Lecture 01: Introduction

- Prof. Markus K. Brunnermeier

STYLIZED FACTS ON SECURITY RETURNS

adopted from Heinz Zimmermann, Elmar Mertens

AGENDA

We will look at how security returns behave . . .

. . . across **asset classes**

. . . compared with their **"risk"**

. . . once they are grouped into **baskets**

. . . in relation to the **macroeconomy**

. . . depending on **firm characteristics**

. . . with regard to **prior performance**

. . . when there is **new information**

. . . and what **investment managers** get out of them

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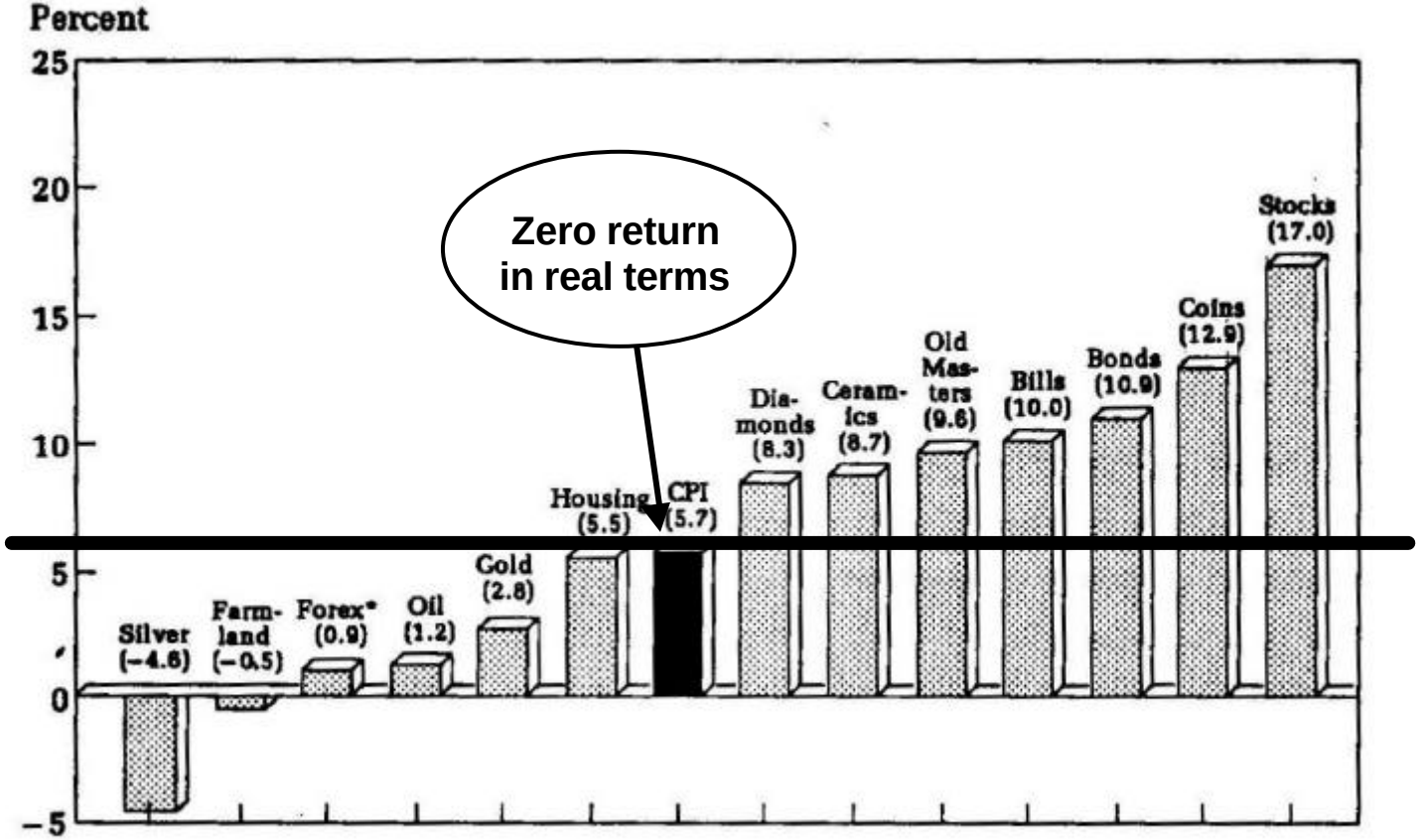
Historical returns on various asset classes differ considerably

AVERAGE RETURNS ON FINANCIAL AND PHYSICAL ASSETS

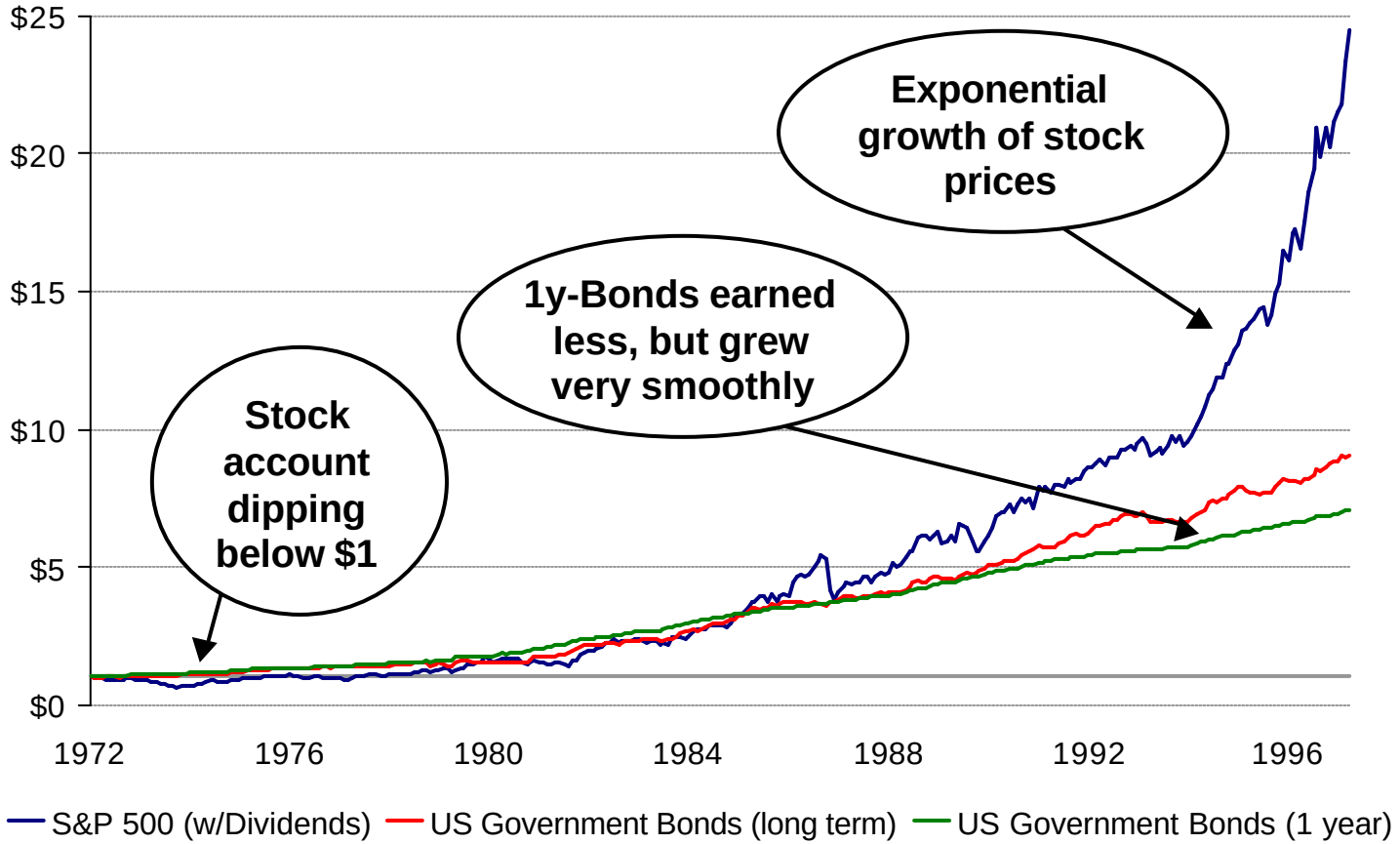
Percent p.a. in U$, average over the 1980s



Source: Malkiel (1996), p. 383

The long-term gains from the stock market have been astounding

TODAY'S VALUE OF 1$ INVESTED IN 1972
Including reinvestment of interests and dividends

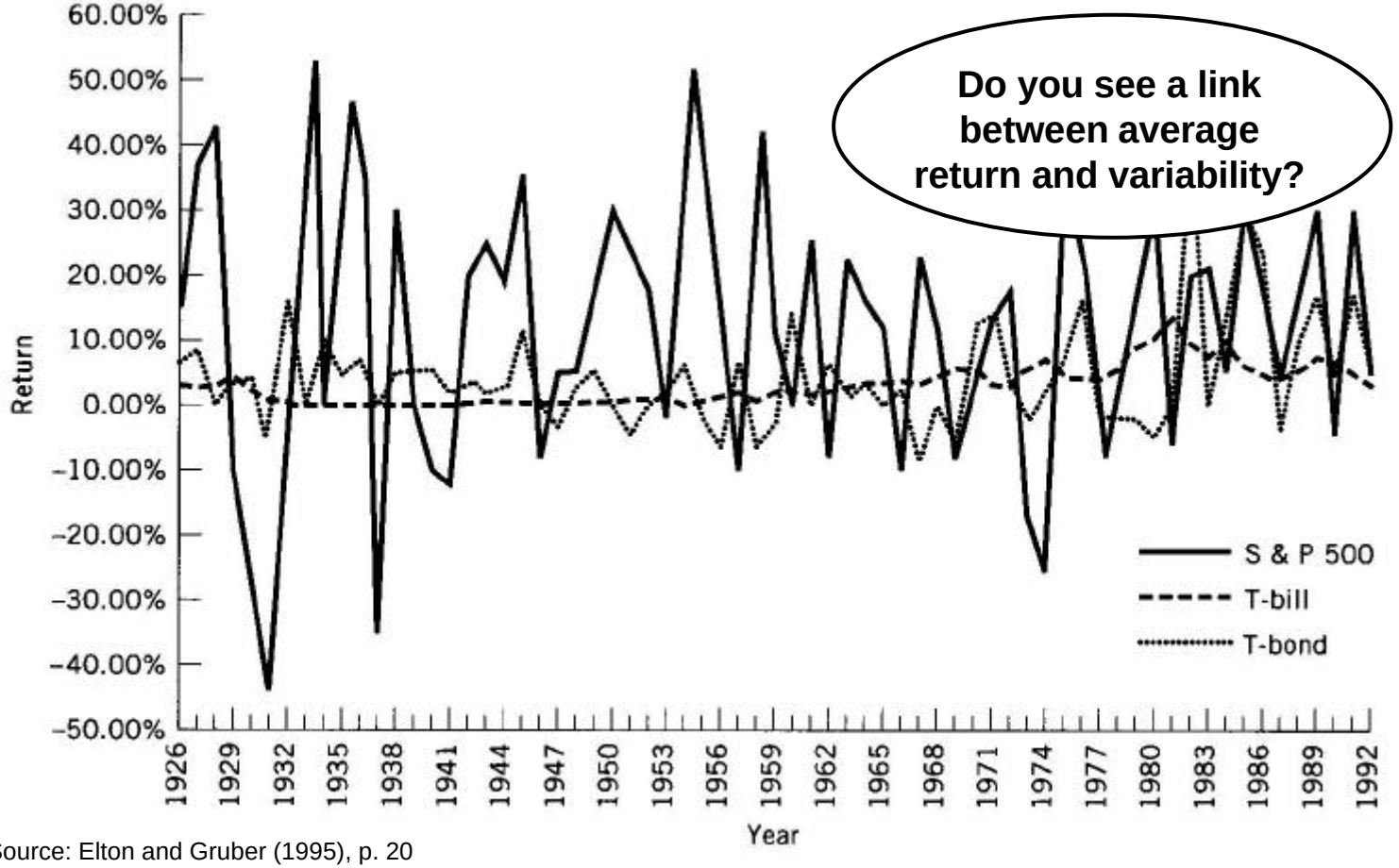


Source: Mertens, Data from Ibbotson Associates

The variability in returns differs, too

TYPICAL RETURNS ON U.S. STOCKS AND BONDS

Percent p.a.



Source: Elton and Gruber (1995), p. 20

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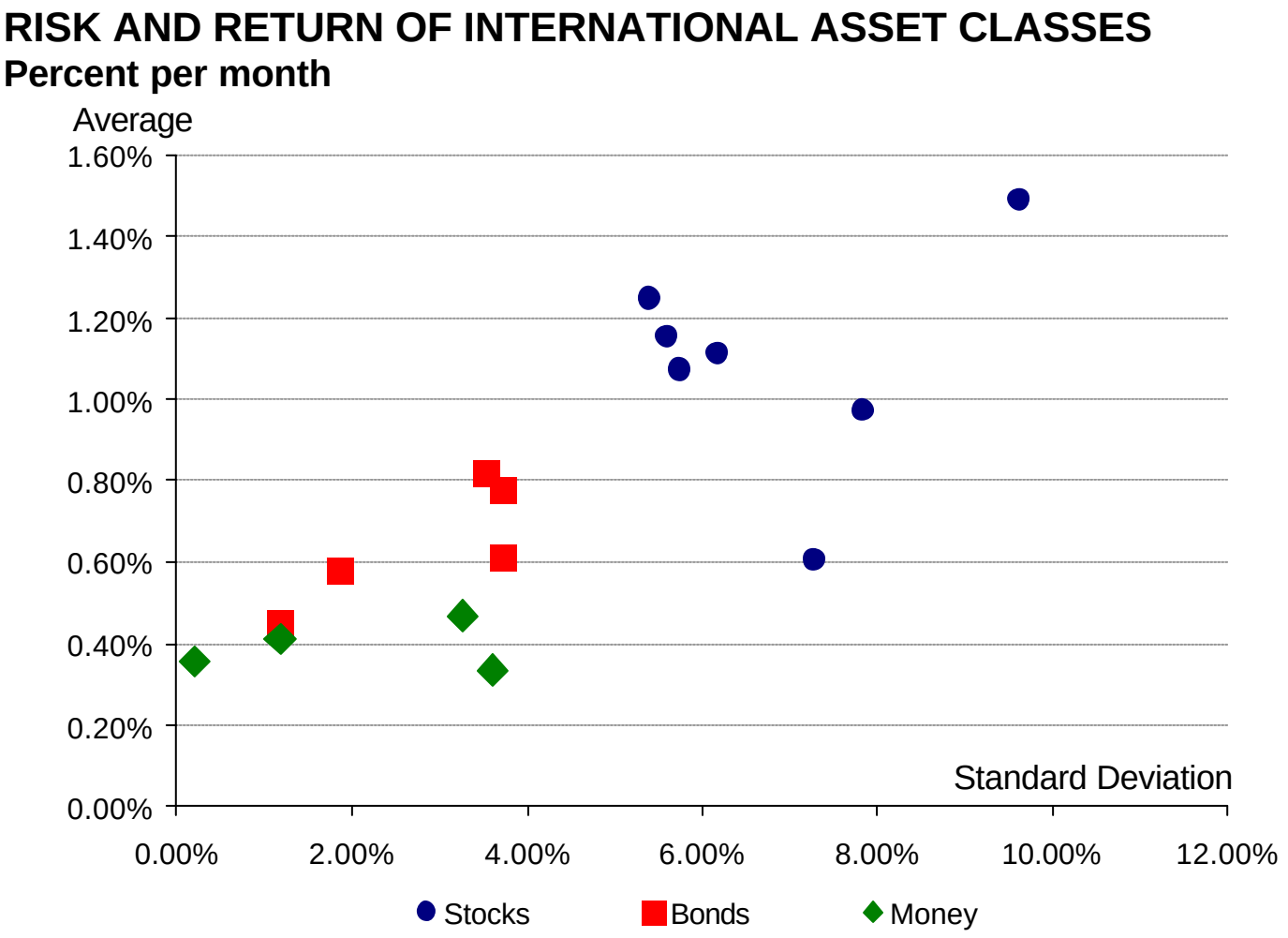
The relation between average return and dispersion is not straightforward



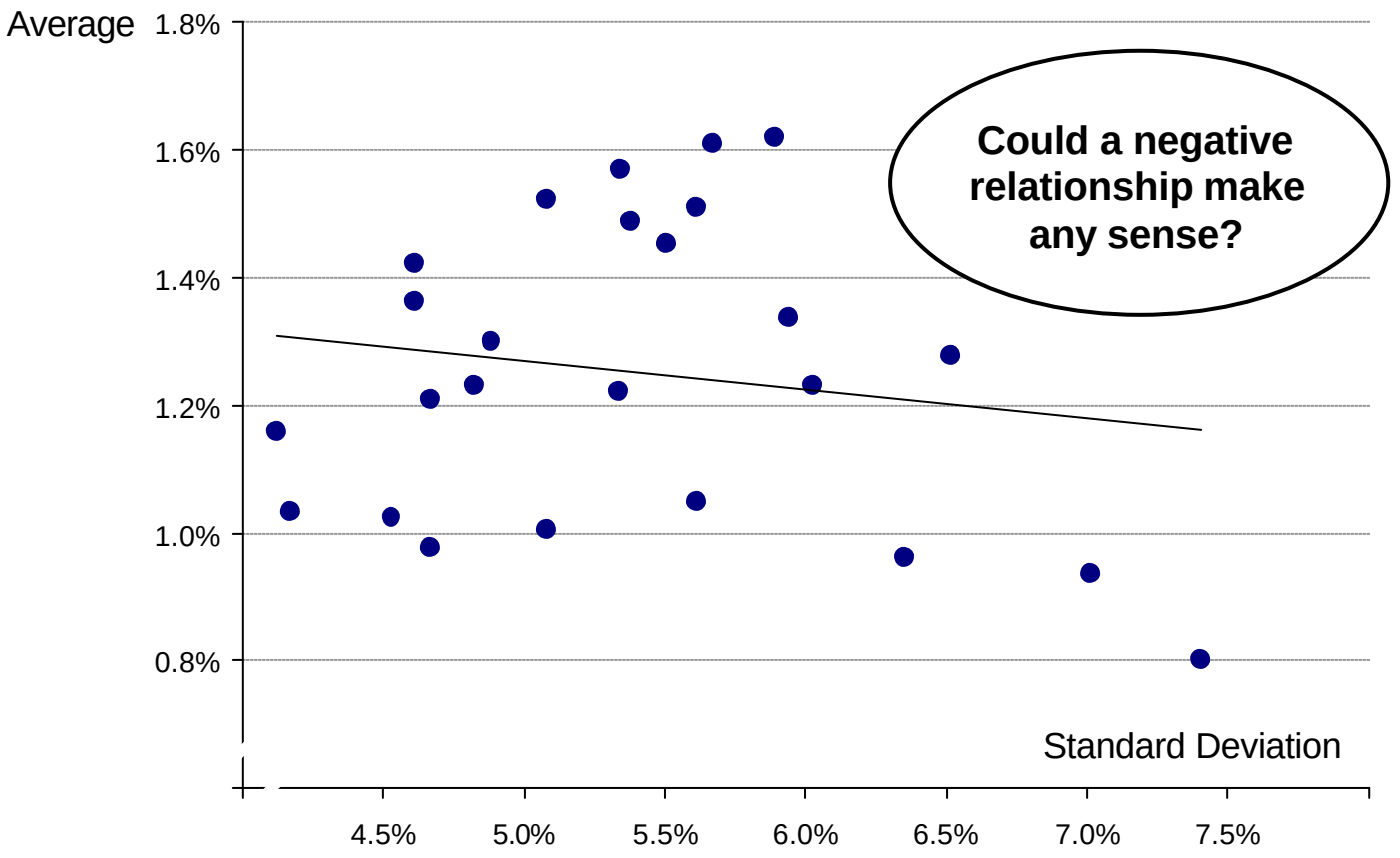
Source: Mertens, Data from Investment Consulting Group

For a single asset class, like stocks, there is almost no relationship

RISK AND RETURN OF SOME U.S. STOCK PORTFOLIOS

Percent per month

BACKUP



Source: Mertens, Data from Fama and French (1992)

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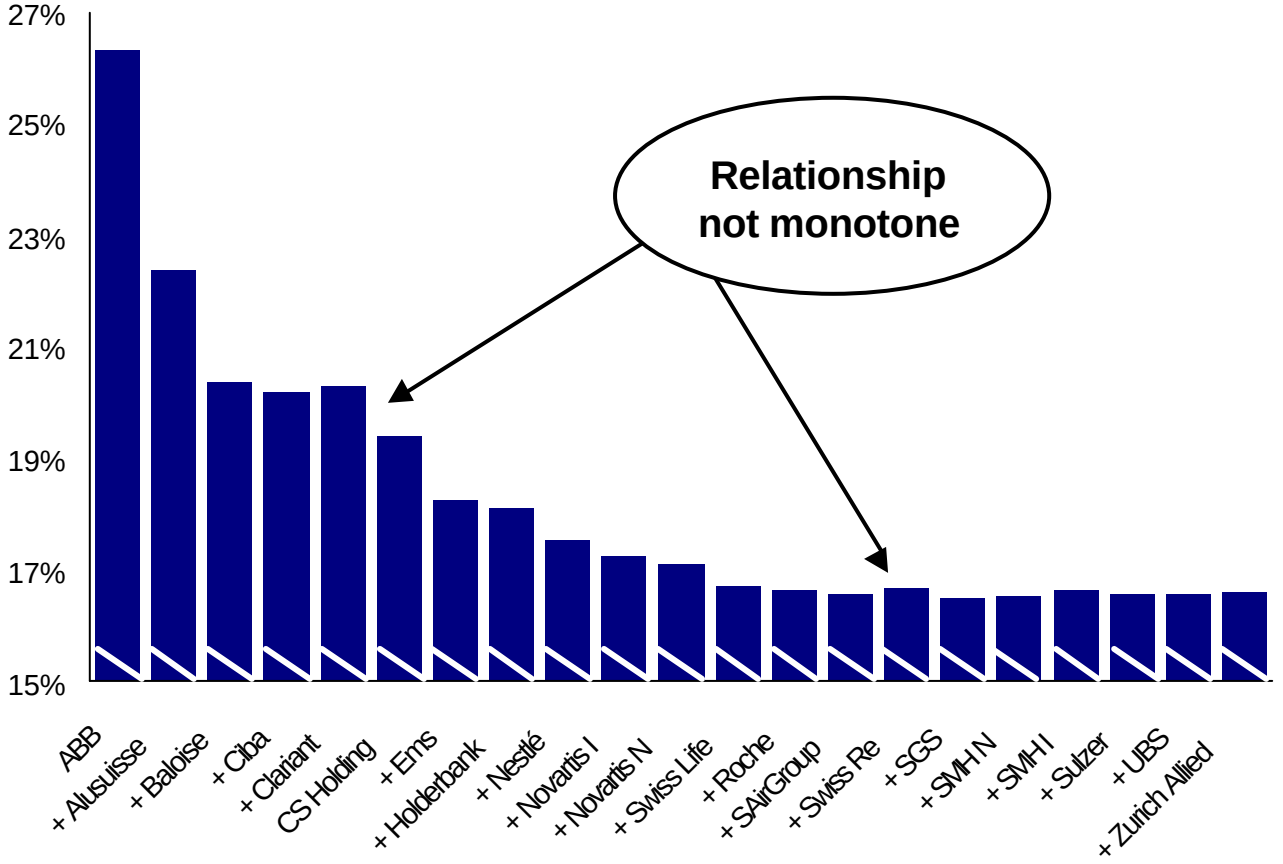
Even a naïve mix of just a few stocks reduces risk considerably

ADDING STOCKS IN ALPHABETIC ORDER TO A PORTFOLIO

Volatility of portfolio returns (dispersion around mean) in percent p.a.

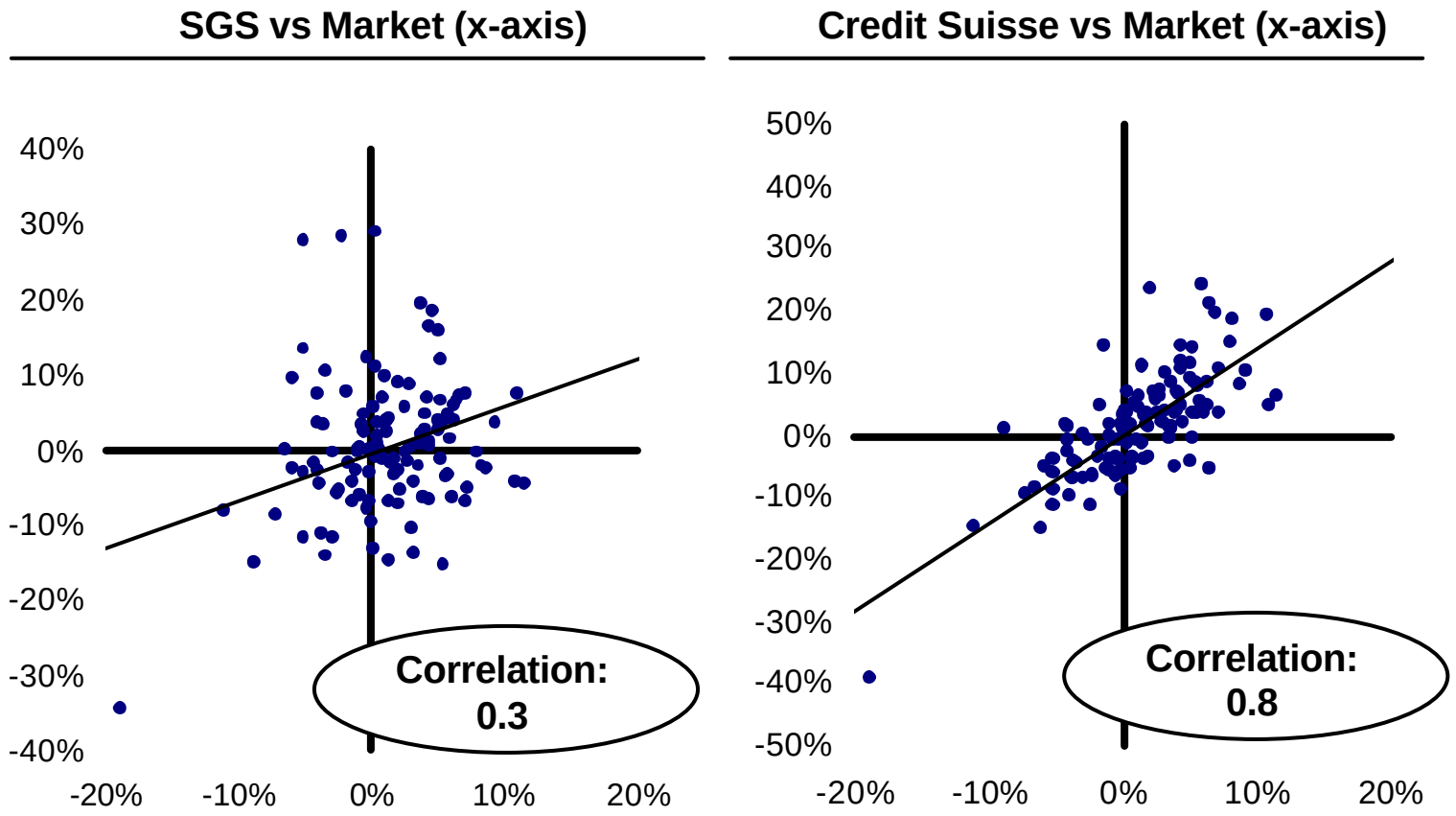


Source: Zimmermann

Some stocks move more, other less closely with the market

COMOVEMENT OF STOCKS WITH MARKET

Returns in percent per month



Source: Mertens

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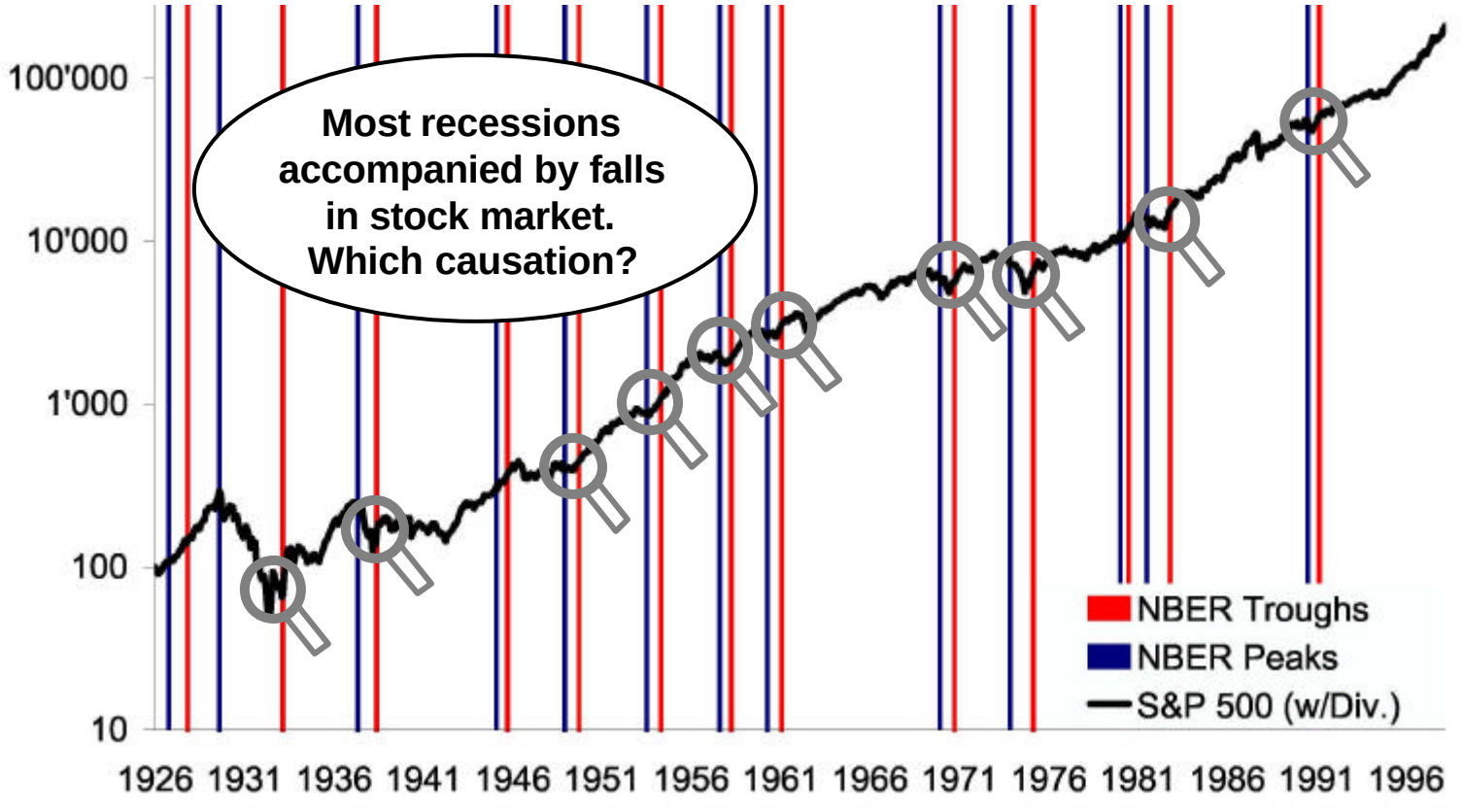
There is a well established link between business cycles and stock market returns

RECESSIONS AND THE U.S. STOCK MARKET SINCE 1926

Indexed S&P 500 (with dividends), logarithmic scale



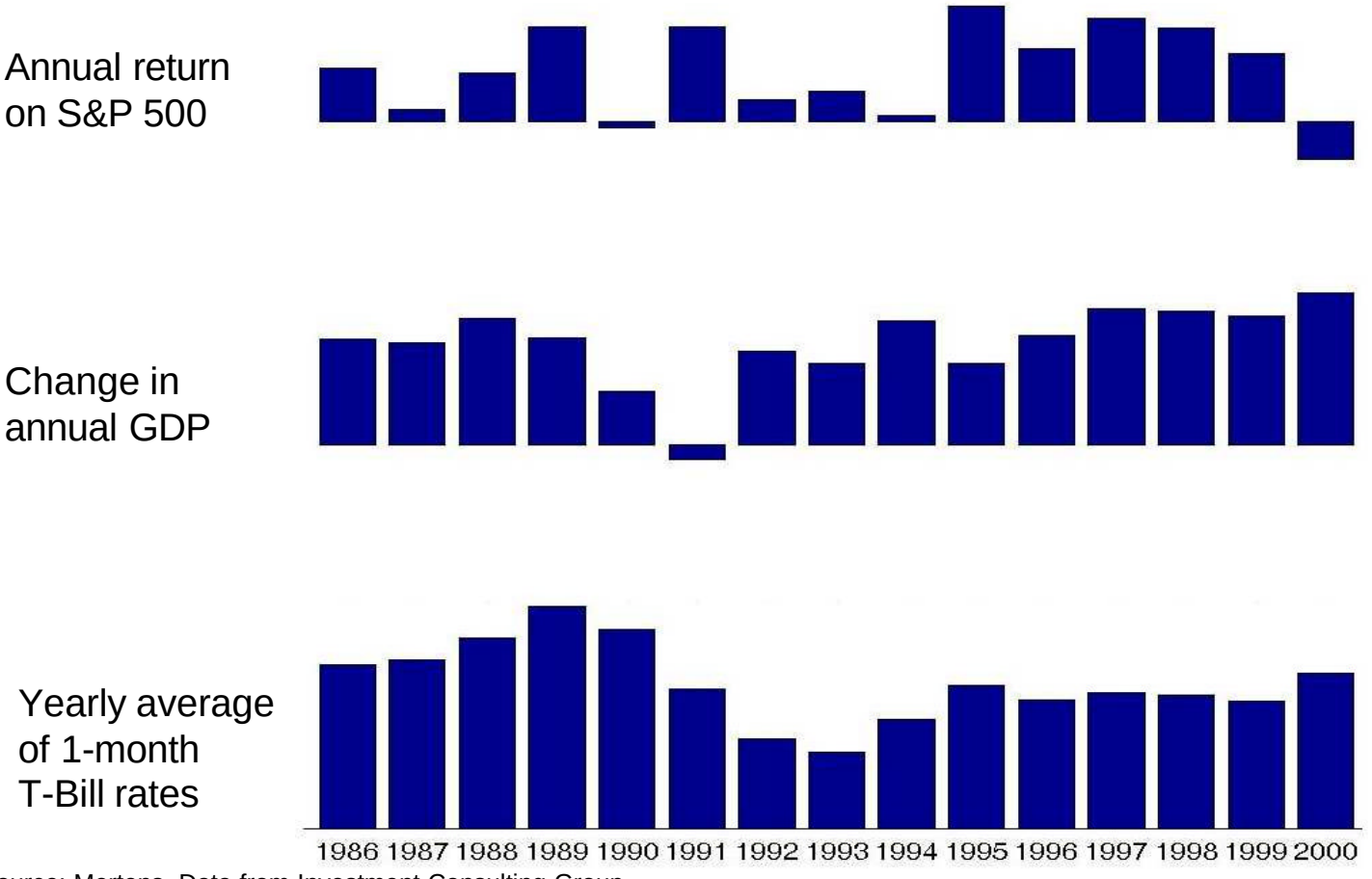
Source: Mertens, Data from NBER and Ibbotson Associates

The relation between stock market, GDP and short rates is not straightforward

U.S. STOCK MARKET AND THE MACROECONOMY

Patterns of yearly returns / changes (different scales)

BACKUP



Source: Mertens, Data from Investment Consulting Group

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TYPICAL FIRM CHARACTERISTICS

- Size
- Industry affiliation
- Accounting Ratios:
  - Price-Earnings
  - Book-to-Market
  - Price-to-Cash-Flow
  - Leverage ratio
  - . . .
- Location of Headquarters and the place of major share listing
- Type of securities issued (stock, preferred, bonds, derivatives)
- Type of activities: conglomerate, start-up etc.
- . . .

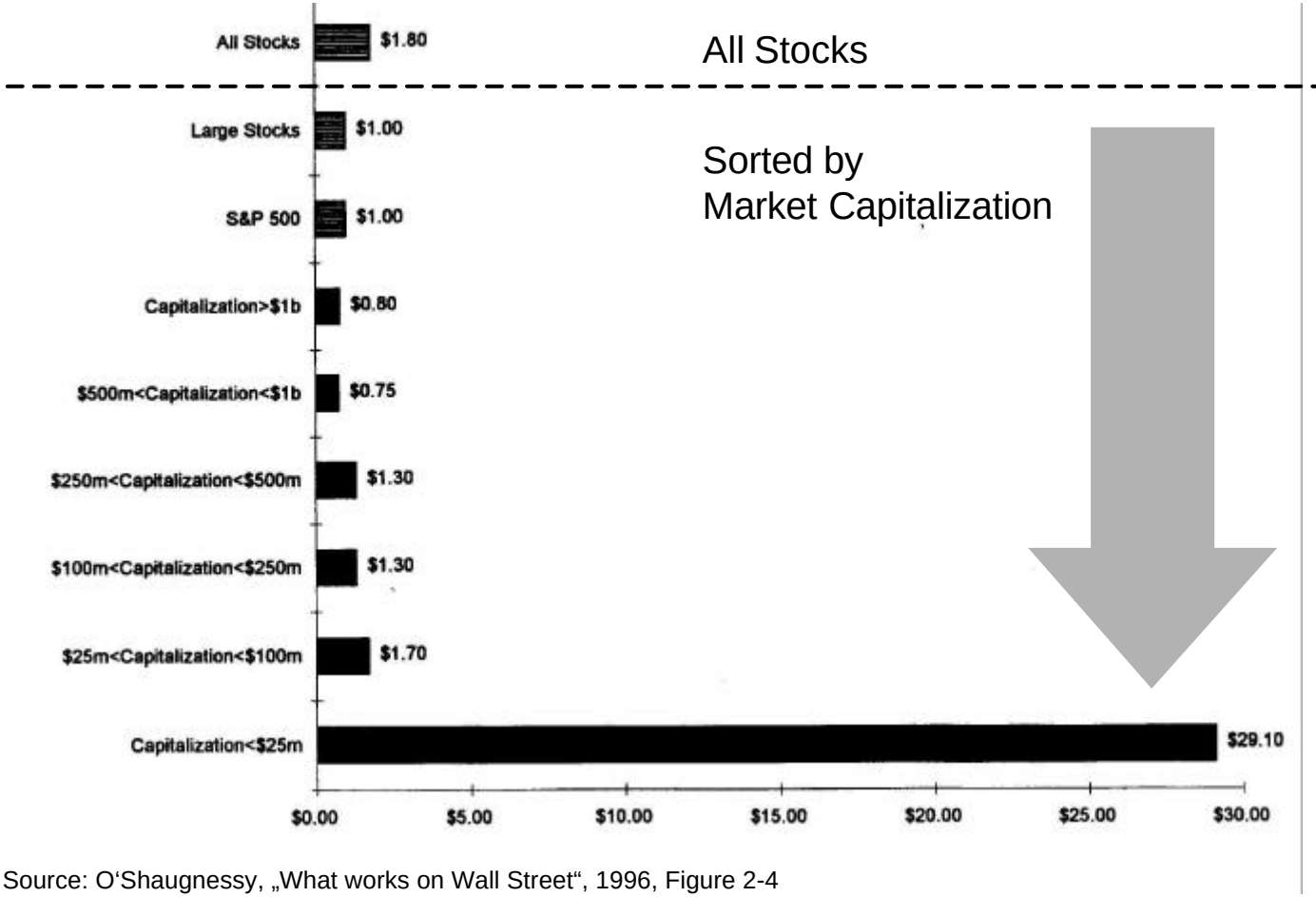
Accounting Ratios are supposed to convey growth expectations. Note: Most ratios are scaled prices

Source: Mertens

Small firms have higher returns, but the most extraordinary results apply only to „micro-caps“

RETURNS AND FIRM SIZE

Million U$, value of $10,000 invested from 1952-1994



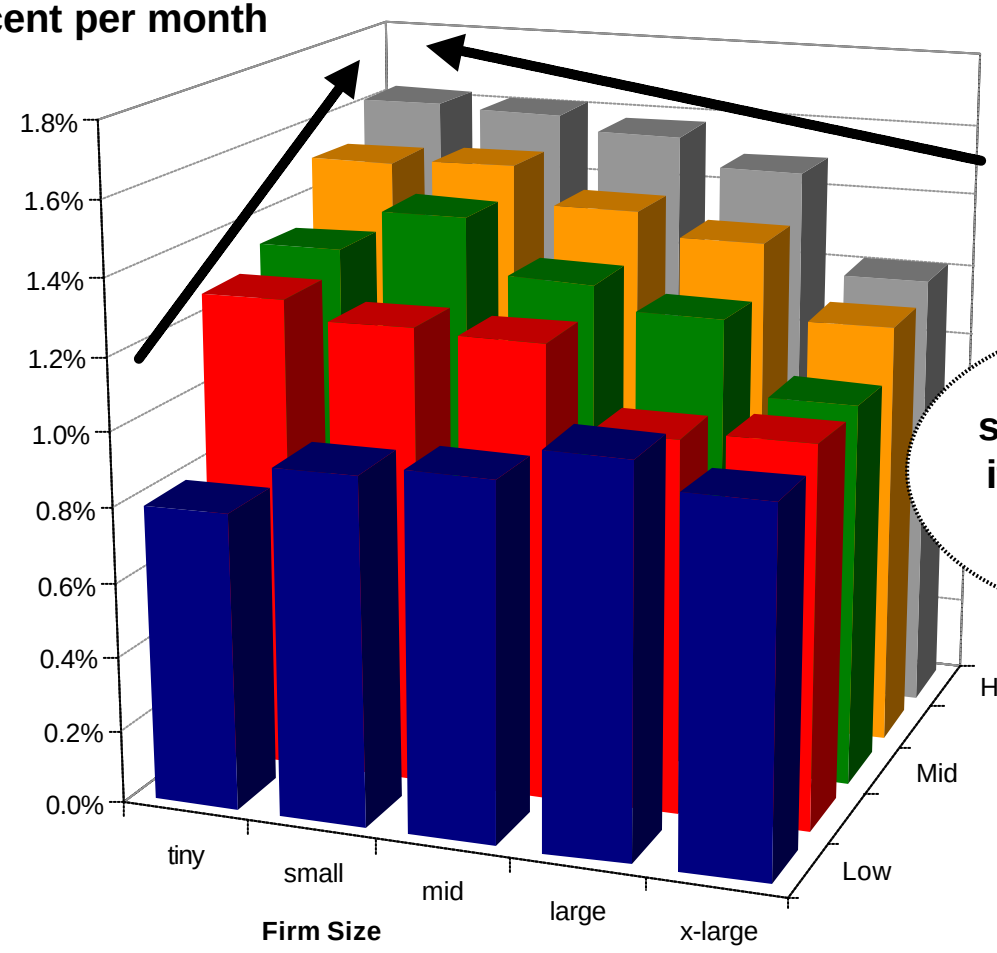
Source: O‘Shaugnessy, „What works on Wall Street“, 1996, Figure 2-4

Small „value“ companies have higher returns

AVERAGE RETURNS ON U.S. STOCKS DEPENDING ON SIZE AND B/M

Percent per month

BACKUP



High B/M is similar to low P/E, it means „value“. The opposite is „growth“

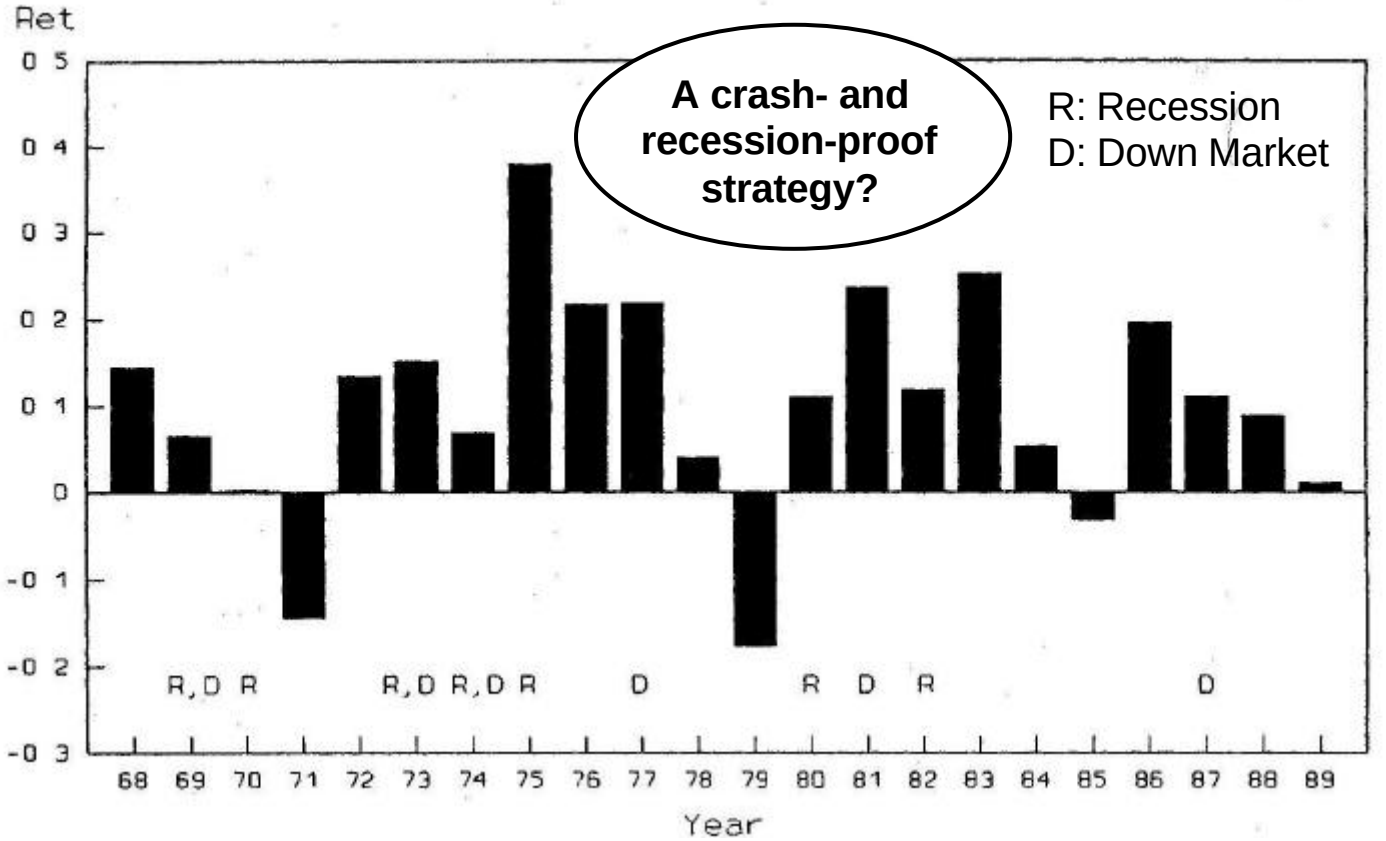
Source: Mertens, Data from Fama and French (1992)

For a long time, the performance of buying „value“ companies seemed very persistent

PORTFOLIO OF BUYING „VALUE“ AND SELLING „GROWTH“ ´68-´90

Percent p.a., U.S. Stocks

BACKUP



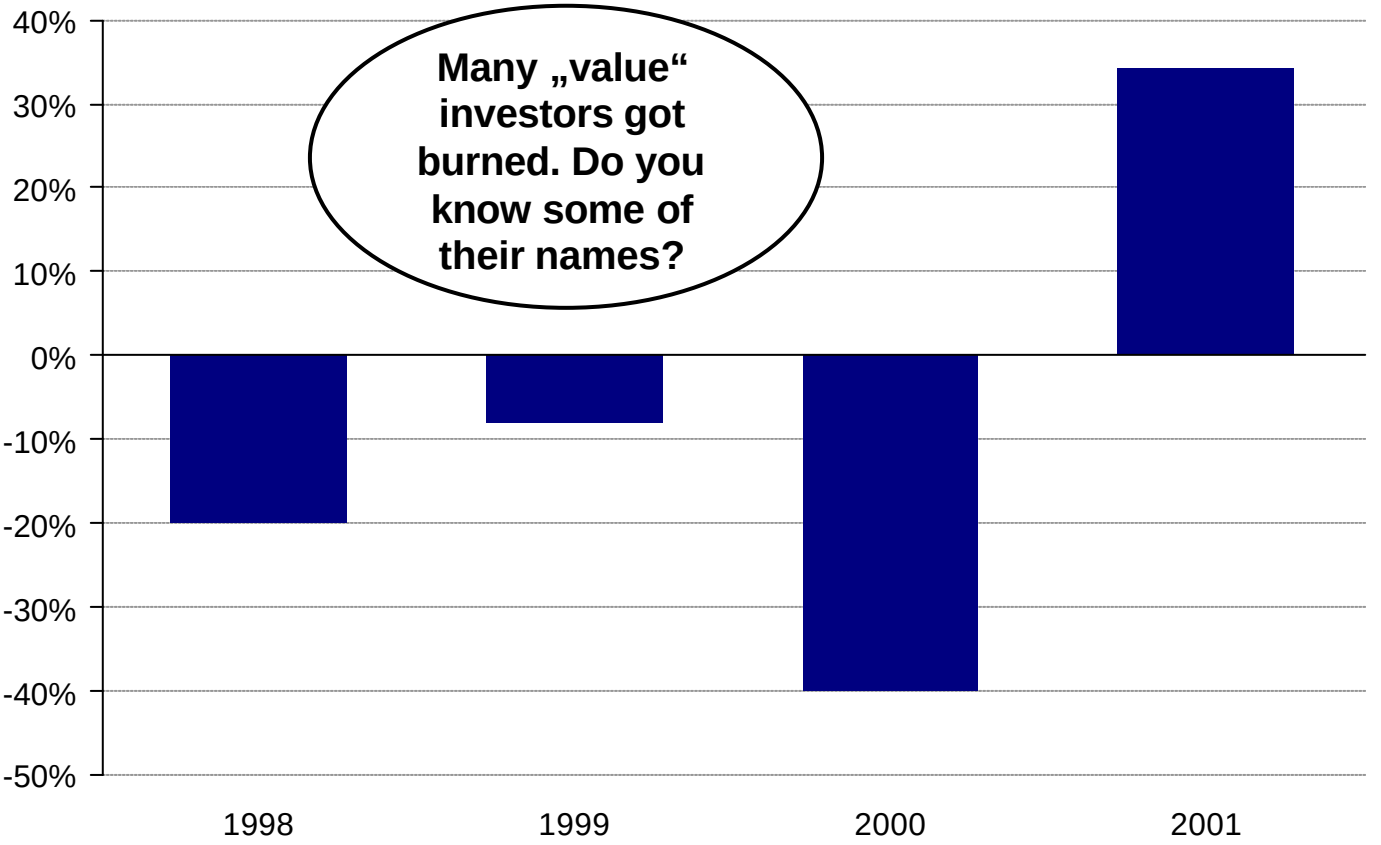
Source: Lakonishok, Shleifer and Vishny (1994)

Recently, the tide has turned against „value“ investors

PORTFOLIO OF BUYING „VALUE“ AND SELLING „GROWTH“ ´90s

Percent p.a., STOXX Euro Style Indices

BACKUP



Source: Mertens, Data from STOXX

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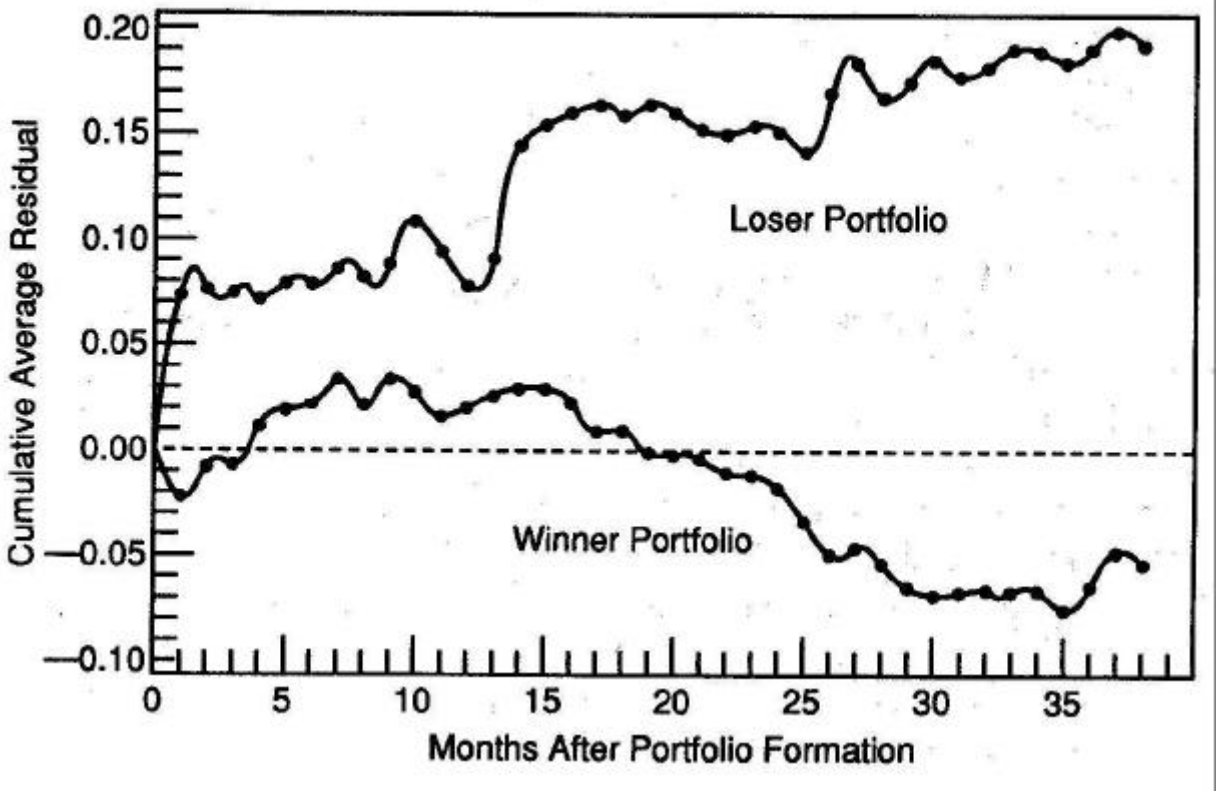
In the long-term, returns of extreme winner/loser tend to reverse

RETURNS TO PREVIOUS 5-YEAR'S WINNER/LOSER STOCKS (U.S.)

Market adjusted returns

Figure 1 Cumulative Average Residuals for Winner and Loser Portfolios of 35 Stocks (1–36 months into the test period)

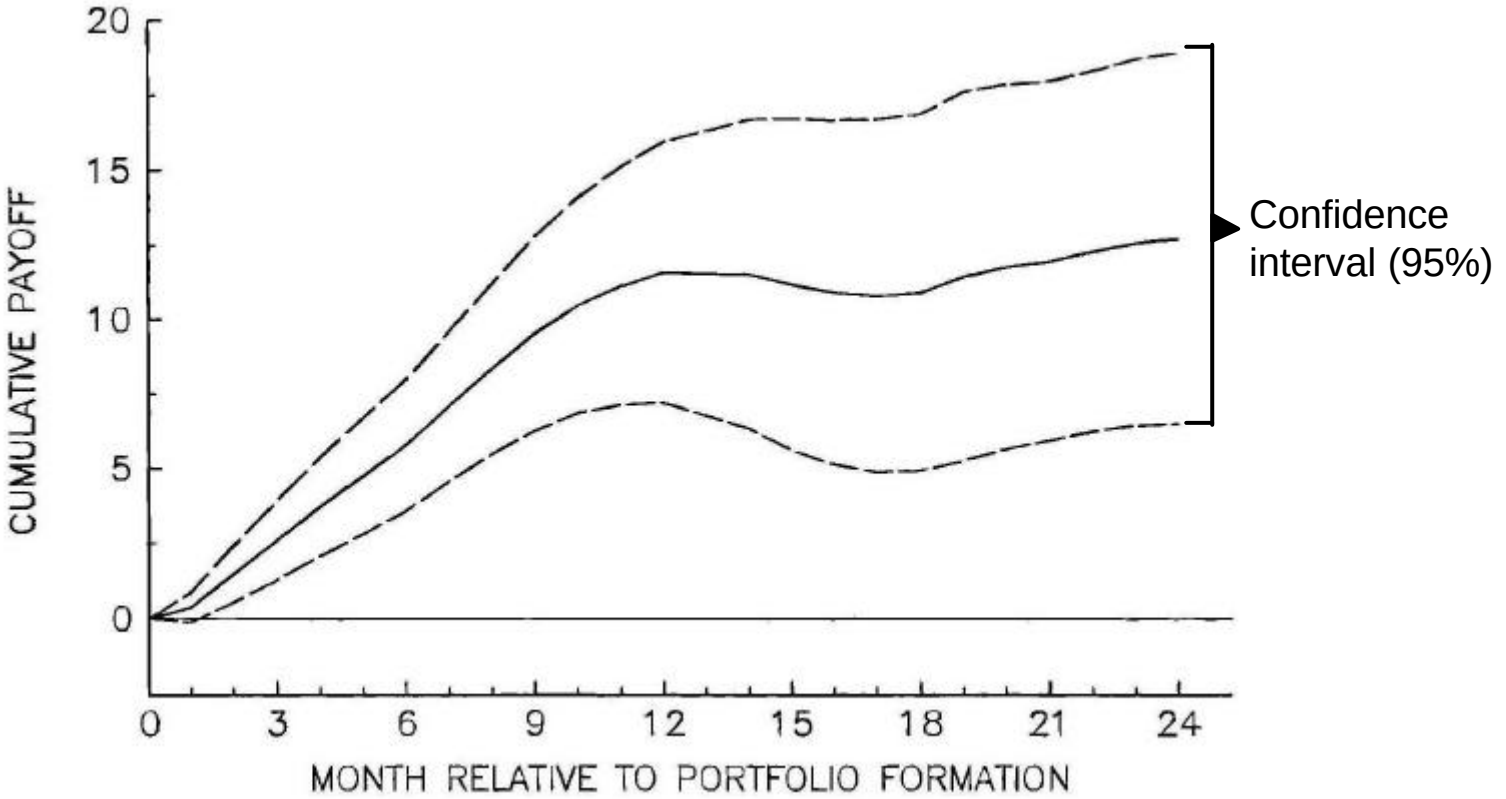


Source: DeBondt and Thaler (1985) reproduced in Thaler (1993)

Short-run continuations seem to be persistent, too

RETURN TO BUYING SHORT-RUN WINNER AND SELLING LOSER

Market adjusted return, international sample of stocks



Source: Rouwenhorst (1998)

LIST OF REFERENCES 1/2

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[b]**Lowenstein** (1995). Buffet - The Making of an American Capitalist, Random House

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[b]**Malkiel** (1996). A Random Walk Down Wall Street, Norton, New York

[b]**O‘Shaugnessy** (1996). What works on Wall Street, McGraw-Hill, New York

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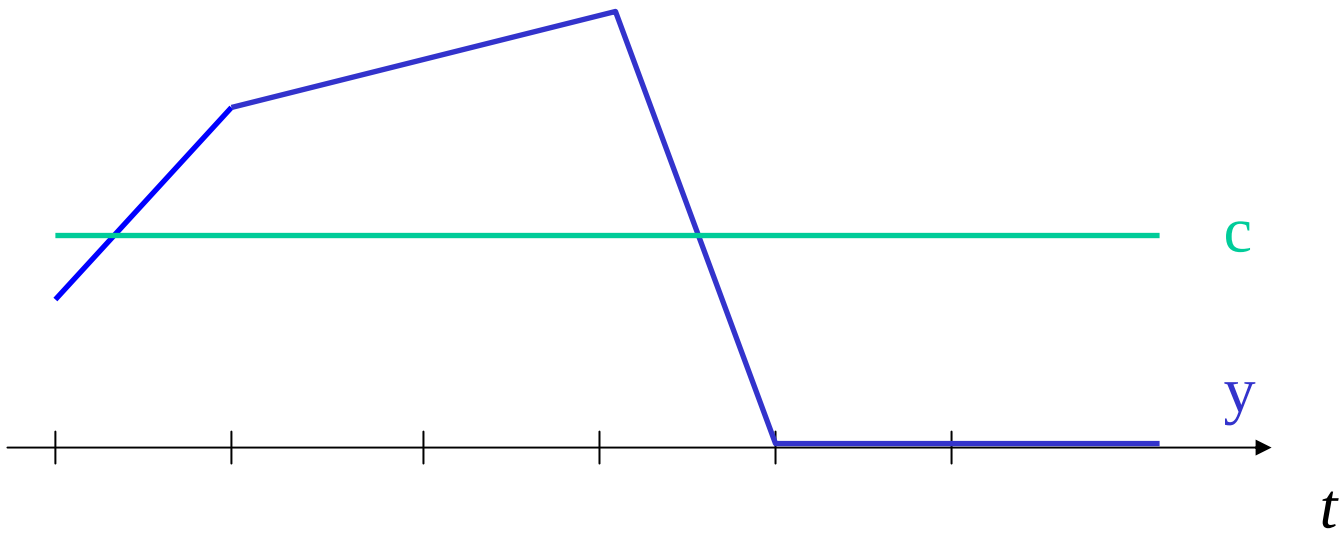
[b] : „bed-time“ reading (and still useful in daylight)

Economic Role of Financial Markets

- Assets allow transfer of cash flow streams
  - over time
    (saving/lending, borrowing)
  - over states of the world
    (insuring, hedging, …)
- Value/price cash flow streams/assets

Transfer over time

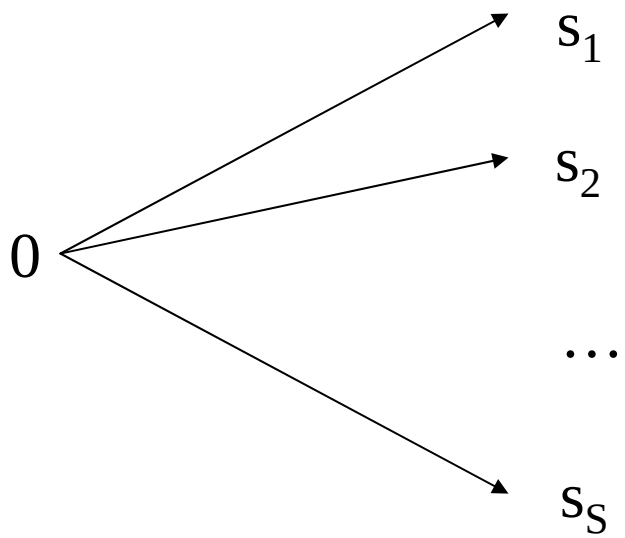
- Borrow and save
  to achieve smooth consumption stream *over time*



- personal loans, bank loans money market bonds, pensions (non-contingent instruments)

Transfer over states

- Insure or hedge to reduce risk
  to achieve smooth consumption *across states*



Desynchronize over states (ctd.)

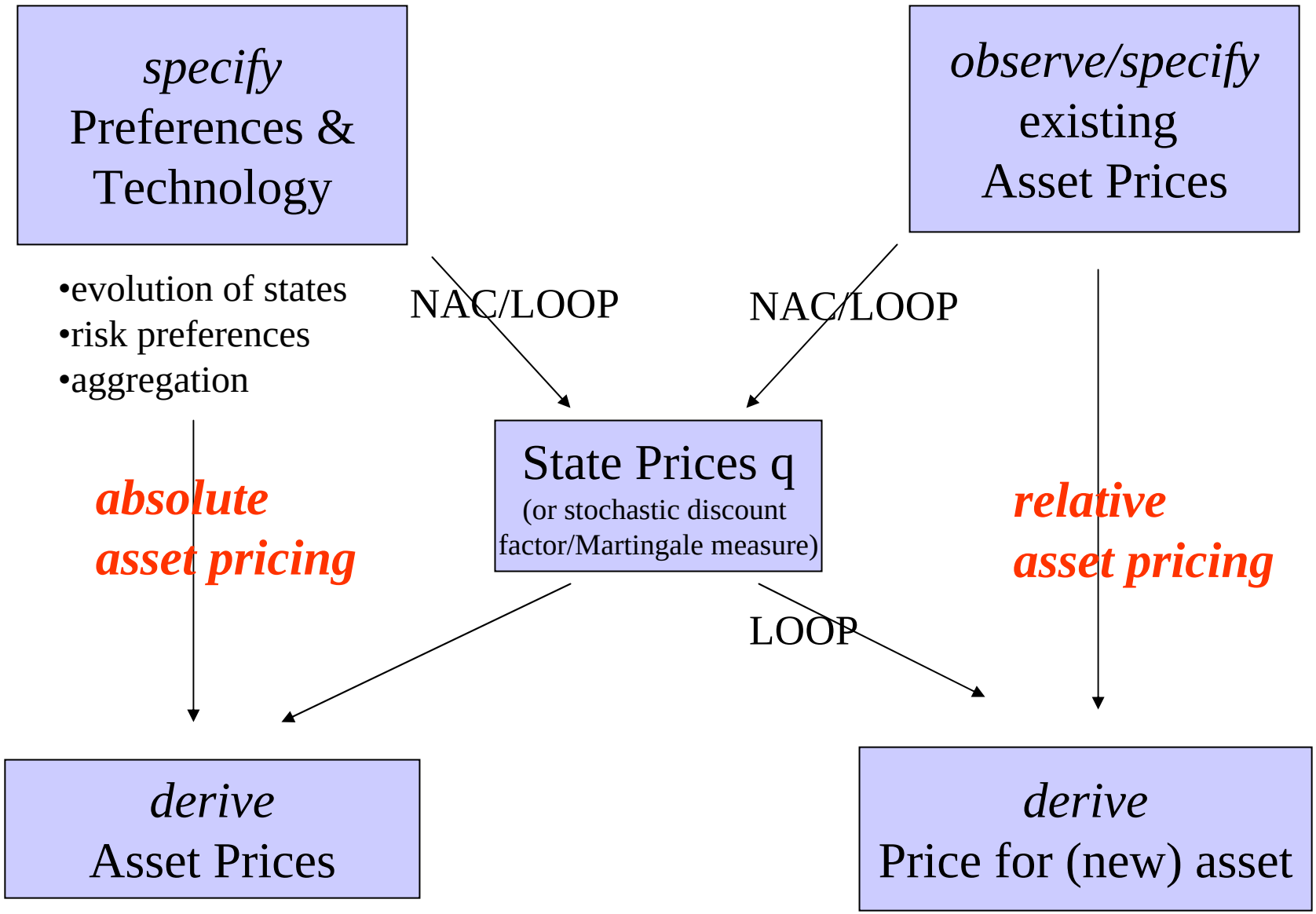
- Contingent commodities
  - Umbrella if it rains at 3:00 p.m.
  - Umbrella if sun shines at 3:00 p.m.

  Goods are defined by *date and state*
- Contingent securities
  - Dollar payoff if it rains at 3:00 p.m.
  - Dollar payoff if sun shines at 3:00 p.m.

  e.g. stocks, derivatives

Pricing: Two Fundamental Approaches

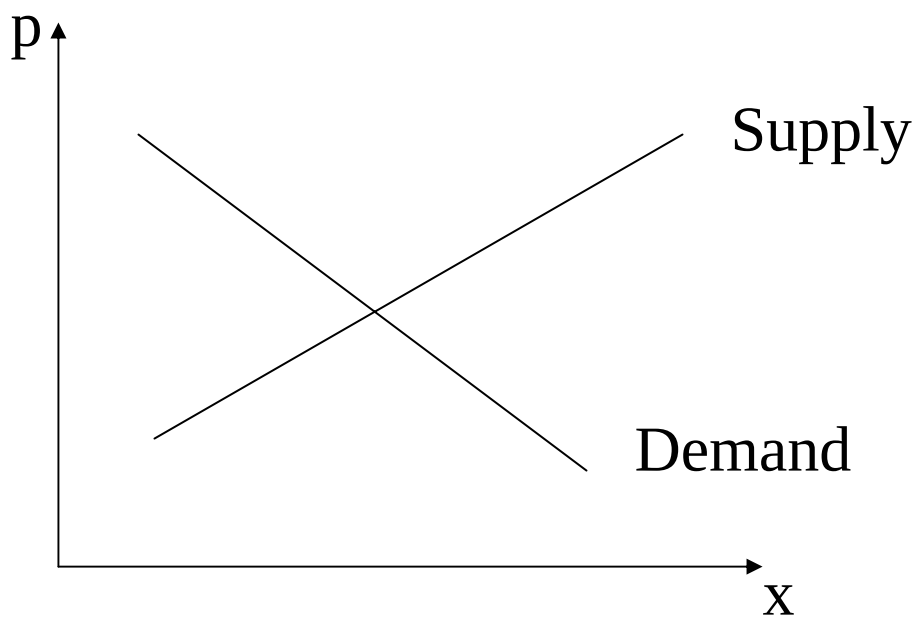
- Equilibrium approach:
  « Absolute Asset Pricing »
  from first principles starting with hypotheses on the structure of the economy and the behavior of economic agents.
- Arbitrage approach:
  « Relative Asset Pricing »
  « piggybacking » on existing price observations



Only works as long as market completeness doesn't change

Equilibrium price of a bicycle

- Analysis of supply and demand for bicycles and substitute products



Arbitrage pricing of bike

Bicycle =	2 wheels:	p_w x 2
	1 saddle:	p_s x 1
	1 frame:	p_f x 1
	1 gearshift:	p_g x 1
	2 brakes:	p_b x 2
		———
		p_{bike} (free labor)