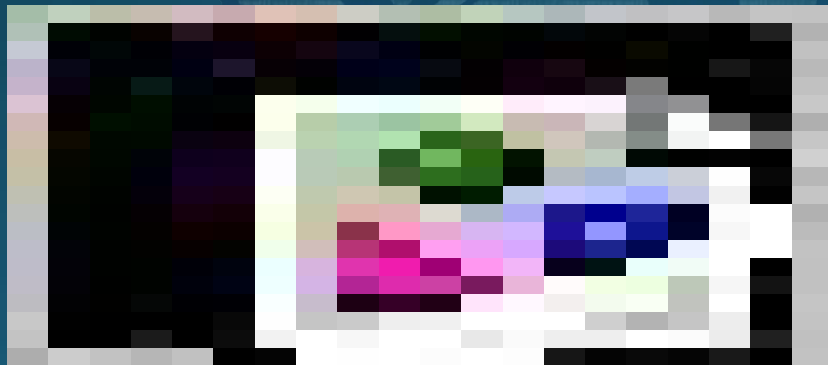


# Technical Trading Strategies

- Technical trading strategies apply your analytical skill set to trading
- We will expose you to many trading strategies including
  - *Statistical Arbitrage*
  - *High Frequency Trading*

# Statistical Arbitrage

- Statistical Arbitrage occurs when the expected value  $E(x)$  differs from the market value  $M(x)$ 
  - A trader can make profit on the difference between  $E(x)$  and  $M(x)$
  - Trading Examples: Pairs Trading, Mean Reversion, Momentum
  - Quick Example: Coin flip, +\$1 Heads / -\$0.50 Tails. What is the expected value?



# High Frequency Trading



- All portfolio-allocation decisions are made by computerized quantitative models
- characterized by high speeds, high turnover rates, high order-to-trade ratios, and short holding periods

# Optional Reading

- Algorithmic Trading: Winning Strategies and Their Rational - Ernie Chan
- Modelling Financial Time Series - Stephen J. Taylor
- Options Futures and Other Derivatives - John C. Hull
- My Life as a Quant: Reflections on Physics and Finance-Emanuel Derman
- Quant Job Interview Questions and Answers - Mark Joshi
- Cracking the Coding Interview - Gayle Laakmann McDowell



Thank you



# Questions, Comments, and Concerns



**Next Meeting**  
**Tuesday (9/27): 9:30pm**