Class 1: Course Overview and Institutions

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Yale SCHOOL OF MANAGEMENT

The goals of this class

1. Understand important financial institutions and markets
2. Provide a toolkit for creating portfolios of financial assets
3. Use **asset pricing models** to trade-off between risk and return
4. Apply these models to:
   - evaluate portfolio performance
   - identify investment opportunities

Who am I?

- Former research economist at the Federal Reserve Bank of New York (2015-2018)
- PhD in economics at Harvard from 2009-2015
- Main research focus:
  1. Consumer finance – bankruptcy, mortgages, housing
  2. Applied statistics – machine learning and other methods

Part 1: Institutional details + setting the stage

What we'll learn:

- Who are the buyers and issuers of financial instruments?
- Define assets + securities classes
- How are financial assets traded?
- How have these financial assets performed historically?
  - Strong focus on statistical properties and **data**

Questions to consider:

- Why do people + institutions trade assets?
- Why do investments make money?
- What is the goal of investments?

Part 2: Portfolio tools

What we'll learn

- How do we interpret observed returns?
  - Build to a model of returns
- Three ingredients necessary for our models:
  1. Defining risk appetite/aversion
  2. Understanding mean-variance trade-off
  3. Allocating between risky and safe investments
- Use models to construct a portfolio of risky investments
  - **Capital Asset Pricing Model** (CAPM)
  - **Arbitrage Pricing Theory** (APT) / Factor Models

Questions to consider:

- What is the goal of an investment portfolio?
- What is risk? How do I quantify it?
- What simplifications am I willing to assume?

Part 3: Critical evaluation of the tools

What we'll learn

- How consistent is CAPM + APT with the data?
  - Markets are efficient? Or is it behavioral?
- How should we use the models when there are market anomalies?
  - Active portfolio management
  - Treynor-Black / Black-Litterman
  - Robust Portfolio Management

Questions to consider:

- Are my portfolio decisions intuitive?
- What am I missing?

Part 4: Evaluate and attribute portfolio returns

- CAPM / APT describe returns from a **passive** strategy (no skill required)
- How should we evaluate active managers?
  - **Portfolio evaluation techniques** answers:

    "Did they beat your benchmark?"
  - **Performance attribution** answers the question,

    "**How** did they beat your benchmark?"

Part 5: Applications and alternative forms of investing

What are other investment settings?

- Private equity and hedge funds
- International investing
- Fixed income (bonds)
- Derivatives (options, forwards, futures)

Key focus:

- What changes when you shift markets?

Class requirements

- Quizzes at beginning of each class
  - 5-10 minutes, no notes, multiple choice
- Two problem sets as homework:
  - Due February 14 and April 2
  - **To be done individually**
- One case write-up:
  - Yale University Investments Office (Due in class April 14)
  - **To be done in groups 3-5**
- Exams:
  - Final exam, no midterm

TA: Antoine Cauzot

Quizzes

- Quiz will be open no more than 10 minutes (usually 5-7)
  - So be punctual!
- Quizzes (40%) + participation (10%) are 50% of grade!
- Cumulative on material in the class + Matt Levine readings

Today's open question:

If the average mutual fund manager can't beat the market, why do they manage 40 trillion?

Goals:

1. Identify the major institutional investors in financial markets
2. Explain mutual fund fee structures and how they affect investor returns
3. Evaluate evidence on mutual fund performance relative to benchmarks

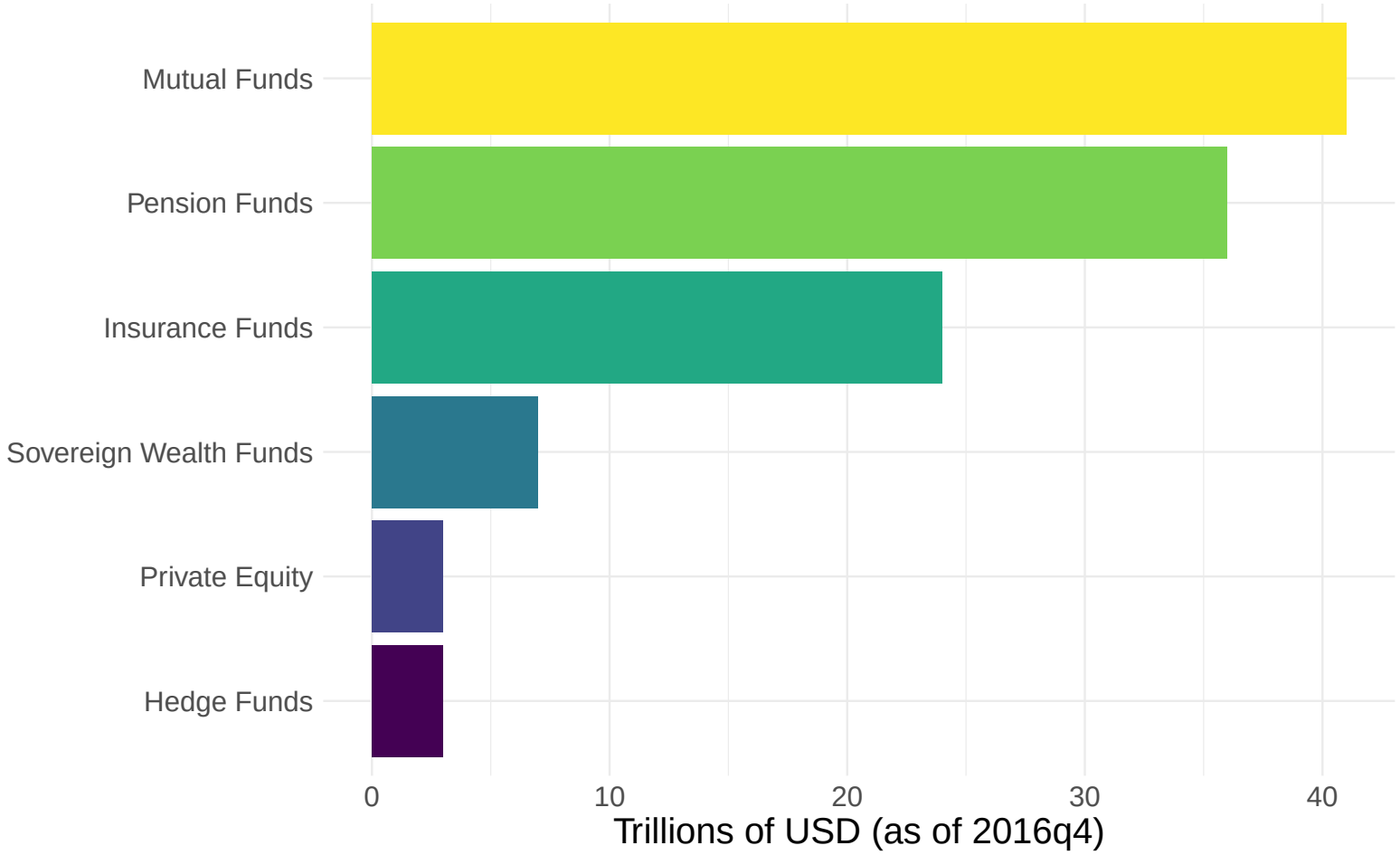
Know thy enemy and know yourself; in a hundred battles, you will never be defeated. When you are ignorant of the enemy but know yourself, your chances of winning or losing are equal. If ignorant both of your enemy and of yourself, you are sure to be defeated in every battle.

— Sun Tzu

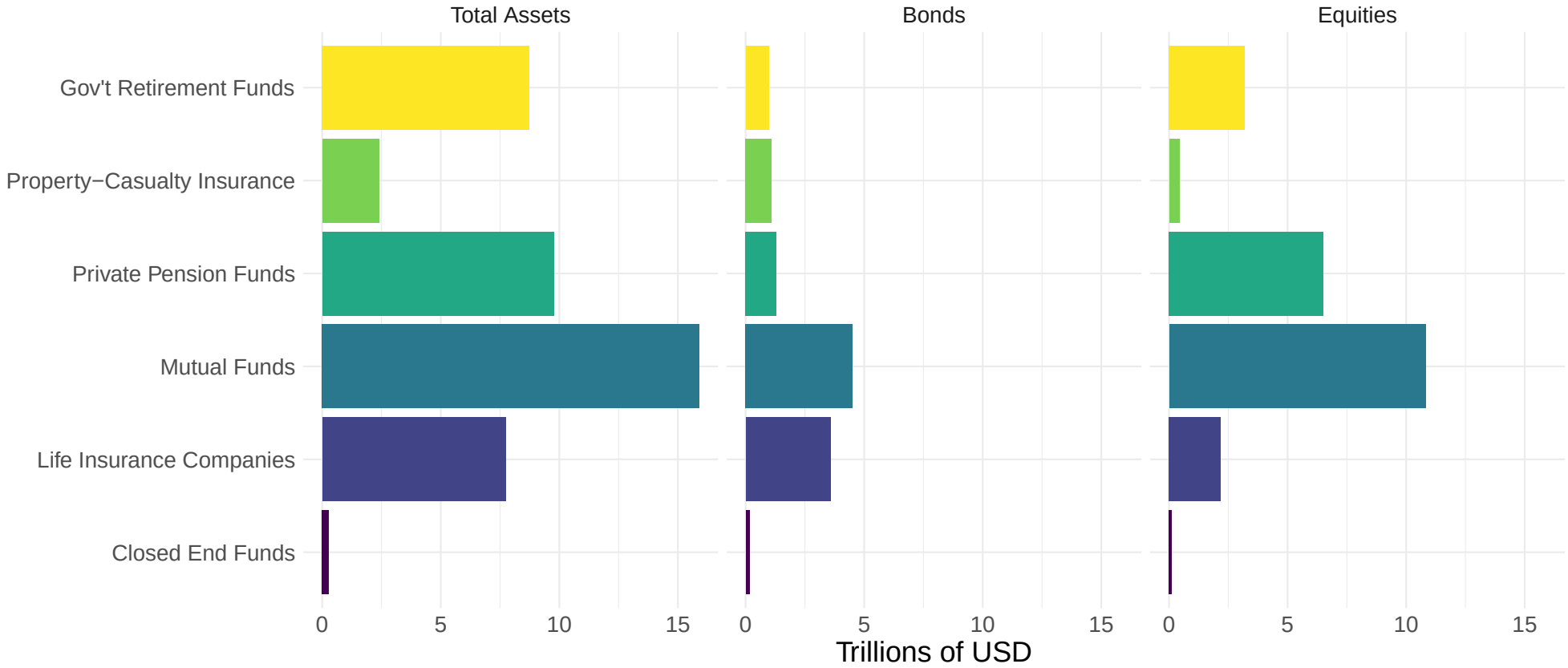
Underwstand the marketplace

1. Who are the participants in the equity market?
   - Overall estimated level AuM (globally) as of 2022: 115+ trillion dollars (more than global GDP).
   - What institutions hold most assets under management (AUM)?
2. What incentives do they have?

Global assets under management



U.S. Institutional Holdings



- Also known as open-end funds
  - Investors pool and benefit from sharing information collection and back-office costs
- Fund issues new shares when investors buy in and redeems shares when investors cash out
- Priced at Net Asset Value (NAV):

$$\frac{\text{Market Value of Assets} - \text{Liabilities}}{\text{Shares Outstanding}}$$

Mutual Funds Fees

- Fee Structure: Four types
  1. Operating expenses (recurring)
  2. 12 b-1 charge (recurring)
  3. Front-end load (one time)
  4. Back-end load (one time)
- Fees must be disclosed in the prospectus
- Share classes with different fee combinations

Example of fees for various classes of mutual funds

Shareholder fees
(fees paid directly from your investment)

	Share classes				
	A and 529-A	B and 529-B	C and 529-C	529-E	F-1, F-2 and 529-F-1
Maximum sales charge (load) imposed on purchases (as a percentage of offering price)	5.75%	none	none	none	none
Maximum deferred sales charge (load) (as a percentage of the amount redeemed)	none	5.00%	1.00%	none	none
Maximum sales charge (load) imposed on reinvested dividends	none	none	none	none	none
Redemption or exchange fees	none	none	none	none	none
Maximum annual account fee (529 share classes only)	$10	$10	$10	$10	$10

Annual fund operating expenses
(expenses that you pay each year as a percentage of the value of your investment)

	Share classes				
	A	B	C	F-1	F-2
Management fees	0.24%	0.24%	0.24%	0.24%	0.24%
Distribution and/or service (12b-1) fees	0.24	1.00	1.00	0.24	none
Other expenses	0.19	0.19	0.21	0.16	0.17
Total annual fund operating expenses	0.67	1.43	1.45	0.64	0.41

- Compare the A, B and C shares
- What are the trade-offs between initial and deferred loads?
- Level of annual fees and expenses

People don't avoid high-fee index funds (Choi et al. 2010)

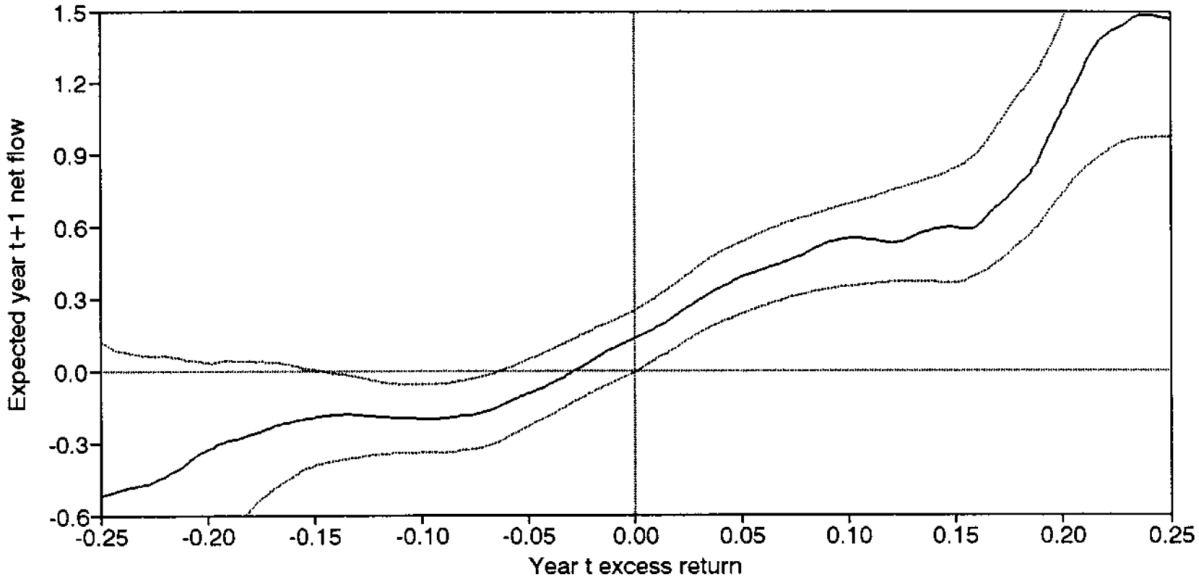
- Experimenters overfocused on returns since **fund inception**

Characteristics of S&P 500 index funds used in experiment

	MBA and college students (2005)			
	Allegiant	Mason Street	Morgan Stanley	UBS
Ticker symbol	AEXAX	MISAX	SPIAX	PSPIX
Inception date	15/10/1998	31/3/1997	26/9/1997	2/10/1998
Minimum opening balance	$500	$1000	$1000	$1000
Expense ratio[a]	0.59%	0.80%	0.64%	0.70%
Front-end load	2.50%	4.75%	5.25%	2.50%
Approximate fee on $10,000 investment	$309	$555	$589	$320
1-year return reported in prospectus[c]	23.23%	21.57%	21.11%	24.58%
5-year return reported in prospectus[c]	−1.88%	−2.19%	−2.34%	−1.74%
Longest-horizon return reported in prospectus	1.28%[d]	5.90%[d]	2.54%[d]	2.54%[d]
Annualized return standard deviation	15.49%	15.49%	15.51%	15.51%
Monthly alpha	−0.047%	−0.057%	−0.057%	−0.053%
R^2	99.99%	99.98%	99.99%	99.99%

Fund flow distorts risk-taking incentives (Chevalier and Ellison 1997)

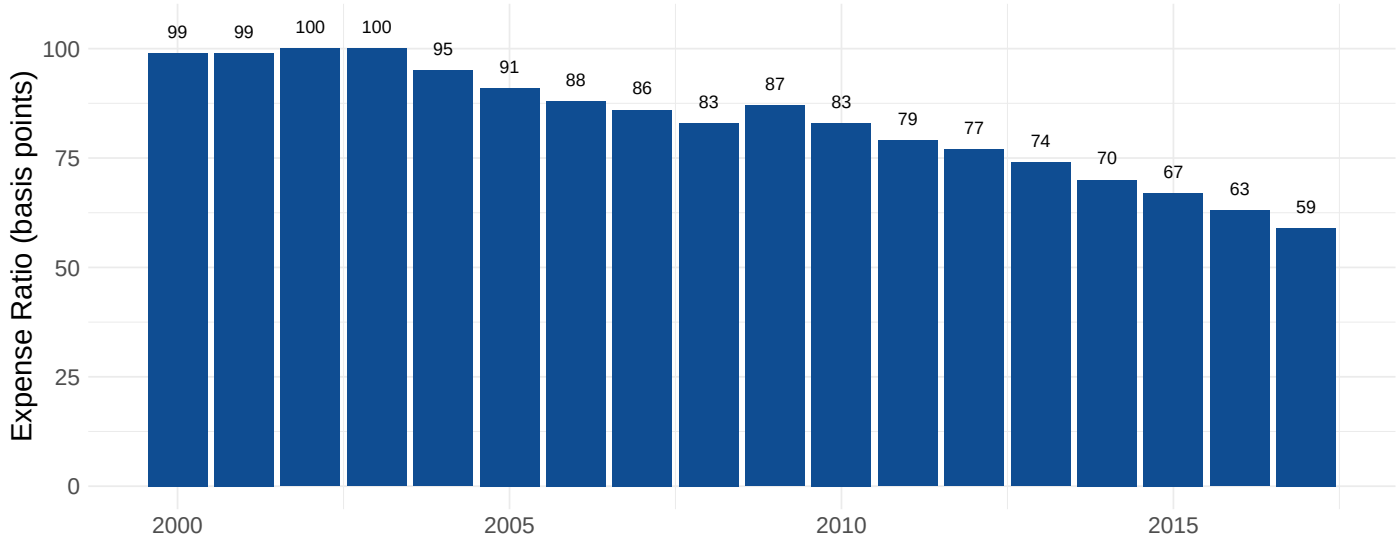
- Managers who are:
  - behind their peers mid-year ↑ portfolio risk
  - those who are ahead lock in their gains ↓ portfolio risk
- Why? The flow-performance relationship is convex.



Mutual fund expense ratios have fallen over time

The decline is driven by several factors:

1. Scale economies - assets under management have grown
2. Competition - investors pick funds with lower expense ratios
3. Increased presence of employer-sponsored retirement plans

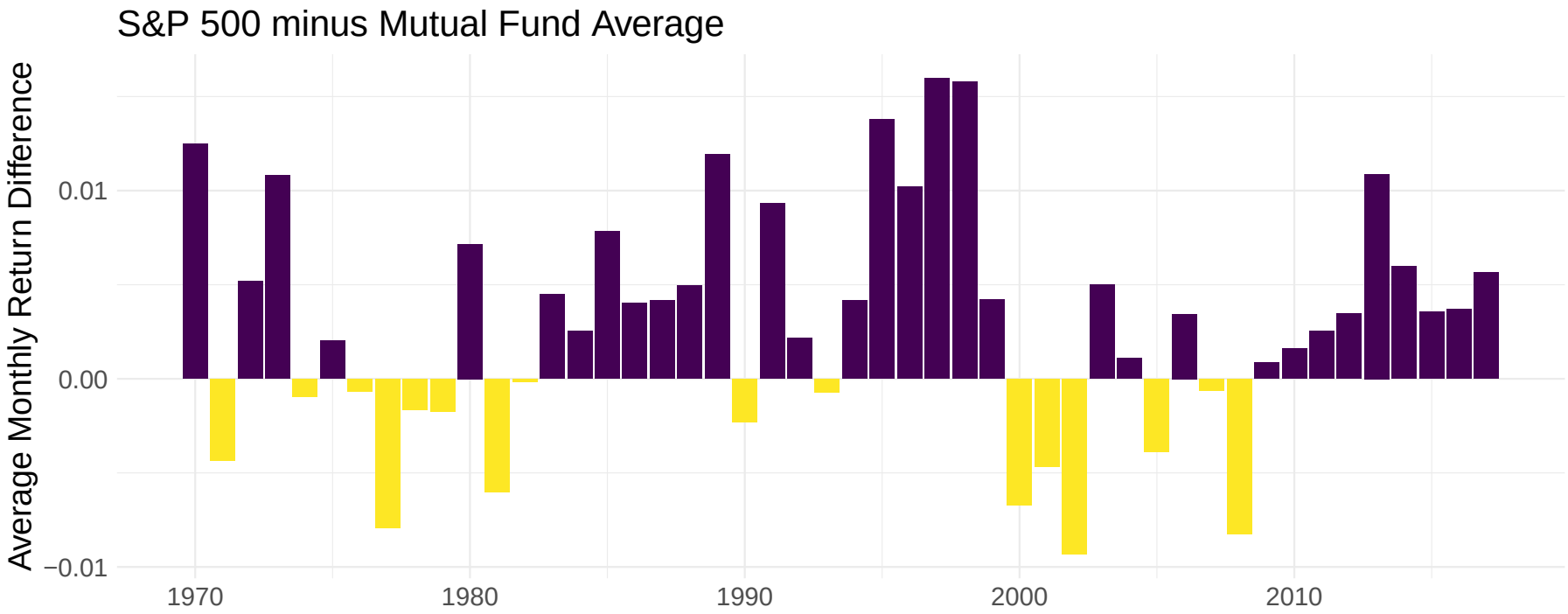


Source: Investment Company Institute

Do mutual fund managers earn their fees?

- How do you know if a mutual fund manager earns their fees?
- One idea: how do mutual funds do compared to an index?

S&P index beats actively managed funds in 30 of 47 years



Mutual fund managers are Andy Dwyer

- “Active investment funds should be illegal for fiduciaries.”

Do you agree or disagree?

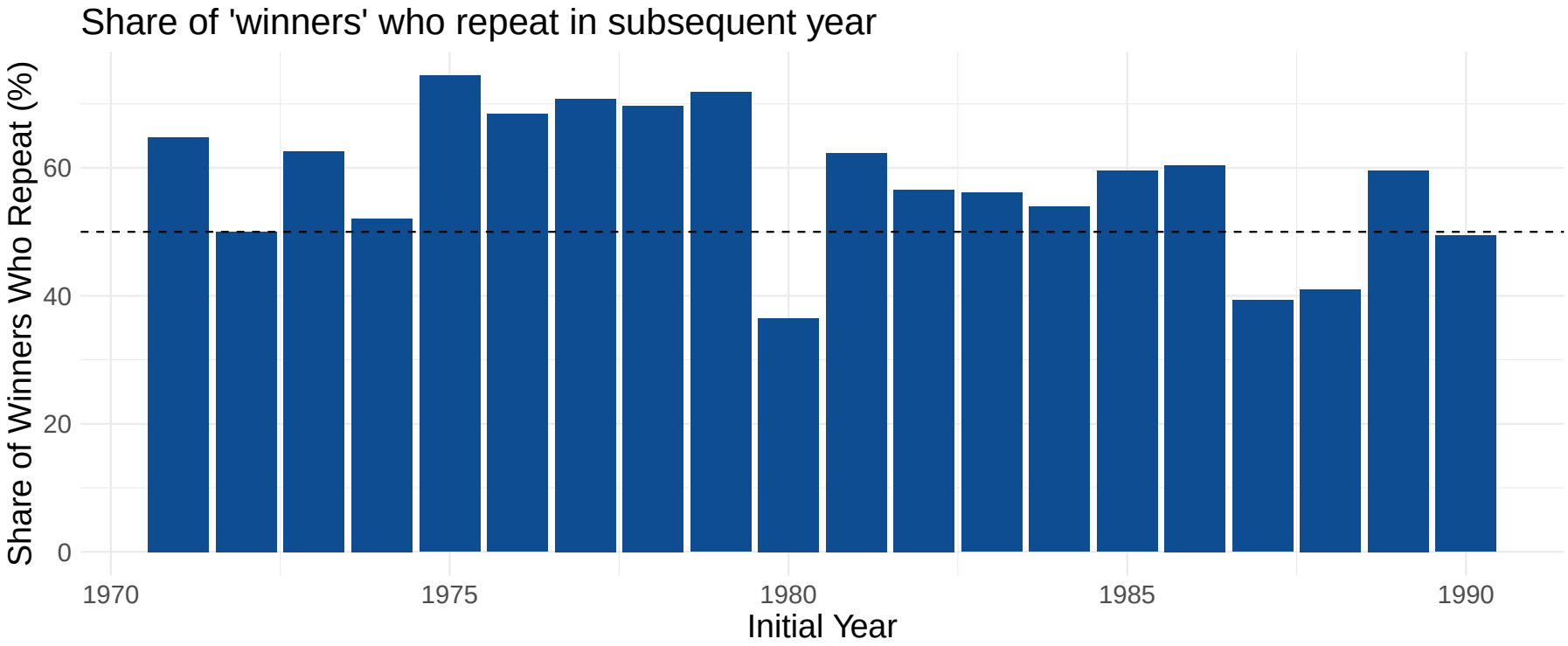
Do fund managers earn their fees?

- Are all mutual fund managers like Andy Dwyer, or just the average?
- Malkiel (1995) evaluates 239 mutual funds with at least ten-year records
  - Compare each fund's performance to holding the S&P 500

	Net Returns (After Expenses)	Gross Returns (Before Expenses)
Average α	−3.20%	−2.03%
t-ratio	−5.27	−3.46
No. of individual αs positive and statistically significant	0	0
No. of individual αs negative and statistically significant	19	13

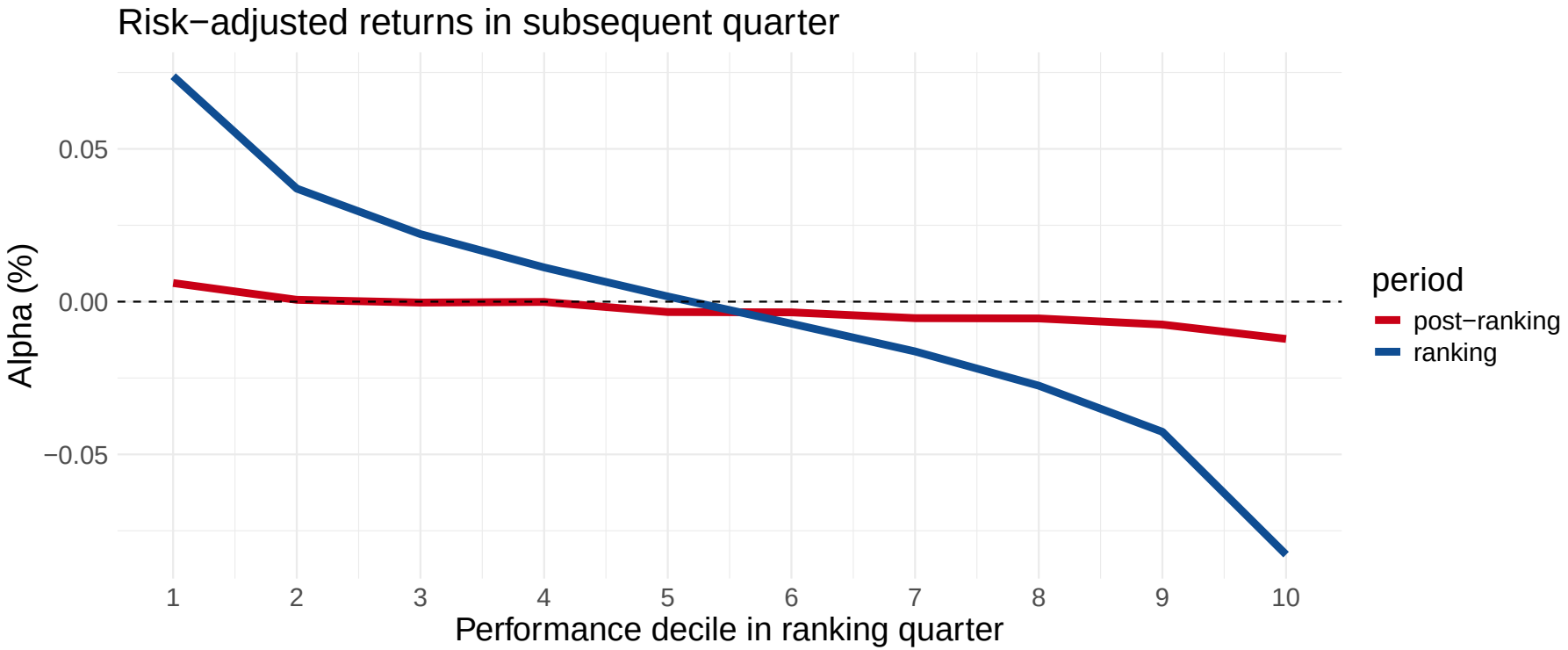
Is there a 'hot hand' for mutual fund managers?

- Evidence for persistent performance is weak, but suggestive
- Malkiel (1995) tracks funds based on above/below median performance:



What about persistence in performance?

- Bollen and Busse (2004) find tiny persistence at the quarterly level



- Value weighted portfolio of active funds earns the market return, minus fees
- Distribution of “alpha” looks more consistent with luck than skill

Net Returns

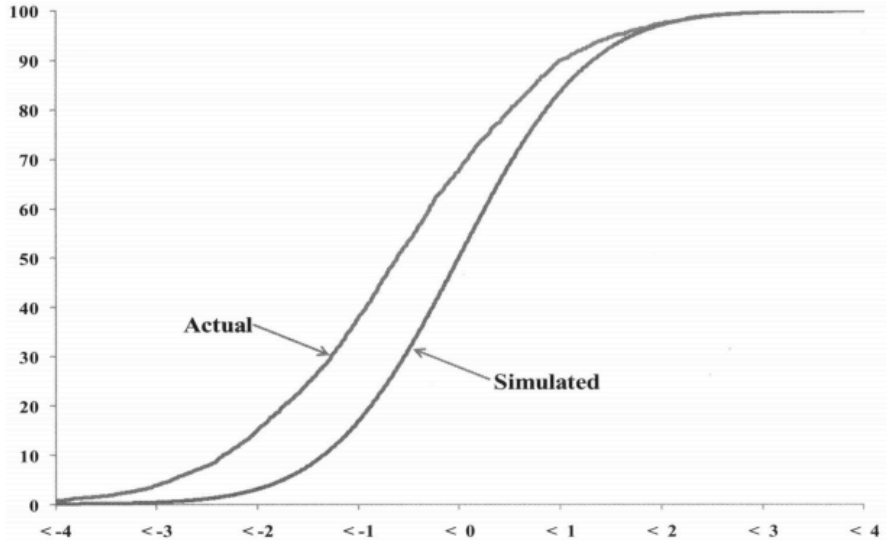


Figure 1. Simulated and actual cumulative density function of three-factor $t(\alpha)$ for net returns, 1984–2006.

Closed-End Funds

- Unlike open-end funds, no change in shares outstanding
  - Old investors cash out by selling to new investors
  - Managers unburdened with managing flows
- Traded continuously on exchanges
- Priced at premium or discount to NAV
  - No easy arbitrage to close price gaps
- Hedge funds may ride discounts
  - Alternatively, may attempt to “open” funds

Other buyers, perspectives and institutions

- Pension funds
- Endowment Funds
- Alternative Asset Managers
  - to be discussed in the context of Yale Endowment case

Next Class: January 22

- Topics: Market Structure
  - Order types and limit order books
  - Market makers and specialists
  - Electronic trading and high-frequency trading
  - Short selling mechanics
- Matt Levine Reading: “Market-Making Is Making Markets”