

The Present Value Formula

$$P_t = \frac{E[CF_{t+1}]}{1+r} + \frac{E[CF_{t+2}]}{(1+r)^2} + \frac{E[CF_{t+3}]}{(1+r)^3} + \dots$$

- This formula says that the price, or value, of an asset is the sum of its discounted expected future cash flows
 - This is why the expected return r is often called a "discount rate"
- This formula is incredibly useful in finance for a range of applications (i.e., valuation, capital budgeting, etc.)

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The Present Value Formula

- Special case: cash flows are expected to grow at a constant rate g

$$\begin{aligned} P_t &= \frac{E[CF_{t+1}]}{1+r} + \frac{E[CF_{t+2}]}{(1+r)^2} + \frac{E[CF_{t+3}]}{(1+r)^3} + \dots \\ P_t &= \frac{CF_t(1+g)}{r-g} \\ P_t &= \frac{CF_{t+1}}{r-g} \end{aligned}$$

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Valuing the stock market with the PV formula

- Given a reasonable risk premium, what is a fair value for the stock market?

$$\frac{P_t}{E_t} \approx \frac{1}{r-g} = \frac{1}{r_f + RP - g}$$

- Given today's prices, what is the likely average risk premium going to be, going forward

$$RP \approx g + \frac{E_t}{P_t} - r_f$$

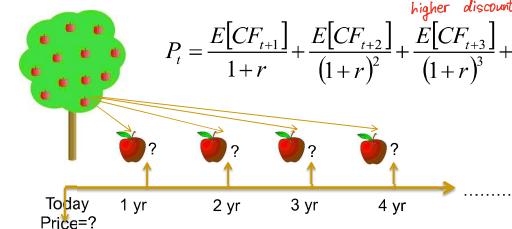
- Historically, a high D/P or E/P ratio implies significant high stock returns 高增长的股票往往有高回报率

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The Present Value Formula

- Think of a stock like a tree which yields some uncertain amount of fruit each year ("dividends") *Uncertainty cause a higher discount rate*



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Understanding changes in asset prices

- When the price of an asset moves, it can be due to:

- Changes in expectations about future cash flows $E[CF_{t+k}]$
- Changes in the discount rate r
 - Changes in the real interest rate
 - Changes in the rate of inflation $\rightarrow r \uparrow \rightarrow p \uparrow$
 - Changes in the risk premium \downarrow 不一定越大
- Changes in the risk premium can be due to:
 - Changes in the amount of risk
 - Changes in the price of risk

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Understanding economic reports

Inflation news

Bonds

- If inflation is higher than expected, bonds fall *price ↓*
- The discount rate goes up
- Lenders raise interest rates to cover the rise in inflation

How about stocks?

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The Present Value Formula

- What is the price, or value, of the tree?
- It is the present value of all the fruit we expect to get
- We "discount" future fruit because it is risky / uncertain and because we are impatient

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Understanding the 1995-2000 surge in stock prices

- From 1995-2000 stock prices nearly tripled
- How can we understand this?
 - An increase in expected future cash flows
 - A fall in the discount rate due to
 - A fall in the risk premium
 - People decided that stocks were less risky
 - People became less risk averse
 - A fall in the real interest rate
 - A fall in inflation
- Note: the fall in real interest rate and inflation were likely small effects

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Understanding economic reports

- Stocks usually do not react as much to inflation news

Inflation higher than expected

- The discount rate goes up
- Expected cash flows increase (in nominal terms) while in Bonds, Dividend amount is quite stable.
- Effects tend to cancel each other out

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Understanding economic reports

- Employment reports and bonds
- If unemployment figures are better than expected (i.e., good news), bonds fall
- The discount rate goes up
- Firms borrow more in a stronger economy, pushing the riskless rate up

Bond Prices Post Steep Losses on Strong Economic News

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Review of the Market Efficiency Debate

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Versions of the EMH

What is information in the Market?

- Weak
 - Market trading data
- Semi-strong
 - All public information
- Strong
 - All information, including insiders' private information
- All versions assert that prices should reflect available information

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Understanding economic reports

- Employment reports and stocks
- Stocks typically do not react as much to employment reports
- If unemployment figures are better than expected (i.e., good news)
 - Again, the discount rate will rise
 - But the stronger economy means that cash flows will rise as well
 - The two effects tend to cancel out (on average)

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Efficient Market Hypothesis (EMH)

- EMH says stock prices already reflect all available information
- A forecast about favorable *future* performance leads to favorable *current* performance, as market participants rush to trade on new information.
- Result: Prices change until expected returns are exactly commensurate with risk.
相称的

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Implications of the EMH

- Using prices and volume information to predict future prices (Technical Analysis) → 不靠谱
- Success depends on a sluggish response of stock prices to fundamental supply-and-demand factors.
- Test of the weak form efficiency

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(In)Efficient Markets

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Definition of market efficiency

- Market efficiency means that security prices are right
 - i.e. they fully reflect all available information
- Equivalently, all prices equal their fundamental value
$$FV_0 = \frac{E(CF_1)}{1+r} + \frac{E(CF_2)}{(1+r)^2} + \dots$$
 - use all available information to make the best possible cash-flow forecast
 - use a discount rate r that is appropriate for the risk

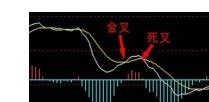
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Technical Analysis 
{weak form, semi-strong} EMH Hold ⇒ Technical Analysis 无效

Candle Plot

- Gold Crossing (金叉)
 - Short term moving average line surpass the long term moving average line upward.
- Dead Crossing (死叉)
 - Short term moving average line surpass the long term moving average line downward.



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Implications of the EMH

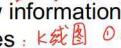
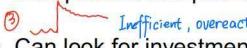
- Fundamental Analysis - using economic and accounting information to predict stock prices
 - Try to find firms that are better than everyone else's estimate.
 - Try to find poorly run firms that are not as bad as the market thinks.
 - Test of the semi strong form efficiency
Most of the times hold

定价: 指导社会资源配置

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How can we tell if markets are inefficient?

- Q: ① 市场有效性出现问题, 价格出现差异 or ② 资产定价模型出错
- Can look for stocks whose prices seem wrong
 - but hard to be sure the price is wrong
 - when we say 'prices are wrong', we are **implicitly stating what 'correct' is**
 - Can look to see if new information is **quickly** and fully incorporated into prices :  Market efficient: 
 - ③  Inefficient, overreact ④  Inefficient: 
 - Can look for investment strategies that seem to earn higher average returns than they deserve for their risk
 - but hard to judge their risk, so it is hard to be sure they really are earning more than they deserve

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What does the evidence suggest?

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Implications on Asset Management

- Active Management
 - An expensive strategy → *Transaction costs are high*
- Passive Management:
用计算机打败
 - Accept EMH, don't attempt to outsmart the market
 - Index Funds and ETFs with very low costs
Automatically generate a portfolio
- The role of portfolio management in an efficient market
 - Diversification
 - Appropriate risk level

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Theoretical argument for market efficiency

- Milton Friedman (1953)
 - If a security becomes mispriced, smart investors should quickly take advantage of it, and the mispricing should disappear quickly
 - this process is often called "arbitrage"
 - Anyone who claims markets are inefficient, must explain why the arbitrage process breaks down
 - major challenge for behavioral finance

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Evidence for market efficiency

- Professional money managers do not beat the market on average
- What does this mean?
 - There are no market inefficiencies to exploit?

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Implications of market efficiency

- Prices react to new information quickly and to the right extent 程度
- There is no free lunch:
 - the only way to get higher returns is by taking on more risk
 - there is no information out there that can be used to construct strategies that earn returns higher than required for their risk

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Why do we care?

- In an efficient market, resources have been allocated efficiently by markets.
干预
- There is no role for intervention
- In an inefficient market, capital is not properly allocated across firms.
- Potentially, there is a role for regulation

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Evidence for market efficiency

- New information appears to be quickly incorporated into prices
 - e.g. suppose "news" is the announcement of a takeover
 - look at the target firm's stock price reaction to the news
 - average over many companies to see the typical pattern
 - This is called an "event study"

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Event Studies

- Empirical financial research enables us to assess the impact of a particular event on a firm's stock price.
- The **abnormal** return due to the event is the difference between the stock's actual return and an estimate of the stock's return **in the absence of the event**.

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Evidence against market efficiency

- Cases where prices seem to move even though there is no new information
 - e.g. the 20% drop in the stock market in one day in October 1987 *Black Friday*
- The Treasury "flash" rally, occurred on Oct. 15, 2014 and only lasted for about an hour. But the ferocity of the ascent — and the simultaneous eye-popping plunge in the yield — prompted widespread concern about the functioning of the market for *Treasury securities*.
- There are investment strategies that seem to have earned higher average returns than is consistent with their risk ("beat the market")
 - these are so called "anomalies"
- Shiller (1981) provided evidence that the stock market prices are too volatile to be explained by changes in fundamentals.

S & P 500 Index,

$$\text{Price} = \sum_{k=1}^n \frac{D_k}{(1+r)^k} + \frac{P_{t+1} + \text{Capital}}{(1+r)^{k+1}}$$

Dividend 稳定, $P \rightarrow r$ 负相关

$$r = r_f + \text{Inflation} + \text{Risk Premium}$$

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Shiller 提出: 市场投资者非理性

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Arbitrage

- One need to borrow the stock in order to short it.
 - Mutual funds, trusts, and asset managers usually lend shares and demand fees.
- It might be hard or impossible to borrow.
- It is costly to borrow shares. If the stock price is \$10, and lending fee is 10%, then one need to return one share plus \$1 if he borrows the stock for a year.
- Cost of shorting was 35% in July 2000 for Palm.
 - 借股利率

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Event Studies

- Expected Return

$$r_t = a + br_M + e_t$$
- Abnormal Return = (Actual - Expected)

$$e_t = r_t - (a + b * r_M)$$

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Specific Examples--The Oct. 15, 2014 "flash rally" in US Treasury bond market: *Save Heaven (No risk)*

Figure 2.1: 10-Year Treasury Yield on October 15 (Cash) 无风险利率



Joint Staff Report: THE U.S. TREASURY MARKET ON OCTOBER 15, 2014

The report asserts that the banks and principal trading firms took steps to protect themselves from a rise in Treasury prices—and those steps seemed to drive the prices even higher. The banks widened the gap at which they would buy and sell Treasuries, a standard practice in volatile moments in the markets. At one point, they stopped offering to sell Treasuries. The principal trading firms, for their part, reduced the average size of their trades. Both actions served as risk management strategies by reducing the number and size of orders that could be executed, the report said.

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Slow incorporation of news into stock prices 合并

- Earnings news does not appear to be quickly and fully incorporated into prices
- On unexpectedly good news, a firm's stock price jumps up, but continues to drift up in the weeks thereafter
- On unexpectedly bad news, a firm's stock drops in value, but continues to drift down in the weeks thereafter

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Example: Cumulative Abnormal Returns Before Takeover Attempts: Target Companies 被买的公司

内部交易危害
Insider Trading:

① 个人投资者损失，

普通人减少投资。

② 原公司高管进行内部交易，

大量收购本公司股票，

使原公司崩溃。

③ 不公平公正



Figure II.1 Cumulative abnormal returns before takeover attempts: target companies

Source: Arthur Keown and John Pinkerton, "Merger Announcements and Insider Trading Activity," *Journal of Finance* 36 (September 1981). Used with permission of John Wiley and Sons, via Copyright Clearance Center. Updates courtesy of Jinghua Yan.

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Specific Examples

Tech bubble

- In March 2000, 3-Com sold 5% of its subsidiary Palm in an initial public offering (IPO)

- after the IPO, 1 share of the 3-Com would effectively include 1.5 shares of Palm
- after the first day of trading, Palm was at \$95
- in an efficient market, 3-Com should have been at \$142, at least!
- but it was at \$82! \Rightarrow 3-com 折价
- market value of the 95% of Palm owned by 3-Com was almost \$25 billion greater than the market value of 3-Com.
- as if all of 3-Com's other assets were worth a negative \$25 billion

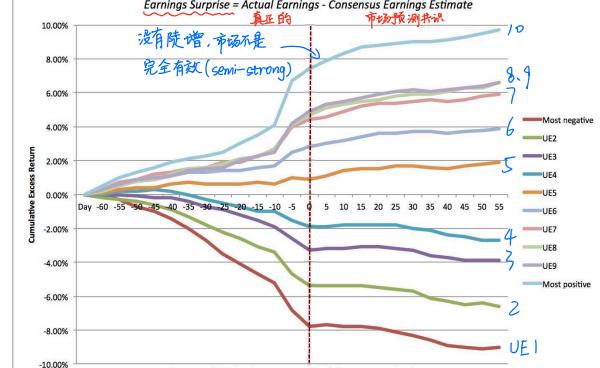
策略: long 1股 3-com, short 1.5股 Palm 赚利

根据: 3-com 只发行 5% Palm, 股票数量少

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Market Reaction to Unexpected Quarterly Earnings Surprises: US Companies from 1988-2002
Earnings Surprise = Actual Earnings - Consensus Earnings Estimate



long-short: 赚相对价差, 去除大盘对个股 return 的影响 (long-short 时有手续费, 传播等减少赚钱机会)

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Can we come up with a strategy that makes money?

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Example: Value vs. Growth

- Form portfolios based on prices to fundamentals
 - use price to earnings (P/E) ratio
 - could also look at price to book (P/B) and price to cash-flow (P/CF) ratios
- Over many decades, average return of value stocks is much **higher** than that of growth stocks
 - but doesn't appear to be riskier
- Value stocks** (with low ratios) appear to earn higher returns than they "deserve," for their risk
- Growth stocks** (with high ratios) appear to earn lower returns than they "deserve," for their risk

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Limits to arbitrage

- If stocks are mispriced, why doesn't the arbitrage process eliminate the inefficiency?
 - The risk that mispricing will get worse in the short run
 - Margin Call
 - Fund managers are evaluated frequently
 - The danger is that if the mispricing worsens, even temporarily, investors will withdraw funds. **资金撤出**
 - Knowing this, the fund managers don't take too aggressive a position against the mispricing, allowing it to survive



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Investment strategies that seem to beat the market

- These are strategies that seem to earn higher average returns than they should, for their risk
- e.g. if you regress excess strategy returns on excess market returns, you get a **positive alpha intercept**:

$$r_{P,t} - r_{f,t} = \alpha_P + \beta_P(r_{M,t} - r_{f,t}) + \epsilon_{P,t}$$

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Average Return as a Function of Book-To-Market Ratio, 1926–2011

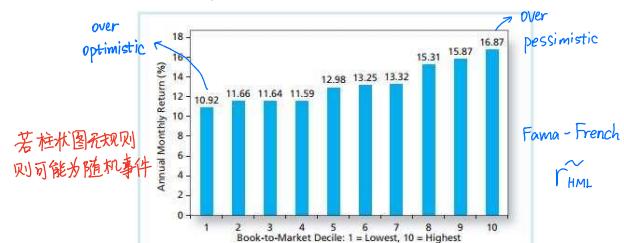


Figure II.4 Average return as a function of book-to-market ratio, 1926–2011
Source: Authors' calculations, using data obtained from Professor Ken French's data library at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

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Example: Twin shares (Royal Dutch/Shell)

- Twin shares are shares that are claims to the same cash-flow stream
- Royal Dutch shares
 - Trade in the Netherlands and the U.S.
 - Are a claim to **60%** of the combined firm's cash flow
- Shell shares
 - trade in the U.K. and the U.S.
 - are a claim to **40%** of the combined firm's cash flow
- In an efficient market, must have:
 - but

$$\frac{\text{Price(Royal Dutch)}}{\text{Price(Shell)}} = 1.5$$

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Average Annual Return for 10 Size-Based Portfolios, 1926 – 2011



Figure II.3 Average annual return for 10 size-based portfolios, 1926–2011
Source: Authors' calculations, using data obtained from Professor Ken French's data library at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

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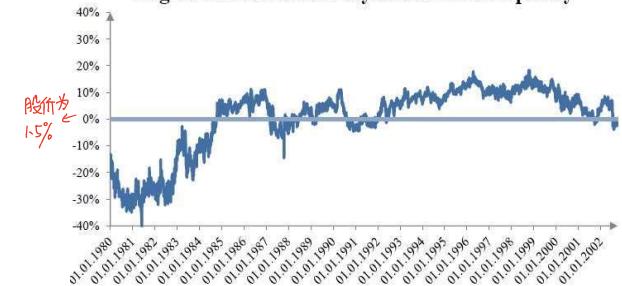
Reactions to the evidence

- Behavioral finance people say:
 - these strategies earn more average return than they should, for their risk
 - they must therefore be exploiting mispricing **利用定价错误**
- Rational finance people say:
 - the strategies are risky, but the standard measures of risk fail to capture this
 - look for new ways to measure risk under which the strategies do look risky

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Log deviations from Royal Dutch/Shell parity



- prices can stay wrong, or become even more wrong

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Summary

- Debate over market efficiency continues ...
- Both sides agree that there are many examples of "anomalies"
- Disagree on what those "anomalies" mean for market efficiency
- Even if prices are "wrong", that doesn't mean it's easy to beat the market!
- Next time: do hedge funds, mutual funds, etc. beat the market?

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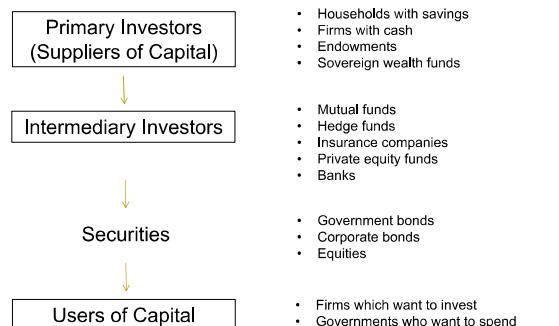
The best performer

- Let's do it now
- What is your number of heads?
- The highest number is
- With n students, the **distribution** of the **highest** number is

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The Financial System



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Performance Evaluation

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CUHK(Shenzhen)

How impressive is this manager?

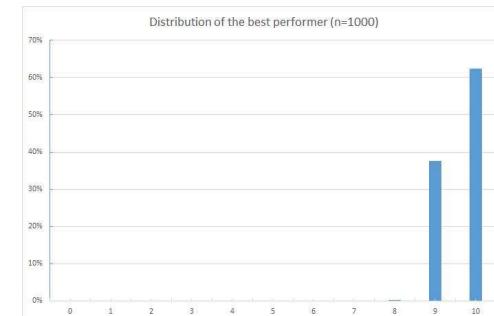
- A manager who beats the markets 10 years in a roll.
- How impressed should you be?
- Let's do one experiment
- If you flip a coin 10 times, what is your probability to get 10 heads in a roll?
 - = $1/2^{10}$, less than one in 1000!

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N=1000

结论: 连续多年基金收益率都很高的manager 可能只是运气好



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Mutual Funds 公募

- Pool money from many investors and invest that money in stocks, bonds, or other securities
 - cater to individual investors 满足
- Charge a fee equal to some fraction of assets under management (AUM) 被管理的资产规模
 - e.g. Fidelity; Vanguard

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Review various types of intermediary investors

Hedge Funds 私募

- Pool money from investors and invest that money in stocks, bonds, or other securities
- Differ from mutual funds in that they use more aggressive investment techniques
 - short-selling, leverage, derivatives 衍生品相关
做空 加杠杆 → 有风险的、投资量大的
- Limited to "sophisticated" primary investors (pension plans, endowments, or wealthy individuals)
- Charge a fee that is some fraction of AUM, and also collect some fraction of the fund's profits
 - e.g. Citadel, SAC Capital, LTCM

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Average Performance

Institutional Fund Managers

- Poor record. Studies have found underperformance, relative to benchmarks, even before fees!

Table 2. Annual Return of Equity Funds and Percentage Underperforming S&P 500, 1983-89*				
Year	Percent		Funds underperforming S&P 500	
	Equally-weighted return across funds	Value-weighted return across funds	S&P 500 return	
1983	17.8	18.1	22.5	59
1984	3.8	3.2	6.3	63
1985	33.3	30.5	32.2	38
1986	18.1	16.8	18.5	50
1987	4.0	4.4	5.2	61
1988	17.9	15.7	16.8	47
1989	29.2	25.9	31.5	61
Mean across years	17.7	16.4	19.0	54

*. Performance database excluding cash portfolio.

Source: Lakonishok, Shleifer, and Vishny (1992)

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Private Equity Funds (many different types)

私募股权投资基金：投资后直接控制该公司

- Venture capital funds 风险投资基金
 - Pool money from primary investors and use it to invest in early-stage firms
 - exit the investment a few years later, typically in an IPO
 - Charge a fee that is some fraction of AUM, and also collect some fraction of the fund's profits

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How to measure?

- Look at their average returns, both before and after fees
- Look at whether they beat benchmarks
 - index benchmarks: S&P 500, Wilshire 5000
 - CAPM benchmark

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Institutional Fund Managers

- In more recent studies
 - In US stock market, during the period of 1971-2009, the average annual return of actively managed stock mutual funds is 1% lower than the return of Wilshire 5000 Index. The average returns lose to the index returns in 23 years out of 29 years.

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Private Equity Funds (many different types)

加杠杆 投资公司

- Leveraged buyout funds (LBO funds) 结合
 - Pool money from primary investors and use it, in conjunction with significant borrowing, to buy entire companies
 - exit from the investment a few years later
 - Charge a fee that is some fraction of AUM, and also collect some fraction of the fund's profits
 - e.g. KKR, TPG Capital, Bain Capital, Blackstone

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The CAPM benchmark

- Run a regression of excess fund returns on excess market returns:
$$r_{P,t} - r_{f,t} = \alpha_P + \beta_P(r_{M,t} - r_{f,t}) + \epsilon_{P,t}$$
- If $\alpha_P > 0$, this is interpreted as evidence that the manager has skill
- The fund's "alpha"
$$\alpha_P = \bar{r}_P - (\bar{r}_f + \beta_P(\bar{r}_M - \bar{r}_f))$$

Skill How the fund did How the fund should have done, given the risk

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Mutual Funds and Hedge Funds

- Mutual Funds
 - On average, beat their benchmarks slightly before fees but underperform after fees
- Hedge Funds:
 - Outperform benchmarks slightly, before fees, but underperform, after fees

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Private Equity Funds

■ Private equity funds:

- ❑ On average, both LBO funds and venture capital funds outperform the S&P 500 slightly, before fees, but underperform, after fees
跑赢大盘
不引人注意
流动性小
- ❑ Particularly unimpressive, given the illiquidity of the investments, and the use of leverage
- ❑ Different types of investors have different returns

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Consistency of performance of others

■ Institutional fund managers

- ❑ Very little persistence in performance from year to year
持续的

■ Mutual funds

- ❑ Some limited persistence from year to year

■ Hedge funds

- ❑ Some limited persistence from year to year

■ Private equity funds

- ❑ Quite strong persistence from year to year

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Implications for primary investors

■ Individual investors

- ❑ even though markets probably contain inefficiencies, index funds are still best for individuals
- ❑ active money managers don't beat benchmarks, after fees
- ❑ it's puzzling why actively managed mutual funds remain so popular

■ Other primary investors

- ❑ beware of the poor returns, after fees, of many investors
如果所有人都投ETF, 没有公募基金经理, 则市场消息不会使价格发生变动

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Are some funds persistently better than others?

Consistency of performance of pension funds

Table 9. Equity Fund Performance over Time Using Quartile Rankings of One-Year Past Performance to Predict Future One-Year Performance^a

Investment style	1 ^b	2 ^b	3 ^b	4 ^b	Return over past one-year period ^c	Return over future one-year period ^c
All (Top)	1	26	24	23	27	25.5
	2	20	26	29	25	18.4
	3	22	28	26	24	13.7
	4	32	22	22	24	5.5

Source: Lakonishok, Shleifer, and Vishny (1992)

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Implications on market efficiency

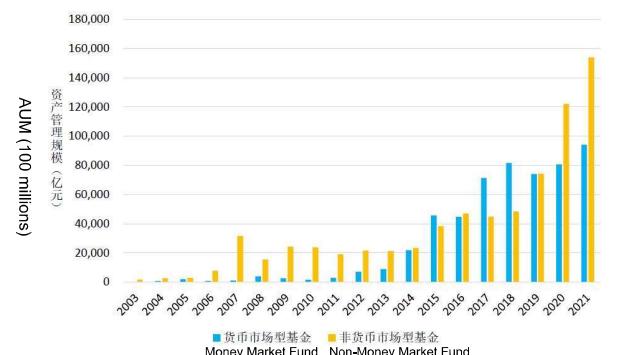
个人投资者太菜了

- Overall, intermediary investors do not seem particularly skilled at exploiting mispricing
 - ❑ before fees, intermediary investors do not significantly outperform benchmarks
 - ❑ little persistence in fund returns 纯靠运气
 - ❑ even existence of people like Peter Lynch does not prove that stock-picking ability exists (e.g., coin-flip example)
选股能力

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Can mutual fund manager beat market (China)



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Implications on market efficiency

机构投资者

- But the weak performance of intermediary investors before fees can still be consistent with inefficient markets

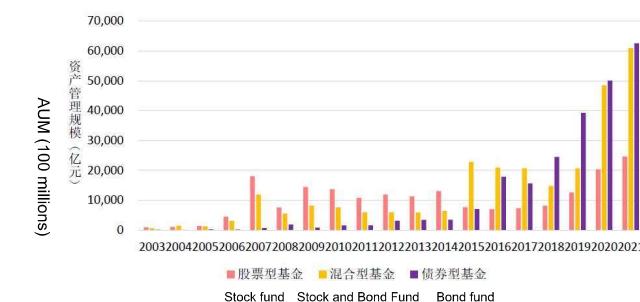
- ❑ Even if prices are wrong, it's not easy to beat the market

- ❑ Intermediary investors may be swamped with more money than they can usefully invest, lowering their average returns
资金量过大 → 回报率为市场回报率

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Can mutual fund manager beat market (China)



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How to evaluate the performance of China's mutual funds? General principles

- Total return perspectives
- Risk adjusted return
 - Sharpe ratio
 - Risk adjusted returns (APT model)
- Performance persistency

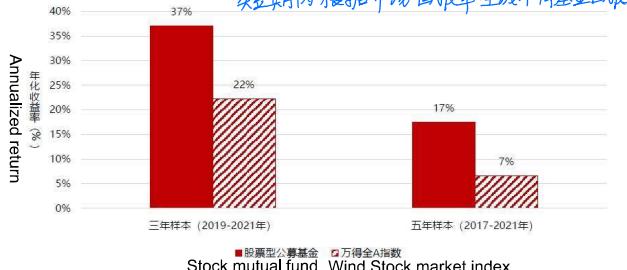
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Can mutual fund managers beat the market (China)?

- Cumulative return

短期内根据市场回报率生成不同基金回报率

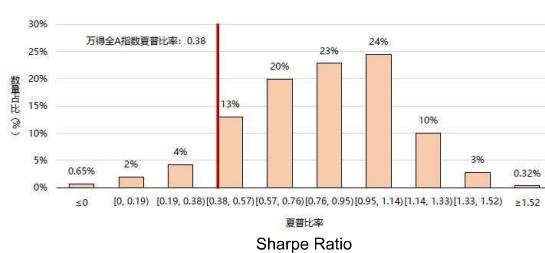


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Can mutual fund manager beat market (China)?

- The distribution of Sharpe ratio

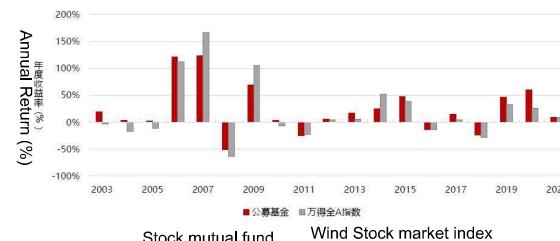


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Can mutual fund managers beat the market (China)?

- Mutual fund return is equal weighted

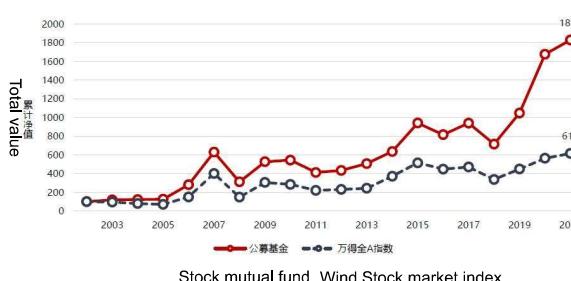


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Can mutual fund manager beat market (China)?

- Cumulative return (Index 10% vs fund 17%)



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Can mutual fund managers beat market (China)?

- Fama-French four factors model

- The distribution of alphas

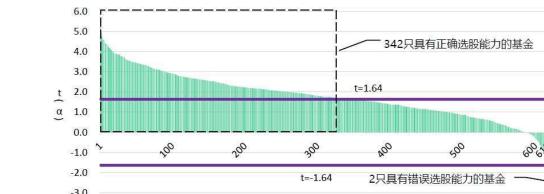


图 3-1 股票型基金的选股能力 α 的 t 值 (显著性) 排列: 2017-2021 年

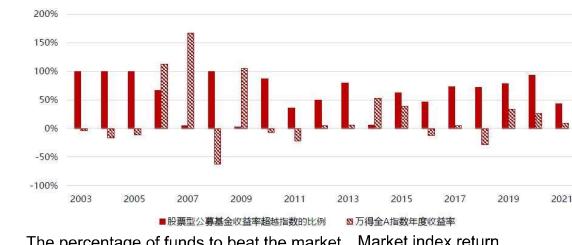
注: 正确选股能力代表 $t(\alpha) > 1.64$; 错误选股能力代表 $t(\alpha) < -1.64$; 未表现出选股能力代表 $-1.64 \leq t(\alpha) \leq 1.64$, 基金具有选股能力是指基金表现出正确的选股能力, 基金不具有选股能力代表基金表现出错误的或未表现出选股能力。

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Can mutual fund managers beat the market (China)?

- The percentage of mutual funds to beat the market

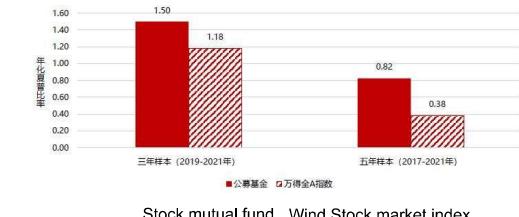


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Can mutual fund manager beat market (China)?

- Sharpe ratio $\frac{\mu - r_f}{\sigma}$: $\frac{\sqrt{2}(\bar{r} - r_f)}{\sigma \sqrt{T}}$



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Can mutual fund manager beat market

- Market timing can be profitable theoretically

The Allure of Market Timing: Missing the Worst Days

20 Years (1/1/1995 - 12/31/2014)	\$10,000 Invested in the S&P 500 Index	S&P 500 Annualized Return	Value of \$10,000 at the end of the period	Gain/ Loss	Impact of Missing Days
All 5,036 trading days	9.85%	\$65,475	\$55,475	--	--
Less the 5 days with the biggest losses	12.24%	\$100,688	\$90,688	63.48%	
Less the 10 days with the biggest losses	14.13%	\$140,670	\$130,670	135.55%	
Less the 20 days with the biggest losses	17.19%	\$238,681	\$228,681	312.22%	
Less the 40 days with the biggest losses	22.19%	\$550,011	\$540,011	873.43%	

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Can mutual fund manager beat market

- But, if the market pricing is wrong....

The Problem with Market Timing: Missing the Best Days						
20 Years (1/1/1996 - 12/31/2015)		S&P 500		Value of \$10,000 at the end of the period		Impact of Missing Days
\$10,000 Invested in the S&P 500 Index	Annualized Return			Gain/Loss		
All 5,036 trading days	8.19%		\$48,249.94	\$38,249.94		-
Less the 5 days with the biggest gains	5.99%		\$32,008.68	\$22,008.68	-42.46%	
Less the 10 days with the biggest gains	4.49%		\$24,079.67	\$14,079.67	-63.19%	
Less the 20 days with the biggest gains	2.05%		\$15,004.35	\$5,004.35	-86.92%	
Less the 40 days with the biggest gains	-1.96%		\$6,734.45	-\$3,265.55	-108.54%	

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Can mutual fund managers beat market? (China)

- Is past winner still the winner in the future

%	G1 (Lowest)	G2	G3	G4	G5 (Highest)	Last year return	Next year return
G1 (Lowest)	23.6	18.8	18.3	20.1	19.1	5.01%	24.15%
G2	16.9	22.7	20.4	20.6	19.1	15.6%	25.34%
G3	16.8	17.0	20.8	25.8	19.7	22.25%	26.82%
G4	20.8	22.2	20.9	18.4	17.4	29.26%	24.28%
G5 (Highest)	22.9	19.4	18.9	15.1	23.6	42.85%	26.02%

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The Market Timing capacity

- The proposition of mutual funds having market timing capacity

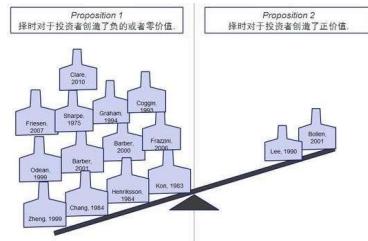


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Can mutual fund manager beat market

- Most academic research find no evidence of successful market timing



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Overall

- Mutual fund can beat the market in China
 - ❑ Larger average return (on average beat the market by 4%-5% each year)
 - ❑ Larger cumulative return
 - ❑ In terms of lower Sharpe ratio
 - ❑ Then, how?
 - ① 高回报率: Market timing? $\beta_{im} > 0$ 纯赚, 选股精准 Stock Picking
 - ② β_i 较大 冒险 Stock Picking
 - ③ SMART β 动态调整 β 大小, 调市场杠杆 (通过预测市场) Market Timing

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Can mutual fund manager beat the stock market?

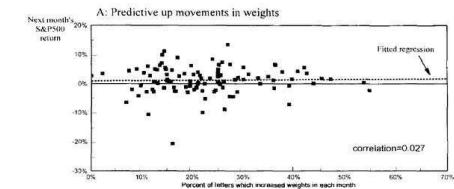
- There is evidence in support of fund managers' stock picking capacity
- There is no evidence in support of fund managers' market timing capacity

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Can mutual fund managers beat market?

- The recommendations of Investment magazine can not predict the stock market movement
 - ❑ When they recommend buying stocks



Source: Graham, John R., and Campbell R. Harvey. "Market timing ability and volatility implied in investment newsletters," 39; asset allocation recommendations," 34; Journal of Financial Economics 42.3 (1996): 397-421.

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How to test fund managers' market timing capacity?

Treynor-Mazuy Model

- ❑ If the coefficient of the square term is positive and significant, it indicates the existence of market timing
- $$R_{it} - R_{ft} = \alpha_t + \beta_{im} * (R_{mt} - R_{ft}) + \gamma_1 * (R_{mt} - R_{ft})^2 + \beta_{ismb} * SMB_t + \beta_{ihml} * HML_t + \beta_{lomom} * MOM_t + \varepsilon_{it}$$
- 若显著, 证明不管大盘涨跌, 都能赚钱, 此投资者具有择时能力

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Investor Behavior

Jinfan Zhang
CUHK(Shenzhen)

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Overview

- We want to understand investor behavior
 - the decisions investors make about their assets and liabilities
 - the portfolios they hold and how they trade
- This is an important topic:
 - There is a real danger that many investors are making poor financial decisions
 - Financial markets are complex and sometimes counter-intuitive
 - Many decision-makers are unsophisticated, and all the more so in recent years
 - If some people **are** making poor decisions, we need to find ways to help them do better

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Under-saving

- Survey evidence suggests that many Americans are not saving as much as they should for retirement
- E.g., in a survey of hundreds of employees at a large U.S. company
 - two-thirds said that their saving rate was below the ideal
 - one-third said that it was about right
 - no one said they were saving too much
- Of those who said their saving rate was too low, 35% planned to raise it in the future
 - However, hardly any of them actually did

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Responses to present bias

- "四两拨千斤"**
- **Nudges.** Governments/pension companies may give us incentives to **nudge** us into taking out pension commitments.
 - **Highlight of costs.** Government campaigns to highlight costs of consuming demerit goods or taxes to make them less palatable.

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Overview

- We divide investors into individuals and institutions
 - focus more on individuals
 - they are more likely to be making poor decisions
- The field that studies the financial decisions of individuals is called "household finance"
 - It has grown rapidly in recent years

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Behavioral approach: present bias

- Our heavy focus on the **present** leads us to consume **too much today**
 - and to save too little for the future
- Present bias also explains why people fail to follow through on their plans

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Non-participation 不参与投资

- A sensible investment portfolio should contain at least some exposure to the stock market
- For many decades, however, **most U.S. households** had **no exposure at all to the stock market**
 - e.g. in 1984, only 28% had any exposure
 - even among people with more than \$100,000 in liquid assets, only 50% held any equity
- Even in more recent years, many households do not participate in the stock market

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Financial decisions of individuals

- **Assets (pre-retirement)**
 - under-saving
 - non-participation
 - buying high, selling low
 - preference for active management
 - under-diversification
 - stock-picking performance
 - the selling decision
 - the buying decision
- **Assets (post-retirement)**
 - under-annuitization
- **Liabilities**

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Implications of present bias

- **Insufficient saving for pensions.** We discount value of future pension payments and save insufficiently
- Consumption of demerit goods. We ignore future health costs for short-run utility of **enjoying the drug**.
- **Delaying decisions.** Given a choice between doing a project now, when we have time, we may put off until last moment, when we are tired and can't do as well.

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Non-participation

- **Rational approaches?** 前景
- **Behavioral approach: prospect theory**
 - Over the next year, the stock market may go up in value, but it may also go down
 - Investors who are **loss averse** find this prospect unappealing
 - Probability weighting makes the stock market even less appealing: **(overweight small probability of crash)**
 - Market return is negatively skewed

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Non-participation

- Behavioral approach: **experience effects**
- When making a decision, we should take into account of **all available data**
- However, people appear to pay too much attention to the data that they have **personally experienced**
 - predicts that whether people participate in the stock market will depend on the stock returns they have experienced during their lifetime
- The data confirm this prediction
 - Malmendier and Nagel (2012)

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Non-participation

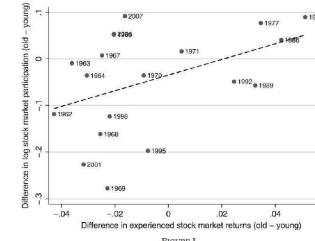


FIGURE I
Differences in Log Stock Market Participation Rates of Old and Young Individuals Plotted Against Differences in Experienced Stock Market Returns
Source: Malmendier and Nagel (2011)
Note: The figure displays differences in participation rates and stock market returns for individuals aged 60 years or older minus those aged 40 years. The vertical axis shows the difference in the log participation rates of old (household head age > 60 years) minus young (household head age ≤ 40 years) households. The horizontal axis shows the average real stock market return (S&P 500 total return minus inflation) over the prior 20 years minus the average real stock market return (S&P 500 total return minus inflation) over the prior 20 years for young households (as proxy for the return experienced by young households). The years refer to the respective SCF survey waves. Observations are weighted with SCF sample weights. The 1960 and 2004 observations overlap in the plot.

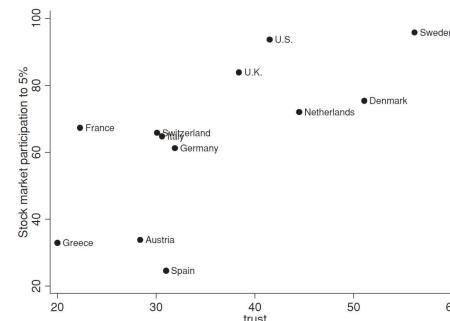
Source: Malmendier and Nagel (2011)

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Non-participation

不好说谁影响谁，可能两个因素互相影响



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Non-participation

- Trust may also explain another puzzle: the difference across countries
- Trust explains the differences in participation rates across different countries
- More trusting countries have more participation

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Correlation vs. causality *Correlation ≠ Causality*

- Observation: when A happens, B is likely to happen
 - Conclusion:
 - A caused B
 - B caused A
 - C caused both A and B.
 - Trust and participation
 - Giannetti and Wang (2016) suggest that trust causes participation
 - Exogenous shock: The collapse of Arthur Andersen
 - Personal experience
- Instrumental Variable 工具变量 influence trust

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Non-participation

不知道 probability distribution

- Behavioral approach: ambiguity aversion
- The stock market is more "ambiguous" than a bank deposit or T-Bill
- Investors who are ambiguity-averse therefore find the stock market unappealing

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Non-participation

- Behavioral approach: **Trust**
- An investment in financial markets requires trust
- Trust can be measured through questions like:
 - "Generally speaking, would you say that most people can be trusted, or that you have to be careful in dealing with people?"
- In a study of 2,000 Dutch households, less trusting households were **less likely** to participate in the stock market
 - Guiso, Sapienza, Zingales (2006)

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More on Trust

- Trust may also affect the composition of investors' portfolios
- Less trusting households tilt their portfolios more toward dividend-paying stocks (Kelly, 2014)
risk 较小

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Buying high, selling low

- 散户
- Many investors appear to have poor market timing
 - They increase their exposure to the stock market when it is highly valued, in advance of poor returns
 - and reduce their exposure when its valuation is low, in advance of high returns
 - Key evidence: the **dollar-weighted** average return on mutual funds is lower than the **time-weighted** average return
 - by 1.5% per year
 - Investors chase past returns of mutual funds

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Buying high, selling low

- Behavioral approach: **over-extrapolation**
过度推断
- Some investors overweight past returns when forming beliefs about future returns “**追涨杀跌**” *typical evidence*

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Home bias

- Individuals often invest heavily in **domestic** stocks, apparently ignoring the benefits of international diversification
- Rational approaches?
 - Information advantage
- Behavioral approach: Preference for the familiar/mere exposure effect *心理效应*
 - Mere exposure to something makes us like it more than justified based on informational considerations alone
 - We are exposed, every day, to our home country

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Concentrated stock holdings

- Some households hold concentrated positions in relatively few stocks
- Rational approaches?
- Behavioral approach: **Overconfidence**
 - Investors may be overconfident about the validity of their analysis

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Preference for actively-managed funds

- Mutual funds come in two types: index funds and actively-managed funds
- A large body of research indicates that, after fees, actively-managed funds underperform index funds, on average
 - It is therefore puzzling that actively-managed funds are as popular as they are
- Rational approaches?
- Behavioral approaches?
 - Over confidence *“我觉得我行”*
 - Extrapolation

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Local bias

- Within their domestic equity holdings, individuals tilt toward locally-headquartered stocks
 - The average distance to a stock in the typical investor's portfolio is 917 miles *喜欢买自己家乡的股票*
 - But the average distance to a stock, across all stocks, is 1225 miles
- Investors appear to be forgoing the diversification benefits of a more geographically-dispersed portfolio *放弃地理位置分散*

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Concentrated stock holdings (cont'd)

- Behavioral approach: **Prospect theory (probability weighting)**
赌一把
- People may want to have large positions in “lottery-type” stocks so as to give themselves a chance of becoming wealthy
- There is empirical evidence to support this idea (Boyer, Mitton, Vorkink, 2010)

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Under-diversification

- Traditional advice tells people to diversify their holdings of financial assets
- Many households appear to ignore this advice,
- Four types of under-diversification
 - home bias
 - local bias
 - concentrated stock holdings
 - large holdings of own-company stock

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Local bias (cont'd)

- Rational approaches?
- Behavioral approach: Preference for the familiar / mere exposure effect
 - We are exposed, every day, to our local region

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Large holdings of own-company stock

- People invest a surprisingly large fraction of their retirement savings in the stock of their own company (Benartzi, 2001)
 - 23% of their discretionary contributions
 - Worst under-diversification *工资、股票高度相关*
- Rational approaches?
- Behavioral approaches?
 - Familiarity
 - Overconfidence
 - Loyalty
 - Inertia *惯性（跟风）*

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Stock-picking performance

- Most studies find that individuals do a poor job trading stocks
- They underperform a range of benchmarks
 - ❑ their beginning-of-the-year portfolio
 - ❑ the return of the overall market
 - ❑ a CAPM benchmark

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Stock-picking performance (cont'd)

- More evidence:
 - ❑ This view predicts that more overconfident people will trade more
 - ❑ One study tests this using data from Finland
 - measures overconfidence as self-reported confidence minus an objective measure of confidence
 - finds that more overconfident people indeed trade more Net Return 更低
 - ❑ The psychology literature suggests that men are more overconfident than women
 - this predicts that men will trade more, and perform worse
 - the evidence is consistent with this (Barber and Odean, 2002)

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Selling behavior: The disposition effect

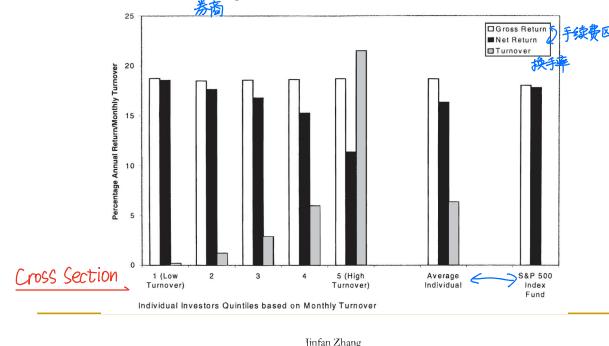
- (Potential) rational approach: **information**
 - ❑ Perhaps individuals sell past winners because they have good information that these stocks will subsequently do poorly
 - ❑ and hold on to their past losers because of information that these stocks will do well
- It turns out, however, that the past winners people sell subsequently do **better** than the past losers they hold on to
- Other rational approaches?

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Example: Barber and Odean (2000)

- ❑ Looked at the trading of 70,000 households through a large discount brokerage from 1991 to 1996



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More on Overconfidence

- Overconfidence has also been applied to understanding the puzzlingly high level of trading volume in many financial markets
- In an economy where all investors are fully rational, there will be relatively little trading
 - ❑ Each investor will infer a negative signal from others' willingness to trade with them
- Trading volume will be much higher, however, when investors are overconfident
 - ❑ They disregard the signal in others' willingness to trade

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Selling behavior: The disposition effect

- Other evidence also suggests that the disposition effect is a mistake
 - ❑ Among individual investors, it is more pronounced for the "less sophisticated" 散户: "别想得太复杂"
 - ❑ It is also more pronounced for individuals than for mutual fund managers

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Stock-picking performance (cont'd)

- Rational approaches?
- Behavioral approach: **overconfidence**
 - ❑ Most investors believe that they are "above average" traders, and therefore trade stocks actively
 - ❑ Many are over-estimating their ability, however, and end up under-performing
- More Evidence?

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Selling behavior: The disposition effect

处置效应

- Individual investors have a greater propensity to sell a stock at a gain relative to purchase price, rather than at a loss (Odean, 1998) 卖赚钱的股, 留赔钱的股
- A similar effect has been documented in the real estate market 房地产市场
 - ❑ People appear reluctant to sell their homes below purchase price (Genesove and Mayer, 2001)

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Selling behavior: The disposition effect

- Behavioral approach: **realization utility**
 - ❑ The idea that people feel pleasure when they sell an asset at a gain and pain when they sell an asset at a loss
- This simple idea was not taken seriously until recently
- Realization utility may stem from the way people think about their investing history
 - ❑ as a series of investing **episodes**, each one defined by the name of the asset, the purchase price, and the sale price

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Selling behavior: The disposition effect

- Selling at a gain brings pleasure because it creates a positive investing episode
- Selling at a loss brings pain because it creates a negative investing episode
- Realization utility can explain the disposition effect, although an additional ingredient is needed
 - e.g. impatience (time discounting)
 - Barberis and Xiong (2012)

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Selling behavior: The disposition effect

- The experiment was designed so that there was momentum in stocks' returns
 - and participants had enough information to figure this out
- Given this, participants should have exhibited the opposite of the disposition effect
 - but they actually exhibited a disposition effect
 - a mistake, in this context

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Buying behavior

- 倾向**
- The propensity to **buy** a stock is positively related to the stock's past returns, going back at least three years
 - Such buying behavior may not be fully rational
 - Long-term prior winners subsequently underperform (De Bondt and Thaler, 1985)
 - Behavioral approach: *over-extrapolation*
 - Note:
 - Both buying **and** selling propensities are positively related to past returns

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期末考试结束段 55

Selling behavior: The disposition effect

- Broad theme: when making selling decisions, we should focus on an asset's **future** performance
 - Allowing yourself to be influenced by realization utility is a mistake because it is based on the **past**
 - It leads investors to exhibit a disposition effect, which is costly, because of momentum 动量因子
- Professional traders recognize this
 - basic advice is to ignore realization utility
 - part of being a disciplined trader 训练有素

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Selling behavior: The disposition effect

- We can test the hypothesis that realization utility is driving the trading mistake
 - A part of the brain called the ventral striatum (vSt) tracks feelings of pleasure and pain
 - Under realization utility, people should feel a burst of pleasure when they sell at a gain, as compared to when they hold a stock with a similar gain.
 - When participants sell at a gain, we should see a spike in activity in the vSt, as compared to when holding a gain.
 - That is exactly what we find.

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Selling behavior: The disposition effect

- Recent work has used techniques from neuroscience to provide evidence for realization utility
 - Frydman, Barberis, Camerer, Bossaerts, Rangel (2014)
- 28 participants traded stocks in an experimental market while we monitored their brain activity using fMRI

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Selling behavior: The disposition effect

- The disposition effect can be used to extract information from the sales of corporate insiders
- One might have thought that sales of stock by insiders would be followed by poor returns
 - but the evidence for this is weak
- However, a sale of stock *at a loss* by an insider is followed by poor returns (Kelly, 2014)
 - intuition? 在亏了的情况下还要卖 (违背处置效应)
 - 表示股票前景较差

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