Georgia Institute of Technology

Computational Investing, Part I

021: So you want to be a portfolio manager?

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Find out how modern electronic markets work, why stock prices change in the ways they do, and how computation can help our understanding of them. Learn to build algorithms and visualizations to inform investing practice.

School of Interactive Computing

Objectives:

- Understand course viewpoint: Portfolio Manger.
- Understand portfolio manager incentives.
- Understand two main types of funds.
- Understand benchmarks.

Viewpoint

- I assume you want to be a portfolio manager.

Portfolio Manager / Hedge Fund Incentives

- Expense ratio
  - Used by mutual funds & ETFs.
  - Usually less than 1%.
- “Two and twenty”
  - Classic structure for hedge funds.
  - $1M with 20% / year = $60K/year.
- How/why different?

How to Attract Investors?

Know your audience:

- Individuals
- Institutions:
  - Harvard Foundation
  - CalPERS
- Funds of Funds

How to Attract Investors?

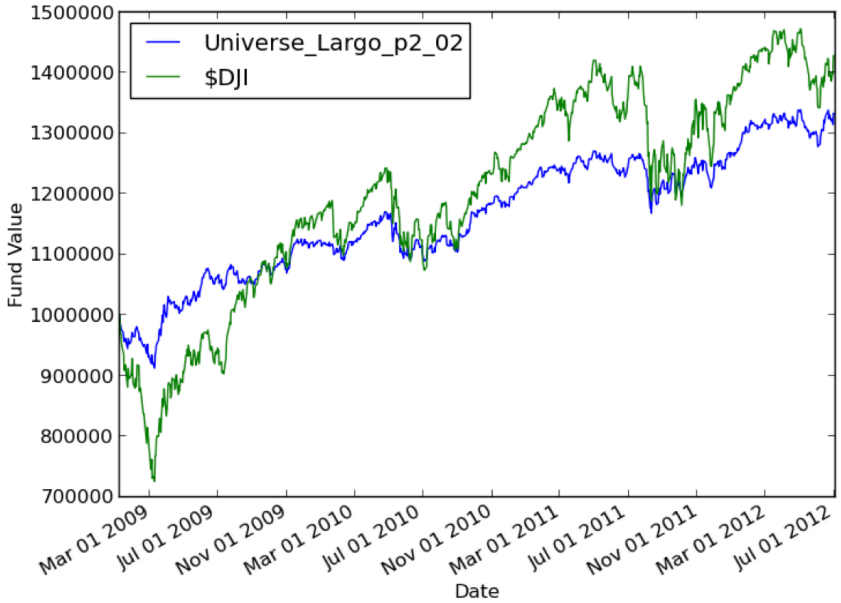
- Must have track record, or
- Very compelling story and back test.
- Fit in a “pigeon hole?”

- What do investors want to see?

Two Main Types of Fund Goals

- Reference to a benchmark (pigeon hole).
- Absolute return.

Example: Compare with Benchmark

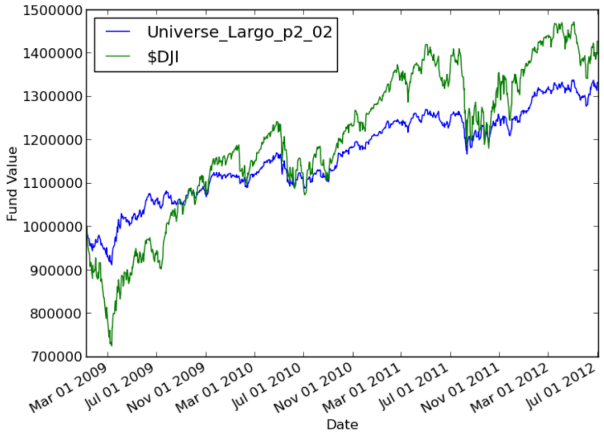


Thanks Lucena Researcn

What are Investors Looking For?

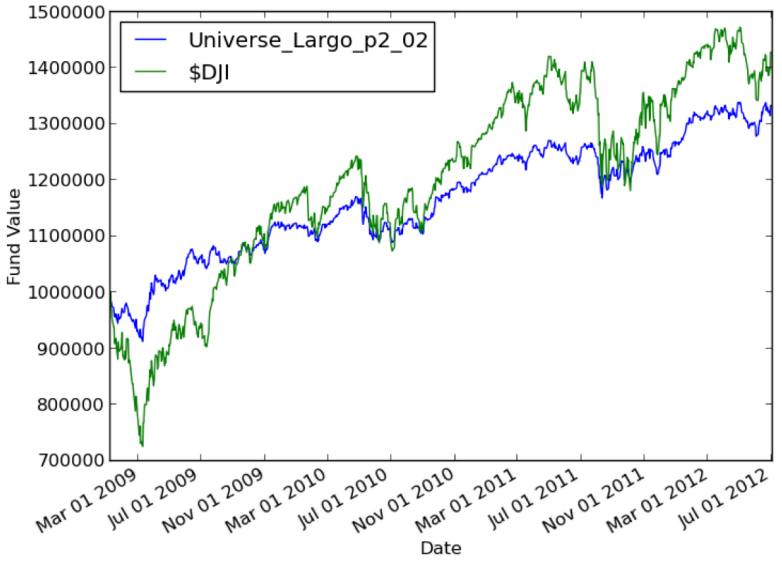
Common Metrics

- Annual return.
- Risk: Standard deviation of return.
- Risk: Draw down.
- Reward/Risk: Sharpe Ratio.
- Reward/Risk: Sortino Ratio.
- Jensen's Alpha.



Example

	Return	Sharpe	STDEV	D-down	Corr
Fund	33%	.94	0.58%	-8.67%	0.89
$DJI	43%	.63	1.23%	-27.38%	1.00



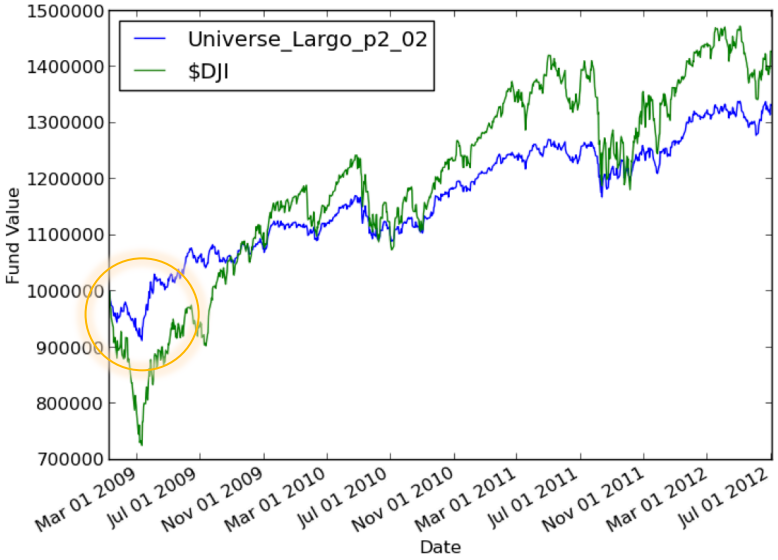
Annual Return

- metric = (value[end]/value[start]) – 1
- Example: $100 to $110:
  - (110/100) – 1 = 0.10 = 10%

Standard Deviation of Daily Return

- daily_rets[i] = (value[i]/value[i-1]) – 1
- std_metric = stdev(daily_rets)

Max Draw Down



Sharpe Ratio

$$S = \frac{E[R - R_f]}{\sigma} = \frac{E[R - R_f]}{\sqrt{\mathrm{var}[R - R_f]}},$$

- metric = (average(daily_rets)/ stdev(daily_rets)) * sqrt(250)

Homework 1

- Find online broker to “paper trade.”
- Invest $1M in 4 equities.
- Assess your portfolio for 2011:
  - Annual return
  - Average daily return
  - Stdev of daily return
  - Sharpe Ratio
- Compare with benchmark: SPY
- Submit
  - .pdf printout of your spreadsheet.
  - Screenshot of your portfolio online.

Demo Using Excel