Mgmt 237M2 **Statistical Arbitrage**

Lecture 06: More Alphas

Professor Olivier Ledoit

University of California Los Angeles
Anderson School of Management
Master of Financial Engineering
Fall 2016

Wall Street Job Interview Question

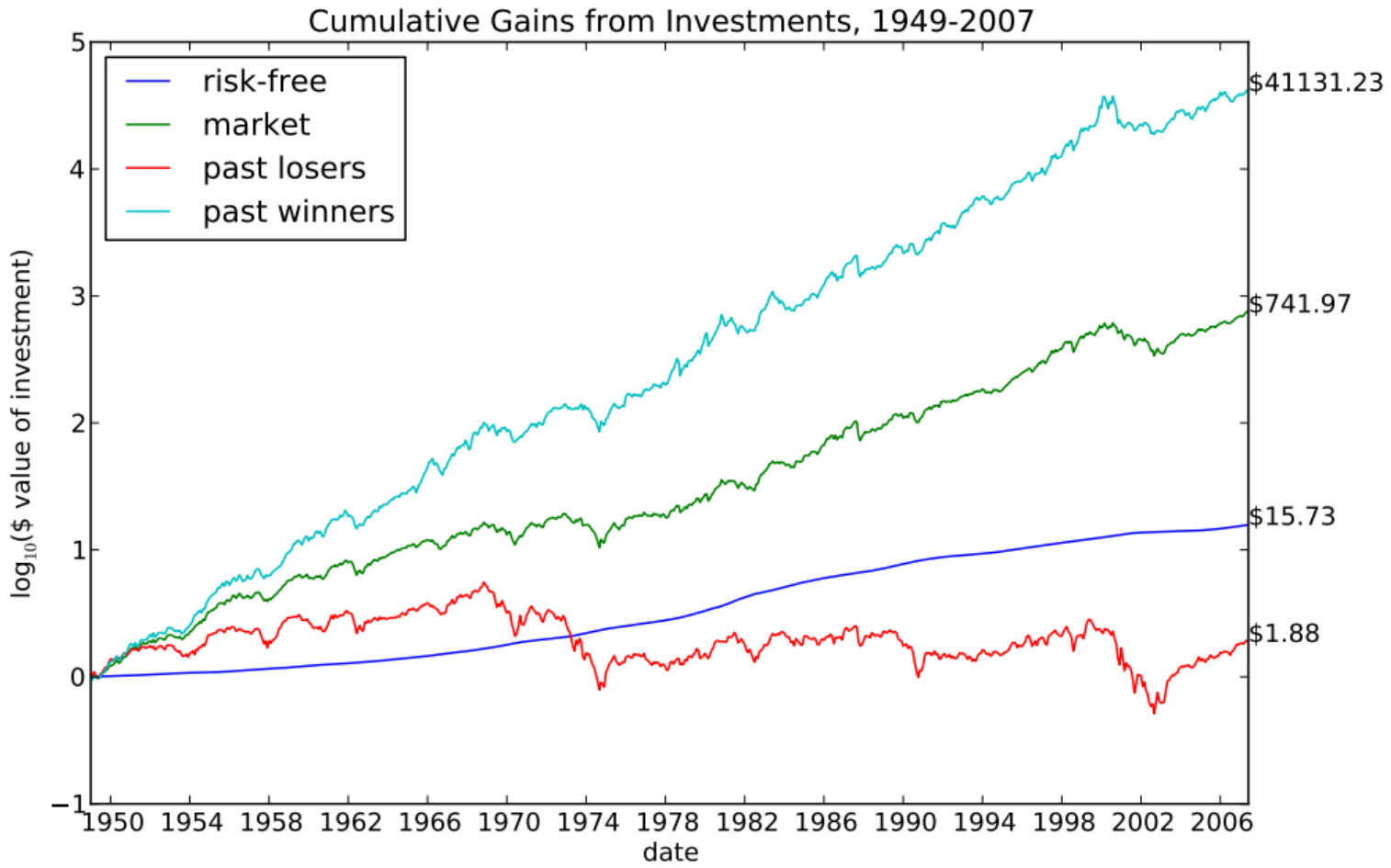
- There are 3 doors. Prize behind one door and nothing behind other two. You get prize if you choose the right door.
- Initially you chose Door 3. But your host keeps Door 3 closed for now, and opens Door 2 to reveal that it is empty.
- You get a chance to switch your choice from Door 3 to Door 1. Should you do it?

Follow-up on Momentum

- Returns to momentum strategies experience infrequent but strong and persistent strings of losses
- These momentum "crashes" are forecastable: they occur:
  - following market declines
  - when market volatility is high
  - and contemporaneous with market "rebounds"

Momentum Crashes - Daniel (2011)

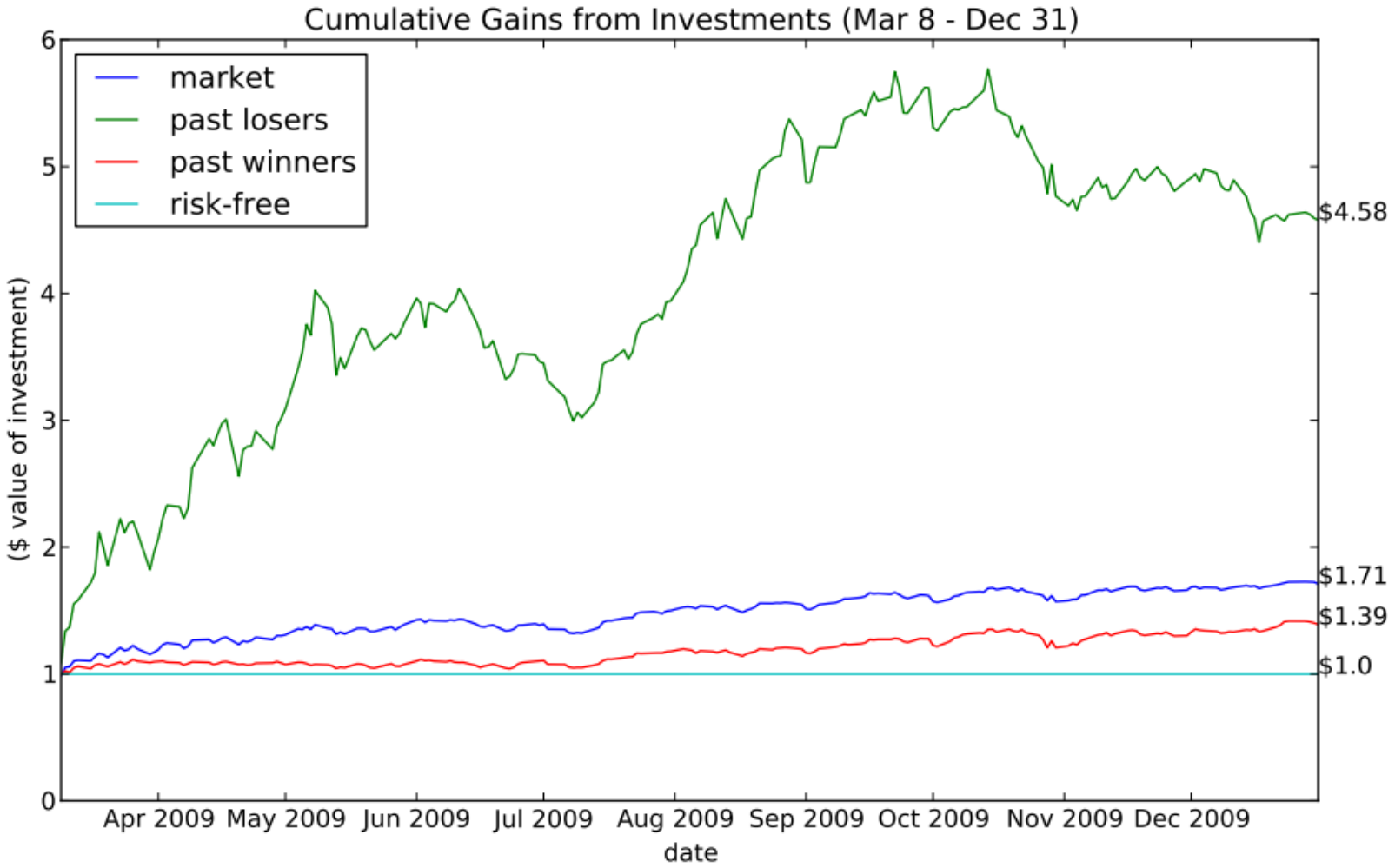
Figure 2: Momentum Components, 1949-2007



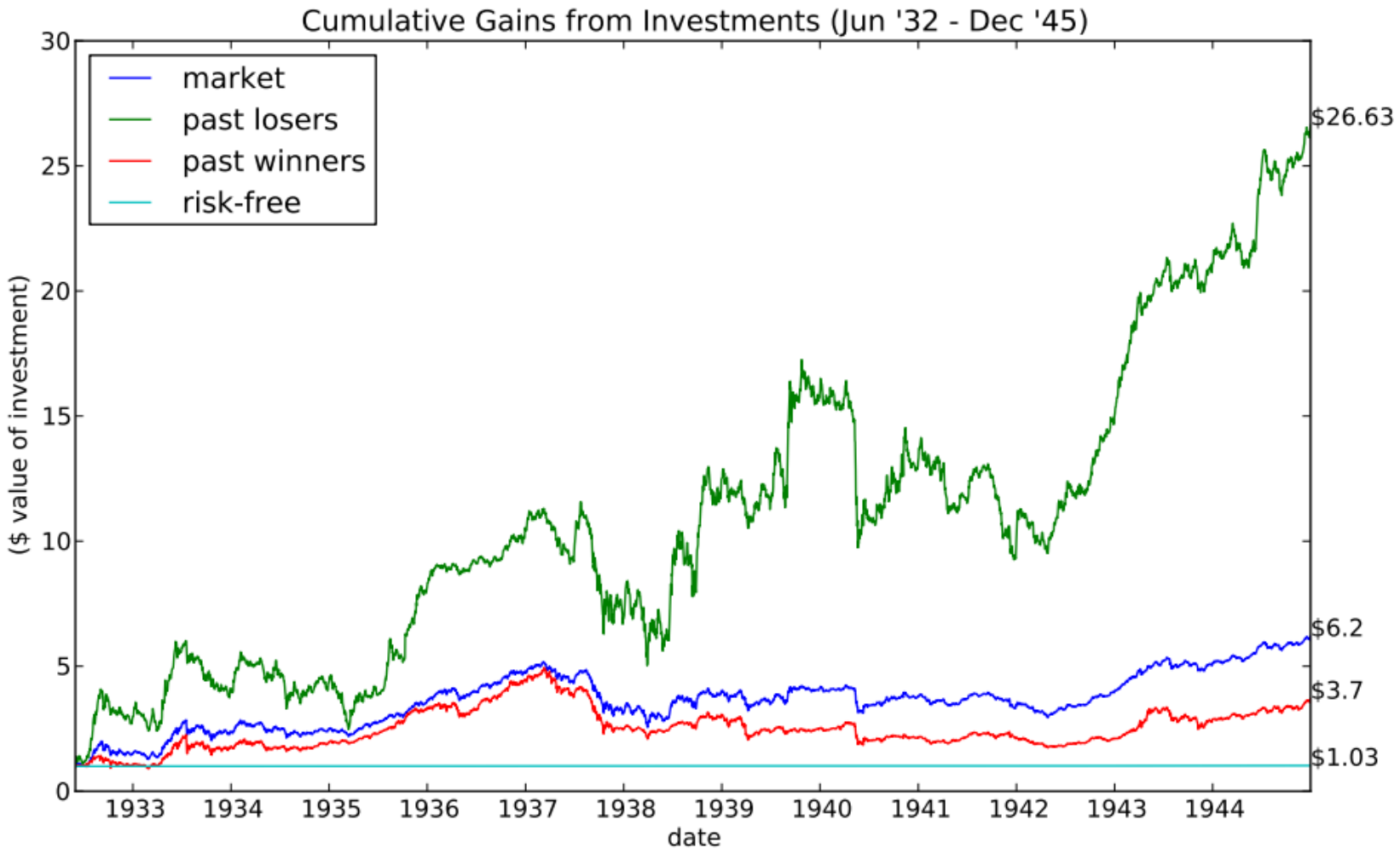
Worst Monthly Momentum Returns

Rank	Month	WML_t	Mkt-2y	Mkt_t
1	1932-08	-0.7896	-0.6767	0.3660
2	1932-07	-0.6011	-0.7487	0.3375
3	2009-04	-0.4599	-0.4136	0.1106
4	1939-09	-0.4394	-0.2140	0.1596
5	1933-04	-0.4233	-0.5904	0.3837
6	2001-01	-0.4218	0.1139	0.0395
7	2009-03	-0.3962	-0.4539	0.0877
8	1938-06	-0.3314	-0.2744	0.2361
9	1931-06	-0.3009	-0.4775	0.1380
10	1933-05	-0.2839	-0.3714	0.2119
11	2009-08	-0.2484	-0.2719	0.0319

2009 Momentum Performance



Momentum in the Great Depression



Explanation

- Poor performance due to short side:
  the short side of the portfolio (the losers) are crashing up rather than down.
- Loser portfolio optionality:
  loser up-market beta >> loser down-market beta
  ???

- *Dangerous to be short losers after bear market when volatility is high... because they might rebound!*

Haugen & Baker (2010) Case Closed

Most important factors for predicting the cross-section of US stock returns:

1) Residual Return = last month's residual stock return unexplained by the market
2) Cash Flow-to-Price = 12-month trailing cash flow-per-share divided by current price
3) Earnings-to-Price = 12-month trailing earnings-per-share divided by current price

Factors 4-6

4) Return On Assets = 12-month trailing total income divided by most recently reported total assets
5) Residual Risk = 24-month trailing variance of residual stock return unexplained by market return
6) 12-month Return = total return for the stock over trailing twelve months

Factors 7-9

7) Return on Equity = 12-month trailing earnings-per-share divided by most recently reported book value-per-share
8) Variance = 24-month trailing variance of total stock return
9) Book-to-Price = most recently reported book value of equity divided by current market price

Factors 10-12

10) Profit Margin = 12-month trailing earnings before interest divided by 12-month trailing sales
11) 3-month Return = total return for the stock over trailing 3 months
12) Sales-to-Price = 12-month trailing sales-per-share divided by market price

Lessons

- Value, momentum, reversion: we knew
- Some accounting performance ratios:
  - Return on Book Value of Total Assets
  - Return on Book Value of Equity
  - Profit Margin: Earnings divided by Sales
- Low residual risk, low variance: Haugen & Baker's contribution
- Missing: analyst revisions, earnings announcements

Required Reading for Next Class

- Portfolio Optimization with Transaction Costs, by Clark and Mulready (2007)

- It is 69 pages long, so pick a section that seems important and read it carefully