

# A Preview of FM 5990

Pritam Dalal

# Motivation

- ▶ **Data analysis** is a **crucial skill** for quantitative professionals.
- ▶ *Quants* are being replaced by *Data Scientists*.
- ▶ MFM graduates are increasingly working in data analysis roles.
- ▶ This course is the MFM's response to the changing professional landscape.
- ▶ It is an **introductory treatment** of **R** and **Python** for data analysis in the context of **quantitative finance**.

# Course Specifics & Philosophy

- ▶ Tuesdays from 5:30p-7:10p in Vincent 364.
- ▶ 2 credits pass/fail - let's focus on learning not grades.
- ▶ Learning data science on toy data sucks.
- ▶ Learning data science on cool data is awesome.
- ▶ **Theorem:** awesome  $>$  sucks. **Proof:** Exercise.
- ▶ **Corollary:** All in-class examples, projects, and assignments are going to involve real world financial data.
- ▶ A big **THANKS** to our industry data partners.

# Industry Data Partners

[www.wolve.com](http://www.wolve.com)



[www.historicaloptiondata.com](http://www.historicaloptiondata.com)



[www.qandl.com](http://www.qandl.com)



# Wolverine Analysis Project (1 of 3)

- ▶ Wolverine Trading is a option market maker. **What???**
- ▶ Let's say you wanted to trade a particular option, and that Wolverine is a market-maker for that option.
- ▶ This means that you can call up Wolverine and ask them what their *market* is for that option. (Note: you haven't told them if you want to buy or sell.)
- ▶ **Wolverine's Market:** A price at which they would sell the option *-and simultaneously-* a price at which they would buy the option.
- ▶ The price at which they are willing to buy is their **bid price**.
- ▶ The price at which they are willing to sell is their **ask price**.
  - ▶ Question: Which is higher the bid or the ask?

## Wolverine Analysis Project (2 of 3)

- ▶ On any given day, Wolverine is a market maker for literally hundreds of thousands of options.
- ▶ The way they make money is by buying and selling lots of different options, with their bids being lower than their asks.
- ▶ All the while, they hope they don't accumulate large positions in any one option or underlying (AAPL, FB, GOOG).
- ▶ If they do accumulate positions, which is inevitable in their business, they hope that the underlying stock doesn't move too much, as this could result in significant losses.

# Wolverine Analysis Project (3 of 3)

- ▶ Companies whose stock can be owned by anyone (AAPL, FB, GOOG) are highly regulated.
- ▶ They are required to publicly report their profitability once per quarter. This is called their *quarterly earnings report*.
- ▶ What do you think happens to the companies stock price around the time of their earnings report?
- ▶ This is a time of **high risk** for option market-makers.
- ▶ Wolverine has tasked us with analyzing the price movement of stocks in the days following their earnings reports.
- ▶ **How:** We will use the data that Wolverine has provided. We will also repeat the analysis using the Delta Neutral data and make sure they lead to similar conclusions.