

Part 1: Behavioral Finance & Inefficient Markets



Finance 686

Three-part course in financial history

Part 2. Comparative Financial Systems

- Different countries' financial systems are very different from the financial system of the USA, which is the focus of most textbooks. Running a company or investing in a country without understanding these differences can cause major problems.
- This section is about how different countries' financial systems differ and why these differences arose

Part 1. Behavioral Finance & Inefficient Markets

- The equations in most finance models assume perfect rationality, complete arbitrage and efficient markets.
- Financial history shows that psychological factors also matter
- This section is about how psychology affects finance

Introductory lecture. Finance and Economic Growth

- Financial history shows how prosperity requires an efficient financial system
- This section shows how finance is linked to economics in ways that make the financial system of major importance to economic growth

John Maynard Keynes



Adam Smith, Karl Marx, Ann Krueger, Joseph Schumpeter & John Maynard Keynes
(Left to Right)

Keynes, John Maynard. 1936. *The general theory of employment, investment & money*. Palgrave Macmillan

- “Successful investing is anticipating the anticipations of others.”
- “It is not a case of choosing those which, to the best of one’s judgment, are really the prettiest, nor even those which average opinion genuinely thinks the prettiest. We have reached the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practise the fourth, fifth and higher degrees.”
- “Markets can remain irrational longer than you can remain solvent.”

John Maynard Keynes



亚当·斯密、卡尔·马克思、安·克鲁格、约瑟夫·熊彼特和约翰·梅纳德·凯恩斯(从左至右)

凯恩斯，约翰·梅纳德，1936。《就业、投资与货币通论》。帕尔格雷夫麦克米伦

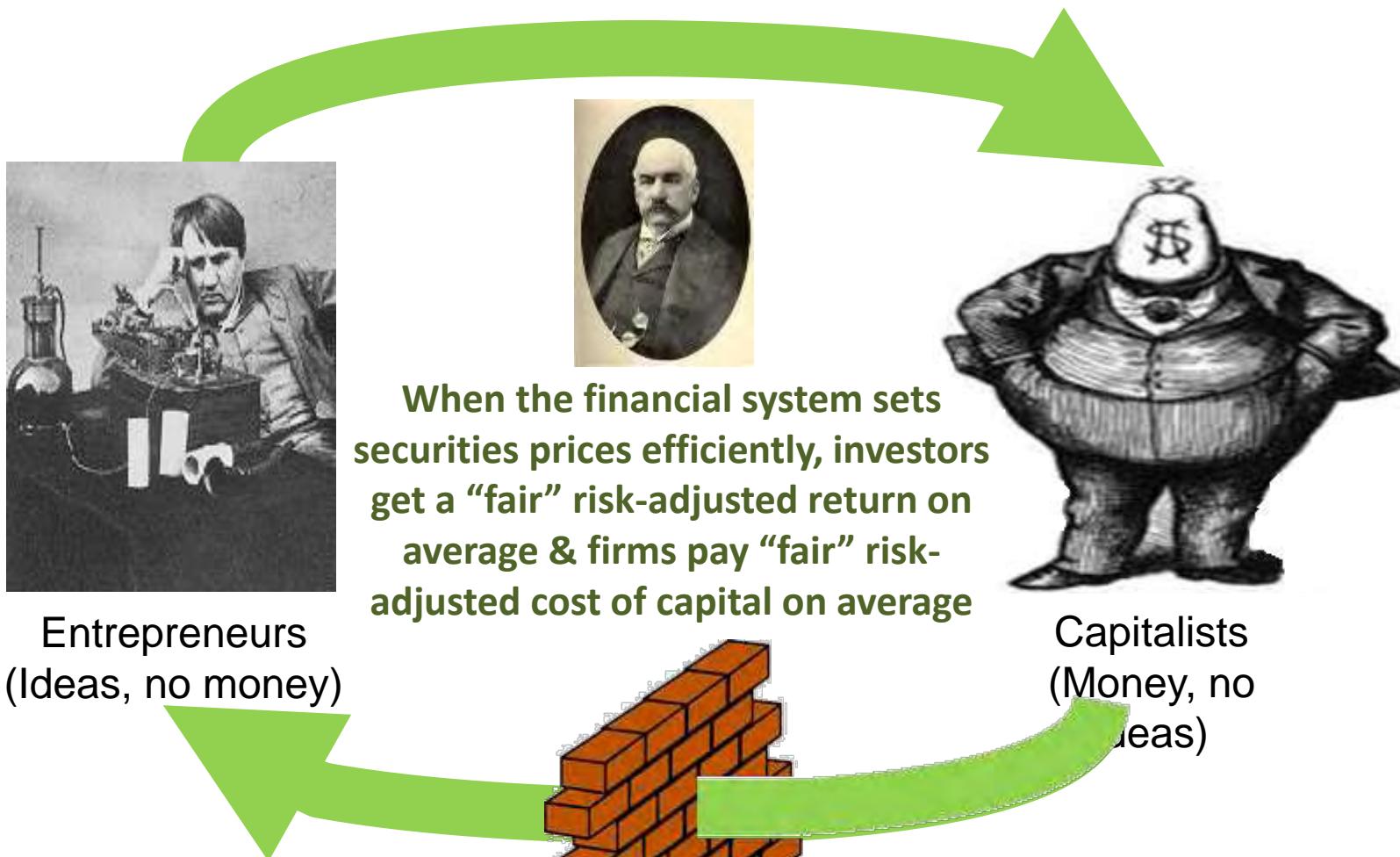
“成功的投资是预测别人的预期。”

根据自己的判断，选择那些真正漂亮的股票是不可能的，甚至一般人认为最漂亮的股票也是不可能的。我们已经达到了第三个阶段，我们把我们的智慧投入到预测一般意见对一般意见的期望上。我相信，还有一些人在实践第四、第五甚至更高的层次。”

“市场保持非理性的时间可能比你保持偿付能力的时间长。”

Recall Schumpeter's Circular Flow

- Schumpeter argued the ultimate purpose of financial market is financing innovation
- This is why stock market efficiency is socially important
- If people stop trusting financial markets, innovators no longer get money to fund innovation



If Stock Prices Are Wrong ...

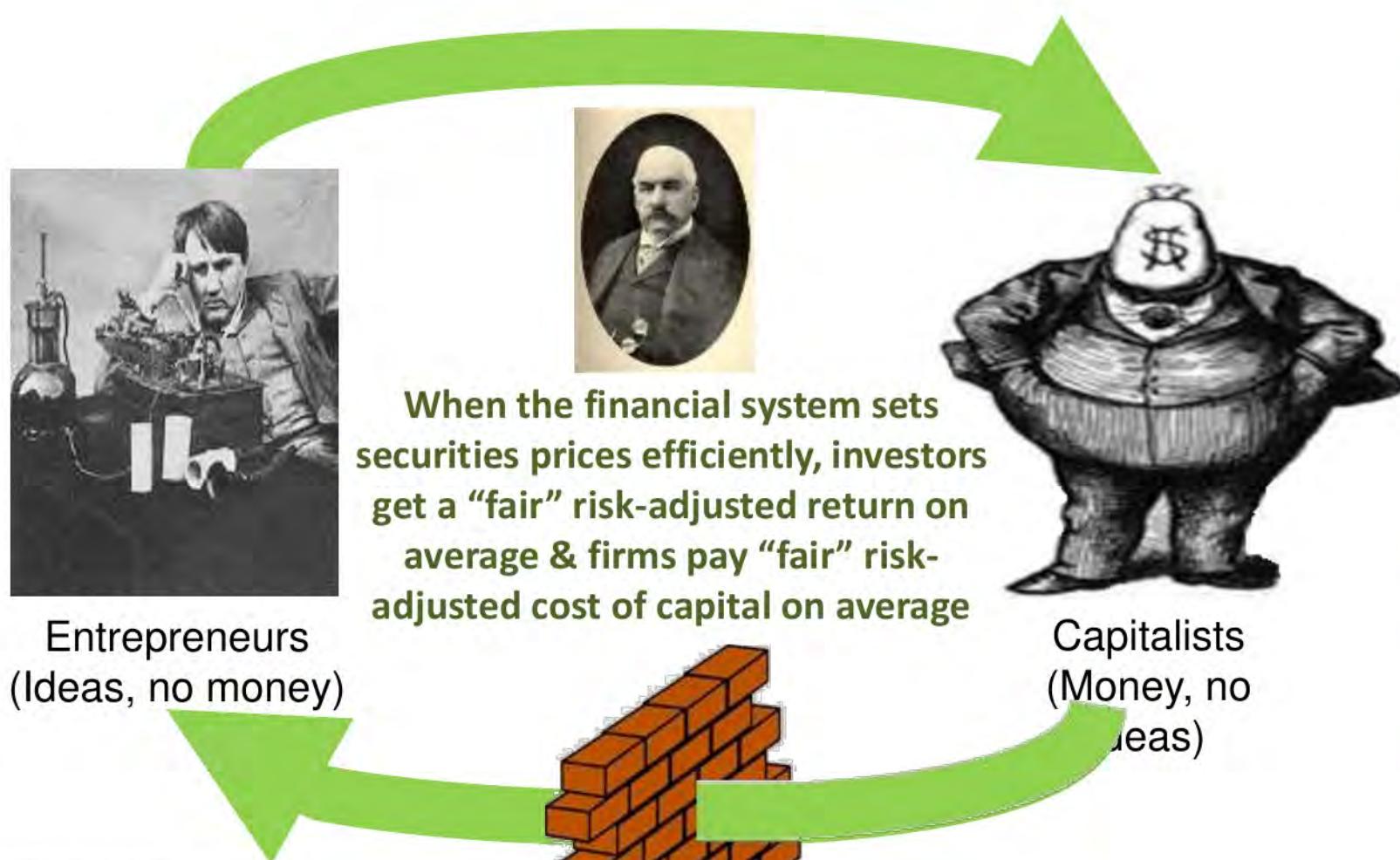
- Investors don't trust the market & worry they pay too much for securities
- Entrepreneurs don't trust the market & worry they get too little money for securities they issue
- Schumpeter's "circular flow" stops circulating
- This is why stock market inefficiency is socially costly

回想一下熊彼特的循环流理论

熊彼特认为，金融市场的最终目的是融资创新

这就是为什么股市效率在社会上很重要

如果人们不再信任金融市场，创新者就无法获得资助创新的资金



如果股票价格错 Wro! 市

□ Investors don't trust the market & worry they paid much for securities

企业家不信任市场，担心他们从证券上赚到的钱太少

熊彼特的“循环流动”无效
stops circulating

□ This is why stock market inefficiency is socially costly

Late 1990s Dot.com Bubble



Intro finance:
To make
money from
overvalued
stocks, ..
Buy put
options!!!

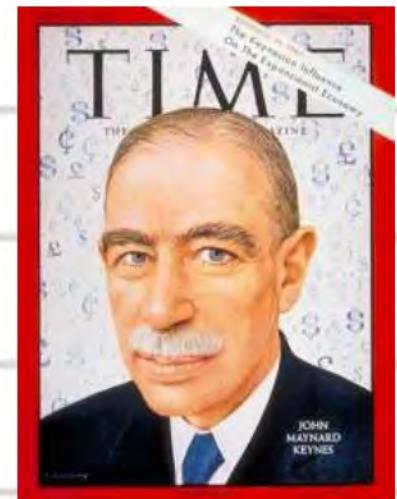
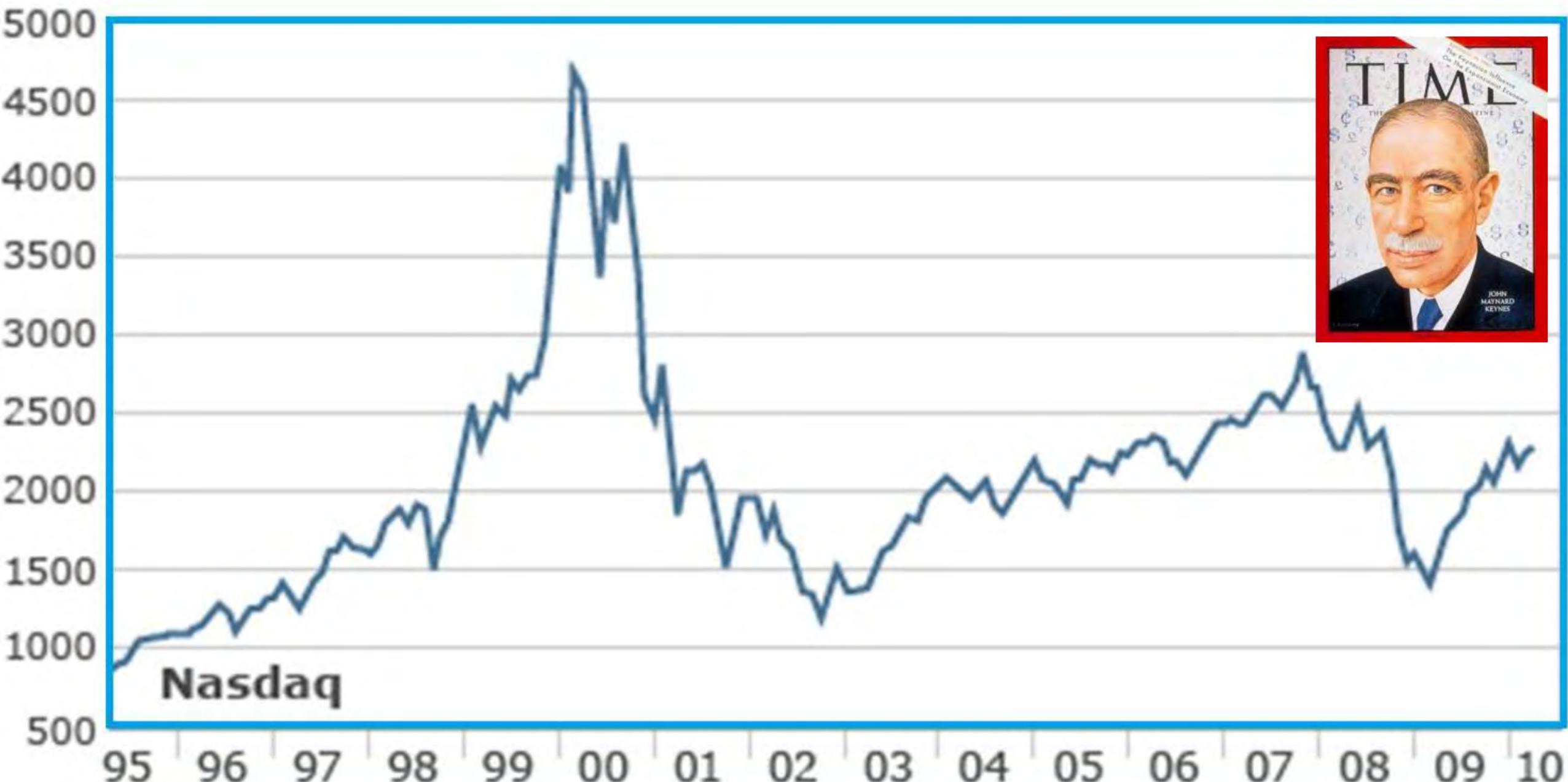
Late 1990s Dot.com Bubble



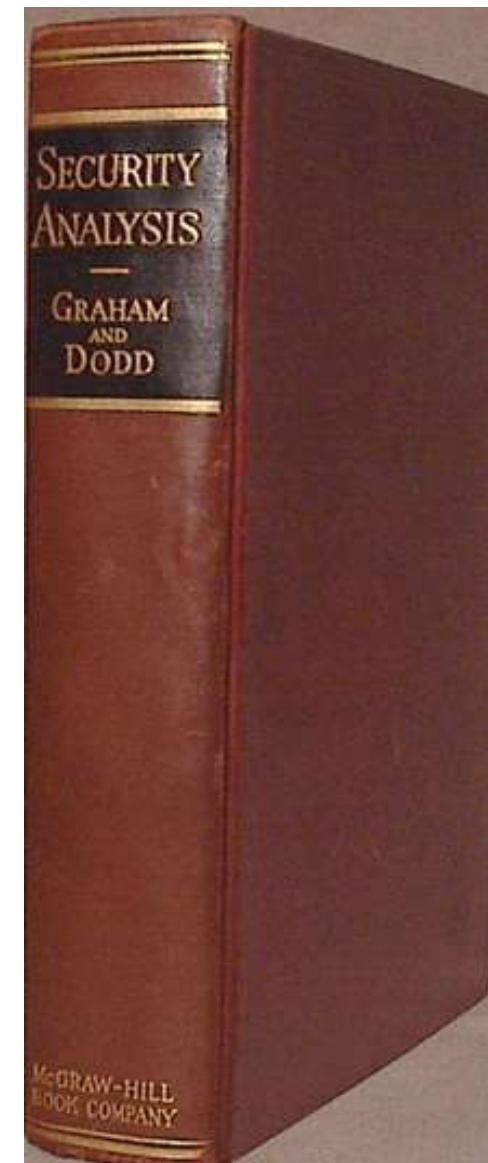
Late 1990s Dot.com Bubble



Late 1990s Dot.com Bubble



Finance 301 until circa 1975



Graham, Benjamin & David Dodd. 1934. *Security Analysis: Principles & Technique*. McGraw Hill

- 1st edition now worth > \$40K
- There are two ways to “beat the market”

Fundamental Analysis

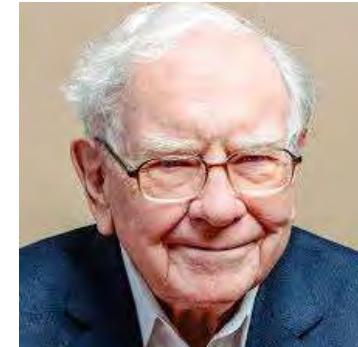
- Based on economics: Use economics to estimate future dividends & discount rates to estimate the “fundamental” value F of a stock as the present discounted value of future dividends

$$F = \frac{E[D_1]}{(1+r)} + \frac{E[D_2]}{(1+r)^2} + \frac{E[D_3]}{(1+r)^3} + \dots$$

- The stock market is inefficient, so $P \neq F$ quite often
- If $P < F$ then “buy”. If $P > F$ then “sell”

Technical Analysis

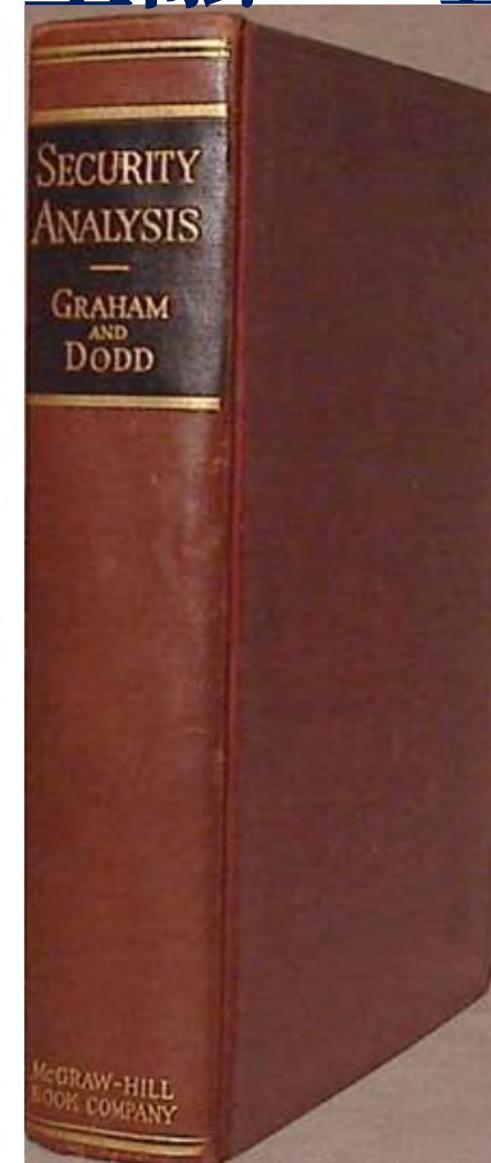
- Based on market traditions
- Technical analysts are also called “elves”
- “Elves” use “Charts” to make “bearish” (price will fall) and bullish (price will rise) predictions about individual stocks or stock market indexes



Warren Buffet
Berkshire Hathaway

金融301直到1975年左右

格雷厄姆，本杰明第一版和大卫现在多德。值1934。安全> \$ 40k分析:原则与技术。麦格劳希尔



有两种方法可以“战胜市场”

基本面分析

基于经济学:用经济学来估计未来

股息和贴现率来估计“基本”价值

Fof股票作为未来股息的现值贴现值

$$F = \frac{E[D_1]}{(1+r)} + \frac{E[D_2]}{(1+r)^2} + \frac{E[D_3]}{(1+r)^3} + \dots$$

<1>股票市场效率低下，所以 $P \neq F$ 往往是<1>
如果 $P < F$ then “买入”。如果 $P > F$ then "卖出"技术分析
基于市场的传统的技术分析师也被称为"精灵"使用
"图表"做出"看跌"(价格将下跌)和看涨

(价格会上涨)对个股或个股的预测
市场指数

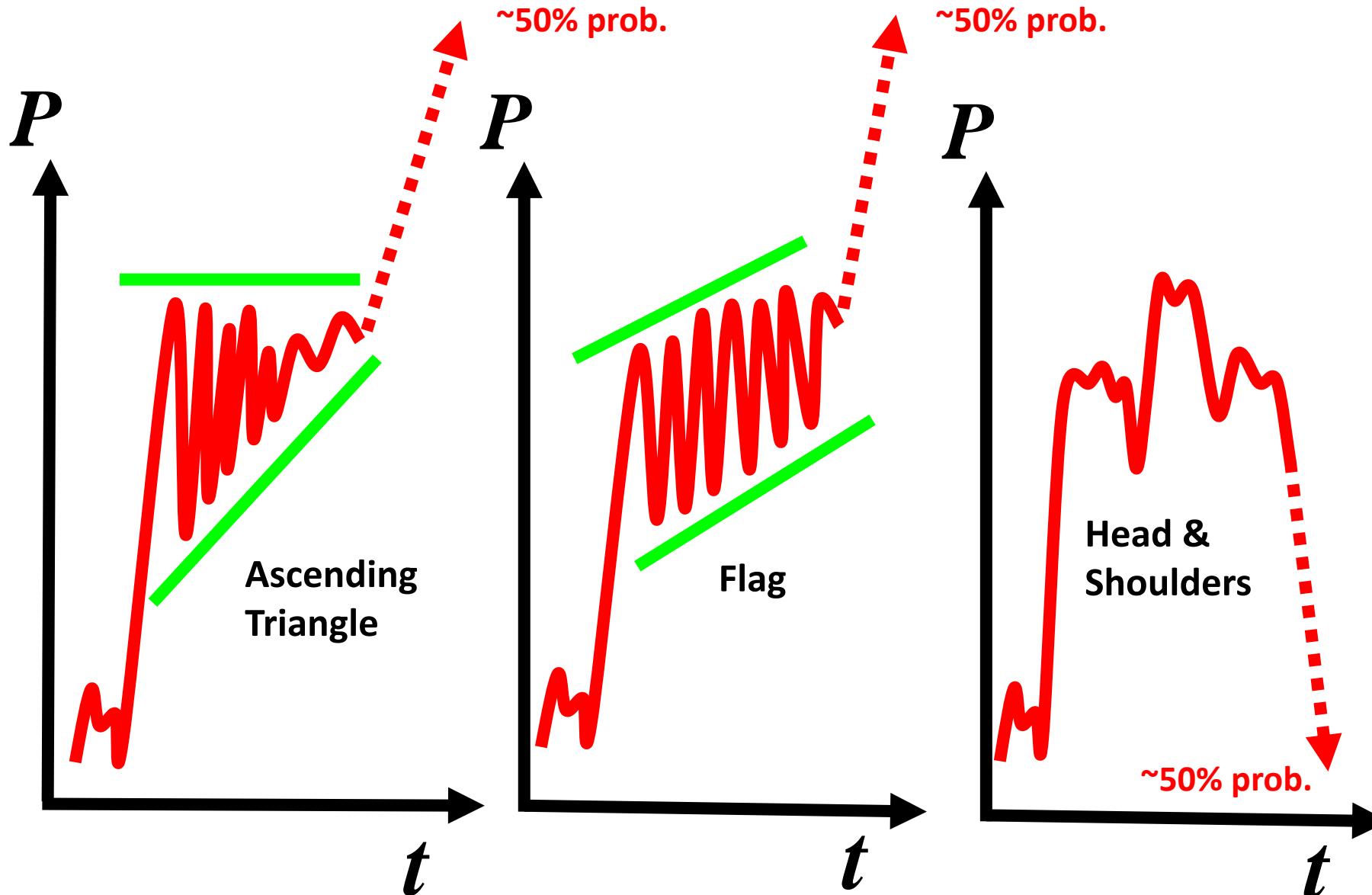


Warren Buffet

伯克希尔哈撒韦公司

Technical Analysis Using “Charts”

Graham, Benjamin & David Dodd. 1934. *Security Analysis: Principles & Technique*. McGraw Hill



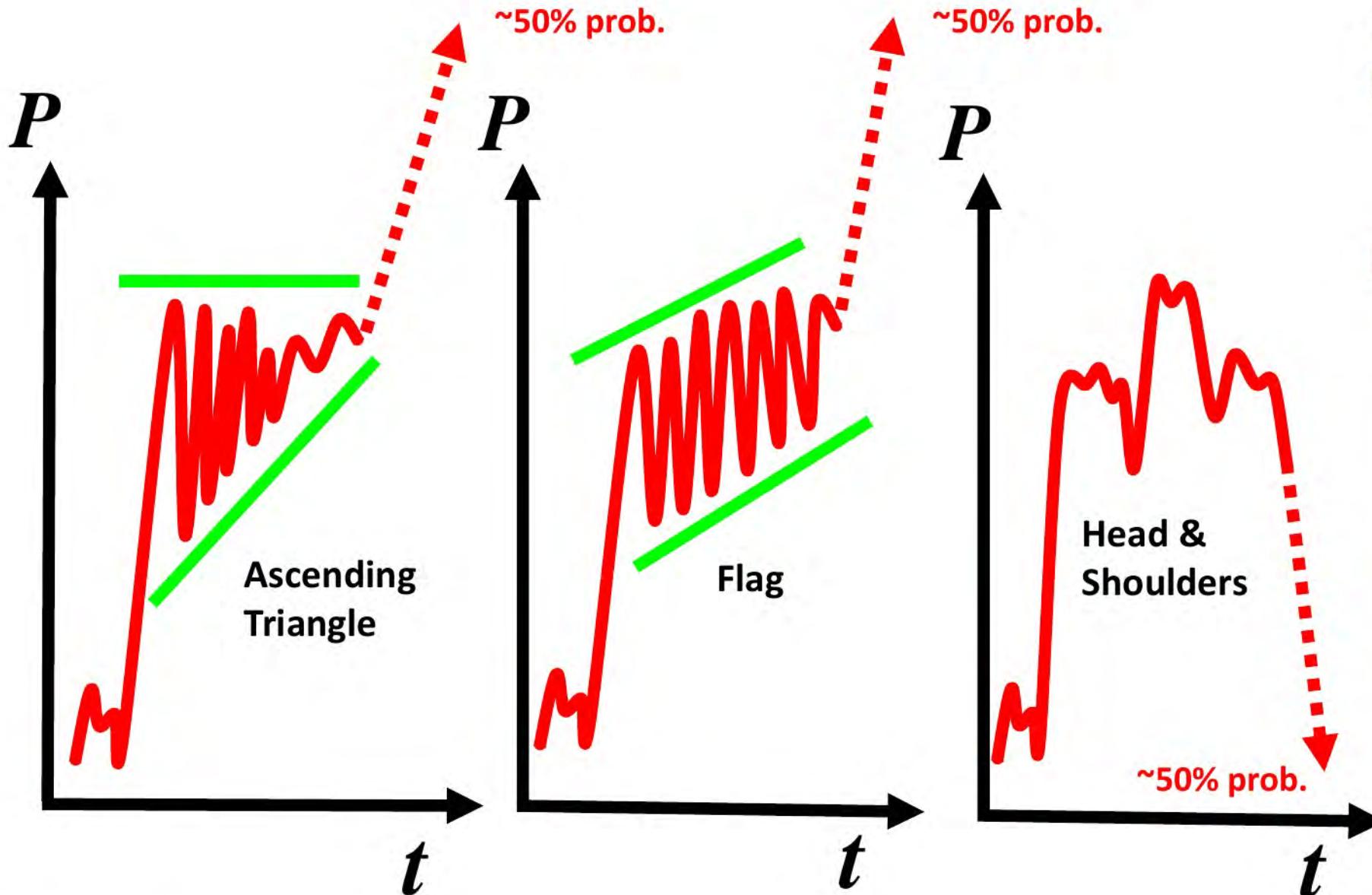
- “Elves” use charts to find
- “Bearish signs”
(predicting declines)
and
 - “Bullish signs”
(predicting increase)



Statue of bear & bull
Wall Street, New York

使用“图表”进行技术分析

本杰明·格雷厄姆和大卫·多德1934。《证券分析:原理与技术》。麦格劳希尔



- “Elves” use charts to find
- “Bearish signs”
(predicting declines)
and
 - “Bullish signs”
(predicting increase)



Statue of bear & bull
Wall Street, New York

Technical Analysis Tests with Early Computers



Gene Fama's Ph.D. thesis showed: Except for a long-term trend, stock returns are unpredictable



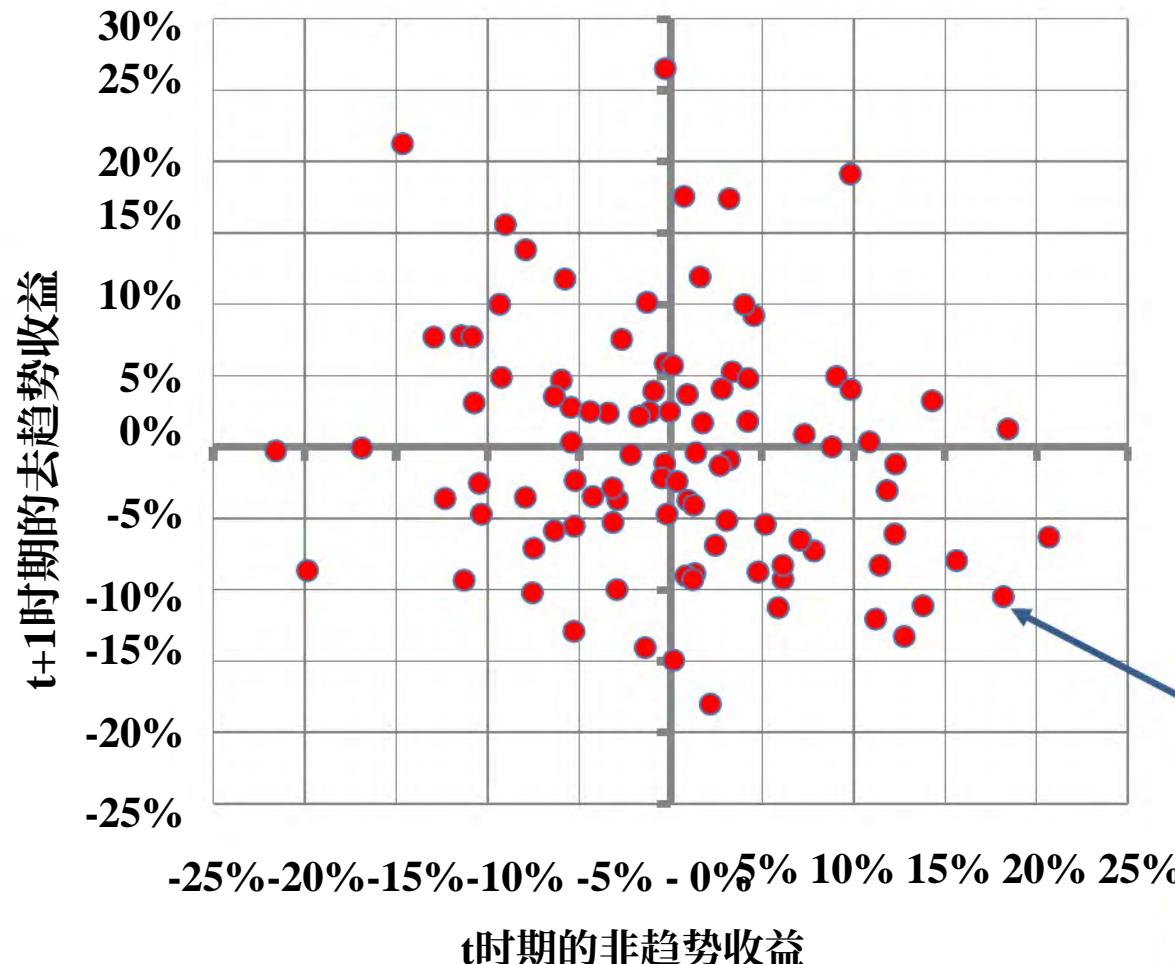
Eugene F. Fama
Professor of Finance,
University of Chicago
Director of Research,
Dimensional Fund Advisors
(\$150B assets under
management)
Nobel Prize, 2013

Random cloud of dots
(No statistically
significant patterns)

Technical Analysis Tests with Early Computers



吉恩·法马的博士论文表明:除了长期趋势, 股票回报是不可预测的



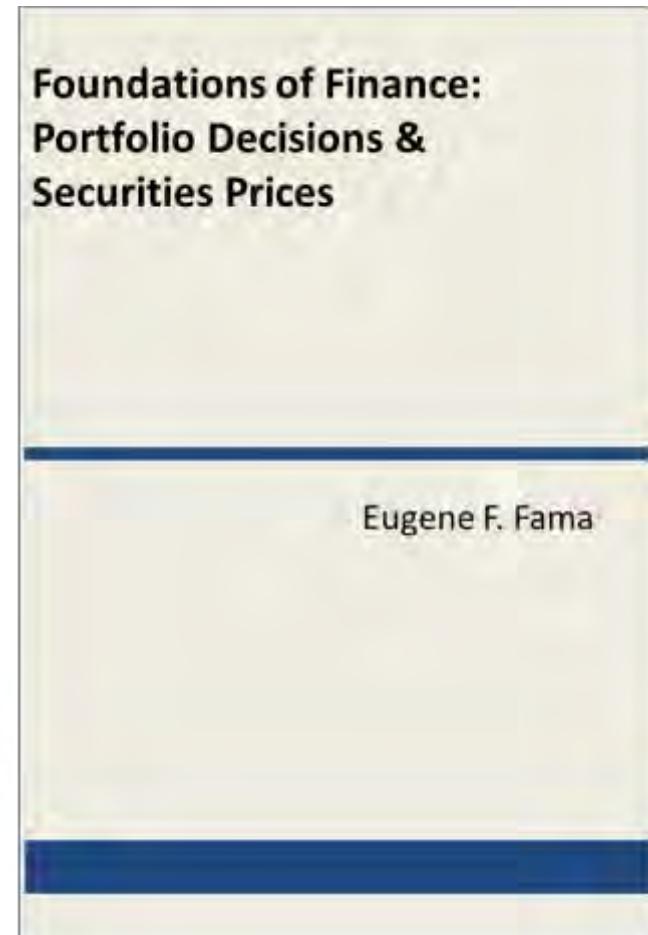
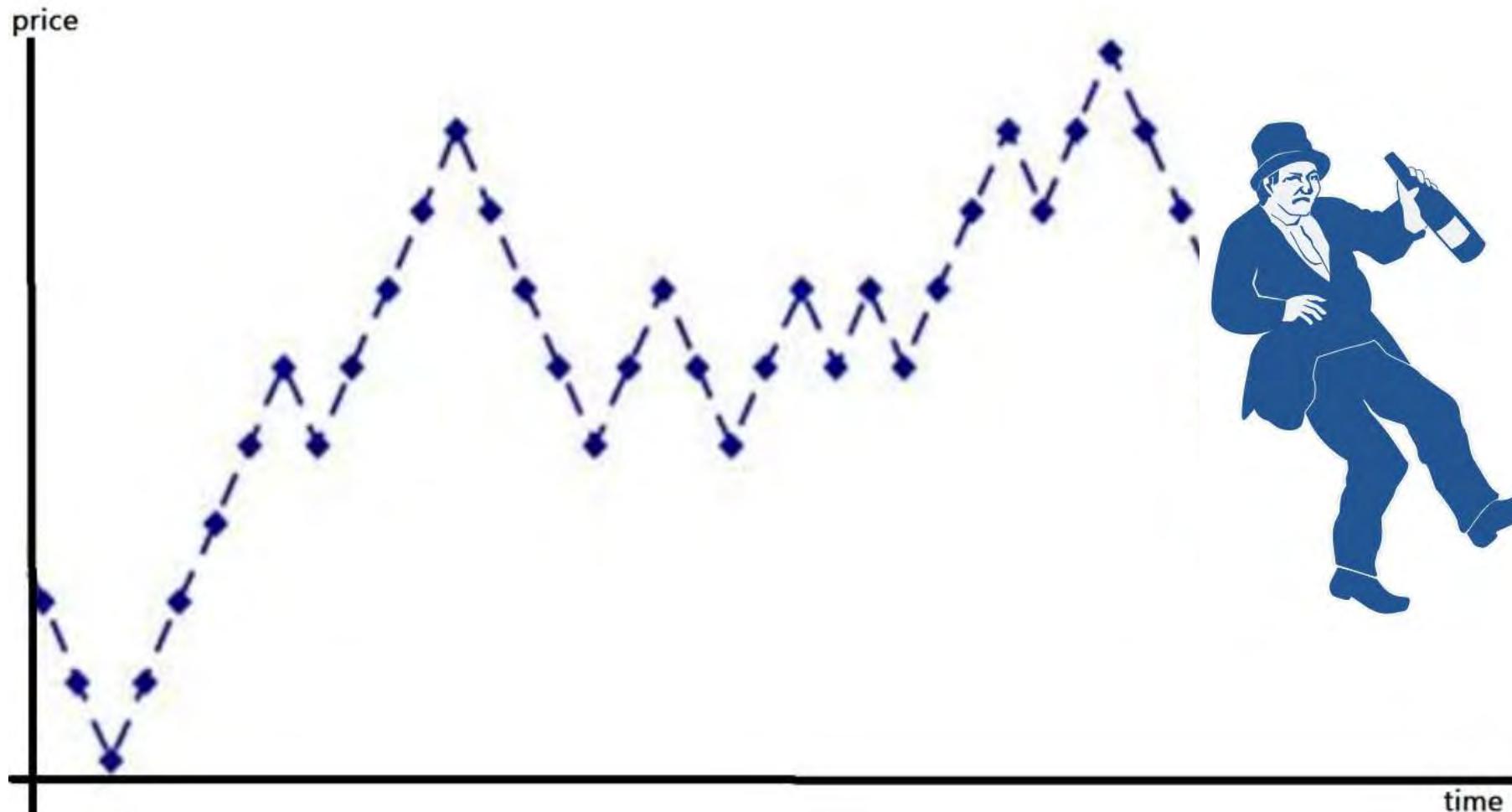
芝加哥大学尤金·法马金融学教授

Dimensional Fund Advisors (管理着1500亿美元资产)
研究部主任, 2013年诺贝尔奖

随机的点云
(没有统计
重要模式)

Computers Showed Stocks Obey Random Walk

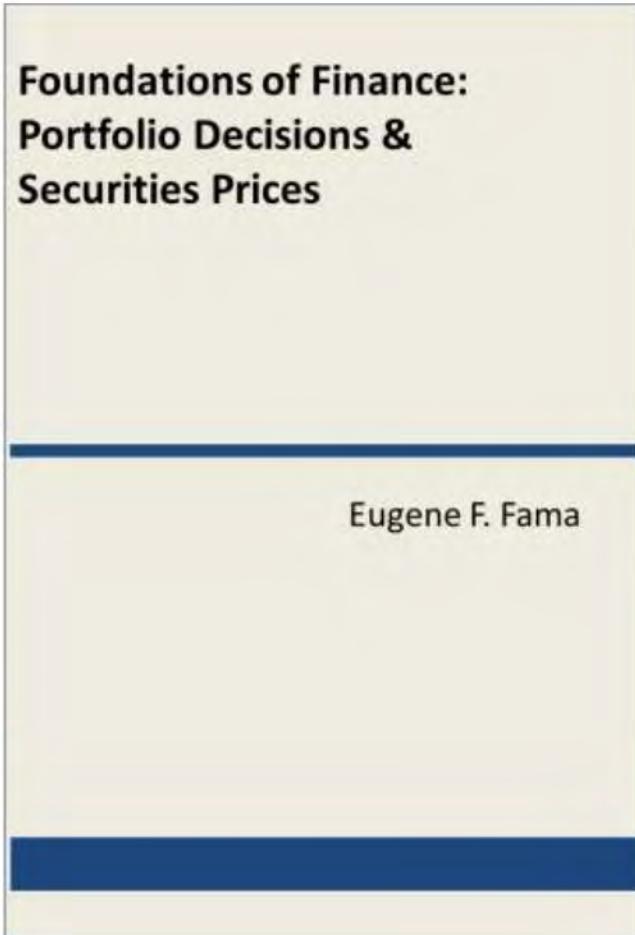
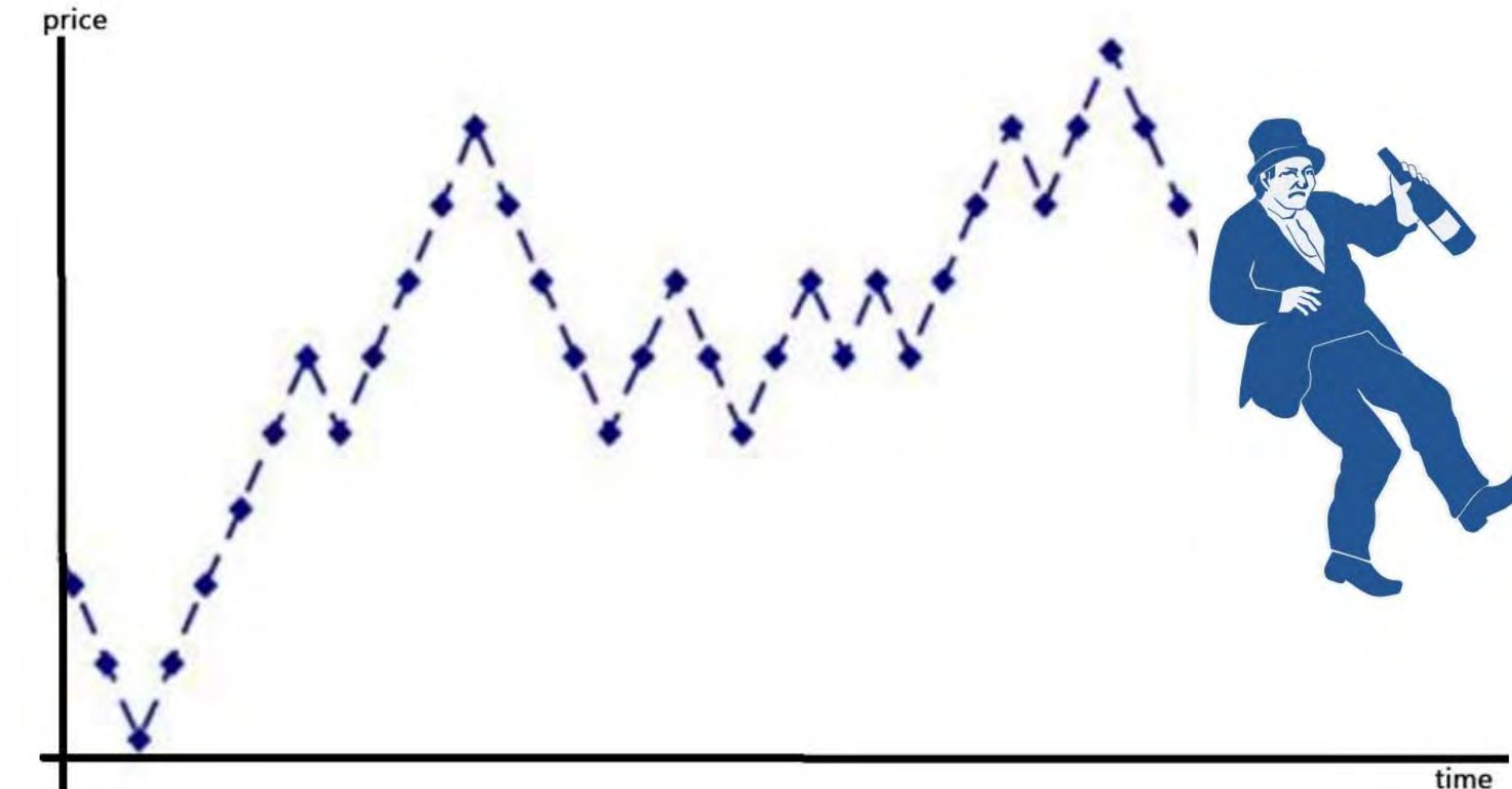
- A “random walk” is also called a “drunkard’s walk”. Whether the drunkard staggers left or right with each step is unpredictable
- Stock returns are like a drunkard’s staggering



Finance after circa. 1975

计算机显示股票服从随机漫步

“随机漫步”也被称为“醉鬼漫步”。醉汉是摇摇晃晃地往左走还是
每一步都是不可预测的
股票回报就像醉汉摇摇晃晃的....



金融后约。1975

Unpredictability as Evidence of Market Efficiency

Malkiel, Burton G. 2007. A random walk down Wall Street. Norton.



Beat the market tests

1. Forbes Magazine's monkey
2. All sorts of statistical tests fail to reject the null hypotheses that

- Professionally run mutual funds, hedge funds, pension funds, etc. perform no better than randomly selected portfolios
- Portfolios chosen using the investment rules fund managers “say they use” perform no better than randomly selected portfolios
- Stocks selected using technical analysis perform no better than randomly selected portfolios
- Stocks selected using fundamental analysis perform no better than randomly selected stocks

... so stock predictors are either fools, liars or crooks (use inside information)?

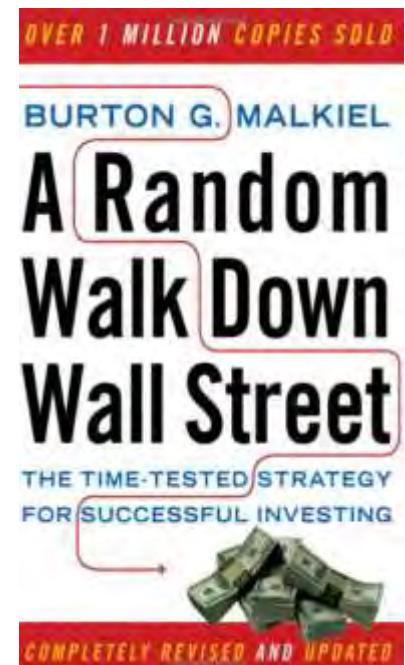
Variants of efficient markets hypothesis

Weak Form Past & present stock returns & volumes do not predict future stock returns

Strong Form Future stock returns cannot be predicted

Semi-strong Form Future stock returns cannot be predicted with publicly available information

Most finance textbooks say semi-strong form is “right”, **strong form** is “too strong” & **weak form** is “too weak”



Unpredictability as Evidence of Market Efficiency

麦基尔，伯顿G. 2007。华尔街随机漫步。诺顿。

战胜市场考验

1. 福布斯杂志的猴子

2. 各种统计检验都不能拒绝零假设

专业运营的共同基金、对冲基金、养老基金等的表现并不比

随机选择的投资组合

使用基金经理“说他们使用”的投资规则选择的投资组合表现并不好

比随机选择的投资组合要好

使用技术分析选择的股票的表现并不比随机选择的投资组合好

使用基本面分析选择的股票的表现并不比随机选择的股票好

所以股票预测者不是傻子、骗子就是骗子(使用内幕消息)?

有效市场假说的变体

弱式 过去和现在的股票回报和成交量不能预测未来的股票回报

强烈的形式 未来的股票收益无法预测

半强形式 未来股票收益无法用公开信息预测

大多数金融教科书都说半强形式是“对的”，强形式是“太”

强形式+弱形式是“太弱”



OVER 1 MILLION COPIES SOLD

BURTON G. MALKIEL

A Random Walk Down Wall Street

THE TIME-TESTED STRATEGY FOR SUCCESSFUL INVESTING



COMPLETELY REVISED AND UPDATED

The Efficient Markets Hypothesis

Why might stock returns follow a random walk?

1. The stock market is like a casino

- Financial experts have no idea what they are doing
- Stock prices are as random as throwing dice

2. The efficient markets hypothesis

- All existing information is used to set stock prices
- Price changes result from new information (by definition, unpredictable) coming into existence, so stock price changes are unpredictable



Eugene F. Fama

Professor of Finance,
University of Chicago
Director of Research,
Dimensional Fund Advisors
(\$150B assets under
management)
Nobel Prize, 2013

The efficient markets hypothesis (answer 2) follows if

- Investors have free access to all existing information
- Investors are highly intelligent and rational
- Investors engage in extremely large arbitrage trading strategies so fast that prices are almost always equal to their full information values

These ideas are actually much older

- Jules Regnault (1863)
- Louis Bachelier (1900)

有效市场假说

为什么股票收益会遵循随机游走?

1. 股市就像赌场

金融专家不知道自己在做什么

股票价格就像掷骰子一样随机

2. 有效市场假说

所有现有的信息都被用来设定股票价格

价格变化是由新信息(根据定义, 不可预测的)进入引起的

存在, 所以股票价格的变化是不可预测的



尤金·F·法玛

芝加哥大学金融学教授

Dimensional Fund Advisors(管理着1500亿美元资产)研究部主任,
2013年诺贝尔奖

有效市场假说(答案2)紧随其后

投资者可以自由访问所有现有信息

投资者是非常聪明和理性的

投资者从事极其大规模的套利交易策略的速度如此之快, 以至于价格几乎

总是等于他们的全部信息价值

这些观念其实要古老得多

儒勒·雷尼奥(1863)

路易斯·巴舍利耶(1900)

Which is it? Casino or Market Efficiency?

Event study tests make sense → efficient market explanation

1. The CAPM says stock i 's expected return on day t is

$$E(r_{i,t}) = r_{f,t} + \beta_i(E(r_{m,t}) - r_{f,t})$$

2. Define stock i 's abnormal return on day t , $\alpha_{i,t}$, as its actual return minus its expected return

$$\alpha_{i,t} = r_{i,t} - E(r_{i,t})$$

- Look for events in the news that might affect different companies differently
- General finding: News moves stock prices in ways that make sense

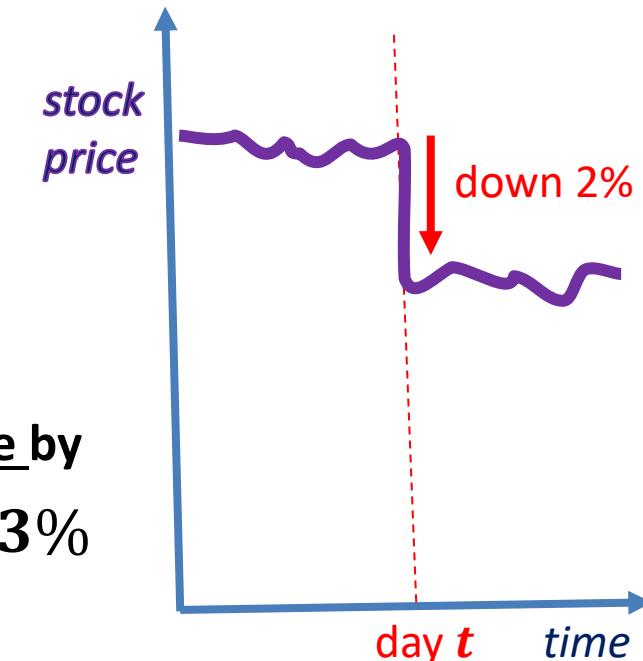
Example

- News on **day t** is “SAUDI ARABIA & IRAN FAIL TO REDUCE OIL PRODUCTION”
- On **day t** , risk-free rate $r_{f,t} = 0\%$ & market return $r_{m,t} = +0.25\%$ that day
- Exxon's beta is $\beta_{Exxon} = 1.2$. Because market rose $+0.25\%$, Exxon expected to rise by

$$E(r_{Exxon,t}) = 0\% + 1.2 (+.25\% - 0\%) = +0.3\%$$

- Exxon's actual day t return is $r_{Exxon,t} = -2.0\%$, so Exxon's abnormal return is

$$\alpha_{Exxon,t} = -2\% - 0.3\% = -2.3\%$$



Bottom line: In general, these sorts of event study analyses “work”, in the sense that individual stocks move up and down relative to the market in ways that seem reasonable given news about that firm that day

是哪一个?赌场还是市场效率?

事件研究测试说得通有效市场解释

1. CAPM表示股票I在当天 T_{is} 的预期收益

$$E(r_{i,t}) = r_{f,t} + \beta_i(E(r_{m,t}) - r_{f,t})$$

2. 定义股票I在日 $<1:1>$, α_I , $<1:1>$ 的异常收益为其实际收益减去预期收益

$$\alpha_{i,t} = r_{i,t} - E(r_{i,t})$$

在新闻中寻找可能对不同公司产生不同影响的事件 different companies find news that makes sense

新闻影响股价: News moves stock prices in ways that make sense

Example

当新闻 T_{is} “沙特阿拉伯和伊拉克未能减少石油产量”

On day t , risk-free rate r_f & market return $r_{m,t}$ were $+0.25\%$ that day

Exxon's beta is $\beta_{Exxon} = 1.2$. Because market rose $+0.25\%$, Exxon expected to rise by

$$E(r_{Exxon,t}) = 0\% + 1.2 (+.25\% - 0\%) = +0.3\%$$

埃克森的实际 $day t$ return is -2% , 所以埃克森的异常收益是

$$\alpha_{Exxon,t} = -2\% - 0.3\% = -2.3\%$$

底线:总的来说,这类事件研究分析是“有效的”,从某种意义上说,个股相对于市场的上下波动,是考虑到当天有关该公司的新闻,似乎合理的方式



Which is it? Casino or Market Efficiency?

The Lucas Critique

Lucas, Robert E. 1976. Econometric policy evaluation: A critique. Carnegie-Rochester conference series on public policy. North-Holland.

Lucas critique of all mathematical models of human behavior

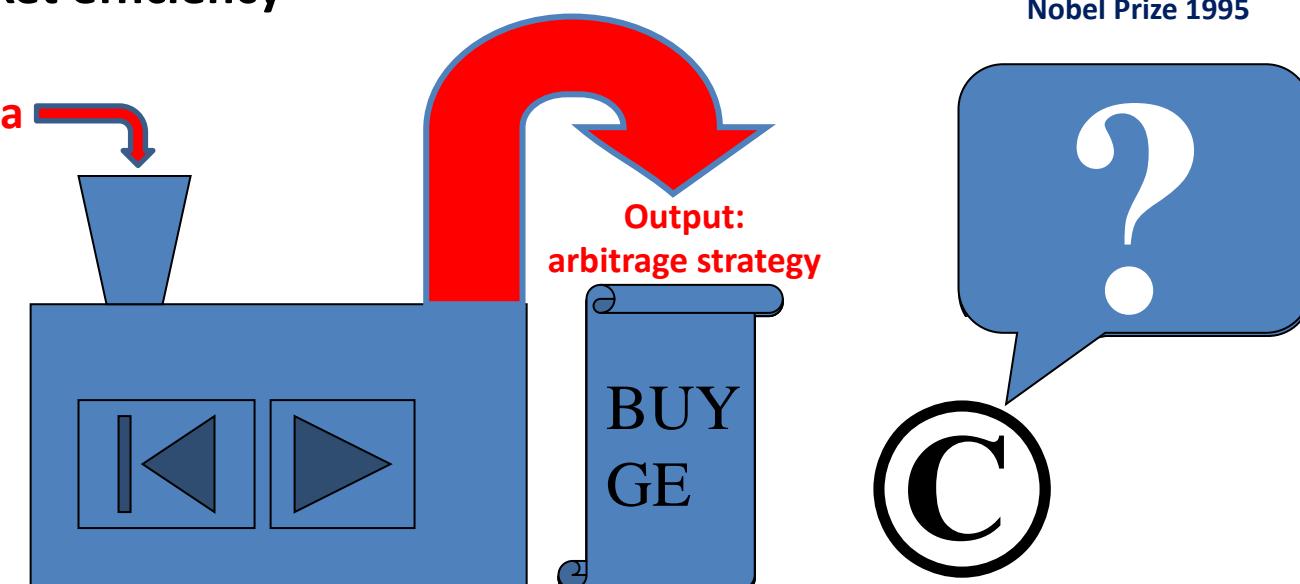
- Mathematical models can stop working if the people being modeled learn about the model
- The only models not affected by this problem are models that assume the people being modeled already know the model
- These are called rational expectations models

Lucas, Robert E. 1978. Asset prices in an exchange economy. *Econometrica* 46(6)1429-45

- How the Lucas critique in finance implies stock market efficiency
- Consider a stock picking machine



Robert E. Lucas Jr.
Nobel Prize 1995



是哪一个?赌场还是市场效率?

卢卡斯批判

罗伯特·卢卡斯, 1976。《计量经济学政策评估:批判》。卡内基-罗切斯特公共政策系列会议。北荷兰。

卢卡斯对所有人类行为数学模型的批判

如果被建模的人了解了模型, 数学模型就会停止工作。唯一不受此问题影响的模型是假设人存在的模型

被建模的人已经知道模型

这些被称为理性预期模型

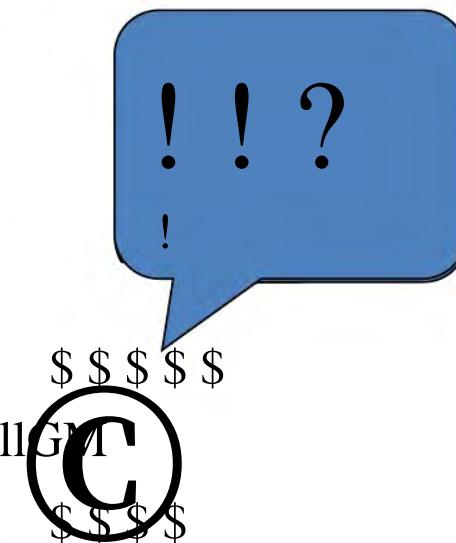
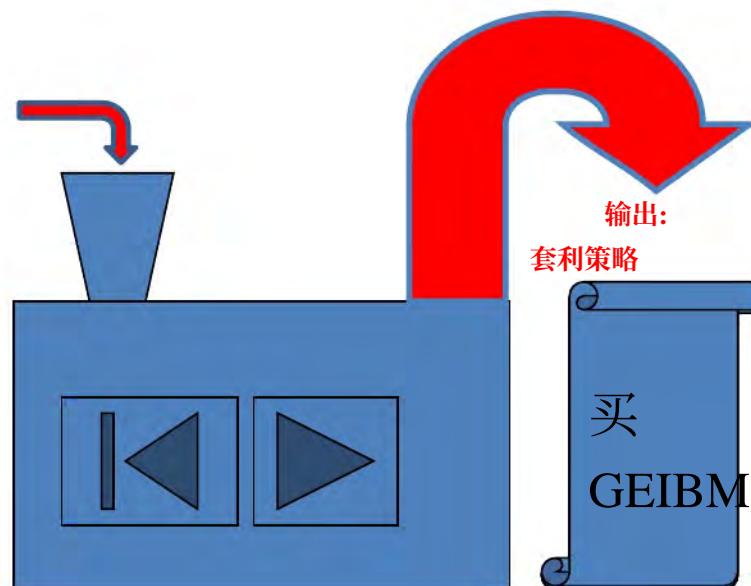


小罗伯特·e·卢卡斯
995年诺贝尔奖

罗伯特·卢卡斯, 1978。交换经济中的资产价格。金融中的卢卡斯批判如何暗示股票市场效率

考虑一下选股机

投入:资本、劳动力、数据1



Which is it? Casino or Market Efficiency?

Lucas, Robert E. 1978. Asset prices in an exchange economy." Econometrica 46(6)1429-45

Lucas Critique applied to Finance → stock markets should be efficient

Arbitrage trading strategy is

1. Identify mispriced stocks (i.e. develop model of investor behavior)
 - Identify "mistakes" other investors are making
2. Use "arbitrage strategy" to take advantage of other traders' mistakes
 - Buy undervalued stocks or sell short overvalued stocks
3. Earn "arbitrage profits" as investors understand their errors & prices correct

Note: arbitrage strategies help to correct mispricing

- Buying undervalued stocks pushes their prices up
- Selling short overvalued stocks pushes their prices down



Robert E. Lucas Jr.
Nobel Prize 1995

But if other investors learn about your model, it stops working!

- Owners of formerly undervalued stocks know & demand the true (higher) price
- Buyers of formerly overvalued stocks now know & will only pay the true (lower) price)

How the Lucas Critique justifies the efficient markets hypothesis

- A model of investor errors (i.e. a model for finding arbitrage strategies) stops working if the people being modeled (investors who were making mistakes) learn about the model and this changes their behavior (they stop making those mistakes)

Which is it? Casino or Market Efficiency?

罗伯特·e·卢卡斯1978。《交换经济中的资产价格》。46(6) 1429 -45。费雪

Lucas Critique适用于Finance股票市场应该是有效率的

套利交易策略是

1. 识别定价错误的股票(即建立投资者行为模型)

识别其他投资者正在犯的“错误”

2. 利用“套利策略”，利用其他交易者的失误

买入被低估的股票或卖空被高估的股票

3. 赚取“套利利润”，因为投资者了解他们的错误和价格纠正

注意:套利策略有助于纠正错误定价

购买被低估的股票会推高股价

卖空估值过高的股票会推低股价



小罗伯特·e·卢卡斯，1995
年诺贝尔奖

但如果其他投资者知道了你的模式，它就失效了！

- ☒ 以前被低估的股票的所有者知道并要求真正的(更高的)价格
- ☒ 以前估值过高的股票的买家现在知道了，只会支付真正的(较低的)价格。

卢卡斯批判是如何证明有效市场假说的

- ☒ 投资者错误模型(即寻找套利策略的模型)停止工作，如果被建模的人(犯错误的投资者)了解了这个模型和这个改变他们的行为(他们不再犯这些错误)

Which is it? Casino or Market Efficiency?

The Law of Large Numbers from Statistics works in Finance

Bernoulli, Jacob. 1713. *Ars Conjectandi* (The Art of Conjecture)



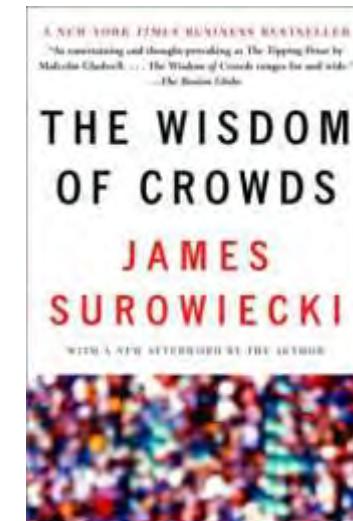
Jacob Bernoulli

- Law of large numbers: The mean of many independent estimates is more precise (i.e. smaller standard deviation) than any individual estimate
- Stock prices are set by many individual investors, each with their individual estimate of the price, so market prices are means of many independent estimates of each stock's price
- Implication: Stock market prices should be more precise than prices estimated by any individual investor

Surowiecki, James. 2004. *The Wisdom of Crowds*.



- Students each estimate how many jelly beans in the jar & the student whose estimate is closest to the true number wins an expensive wine
- But if the mean of all students' estimates is closest, the professor keeps the wine
- In many years of teaching, Prof Surowiecki kept the wine every year



是哪一个?赌场还是市场效率?

统计学中的大数定律适用于金融

雅各布·伯努利(1713年)Ars Conjectandi(猜想的艺术)

大数定律:许多独立估计值的平均值比任何单个估计值更精确(即标准差更小)

股票价格是由许多个人投资者设定的，每个人都有他们对价格的个人估计，所以市场价格是对每只股票价格的许多独立估计的平均值

暗示:股票市场价格应该比任何个人投资者估计的价格更精确

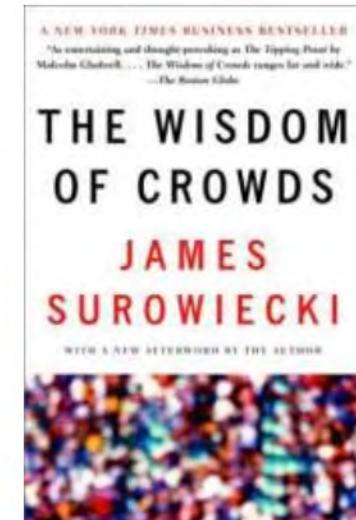


雅各伯努利

詹姆斯·苏洛维茨基2004。《群体的智慧》。

每个学生估计罐子里有多少颗糖豆，估计最接近真实数字的学生赢得一瓶昂贵的葡萄酒

但如果所有学生的估价值的平均值最接近，教授就会保留这瓶酒
在多年的教学中，苏洛维茨基教授每年都会保存葡萄酒



Problem 1. Statistical “Beat the Market” Tests Are “Iffy”



Larry Summers
President of Harvard University
US Treasury Secretary Economic
Advisor to Hilary Clinton

Summers, Lawrence. 1986. Does the Stock Market Rationally Reflect Fundamental Values. *Journal of Finance* 41(3)591-603.

Basic statistics theory about **significance tests**

- Compare null hypothesis to alternative hypothesis

H_0 : *Professional investors do not beat the monkey*

H_1 : *Professional investors do better than the monkey*

Statistics is a system of “three-value logic”

1. H_0 is **TRUE** Data **ARE consistent with professional investors no better than monkey**
2. **WHO KNOWS?** The data are too noisy to show anything
3. H_0 is **FALSE**: Data **NOT consistent with professional investors no better than monkey**

- Statistical **significance** = We can reject H_0

- Statistical **insignificance** = We cannot reject H_0 because either

1. H_0 is **TRUE** The data **show professional investors do no better than a monkey**
2. **WHO KNOWS?** The data are too noisy to show anything

Statistical “power” is about which of these (1. or 2.) explains insignificance

- Summers shows “power of tests” finance researchers use is low, so best conclusion is
- 2. **WHO KNOWS?** The data are too noisy to show anything

Conclusion: These sorts of tests do not prove that stock markets are efficient

问题1。统计“跑赢市场”的测试是“不确定的”



劳伦斯·萨默斯1986年。《股票市场理性地反映基本价值吗?》金融学报41(3)591-603.

关于显著性检验的基本统计理论

比较零假设和备择假设

H_0 :专业投资者不打猴子

H_1 :专业投资者做得比猴子好

统计是一个“三值逻辑”的体系

1. H_0 是TRUE 数据与专业投资者一致不比猴子好

2. 谁知道呢?数据太吵了, 什么都看不出来

3. H_0 为假: 数据不一致专业投资者不比猴子好

统计显著性=我们可以拒绝 H_0

统计不显著=我们不能拒绝 H_0 因为两者

拉里·萨默斯(Larry Summers)

哈佛大学校长美国财政经济部长

希拉里·克林顿的顾问

1. H_0 是TRUE 数据显示, 专业投资者的表现并不比猴子好

2. 谁知道呢?数据太吵了, 什么都看不出来

统计上的“威力”是关于这些(1. (或2.)解释不重要

萨默斯表明, 金融研究人员使用的“测试的力量”很低, 所以最好的结论是

2. 谁知道呢?数据太吵了, 什么都看不出来

结论:这类测试并不能证明股票市场是有效的

Problem 2: Trancomputational Problems

Simon, Herbert. 1986. Models of Bounded Rationality

People are rationally irrational

- ❑ Information, calculation & problem solving cost money & take time & resources
- ❑ Transcomputational problems are solvable in theory, but not in practice
 - ❑ This is important in mathematics & computer science
 - ❑ Mathematicians can prove some problems must have solutions, but computer science can show actually calculating those solutions would take longer than the expected age of the universe, take a computer larger than the solar system, etc.
- ❑ Many finance (& economics) problems are procedurally transcomputational
 - ❑ We can write the solution as an equation, but have no procedure for solving it (we can't get the information necessary to solve it at a realistic cost in a realistic time with realistic effort)
 - ❑ For example, calculating a stock's price as $P_0 = E \left[\sum_{t=0}^{\infty} \frac{D_t}{(1+r_t)^t} \right]$ is procedurally transcomputational.



Herbert Simon,
Nobel Prize 1978

Implications for finance

- ❑ Lucas is wrong to think people simply “solve” problems perfectly, so the Lucas Critique is iffy
- ❑ To deal with transcomputational problems, people use shortcuts, approximations & guessing

This way of dealing with transcomputational problems is bounded rationality

- ❑ Rational people work to get a more accurate solution until

$$Cost(\text{better solution}) < Cost(\text{being wrong})$$

- ❑ Rational people do not insist on an exact solution if the cost of getting an exact solution is greater than the cost of occasional mistakes from using an approximate solution

问题2:跨计算问题

西蒙, 赫伯特, 1986。有限理性模型

人是理性的非理性的

信息、计算和解决问题需要花费金钱、时间和资源

跨计算问题在理论上是可以解决的，但在实践中却无法解决

这在数学和计算机科学中很重要

数学家可以证明一些问题必须有解决方案，但计算机科学可以表明，实际计算这些解决方案将花费比宇宙预

期年龄更长的时间，需要比太阳系更大的计算机，等等。

许多金融(和经济)问题是程序上的跨计算问题

我们可以把解写成方程，但是没有解它的过程(我们无法得到信息)

有必要在现实的时间，以现实的代价，付出现实的努力来解决它

例如，将股票价格计算为 $P = E \infty \left[\frac{1}{1+r} + \frac{1}{(1+r)^2} + \dots \right]$

对金融的启示：

卢卡斯认为人们只是完美地“解决”问题而忽略错误，所以卢卡斯批判是不确定的。处理跨计算问题，人们使用捷径、近似和猜测。处理跨计算问题的这种方式是有限理性的

COSTBETTERSOLUTION < COST(BEINGWRONG)

()

如果获得精确解的代价大于使用近似解偶尔犯错误的代价，理性的人就不会坚持要精确解



Herbert A. Simon,
1978年诺贝尔奖得主

Problem 2: Trancomputational Problems

Grossman, Sanford & Stiglitz, Joseph. 1980. On the Impossibility of Informationally Efficient Markets. American Economic Review 70(3) 393

Mathematical theory of bounded rationality

- Treat information acquisition & processing as an ordinary economic activity
- A rational investor keeps gathering and processing additional bits of information only as long as the marginal cost of more information, $MC(I)$, is less than the marginal revenue, $MR(I)$, the investor expects to make by trading using the information
- A rational trader stops gathering and using information once



Sanford Grossman
Chairman and CEO
Quantitative Financial
Strategies Hedge Fund
Grenwich, CT
(Assets \$1.2B)

$$MC(I) \leq MR(I)$$

Direct implication

- Not all public information gets used in setting share prices. Only information whose marginal cost is no higher than its marginal revenue gets used
- The stock market is not ‘semi-strong form efficient’ because some public information is too expensive to be worth using



Joseph Stiglitz
Nobel Prize, 2001

问题2:跨计算问题

格罗斯曼, 桑福德和斯蒂格利茨, 约瑟夫, 1980。《论信息有效市场的不可能性》。《美国经济评论》70(3)393

有限理性的数学理论

将信息获取和处理视为一种普通的经济活动

理性的投资者会不断地收集和处理额外的信息

只要信息的边际成本越多, 信息的边际成本 $MC(<e:1>)$ 就是
小于边际收益, $MR(<s:2>)$, 是投资者期望赚到的
利用信息进行交易

理性的交易者会一次性停止收集和使用信息



桑福德·格罗斯曼
董事长兼CEO
定量金融
策略对冲基金
Grenwich, CT
(资产1.2美元)

$MC(I) \leqslant$ 先生(我)

直接的含义

并不是所有的公开信息都被用来设定股价。只有信息

谁的边际成本不高于它的边际收益才被使用

股市之所以不是‘半强势形式有效’，是因为有些公募

信息太贵了, 不值得使用



约瑟夫·斯蒂格利茨
2001年诺贝尔奖

“Bounded Rationality” & Zen (Chán 禪) Finance

Grossman, Sanford. 1976. On the Efficiency of Competitive Stock Markets Where Traders Have Diverse Information. *Journal of Finance*. 31(2) 573-585

1. If market too efficient, arbitrageurs can't make enough money to pay information gathering & processing costs

- Arbitrageurs withdraw, noise traders affect prices & market gets less efficient

2. If market becomes too inefficient, arbitrageurs make more than enough money to cover information gathering & processing costs

- Arbitrageurs more active, noise traders move prices less & market gets more efficient

3. Zen Equilibrium: Market attains “efficient inefficiency”

Efficient Markets Hypothesis is illogical

- Markets should not even achieve the semi-strong form of efficiency
- Markets should have “efficient level of inefficiency”
- Some public information is not worth gathering and trading on because its cost is too high and the likely trading profits are too low



洞山良价

Dòngshān Liángjiè

“Enlightenment comes by meditating on contradiction.”

“Bounded Rationality” & Zen (Chán 禪) Finance

桑福德·格罗斯曼, 1976。论交易者信息多样化的竞争性股票市场的效率。《金融杂志》, 31(2):573-585

1. 如果市场过于有效, 套利者无法赚到足够的钱来支付

信息收集和处理成本

套利者退出, 噪音交易者影响价格, 市场效率降低

2. 如果市场变得过于低效, 套利者就会赚得绰绰有余

支付信息收集和处理成本的钱

套利者更活跃, 噪音交易者影响价格更少, 市场更有效

3. 禅宗均衡: 市场达到“有效的无效率”

有效市场假说是不合逻辑的

市场甚至不应该达到半强形式的效率

市场应该有“有效的无效率水平”

有些公开信息不值得收集和交易, 因为它的成本也不值得

过高而可能的交易利润过低

三十八世洞山良价禪師



洞山良价

Dongshān Liangjie

“启蒙运动

来自冥想
矛盾。”

Problem 3. Excess Volatility

Shiller, Robert J. 1992. *Market volatility*. MIT Press.

Stock prices “move too much”

- Price of stock i at time t is the expected PV of firm i 's dividends in all periods after time t

$$P_{i,t} = E \left[\frac{D_{i,t+1}}{1+r_{i,t}} + \frac{D_{i,t+2}}{(1+r_{i,t})^2} + \frac{D_{i,t+3}}{(1+r_{i,t})^3} + \dots \mid Info_{1960} \right]$$

- This equation implies that past stock prices are the present values of subsequent dividends (now known), so e.g.

$$P_{Exxon,1960} = \frac{D_{Exxon,1961}}{1+r_{Exxon,1960}} + \frac{D_{Exxon,1962}}{(1+r_{Exxon,1960})^2} + \frac{D_{Exxon,1963}}{(1+r_{Exxon,1960})^3} + \dots$$

- We now know dividends Exxon paid in 1961, 1962, ..., 2019, but we don't know investors' 1960 discount rate $r_{Exxon,1960}$ for valuing Exxon stock

Shiller's “variance bounds test”

- Much algebra shows that

$$\text{If } P_t = \frac{D_{t+1}}{1+r} + \frac{D_{t+2}}{(1+r)^2} + \frac{D_{t+3}}{(1+r)^3} + \dots \text{ then } var(P_t) < f(var(D_t))$$

- The function f is complicated, but it can be estimated

Finding

- For the average of US stocks, $var(P_t) > f(var(D_t))$
- The variance of stock prices is too high to be explained by the variance in subsequent dividends
- Various criticisms & rebuttals, but ultimately Shiller was shown to be right!

Conclusion: Stock prices move up and down too much



Robert Shiller
Nobel Prize, 2013

Problem 3. Excess Volatility

罗伯特·席勒, 1992。市场波动。麻省理工学院出版社。

股价“波动过大”

<S:1>股票价格 I_{at} 在所有时期股息预期PV(时间后)

$$P_{i,t} = E \left[\frac{D_{i,t+1}}{1+r_{i,t}} + \frac{D_{i,t+2}}{(1+r_{i,t})^2} + \frac{D_{i,t+3}}{(1+r_{i,t})^3} + \dots \mid Info_{1960} \right]$$

这个等式意味着过去的股票价格是随后股息的现值(现在已知), 所以例如:

$$P_{Exxon,1960} = \frac{D_{Exxon,1961}}{1+r_{Exxon,1960}} + \frac{D_{Exxon,1962}}{(1+r_{Exxon,1960})^2} + \frac{D_{Exxon,1963}}{(1+r_{Exxon,1960})^3} + \dots$$

我们现在知道埃克森公司在1961年、1962年支付的股息,2019年,但我们不知道投资者1960年贴现率REXXON,5304

为埃克森公司股票估值

希勒的“方差界限检验”

大量代数证明了这一点

$$\text{If } P_t = \frac{D_{t+1}}{1+r} + \frac{D_{t+2}}{(1+r)^2} + \frac{D_{t+3}}{(1+r)^3} + \dots \text{ then } var(P_t) < f(var(D_t))$$

函数f很复杂, 但可以估计

发现

For the average of US stocks, $var(P_t) > f(var(D_t))$

股票价格的方差太高, 不能用随后股息的方差来解释。各种批评和反驳, 但最终席勒被证明是正确的!结论:股价上下波动太大



罗伯特·席勒,
2013年诺贝尔奖

Problem 4. Arbitrage Costs Are Very Large

Shleifer, Andrei & Robert Vishny. 1997. The Limits of Arbitrage. Journal of Finance 52:1, 35-55.

Cost of being undiversified

- Arbitrageurs must take huge long or short positions in single securities
- Often no effective hedge is possible

Holding period risk

- Mispricing may grow worse before it's corrected

Contracting costs

- Arbitrageurs borrow capital from banks, investment funds, etc to do their arbitrage
- If prices don't "correct" quickly or the mispricing gets worse, lenders worry arbitrageur might be incompetent & demand immediate repayment

All of these factors make "very large" arbitrage positions highly risky and hard to sustain for very long

Problem 4. Arbitrage Costs Are Very Large

施莱弗, 安德烈和罗伯特·维什尼, 1997。《套利的极限》。《金融学报》52:1,35-55。

单一化的成本

套利者必须在单一证券中持有巨额多头或空头头寸

通常没有有效的对冲是可能的

持有期风险

在纠正之前, 错误定价可能会变得更糟

合同成本

套利者从银行、投资基金等处借入资金来完成他们的交易

套利

如果价格不能迅速“修正”, 或者错误定价变得更糟, 贷款人就会担心

套利者可能无能, 要求立即还款

所有这些因素都使得“非常大”的套利头寸具有很高的风险和难度

要维持很长时间

Long-term Capital Management (LTCM) Arbitrage Play

LTCM set up by 2 Nobel Prize winning financial economists

LTCM to do basic textbook arbitrage

Robert Merton & Myron Scholes
receive Nobel Prize



- First major arbitrage uses mispricing of Russian T-bonds
 - Russian government issues US dollar & Russian ruble bonds
 - Coupons & face values identical, but
$$P_{\text{Ruble bonds}} < P_{\text{USD bonds}}$$
- LTCM strategy = riskless hedge as in basic textbooks
 - Buy very many Russian ruble bonds
 - Short sale of very many US dollar bonds
 - Set up a series of dollar-ruble forward contracts to lock in exchange rates for each future coupon payment & final face value payment
- Wait
 - Either $P_{\text{Ruble bonds}}$ rises or $P_{\text{USD bonds}}$ to make $P_{\text{Ruble bonds}} = P_{\text{USD bonds}}$
 - Either way, LTCM makes huge arbitrage profits!!!



Boris Yeltsin

President of Russian Federation

长期资本管理(LTCM)套利游戏由2位获得诺贝尔奖的金融经济学家建立的 LTCM

LTCM做基本课本套利

第一次重大套利利用了俄罗斯国债的错误定价

俄罗斯政府发行美元和俄罗斯卢布债券

息票和面值相同，但是

$$PRUBLEBONDS < PUSDBONDS$$

LTCM策略=基础教科书中的无风险对冲

购买大量俄罗斯卢布债券

卖空大量美元债券

设置一系列美元-卢布远期合约锁定汇兑

每个未来息票支付和最终票面价值支付的利率

⊗等

要么PRUBLEBONDS rises 或 PUSDBONDS to 使 PRUBLEBONDS = PUSDBONDS

无论哪种方式， LTCM获得了巨大的套利利润!!

罗伯特·默顿和迈伦·斯科尔斯获得诺贝尔奖



Boris Yeltsin

President of Russian Federation

Long-term Capital Management (LTCM) Arbitrage Play

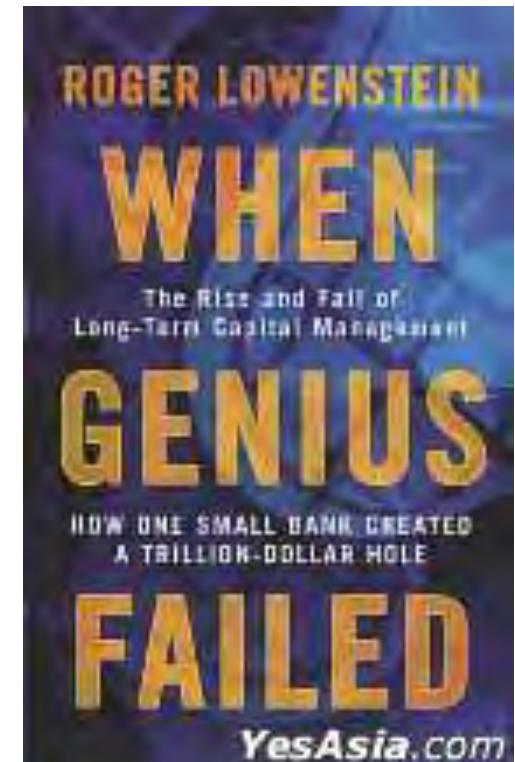
LTCM set up by 2 Nobel Prize winning financial economists

Robert Merton & Myron Scholes
receive Nobel Prize



What actually happened

- Russian government
 1. Defaults on Russian ruble bonds but not Russian US dollar bonds
$$P_{\text{Ruble bonds}} = 0, \text{ but } P_{\text{USD bonds}} \text{ unchanged}$$
 2. Declares all forward contracts illegal
- Lenders demand LTCM close short position
 - LTCM must buy large number of Russian US dollar bonds
 - LTCM bankrupt
 - LTCM bailed out by US government (Treasury Secretary Larry Summers)
- These sorts of problems are actually quite common and are a major reason why actual arbitrage is very limited
- Because arbitrage is limited, stock markets can remain inefficient



长期资本管理(LTCM)套利游戏

LTCM公司由两位获得诺贝尔奖的金融经济学家创立

罗伯特·默顿和迈伦·斯科尔斯获
得诺贝尔奖

到底发生了什么

☒ 俄罗斯政府

1. 俄罗斯卢布债券违约，而不是俄罗斯美元债券违约

PPP RUBLE BONDS = 4, 但 PUSD BONDS

2. 宣布所有远期合约为非法

贷款人要求LTCM平仓

LTCM公司必须大量购买俄罗斯美元债券

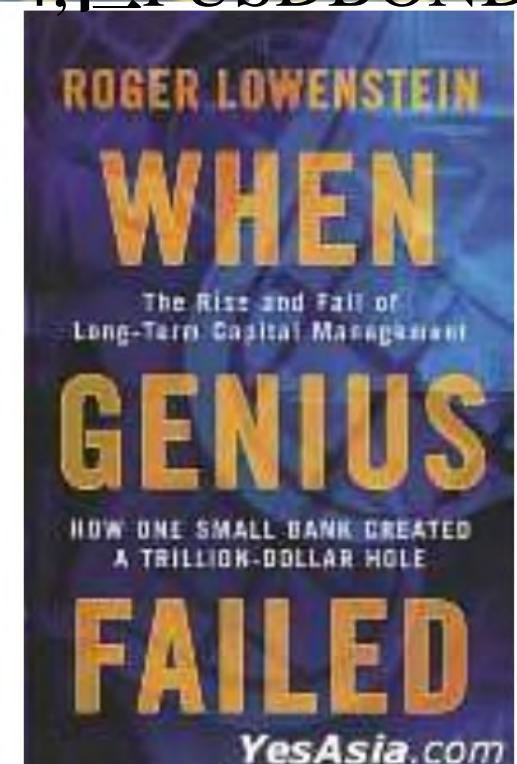
LTCM公司破产

LTCM公司获得美国政府救助(财政部长拉里·萨默斯)

这类问题实际上相当普遍，而且是一个重大问题

实际套利的原因非常有限

因为套利是有限的，所以股票市场可以保持低效率



Problem 5. New High Power Computers

Stock prices do not actually follow random walk

1. Momentum effect (so “momentum factor” in asset pricing models)

- Stocks going up continue going up with probability slightly greater than 50/50 over short horizons (months)
- Stocks going down keep going down with probability slightly greater than 50/50 over short horizons (months)

2. Mean reversion effect (so “book-to-market factor” in asset pricing models)

- Recent extreme losers have probability a bit over 50/50 of higher than CAPM predicted returns over the subsequent few years
- Recent extreme winner have a probability a bit over 50/50 of lower than CAPM predicted returns over the subsequent few years

3. Anomalies

- January effect, small firm effect, ...

问题5。新型高性能计算机

股票价格实际上并不遵循随机漫步

1. 动量效应(所以资产定价模型中的“动量因子”)

股票在短期(月)内继续上涨的概率略大于50/50

股票在短期(月)内持续下跌的概率略大于50/50

2. 均值回归效应(即资产定价模型中的“账面市值比因子”)

最近的极端输家在接下来的几年里有超过50%的概率比CAPM预测的回报高

最近的极端赢家在随后几年的回报率比CAPM预测的回报率低50%以上

3. 异常

1月效应、小公司效应、…

What to Do?

Standard finance

- ❑ Most finance theory assumes perfect arbitrage & random walks as “simplifications” & then derives equations
- ❑ Unfortunately, these equations are usually procedurally transcomputational

Behavioral finance

- ❑ How do people actually behave if they must make a decision whose solution is transcomputational?
- ❑ What can we learn by observing how people actually behave?
- ❑ How would this change finance theories?

怎么办?

标准金融学

大多数金融理论假设完美套利和随机游走作为“简化” & 然后
得出方程

不幸的是，这些方程通常是程序性的跨计算

行为金融学

如果人们必须决定谁的解决方案是

transcomputational吗？

通过观察人们的实际行为，我们能学到什么？

这将如何改变金融理论？

Noise Trader Sentiment Moves Stock Prices

Keynes, John Maynard. 1936. *The general theory of employment, investment & money.*

- Rational investing requires rare skills that most investors do not possess

"The social object of skilled investment should be to defeat the dark forces of time and ignorance which envelope our future."

- Actual investing driven by animal spirits (psychological or "sentiment-based" urges), not rational calculations

- Most investors have no idea what shares are truly worth

"Human decisions affecting the future, whether personal or political or economic, cannot depend on strict mathematical expectation, since the basis for making such calculations does not exist; and that it is our innate urge to activity which makes the wheels go round, our rational selves choosing between the alternatives as best we are able, calculating where we can, but often falling back for our motive on whim or sentiment or chance."

- Trading motivated by urge to acquire or by fear

"Our decisions ... can only be taken as the result of animal spirits – a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities."

- Finance & economics tricks itself by using mathematics

"Too large a proportion of recent "mathematical" economics are mere concoctions, as imprecise as the initial assumptions they rest on, which allow the author to lose sight of the complexities and interdependencies of the real world in a maze of pretentious and unhelpful symbols."

"It is better to be roughly right than precisely wrong."



John Maynard Keynes

Noise Trader Sentiment Moves Stock Prices

约翰·梅纳德·凯恩斯1936。《就业、投资与货币通论》。

理性投资需要具备大多数投资者不具备的稀有技能

“有技巧的投资的社会目标应该是击败时间和无知的黑暗力量
我们的未来。”

实际的投资是由动物精神(心理或 “基于情绪的” 冲动)驱动的，而不是理性的
计算

大多数投资者不知道股票的真正价值

“影响未来的人类决策，无论是个人的、政治的还是经济的，都不可能依赖于严格的数学预期，因为进行这种计算的基础并不存在；正是我们天生的行动冲动使车轮转动，我们理性的自我在各种选择中尽我们所能做出选择，在我们力所能及的地方进行计算，但往往因一时兴起、感情用事或偶然而回到我们的动机上。”



约翰·梅纳德·凯恩斯

出于获得的冲动或恐惧而进行的交易

“我们的决定……只能作为动物精神的结果——一种自发的行动冲动，而不是……
不作为，而不是量化利益乘以量化利益的加权平均结果
概率。”

金融与经济学通过使用数学来欺骗自己

最近的“数学”经济学中有太大一部分仅仅是混合物，和最初的一样不精确
它们所依赖的假设，使作者忽视了经济学的复杂性和相互依赖性
现实世界充满了自命不凡、毫无帮助的符号。”

“宁可大致正确，也不要完全错误。”

Noise Traders in Financial Markets

Black, Fischer. 1986. Noise. American Finance Association Presidential Address. Journal of Finance 41(3) 529-543.

How “noise traders” fit into the financial system

| | Characteristics | Social Purpose |
|---------------|--|---|
| Arbitrageurs | <input type="checkbox"/> Gather & process information <input type="checkbox"/> Detect mispricing <input type="checkbox"/> Trade in mispriced stocks <input type="checkbox"/> Need mispriced stocks to exist | Trading keeps stock prices near fundamentals |
| Noise traders | <input type="checkbox"/> Cause stocks to be mispriced <input type="checkbox"/> Permits profitable arbitrage | Lose money so arbitrageurs can stay in business |
| Savers | <input type="checkbox"/> Contribute most of the capital <input type="checkbox"/> Responsible for little trading <input type="checkbox"/> Assume stocks are fairly priced | Provide savings to firms with $NPV > 0$ investments |



Myron Scholes
Nobel Prize, 1997

Fischer Black
American Finance Association President, 1986

The social purpose of idiots!!!

Noise Traders in Financial Markets

费希尔·布莱克1986。噪音。美国金融协会主席演讲。《金融学报》41(3)529-543。

“噪音交易者”如何融入金融体系

| | Characteristics | Social Purpose |
|---------------|---|---|
| Arbitrageurs | <ul style="list-style-type: none"><input type="checkbox"/> Gather & process information<input type="checkbox"/> Detect mispricing<input type="checkbox"/> Trade in mispriced stocks<input type="checkbox"/> Need mispriced stocks to exist | Trading keeps stock prices near fundamentals |
| Noise traders | <ul style="list-style-type: none"><input type="checkbox"/> Cause stocks to be mispriced<input type="checkbox"/> Permits profitable arbitrage | Lose money so arbitrageurs can stay in business |
| Savers | <ul style="list-style-type: none"><input type="checkbox"/> Contribute most of the capital<input type="checkbox"/> Responsible for little trading<input type="checkbox"/> Assume stocks are fairly priced | Provide savings to firms with $NPV > 0$ investments |



Myron Scholes
Nobel Prize, 1997

费希尔 美国黑人
金融协会主席，1986年

“白痴的社会目的!!”

Measuring Noise Trader Sentiment

Lee, Charles M. C., Shleifer, Andrei, Thaler, Richard. 1991. Investor Sentiment & the Closed-End Fund Puzzle. *Journal of Finance* / 46(1) 75-110.

Chopra, Navin, Lee, Charles M C, Shleifer, Andrei, Thaler, Richard 1993. Yes, discounts on closed-end funds are a sentiment index. *Journal of Finance* 48(2) 801-9.

Closed end fund (CEF)

- A CEF is a listed firm whose **only assets** are shares of other firms
- In efficient market, share price of a CEF should equal its net asset value per share

$$P_{CEF} = \frac{Value_{(CEF's\ portfolio)}}{Number_{CEF's\ shares\ outstanding}} = NAV_{CEF}$$

But usually this is not observed

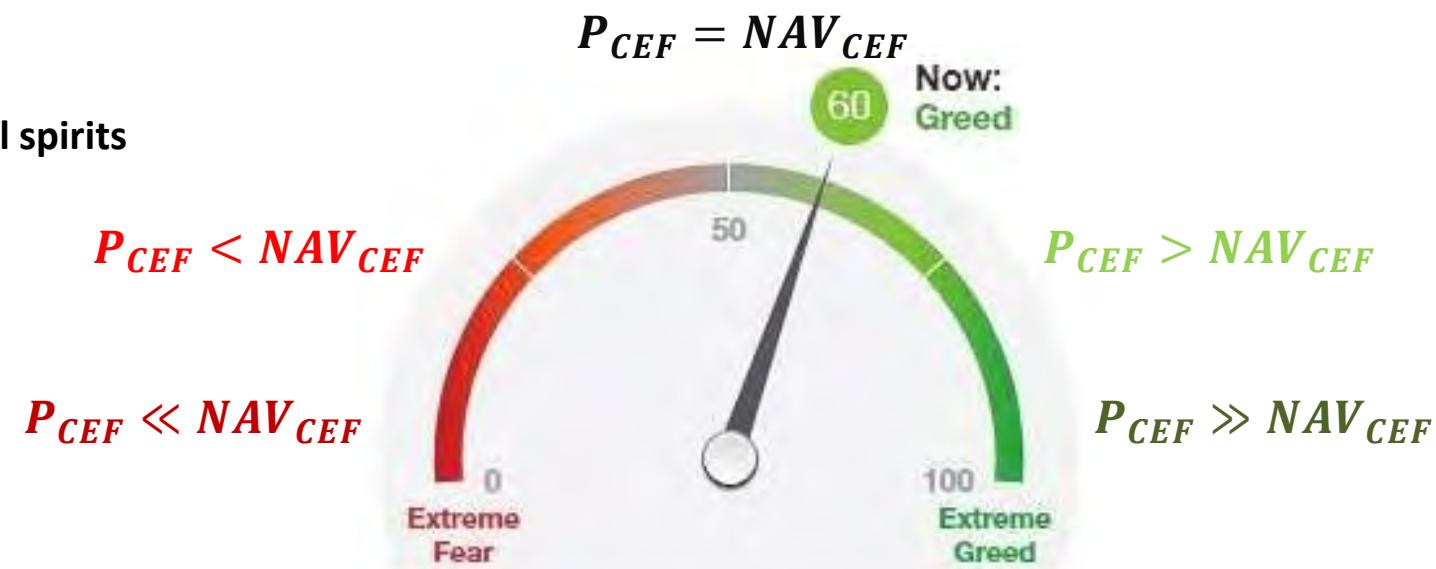
- In Bull Markets (good times) $P_{CEF} > NAV_{CEF}$ for almost all CEFs
- In Bear Markets (bad times) $P_{CEF} < NAV_{CEF}$ for almost all CEFs

Why?

- Rational traders never buy CEFs; better to buy stocks directly (avoid paying fee to CEF managers)
- Only irrational (noise) traders buy CEFs
- CEF over/under pricing is measure of noise traders animal spirits

Implications about noise trader behavior

Charles Lee
Finance Professor, Stanford U, 2008 – now
Managing Director at Barclays Global



Measuring Noise Trader Sentiment

查尔斯·m·C·李, 施莱弗, 安德烈, 塞勒, 理查德·1991。《投资者情绪与封闭式基金之谜》。金融学报/ 46(1):75-110。

Chopra, Navin, Lee, Charles M C, Shleifer, Andrei, Thaler, Richard 1993。是的, 封闭式基金的折扣是一种情绪指数。《金融学报》48(2)801-9。

封闭式基金(CEF)

CEF是一家上市公司, 其唯一资产是其他公司的股票。在有效
市场中, CEF的股价应等于其每股净资产

$$P_{CEF} = \frac{Value_{(CEF's\ portfolio)}}{Number_{CEF's\ shares\ outstanding}} = NAV_{CEF}$$

但通常这是不被观察到的

在牛市市场(好时期) $P_{CEF} > NAV_{CEF}$ 几乎所有的CEFs在熊市市
场(坏时期) $P_{CEF} < NAV_{CEF}$ 几乎所有的CEFs

为什么?

理性的交易者从不购买CEFs;最好直接购买股票(避免向CEF支付费用)
经理)

只有非理性的(噪音)交易者才会购买CEFs

CEF过高/过低定价是噪音交易者动物精神的衡量标准

$P_{CEF} < NAV_{CEF}$
 $P_{CEF} \ll NAV_{CEF}$

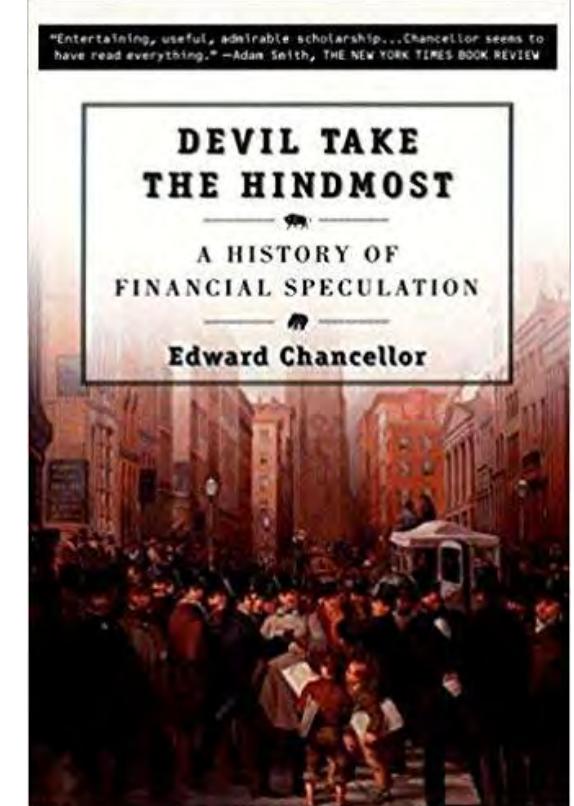
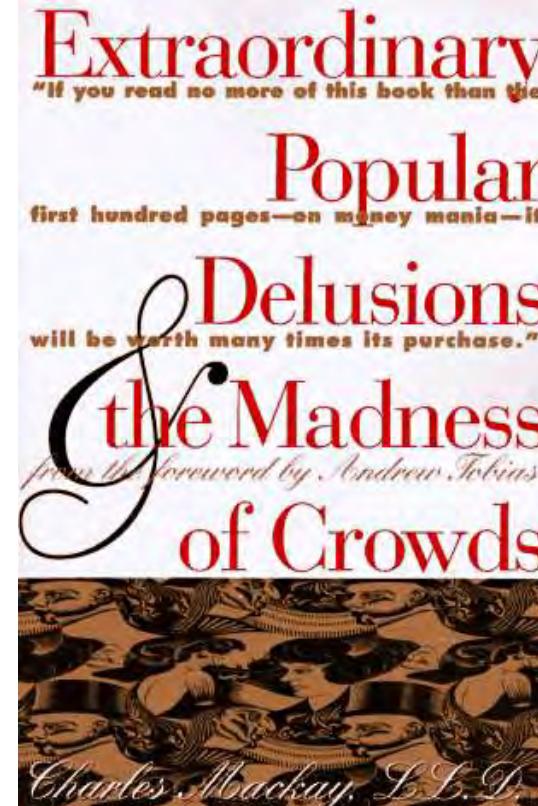
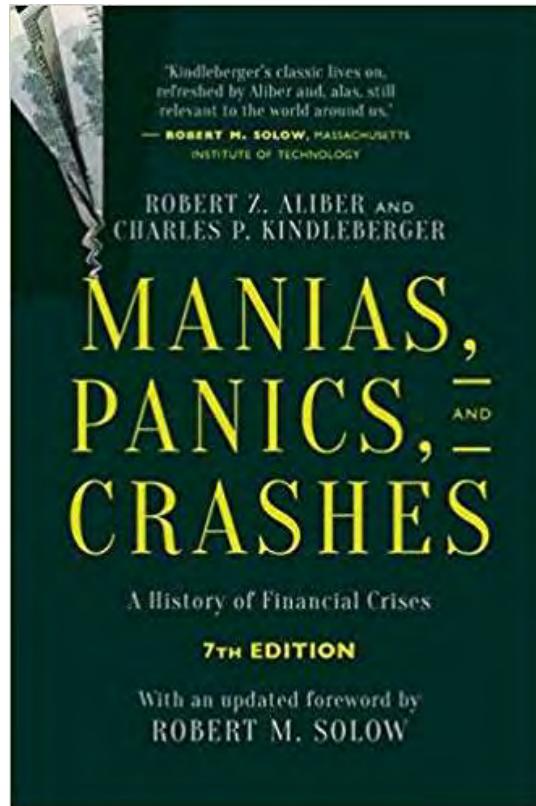


查尔斯·李
斯坦福大学金融学教授, 2008年-现任巴
克莱全球董事总经理



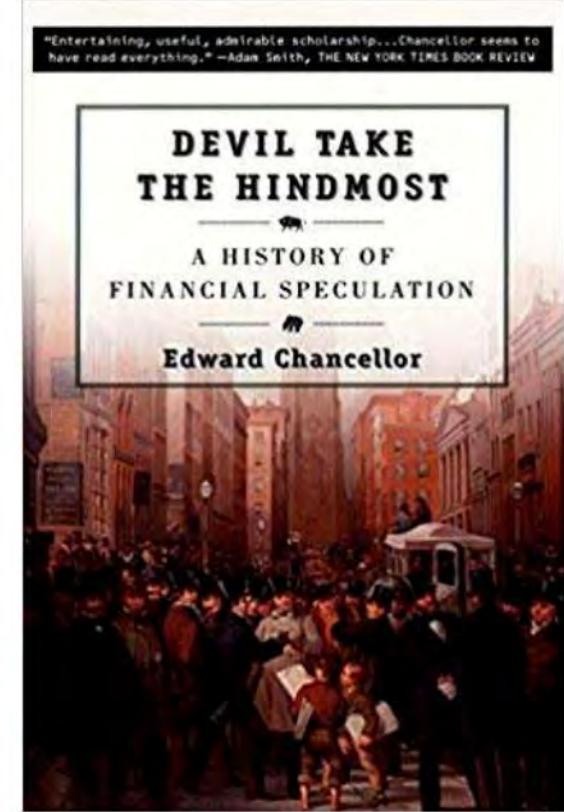
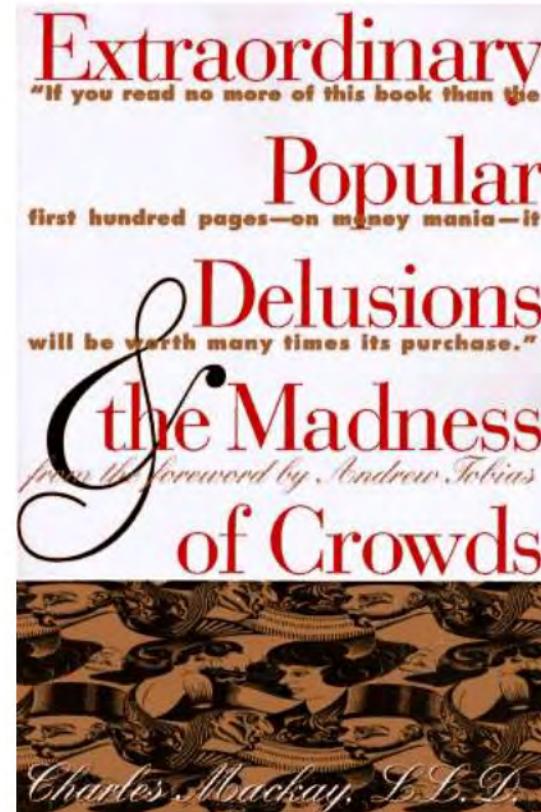
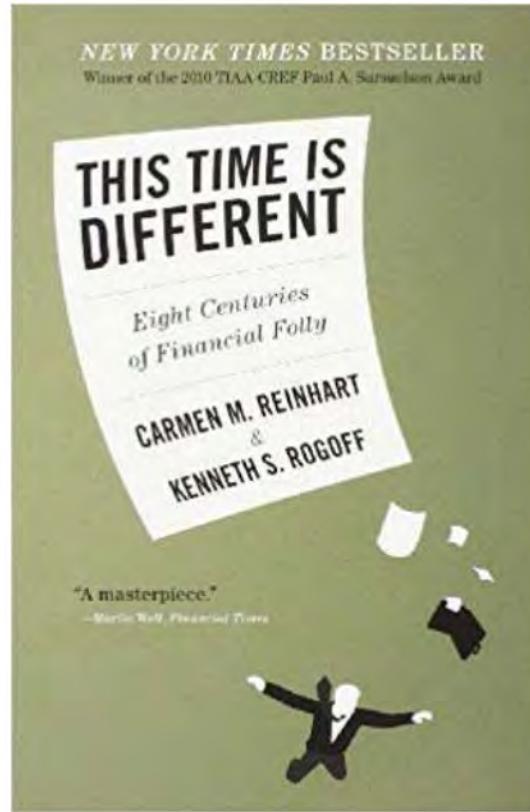
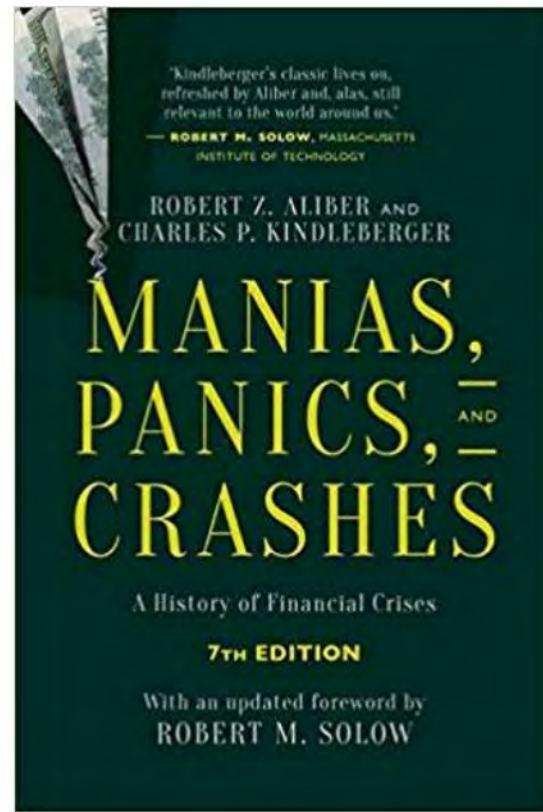
Financial History & the Efficient Markets Hypothesis

These slides are based on the books



& on many research studies of specific historical events

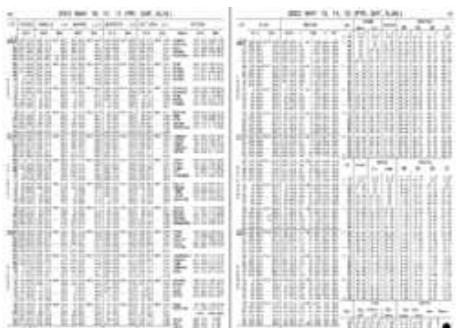
金融史&有效市场假说这些幻灯片是基于书



&基于对特定历史事件的许多研究

The Invention of the Stock Market

- Stock markets existed in the Roman Empire period, but were forgotten
- The first modern stock market, the Amsterdam Stock Exchange, was founded in 1602
- Set up to finance a new high technology industry, trans-ocean trade
 - High-risk high return ventures to trade with China, India, Indonesia, ...
 - Highly mathematical (trigonometry)
 - Complicated equipment (bearing nautical almanac, compass, astrolabe, quadrant, sextant, octant, cross-staff, back-staff, ...)



Amsterdam Stock Exchange, 17th Century



Stock-financed trading company ships in Asia

股票市场的发明

股票市场在罗马帝国时期就存在了，但是

被遗忘的

第一个现代股票市场，阿姆斯特丹证券

交易所成立于 1602

成立的目的是资助一个新的高科技产业，跨洋

贸易

与中国、印度、印尼等进行高风险高回报的贸易

高度数学化(三角学)

复杂设备(带有航海历书、指南针、星盘、

象限仪、六分仪、八分仪、横杖、后杖、……



阿姆斯特丹证券交易所，17thCentury



股票融资的贸易公司在亚洲发货

The First Financial Crisis

Trading companies' early shareholders became rich

- Other investors saw that getting rich looked easy: just buy things that trade on the stock market
- The tulip
 - Origin: Pakistan, Afghanistan
- Etymology (from various Afghanistan languages)
 - Tulip* is from the Tukmen *tulband* meaning *turban* (literally heart band), cc. the Pashto word *taliban* meaning students, from Arabic *talib* meaning seeker
 - The *taliban* are ultra-religious Islamic “seekers” who wear “turbans”



Amsterdam harbor, Dutch Republic, 17th century

“Tulip Book” by R. Cos, 1637

第一次金融危机

其他投资者认为致富看起来很容易:只要买就行了

在股票市场上交易的东西

起源:巴基斯坦、阿富汗

“Tulip” 来自图克曼语*tulband*, 意思是头巾(字面意思是心脏)
band)等普什图语中塔利班一词意为学生, 源自阿拉伯语
塔利班是极端宗教的伊斯兰“寻求者”, 他们戴着“头巾”



Amsterdam harbor, Dutch Republic, 17th century



"Tulip Book" by R. Cos, 1637

The Tulip Bubble

How tulips got to Amsterdam

- Brought from Afghanistan to Turkey by order of Sultan Suleiman the Magnificent (1494 -1566)
- To Vienna by De Busbecq (1522 to 1592), Hapsburg ambassador to Turkey
- To Holland by Carolus Clusius (1526 - 1609), botanist & protestant refugee from Austria
- Clusius would not sell tulips because he was a Protestant Christian (tulips for study, not frivolity)
- Midnight raid on his Leiden botanical garden



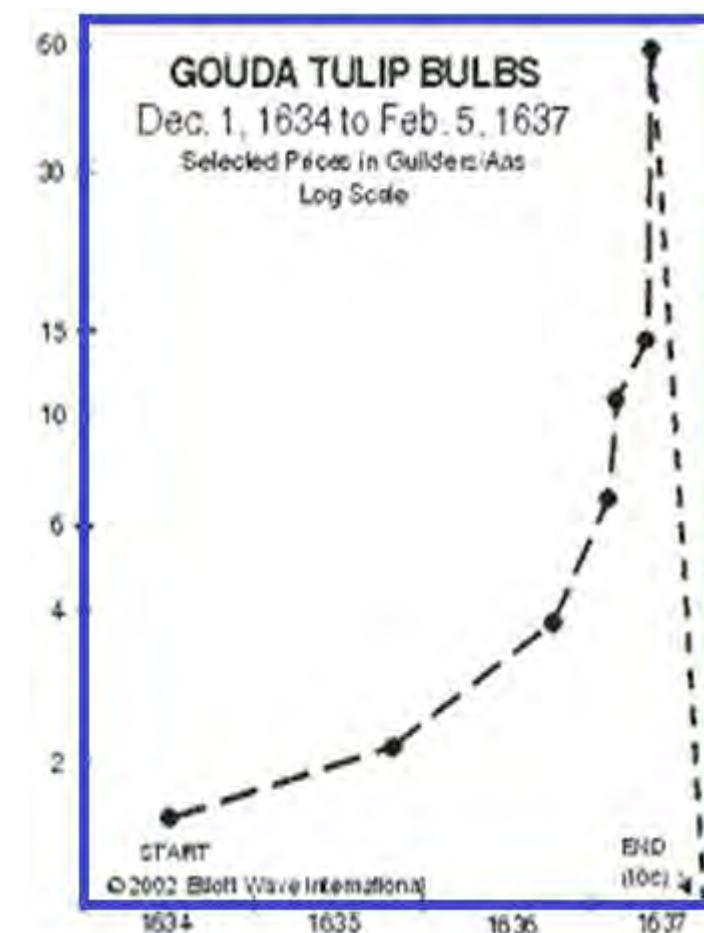
Suleiman the Magnificent (1494-1566), with favored concubine, Roxalana

Early 1600s - tulips a rare and secret luxury

- Early trading company shareholders had become very rich
- Other people wanted to invest in the next “big thing”
- Tulips began trading on the stock exchange
- Then tulip options, tulip futures and tulip futures options
- Tulips seen as risk-free way to get rich quick

Great Tulip Crash of 1637

- Default on one tulip bulb futures contract
- Sellers panic, all try to sell at once
- Option & futures counterparties default in large numbers
- Government bailout buys tulip contracts at 90% haircut
- Stock market crash



郁金香泡沫

郁金香是如何到达阿姆斯特丹的

- ☒ 由苏丹苏莱曼大帝(1494 -1566)命令从阿富汗带到土耳其
- ☒ 由哈布斯堡驻土耳其大使德·布斯贝克(1522年至1592年)前往维也纳
- ☒ 克劳修斯(1526 - 1609), 植物学家, 奥地利新教徒难民
- ☒ 克劳修斯不会卖郁金香, 因为他是新教基督徒(郁金香是为了学习, 不是为了轻浮)。
- ☒ 半夜突袭他的莱顿植物园

17世纪早期, 郁金香是一种罕见而隐秘的奢侈品

- ☒ 早期贸易公司的股东变得非常富有
- ☒ 其他人则想投资下一个“大事件”
- ☒ 郁金香开始在证券交易所交易
- ☒ 然后是郁金香期权、郁金香期货和郁金香期货期权
- ☒ 郁金香被视为无风险的快速致富方式

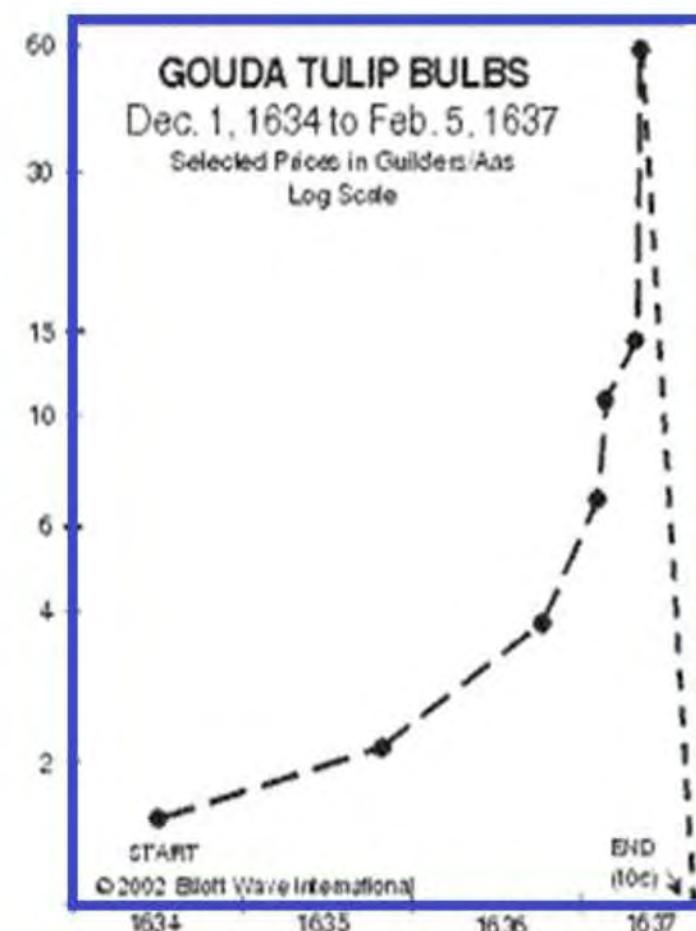
1637 郁金香大崩盘

- ☒ 违约一份郁金香球茎期货合约
- ☒ 卖家惊慌失措, 都试图同时卖出
- ☒ 期权和期货交易对手大量违约
- ☒ 政府救助以90%折价购买郁金香合约
- ☒ 股灾



苏莱曼大帝(1494-1566)

妾Roxalana



The Tulip Bubble

- Tulips lost almost all their value
- Paintings of tulips are now considered “Dutch” masterpieces and are extremely valuable



“Tulip in a Gendi”
Dirck van Delen, 1637



“Tulips”
Ambrosius Bosscheret, 1620.



“Tulips”
by Hans Bollongier, 1639

郁金香泡沫

郁金香几乎失去了所有的价值

现在郁金香画被认为是“荷兰”的杰作，价值极高



《根地的郁金香》
(Tulip in a Gendi),
Dirck van Delen, 1637年



“郁金香”
Ambrosius Bosscheret, 1620.



“郁金香”
汉斯·博隆吉尔(Hans Bollongier), 1639年

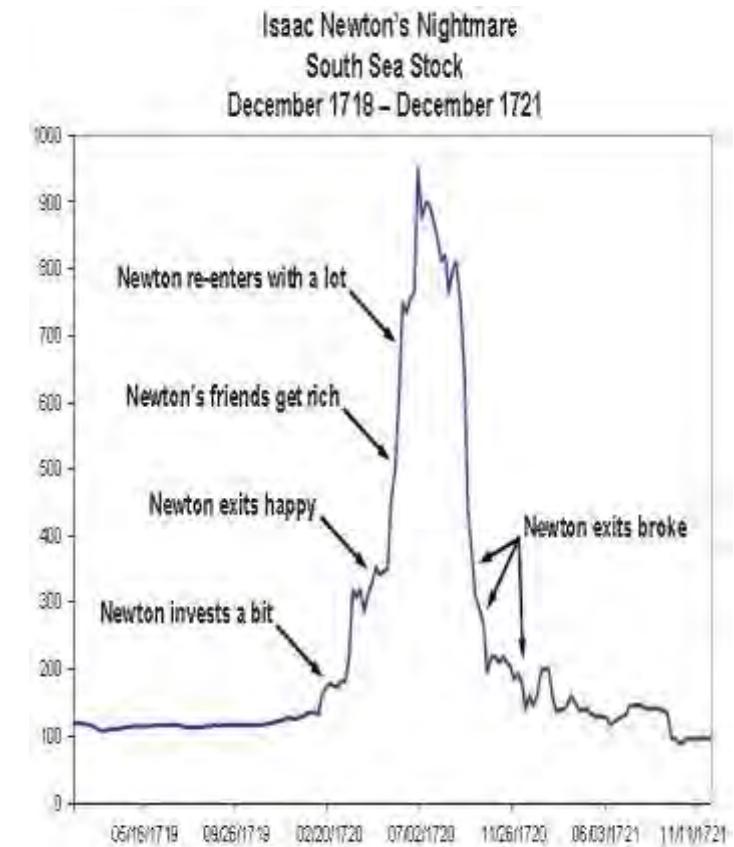
The South Seas Bubble

Dale, Richard. 2004. The first crash. Princeton University Press,

- “Dutch” financing comes to London after 1688 Glorious Revolution
- Early investors in British East India Co., Hudson’s Bay Co., etc. now very rich
- Everyone wants “in” on the “next British East India Co.”
- IPO boom of 1690s & early 1700s
- Robert Harley’s “South Seas Co.” most prominent IPO
 - Monopoly on trade with Latin America
 - Trade barriers
- Other IPOs for
 - “Salt works in the Holy Land”
 - “A machine of perpetual motion”
 - “An undertaking of great advantage, no-one to know what it is”
- Sir Isaac Newton (Master of Royal Mint) runs monetary policy

“I can calculate the motion of heavenly bodies, but not the madness of people.”

- Isaac Newton



南海泡沫

理查德·戴尔，2004。第一次撞车。普林斯顿大学出版社，
“荷兰式”融资在1688年光荣之后来到伦敦

革命

英属东印度公司、哈德逊湾公司等早期投资者现在非常富有
每个人都想“加入”“下一个英属东印度公司”。

17世纪90年代和18世纪初的IPO热潮

罗伯特·哈雷的“南海公司”最著名的IPO

<:1>垄断与拉丁美洲的贸易

☒ 贸易壁垒

其他ipo

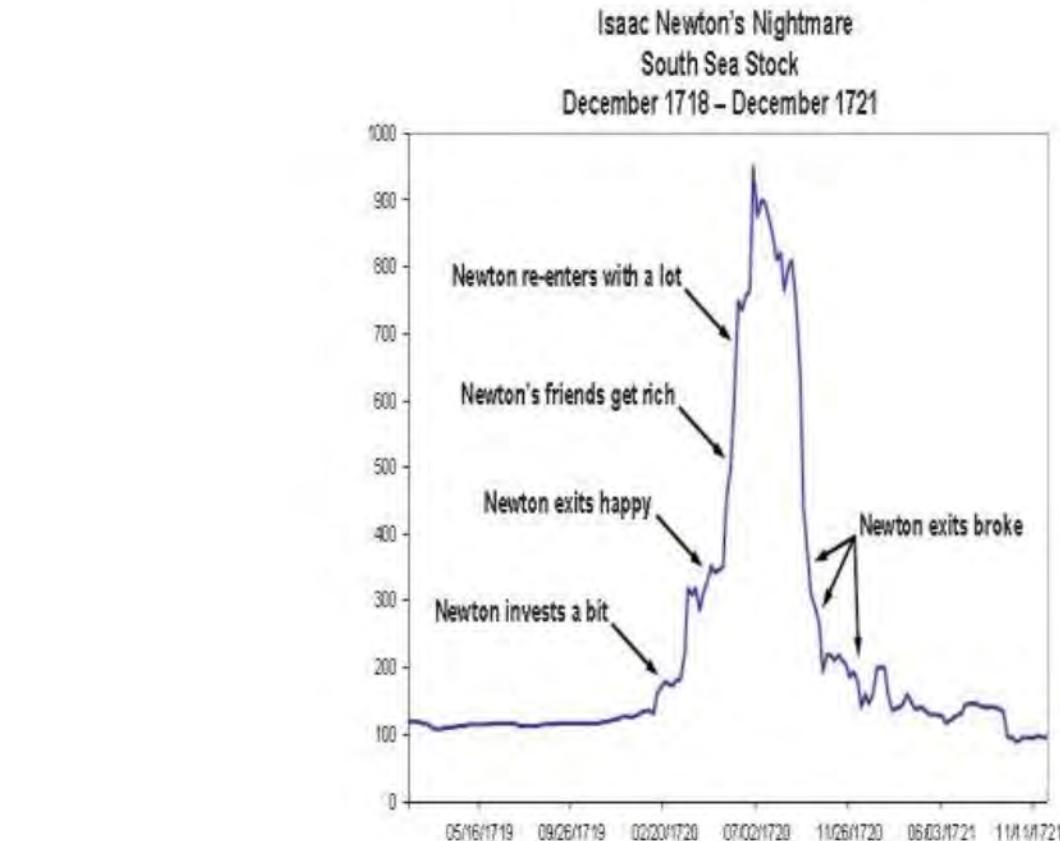
“食盐在圣地工作”

“永动机的机器”

“一项具有巨大优势的事业，没有人知道它是什么”

艾萨克·牛顿爵士(皇家造币厂大师)负责货币政策

“我可以计算天体的运动,但不能计算人的疯狂。”



-艾萨克·牛顿

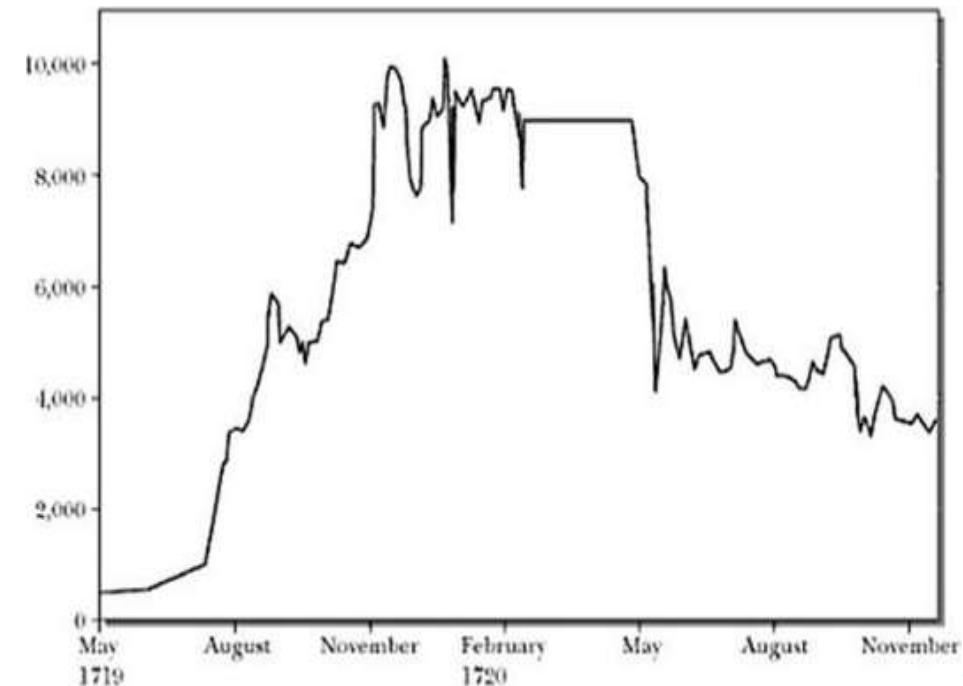
The Mississippi Bubble

France was left behind

- French king bankrupt after losing wars against Netherlands
- French elite wanted to get rich too
- John Law, an escaped murderer from Scotland, offered solution
 - French people wanted their own trading companies
 - Law set up Mississippi Co. for trade between France and (unexplored) Mississippi valley in North America
 - Claims of huge cities of gold in central North America
 - Mississippi Co. would repay king's debt & make all rich
- Law issued Mississippi Co. shares
 - Mississippi Co share price rose rapidly
 - People saw shares rise, so bought more to get richer, so shares rose even more, so ...
 - Law used the profits to repay French king's debts
 - Law continued printing shares to get richer and richer
- French realized Mississippi valley was wilderness
 - Mississippi Co. stock crashed in 1720
 - Law escaped from France



John Law



密西西比泡沫

法国被抛在后面

在与荷兰的战争中失败后，法国国王破产

法国精英也想致富

来自苏格兰的逃犯[约翰·劳\(John Law\)](#)提供了解决方案

法国人希望有自己的贸易公司

劳为法国和(未开发的)密西西比之间的贸易设立了密西西比公司

北美山谷

声称在北美中部拥有巨大的黄金城市

密西西比公司将偿还金的债务，使所有人都富有

[Law](#)发行密西西比公司股票

密西西比公司股价迅速上涨

人们看到股价上涨，所以买更多的股票来变得更富有

股价涨得更多，所以……

劳继续印股，越来越富

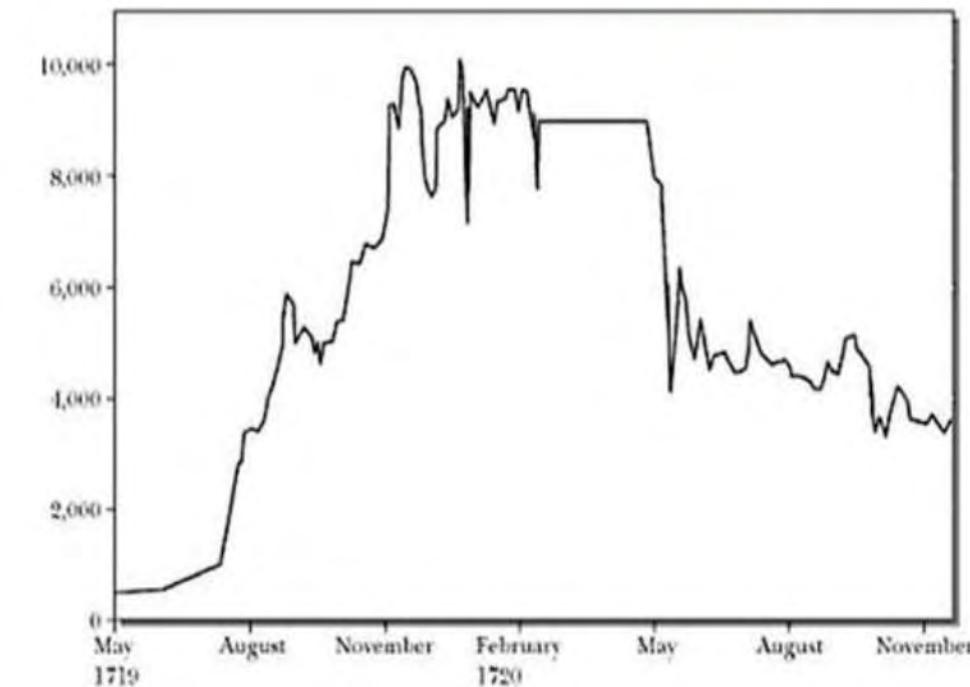
法国人意识到密西西比山谷是荒野

密西西比公司的股票在1720年崩盘

法律逃离法国



John Law

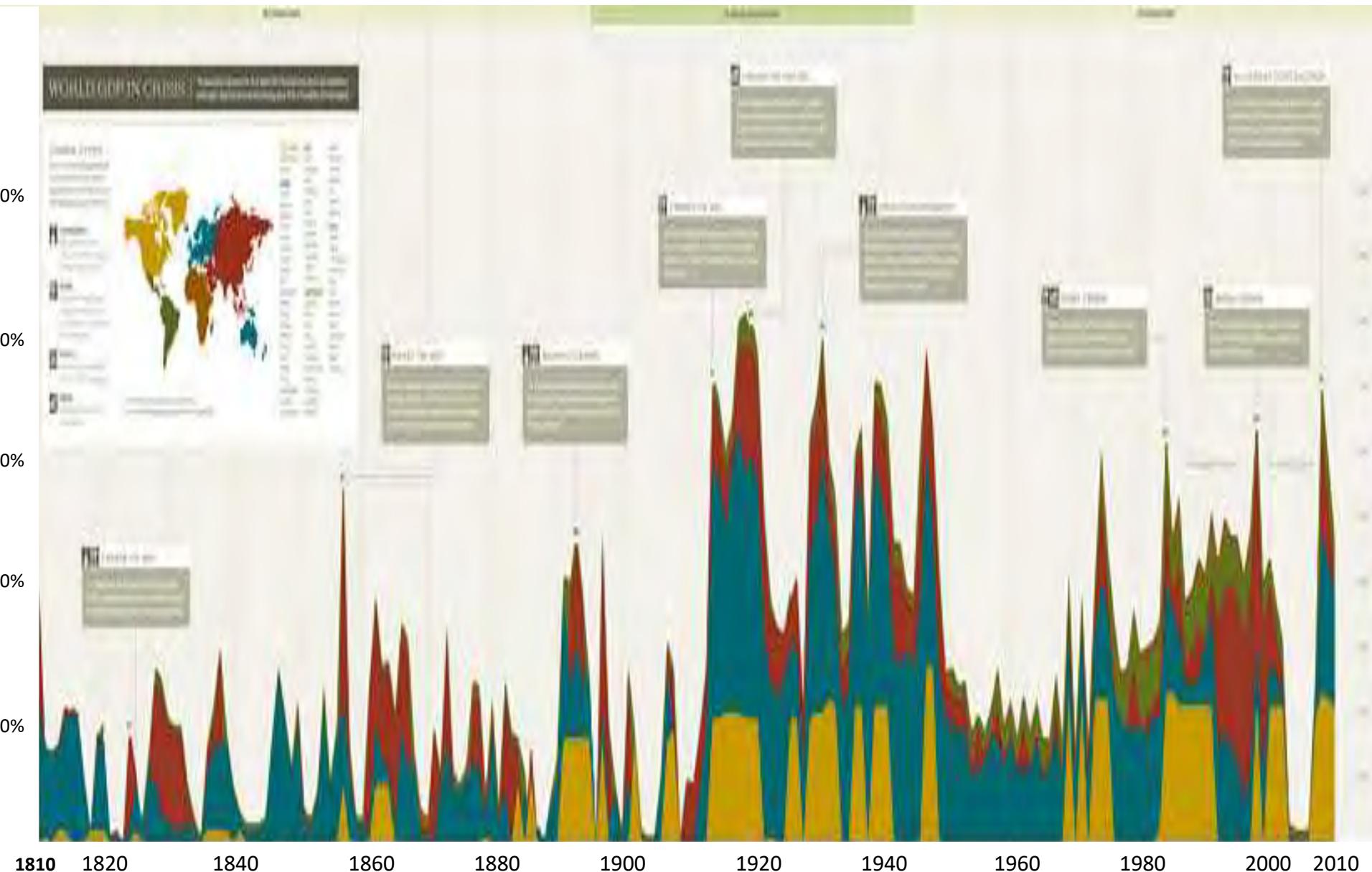
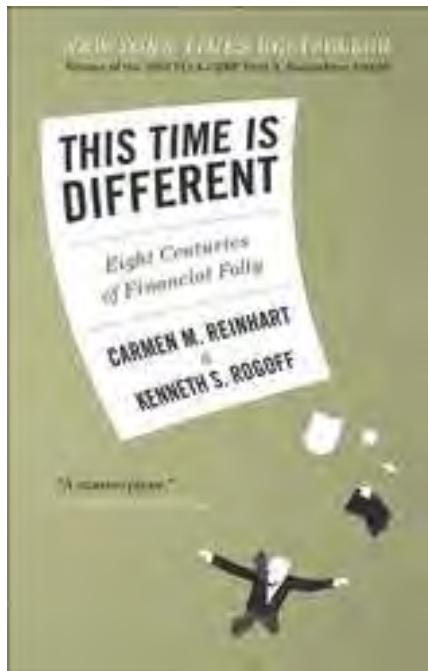


Stock Market & Bond Market Crises Recur in History

Reinhart, Carmen and Kenneth Rogoff. 2009. *This Time Is Different*. Princeton University Press.

Fraction of World
Economy Undergoing →
Financial Crisis

$$f_t = \frac{\sum_i GDP_{it} \times \delta_{i,t}}{\sum_i GDP_{it}}$$

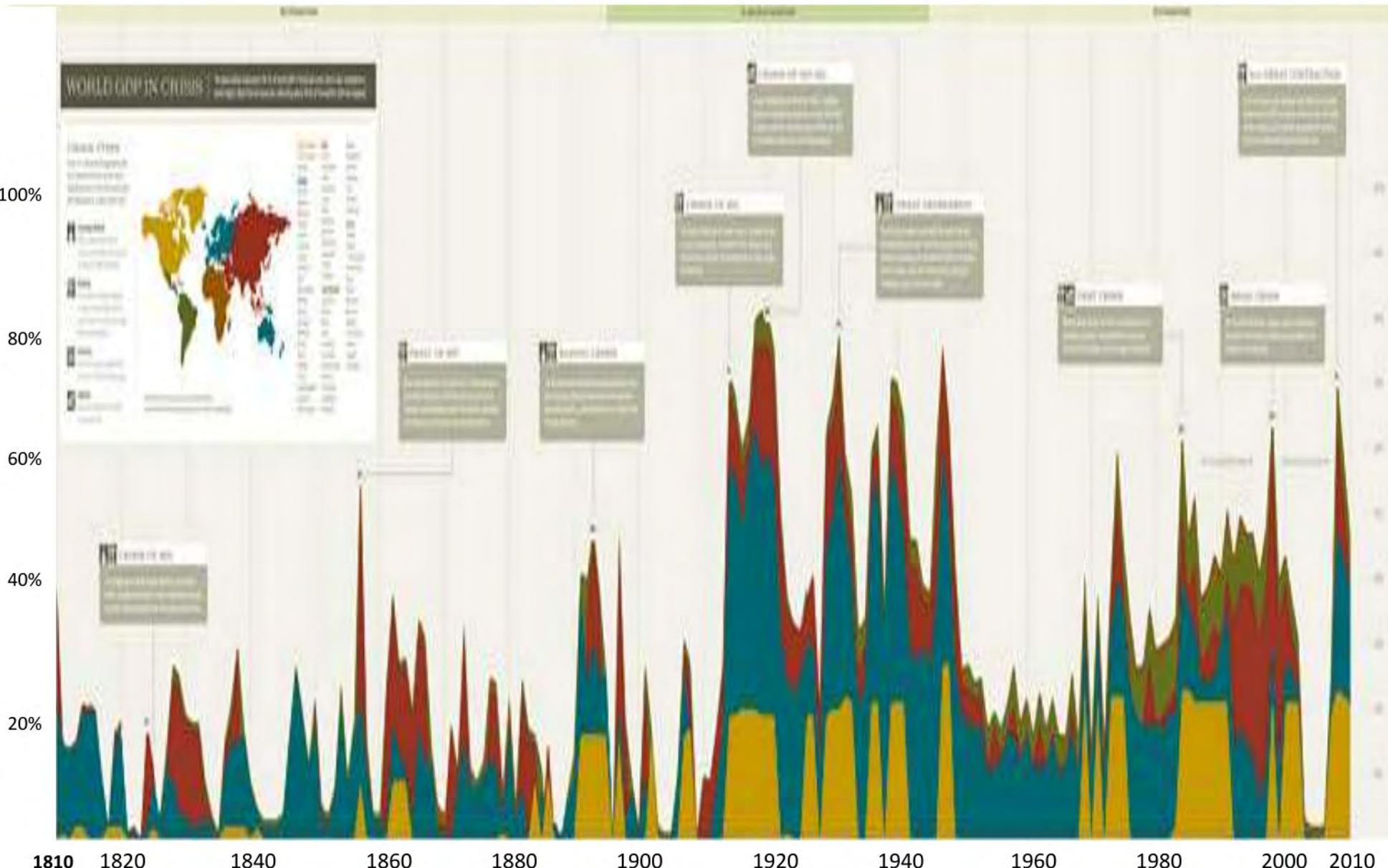
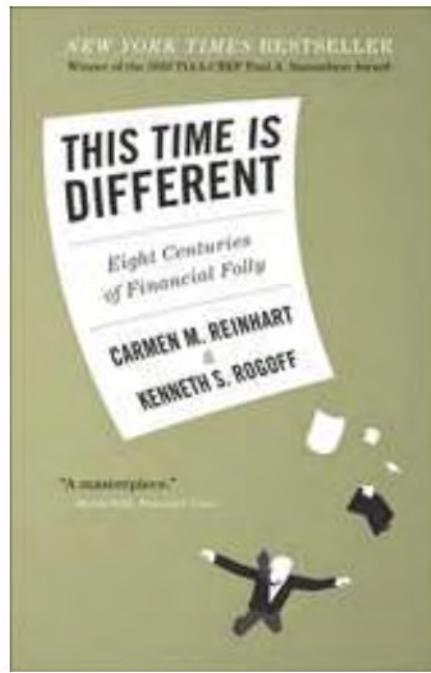


Stock Market & Bond Market Crises Recur in History

莱因哈特，卡门和肯尼斯·罗格夫，2009。《这次不一样》。普林斯顿大学出版社。

世界经济的一小部分正在经历金融危机 →

$$f_t = \frac{\sum_i GDP_{it} \times \delta_{i,t}}{\sum_i GDP_{it}}$$



Each Financial Crisis Causes the Next Financial Crisis

Crash of 1770

- Seven Years War (1756 – 1763, when Britain conquered Canada from France) expensive
- French government defaults on its “risk-free” bonds in 1770
- Investors fear other governments would default too
- Britain increases taxes on American colonies to finance bailouts

American Tobacco Debt Crisis of 1776

- Tobacco growers default because of crop failures in 1774, 1775, 1776
- American Revolution saves tobacco plantation owners (George Washington, Thomas Jefferson, ...) from British banks
- British banks in crisis because Americans refuse to repay loans
- Hyperinflation as USA government prints money to finance war with UK

France declares war on Britain to help USA

- France cannot issue bonds (because of 1770 default)
- France increases taxes to pay for helping USA win independence from UK
- Under French law, elite is exempt from all taxes, so poor pay higher taxes

US wins independence in 1783 & has financial crisis

French Revolution (法国大革命) in 1789 leads to financial crisis

- French poor people kill king & elites, establish French Republic
- Republic seizes all church properties in 1790 & issues assignats, bonds secured by future income from ex-church lands
- Chaos during revolution so ex-church lands produce very little income

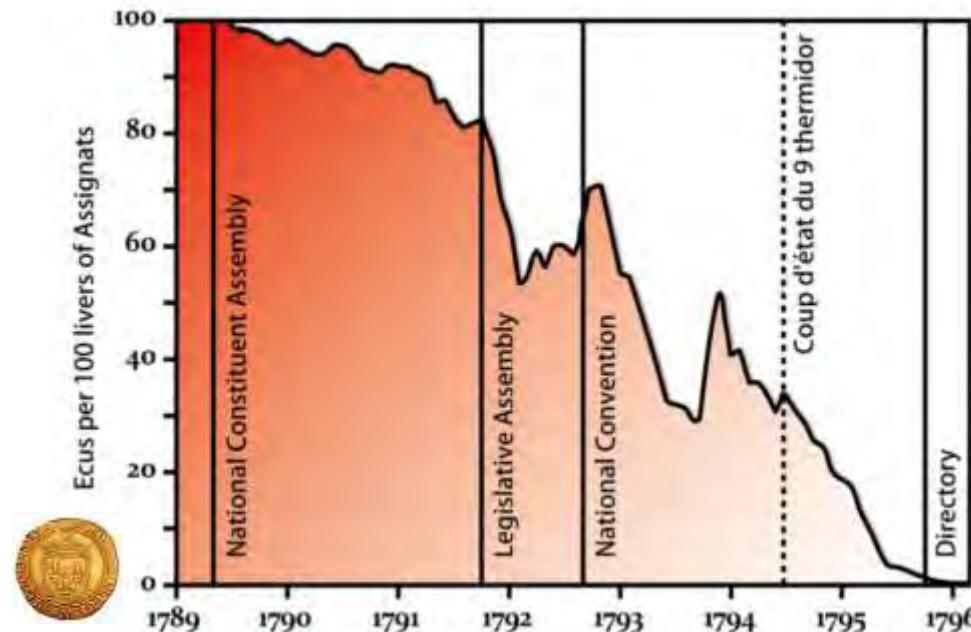
French financial Crisis of 1790s

- Revolutionary French government collapses in hyperinflation (超级通胀), financial crisis
- General Napoleon Bonaparte seizes power

Hyperinflation (超级通胀) in USA

Inflation and Depreciation of the Continental Currency

| YEAR | # OF ISSUES | AMOUNT ISSUED | PAPER TO SPECIE |
|---------|-------------|----------------|----------------------------|
| 1775 | 3 | \$6.0 million | 90% (December) |
| 1776 | 4 | \$19 million | 66% (Dec.) – 1.5 to 1.0 |
| 1777 | 5 | \$13 million | 33% (October) – 3.0 to 1.0 |
| 1778 | 14 | \$63.5 million | 15% (Dec.) – 6.8 to 1.0 |
| 1779 | 14 | \$140 million | 2% (Dec.) – 42 to 1.0 |
| 1780 | 0 | — | 1% (Dec.) – 98 to 1.0 |
| 1781 | — | — | .05% (April) – 146 to 1.0 |
| TOTAL ▶ | 40 | \$241 million | |



Each Financial Crisis Causes the Next Financial Crisis

1770年大崩盘

- 七年战争(1756年至1763年，英国从法国手中征服加拿大)代价高昂
- 法国政府在 1770 上对其“无风险”债券违约
- 投资者担心其他国家的政府也会违约
- 英国增加对美国殖民地的税收以资助救助

1776 的美国烟草债务危机

烟草种植者在1774年、1775年、1776年因作物歉收而违约

美国革命拯救了烟草种植园主(乔治·华盛顿、托马斯·杰斐逊……)

)从英国银行手中

英国银行陷入危机，因为美国人拒绝偿还贷款

USA政府印钞以资助与UK的战争导致恶性通货膨胀

法国向英国宣战以帮助USA

法国不能发行债券(因为1770违约)

法国增加税收以支付帮助USA从UK赢得独立的费用

根据法国法律，精英阶层免税，所以穷人要交更高的税

美国在1783年赢得独立，却遭遇了金融危机

1789年的法国大革命导致了金融危机

法国穷人杀死国王和精英，建立法兰西共和国

1790年共和国没收了所有教会财产，并发行了以未来收入担保的债券

来自前教会的土地

革命期间的混乱，所以前教会土地产生的收入很少

18世纪90年代的法国金融危机

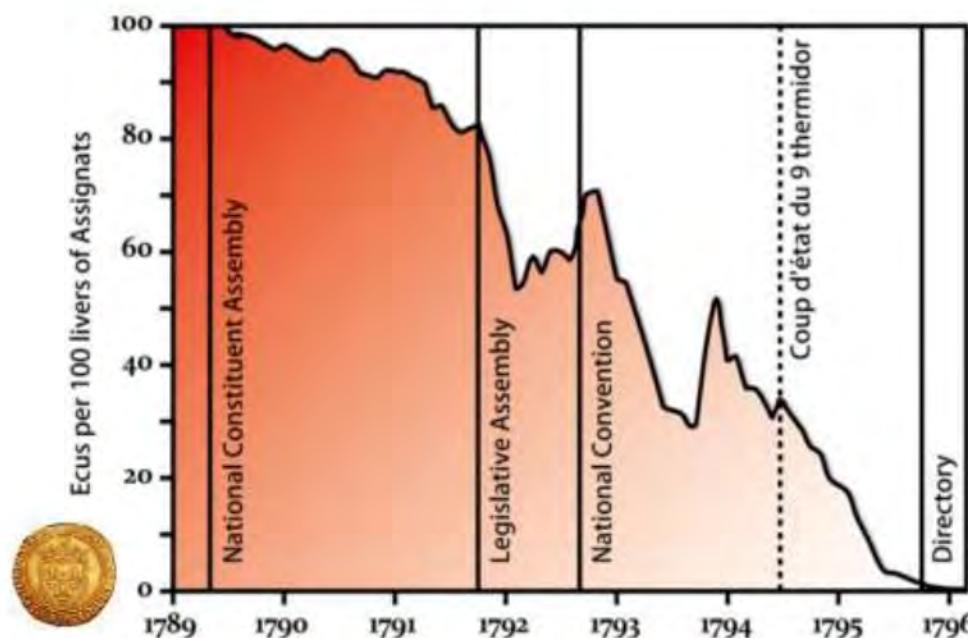
法国革命政府在恶性通货膨胀和金融危机中崩溃

拿破仑将军夺取政权

USA的恶性通货膨胀

Inflation and Depreciation of the Continental Currency

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The Speed of Information

Through most of history, information travels at speed of horse or sailing ship



Horse messenger

- France, under General Napoleon, trying to conquer all of Europe
- UK in World War against France & allies (including USA)
- Britain won with 1815 “Battle of Waterloo”

The London T-Bill Crash of 1815

- Rothschild Bank branches across Europe use homing pigeons (faster than horses)
- Disputed legend
 - At time of Battle of Waterloo, investors saw Rothschild receive pigeon, walk sadly to exchange in London & sell British T-bills
 - Speculators assumed Napoleon won, panic selling caused crash in UK T-Bill prices
 - Rothschild secretly bought British T-bills at very low prices
 - When horse messengers arrived with news of UK victory, UK T-Bill prices rose back



Homing Pidgeon
Columba livia domestica

Rothschild got rich, but the Rothschild bank helped the UK win the war

- The UK government borrowed & deposited money in London branch
- UK generals could withdraw money at Rothschild bank branches anywhere in Europe to pay soldiers
- French army “lived off the land” (soldiers steal from farms and towns to stay alive)
- French army was hated & hungry, UK army was not disliked & was well-fed



Nathan Mayer, Freiherr
von Rothschild
(1777 – 1836)

信息的速度

在历史的大部分时间里，信息以马或帆船的速度传播

法国在拿破仑将军的领导下，试图征服整个欧洲

UK在世界大战中对抗法国及其盟友(包括USA)

英国赢得1815年“滑铁卢战役”

伦敦短期国债崩溃 1815

罗斯柴尔德银行在欧洲的分行使用信鸽(比马快)

☒有争议的传奇

滑铁卢战役时，投资者看到罗斯柴尔德收鸽子，伤心地走进去交换

伦敦和出售英国国库券

投机者认为拿破仑赢了，恐慌性抛售导致UK短期国债价格崩溃

罗斯柴尔德秘密以极低的价格购买英国国库券

当马匹信使带来UK胜利的消息时，UK国库券价格回升

罗斯柴尔德变得富有，但罗斯柴尔德银行帮助UK赢得了战争

UK政府在伦敦分行借款和存款

UK将军可以从罗斯柴尔德银行在欧洲任何地方的分支机构取钱支付

士兵

法国军队“以地为生”(士兵从农场和城镇偷东西以维持生命)

法国军队被憎恨，饥肠辘辘，UK军队没有被厌恶，而且吃得很好



Horse messenger



Homing Pidgeon
Columba livia domestica



Nathan Mayer, Freiherr
冯·罗斯柴尔德(1777 -1836)

19th C Financial Crises

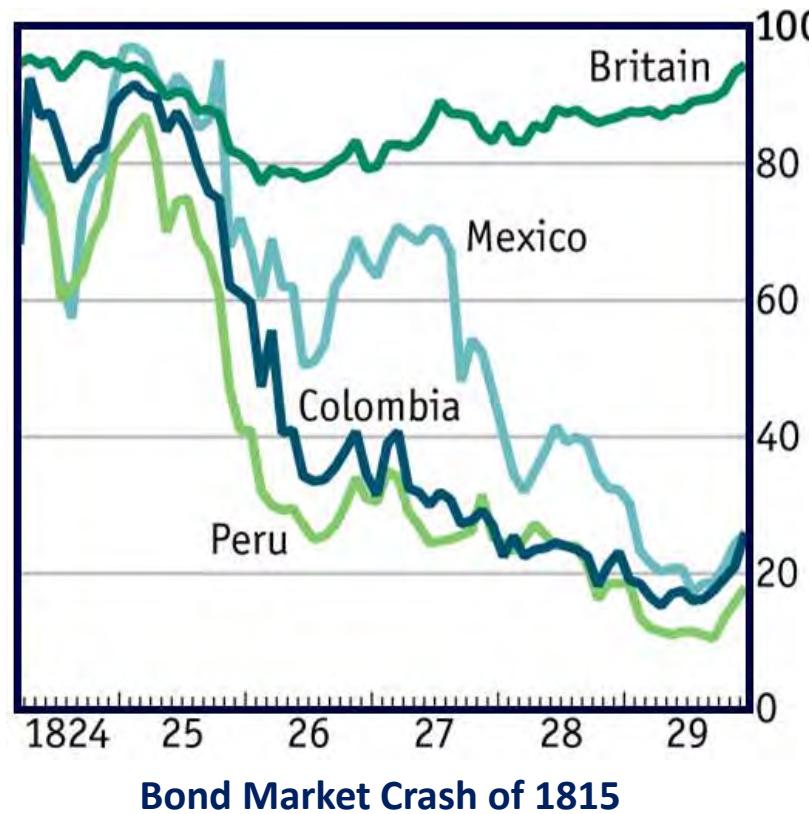
Crash of 1819

Collapse in cotton prices triggers banking crisis

Crash of 1825

Latin American countries (led to independence by Simon Bolivar after Napoleon conquered Spain & Portugal) issued lots of T-bonds in London

- Wave of enthusiasm for investing in “next USAs” of Latin America
- Scotsman MacGregor floats T-bonds in fake country of Poyais
 - Still regarded in Venezuela as honored war hero
- Bond price Crash in 1825
 - Wave of Latin American T-bond defaults in Europe & US
 - Bank of England bailed out by gold transfers from Bank of France
 - 70 banks failed



Gregor MacGregor
(1786 – 1845)
Soldier for Simon Bolivar
Prince of “Poyais”

19th C Financial Crises

1819年崩盘
年崩盘

棉花价格暴跌引发银行危机

拉丁美洲国家(在拿破仑征服西班牙和葡萄牙后由西蒙·玻利瓦尔领导独立)在伦敦发行了大量的国债

一波热潮

投资“下一个美国”

拉丁美洲

苏格兰人麦格雷戈漂浮

假国家的国债

Poyais

在委内瑞拉仍然受到重视

被视为光荣的战争英雄

1825年债券价格崩盘

拉丁美洲T-的浪潮

欧洲债券违约&

我们

英格兰银行退出

由黄金转账而出

法国银行

70家银行倒闭



Gregor MacGregor
(1786 – 1845)
Soldier for Simon Bolivar
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Crash of 1837

New High Technology Industries

1. Canal systems revolutionize transportation

- Land transportation very slow because “highways” are dirt paths, often impassable & much “highway robbery”
- Cost of transatlantic shipping < cost of shipping goods inland a few km

One canal boat, pulled by 1 horse, carries 30 tons

- Huge profits to early canal builders → flood of capital into canal building
- Real estate boom in formerly inaccessible inland areas → huge flow of money into real estate



1830s canal transport

19th C Financial Crises

1819年崩盘

棉花价格暴跌引发银行危机

1825年崩盘

拉丁美洲国家在拿破仑之后由西蒙·玻利瓦尔领导独立
征服了西班牙和葡萄牙)在伦敦发行国库券

1837年股灾

高新技术产业

1. 运河系统彻底改变了交通运输

陆地运输非常缓慢，因为“高速公路”通常是土路
无法通行&很多“公路抢劫”

跨大西洋运输成本<内陆几公里的货物运输成本

一艘运河船，由1匹马牵引，载重30吨

早期运河建设者的巨额利润大量资金涌入运河建设
以前无法进入的内陆地区的房地产热潮巨大的流量
资金流入房地产



1830s canal transport

19th C Financial Crises

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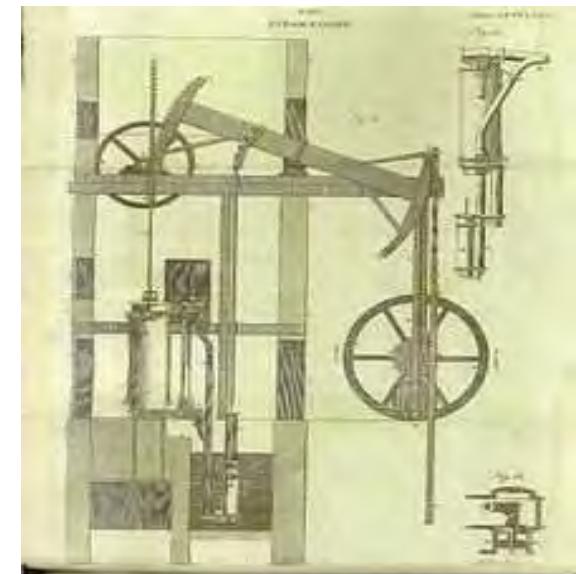
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Crash of 1837

New High Technology Industries

1. Canal systems revolutionize transportation
2. Boulton-Watt steam engine (continuous power) used in mines & mills
3. First experimental telegraph (Gauss in Europe, Joseph Henry in USA)



19th C Financial Crises

1819年崩盘

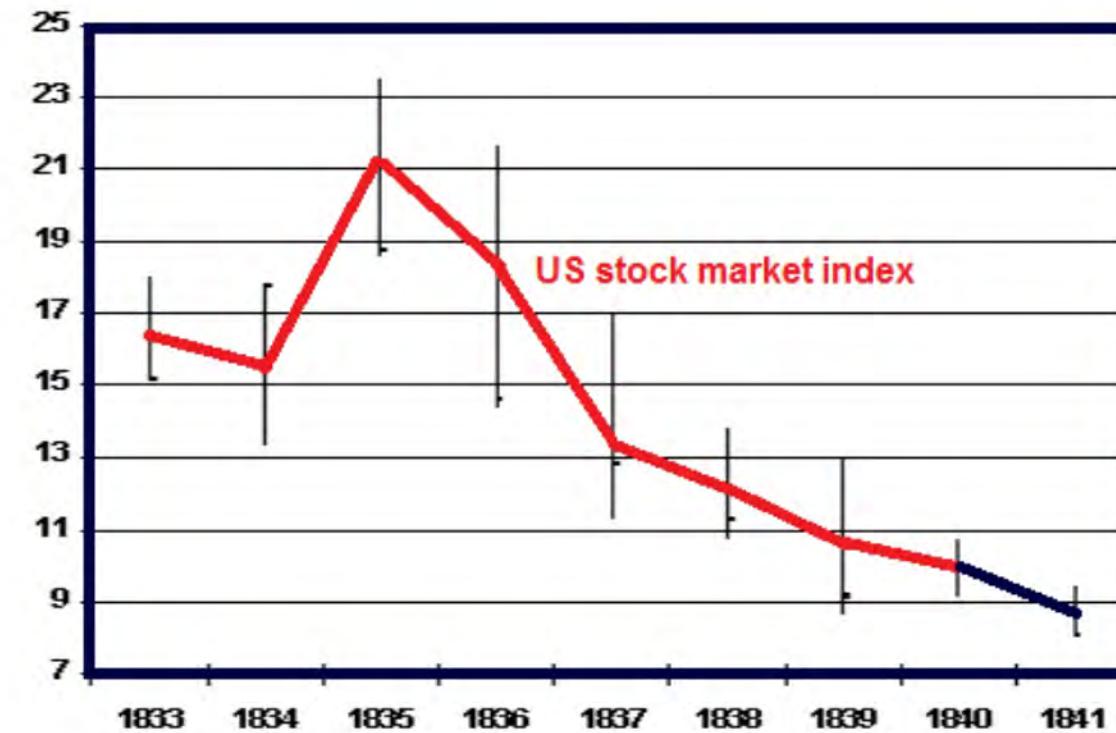
1825年崩盘

1837年股灾

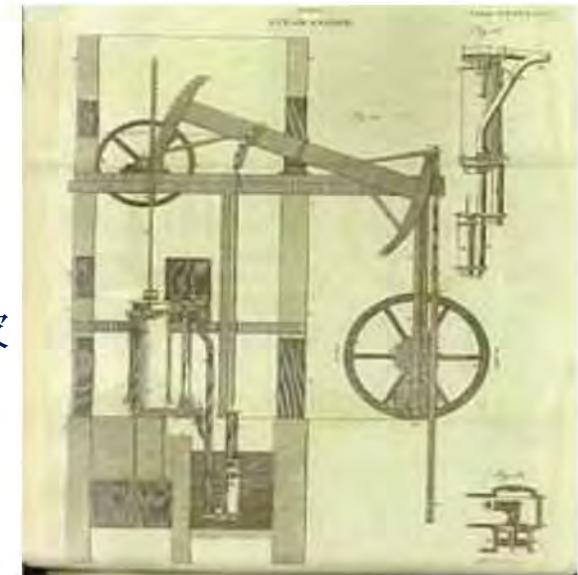
棉花价格的崩溃引发了拉丁美洲国家的银行危机(在拿破仑之后由西蒙·玻利瓦尔领导独立)

征服西班牙和葡萄牙)在伦敦发行国债
高新技术产业

1. 运河系统彻底改变了交通运输
2. 用于矿山和磨坊的博尔顿-瓦特蒸汽机(连续动力)
3. 第一个实验电报(欧洲的高斯, 美国的约瑟夫·亨利)



⊗1837年的股灾



19th C Financial Crises

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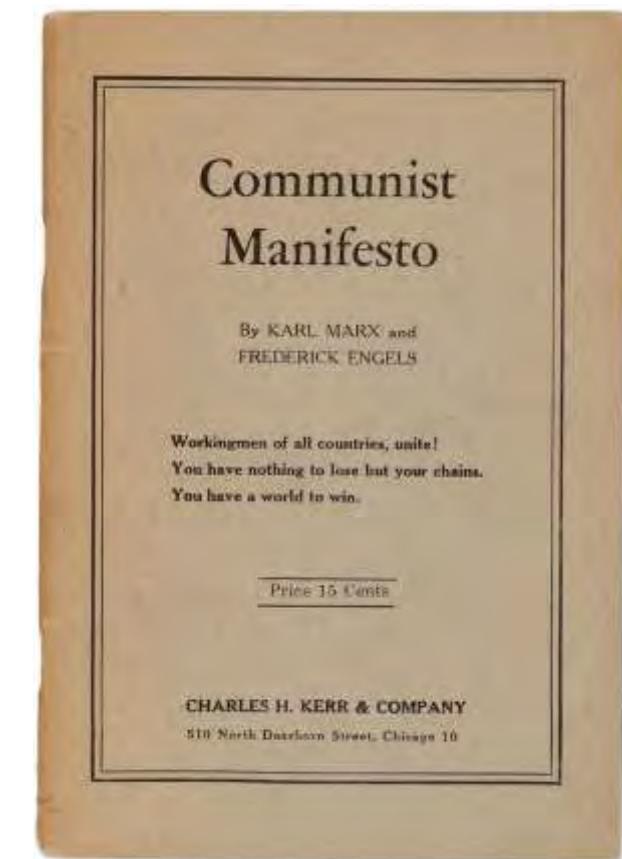
Crash of 1837

New High Technology industries – canals, steam power, telegraph

Crash of 1847

New High Technology industries – railroads, steamships, telegraph lines

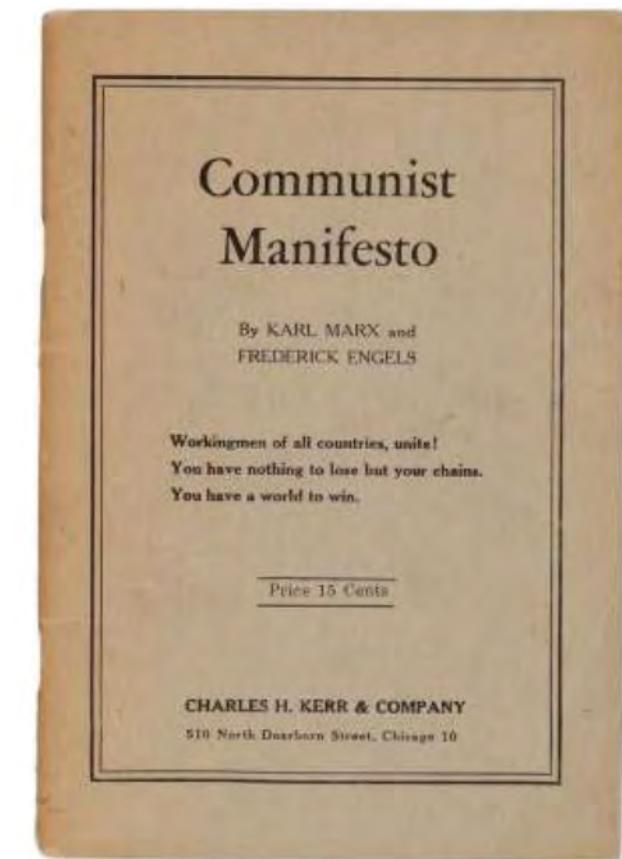
- Overbuilding of railroads, multiple parallel competing lines
- Overbuilding of steamships
- British stock market crash when RR & SS profits turn out to be low
- Claims this is the “Death of capitalism”
- Revolutions against absolute monarchs across Europe in 1848
- Marx & Engels publish Communist Manifesto



19th C Financial Crises

1819 年 崩
盘
1825年
崩盘
1837 年 股
灾
1847年
股灾

棉花价格暴跌引发银行危机
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在伦敦发行国债
高新技术产业——运河、蒸汽动力、电报
高新技术产业——铁路、轮船、电报线路
过度建造铁路，多条平行竞争线路过度建造轮船
当RR & SS的利润被证明很低时，英国股市崩盘
1848年欧洲爆发反对专制君主的革命马克思恩格斯发表
《共产党宣言}



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New High Technology industries – railroads, steamships, telegraph lines

Crash of 1867

New High Technology industries – railroad & telegraph networks

- Long-distance railroads railroad & telegraph alongside railroads
- Real estate bubble alongside railroads
- Overinvestment leads to excess capacity, low profits, stocks collapse
 - Italy abandons silver standard, 1866
 - Overend, Gurney & Co. of London fails, 1866
 - US contracts money supply by withdrawing "greenbacks" from circulation
- "Death of Capitalism" again predicted
- Jay Gould & James Fisk "corner" gold market as US government trying to repurchase "Civil War Bonds" with gold
- US terminates repurchases, gold price collapse "Black Friday" (Sept. 24, 1869)
- Bank failures, stock market crash

"Panics do not destroy capital, they merely reveal the extent to which it has been previously destroyed by its betrayal into hopelessly unproductive works"

John Stewart Mill, 1867



19th C Financial Crises

1819年崩盘
1825年崩盘

棉花价格暴跌引发银行危机
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征服了西班牙和葡萄牙)在伦敦发行国债

1837年股灾
1847年股灾
1867年股灾

高新技术产业——运河、 蒸汽动力、 电报
高新技术产业——铁路、 轮船、 电报线路
高新技术产业-铁路和电报网络

长途铁路铁路和电报旁边的铁路
铁路旁边的房地产泡沫
过度投资导致产能过剩， 利润低下， 股市崩盘

意大利放弃银本位制， 1866年
伦敦Overend, Gurney & Co.公司倒闭(1866年)
美国通过从流通中撤出“美钞” 来收缩货币供应
“资本主义之死” 再次预言

杰伊·古尔德和詹姆斯·菲斯克“垄断” 黄金市场， 因为美国政府试图
用黄金回购“内战债券”
美国终止回购， 黄金价格暴跌“黑色星期五” (1869年9月24日)
银行倒闭， 股市崩盘

“恐慌不会摧毁资本， 它们只是揭示了资本的破坏程度
之前被它的背叛摧毁到无可救药的无产化
作品”



John Stewart Mill, 1867

19th C Financial Crises

Crash of 1819

Collapse in cotton prices triggers banking crisis

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Crash of 1837

New High Technology industries – canals, steam power, telegraph

Crash of 1847

New High Technology industries – railroads, steamships, telegraph lines

Crash of 1867

New High Technology industries – railroad & telegraph networks

Crash of 1873

New High Technology industries – transcontinental railroads

- Germany ceases minting silver *thalers* in 1871, switches to gold standard
- US switches dollar from bimetal to gold standard
- Silver price in gold collapses, gold values of debts surges, debt crisis ensues
- Massive debt-financed over-investment in railroads
- In US, Cooke & Co fails, wave of bank failures & scandal exposés
- Union Pacific directors' Credit Mobilier scandal
- NYSE closed for 10 days
- Viennese bank failures trigger default wave across Europe
- World enters the "Long Depression" 20 years of slow growth from 1873 to 1893

Panicked
depositors try
to withdraw
money from
bank ➔



19th C Financial Crises

1819年大崩盘

棉花价格暴跌引发银行危机

1825年大崩盘

拉美国家(因西蒙而独立)

拿破仑征服后的玻利瓦尔

1837年崩盘

1847年崩盘
高新技术产业——运河、蒸汽动力、电报

1867年崩盘

高新技术产业——铁路、轮船、电报线路

1873年崩盘

高新技术产业-铁路和电报网络

高新技术产业——横贯大陆的铁路
1871年[德国](#)停止铸造银币，转向

改为金本位制

[美国](#)将美元从双金属本位制改为金本位制

黄金中的[银](#)价暴跌，黄金的价值抵债

暴涨，债务危机随之而来

大规模[债务融资](#)的铁路过度投资

在美国，库克公司倒闭，一波银行倒闭和丑闻

公开

联合太平洋董事的Credit Mobilier丑闻

纽约证券交易所休市10天

维也纳银行倒闭引发违约浪潮

欧洲

[世界](#)进入“长萧条”慢20年

1873年到 1893的增长

恐慌的存款人试图从

银行☒



19th C Financial Crises

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New High Technology industries – transcontinental railroads

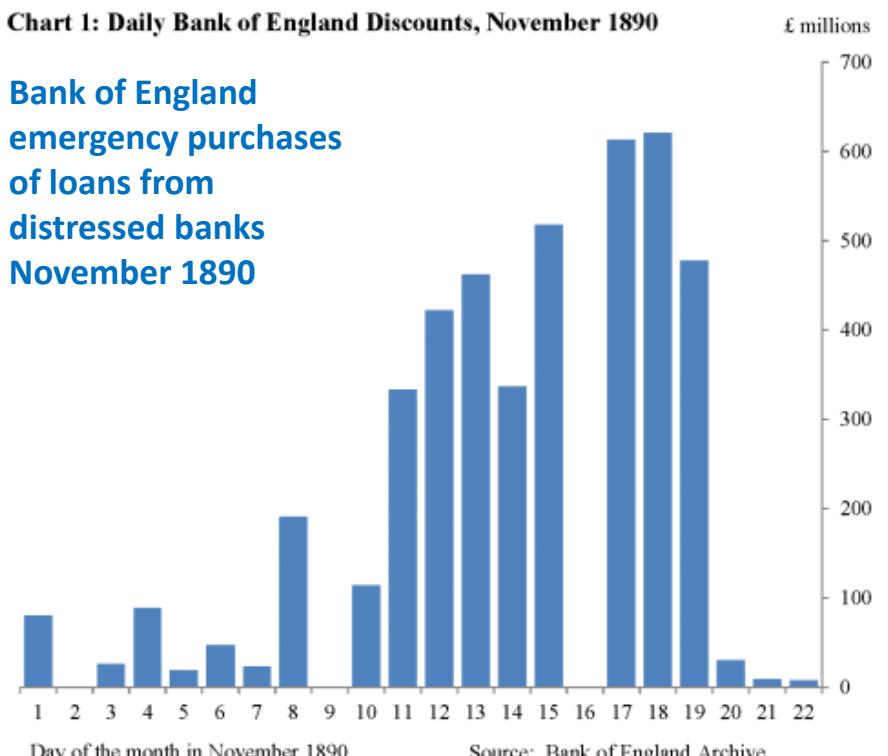
Crash of 1890

New High Technology industries – steel, petroleum, cement, ...

- Rapid growth in Latin America attracts foreign investment
- Argentine defaults on T-bonds, wave of Latin American defaults (Brazil, Chile, etc.)
- UK & US Latin American bondholders default, had borrowed from Barings Brothers Bank of London
- Barings Brothers Bank near default, threatens to ruin British elites (incl. Royal family)
- Bailout by UK taxpayers ultimately ends the crisis

Chart 1: Daily Bank of England Discounts, November 1890

Bank of England
emergency purchases
of loans from
distressed banks
November 1890



Source: Bank of England Archive

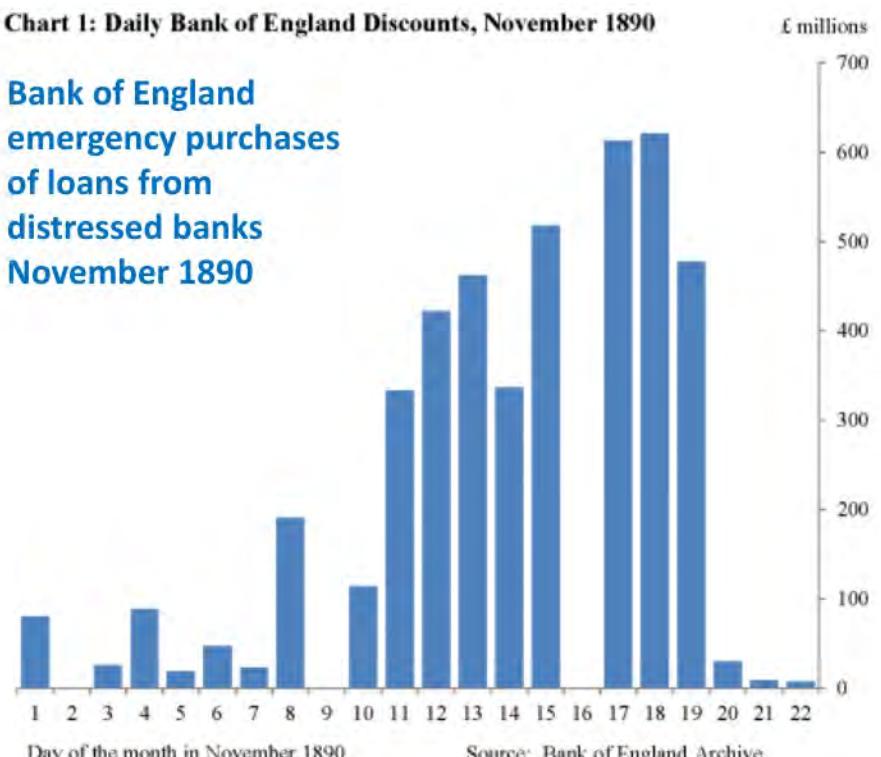
19th C Financial Crises

1819年崩盘
1825年崩盘
1837年崩盘
1847年崩盘
1867年崩盘
1873年崩盘
1890年崩盘

棉花价格暴跌引发银行危机
拉丁美洲国家在拿破仑征服后由西蒙·玻利瓦尔领导独立
西班牙和葡萄牙在伦敦发行国库券
高新技术产业
高新技术产业
高新技术产业
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高新技术产业
高新技术产业
运河, 蒸汽动力, 电报铁路, 蒸汽船,
电报线路铁路和电报网络横贯大陆的
铁路
钢铁、石油、水泥……
拉丁美洲的快速增长吸引外资
投资
阿根廷国债违约, 拉丁浪潮
美国违约(巴西、智利等)
UK和美国拉丁美洲债券持有人违约;
年从巴林兄弟银行借款
伦敦
巴林兄弟银行接近违约, 威胁要违约
毁掉英国精英阶层(包括王室)
UK纳税人的救助最终结束了这场危机

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emergency purchases
of loans from
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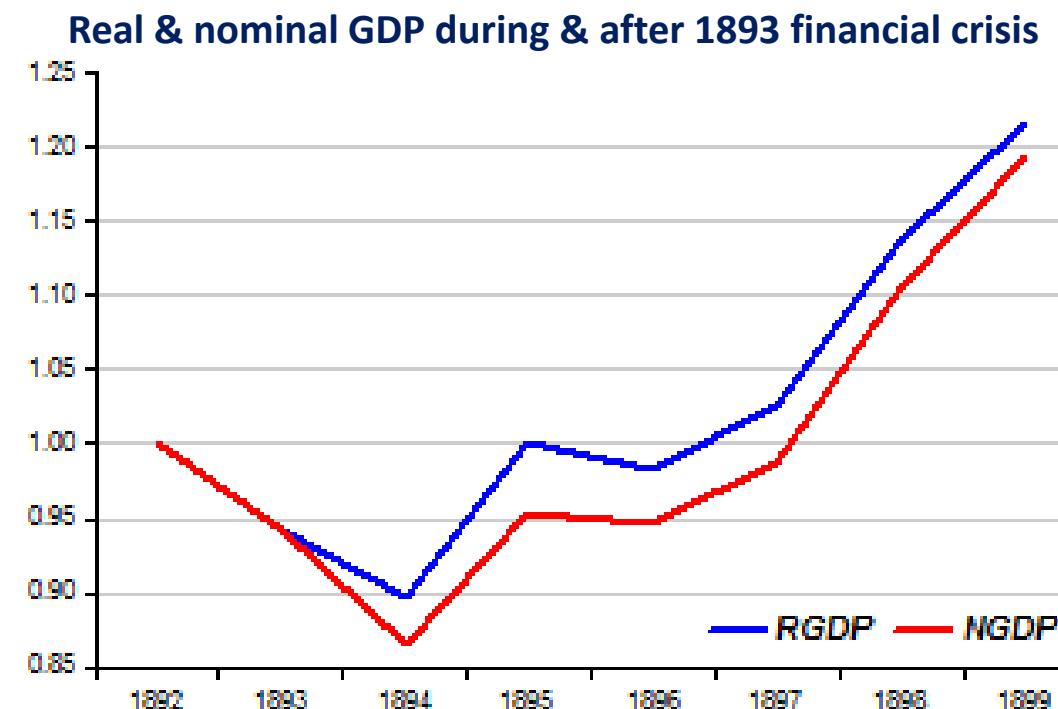
Source: Bank of England Archive

Early 19th C Financial Crises

Crash of 1819
Crash of 1825
Crash of 1837
Crash of 1847
Crash of 1867
Crash of 1873
Crash of 1890
Crash of 1893

Collapse in cotton prices triggers banking crisis
Latin American countries (led to independence by Simon Bolivar after Napoleon conquered Spain & Portugal) issued T-bonds in London
New High Technology industries – canals, steam power, telegraph
New High Technology industries – railroads, steamships, telegraph lines
New High Technology industries – railroad & telegraph networks
New High Technology industries – transcontinental railroads
New High Technology industries – steel, petroleum, cement, ...
Really a continuation of 1890 crisis

- Over-investment in new technology (industrial M&A, transcontinental railroads) overdone
- Bimetallism dispute in US (Wizard of Oz)
- Recovery after Long Depression begins, but interrupted by Panic of 1897



Early 19th C Financial Crises

1819年崩盘
1825年崩盘

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西班牙和葡萄牙在伦敦发行了国债

1837年的大崩盘

高新技术产业

运河，蒸汽动力，电报铁路，蒸汽船，电报线路铁路和电报网络横贯大陆的铁路

1847年崩盘

高新技术产业

1867年崩盘

高新技术产业

1873年大崩盘

高新技术产业

1890年大崩盘

高新技术产业

钢铁、石油、水泥……

1893年大崩盘

真是1890年危机的延续

过度投资于新的

科技(产业并购，
横贯大陆的铁路)

过头了

美国的双金属争议(Wizard)

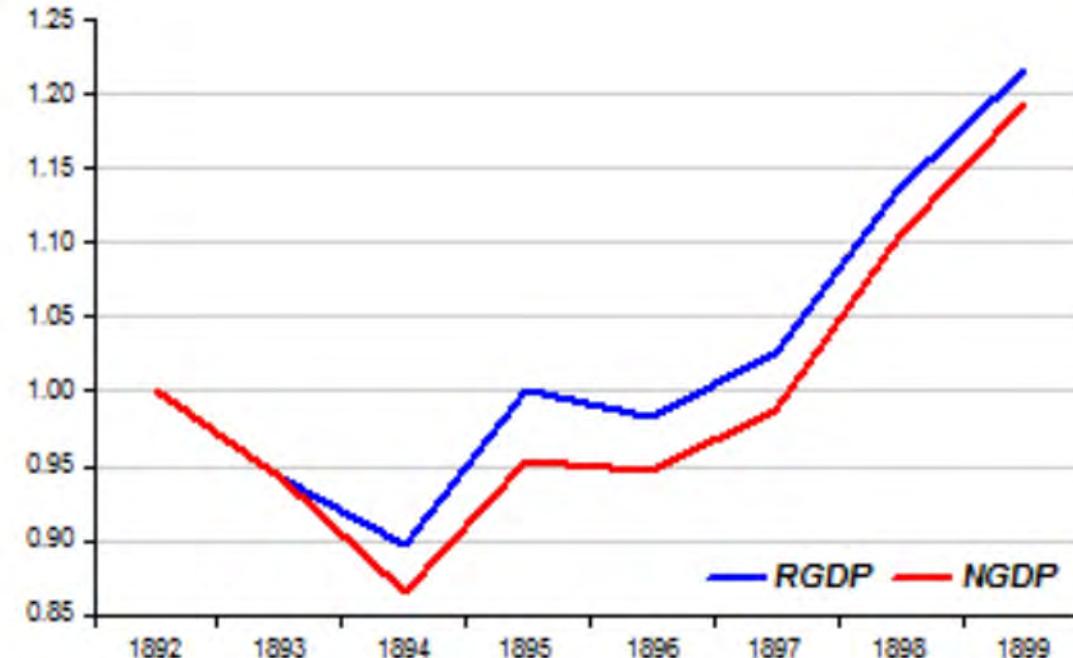
Oz)

长期萧条后的复苏

开始，但被恐慌打断

1897

1893年金融危机期间和之后的实际和名义GDP



The Gilded Age (1893 to WWI)

Economic prosperity 1893 to 1914

- ❑ New High Technology industries – electrical motors, telephones, precision steel-making, steel & concrete high-rise construction, oil refining, internal combustion engines
- ❑ Many “very large firms” now possible because telephone lets CEO in one city direct operations at factories in many other cities and even in other countries

Information travels at speed of electricity

- ❑ Corporate takeovers as big firms buy many smaller firms to get even bigger
- ❑ Large railways buy up smaller ones so coordinated timetables possible, rail shipping costs fall

Rise of US “superrich” high-tech tycoons



Thomas Edison
Founder, General
Electric

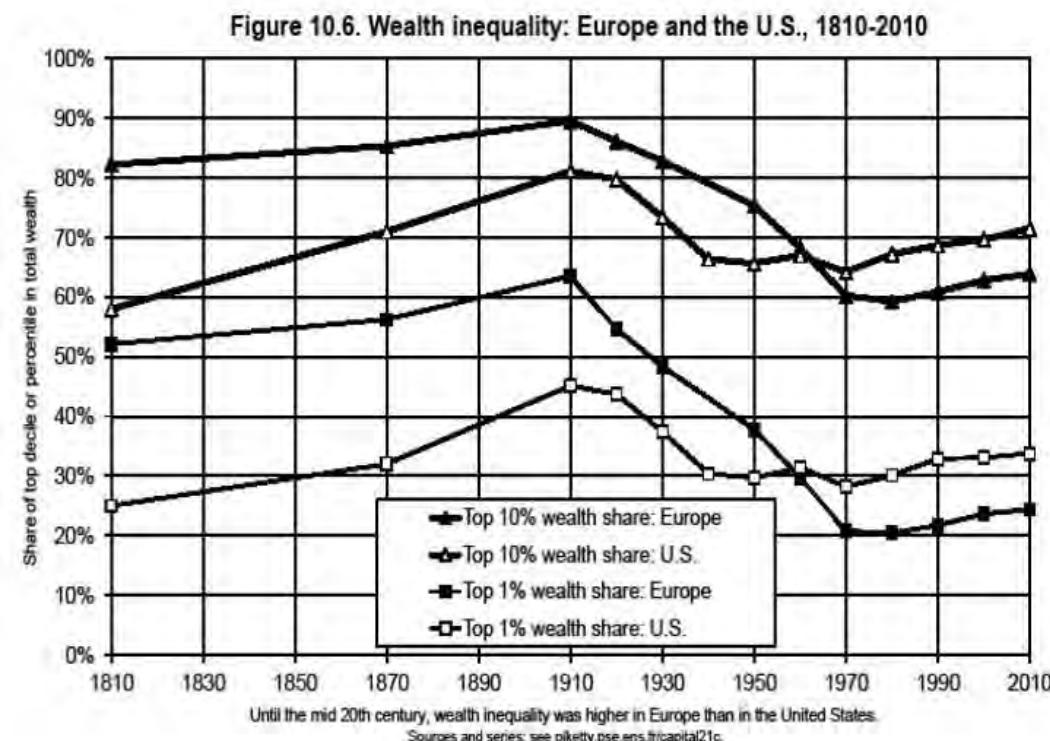


John D. Rockefeller
Founder, Standard Oil
(S.O. – Esso = Exxon)



Andrew Carnegie
Founder, US Steel

Inequality rose as Western economies
recovered prosperity from 1893 to WWI ➔



镀金时代(1893年至第一次世界大战)

经济繁荣1893年至1914年

高新技术产业——电动机、电话、精密炼钢、钢筋混凝土高层建筑、炼油、内燃机

许多“非常大的公司”现在成为可能，因为电话使一个城市的首席执行官可以指挥在许多其他城市甚至其他国家的工厂的运作

信息以电力的速度传播

企业收购，即大公司收购许多小公司以扩大规模

大型铁路公司收购小型铁路公司，使协调时间表成为可能，铁路运输成本下降

美国“超级富豪”高科技大亨的崛起



托马斯·爱迪生
创始人,一般
电

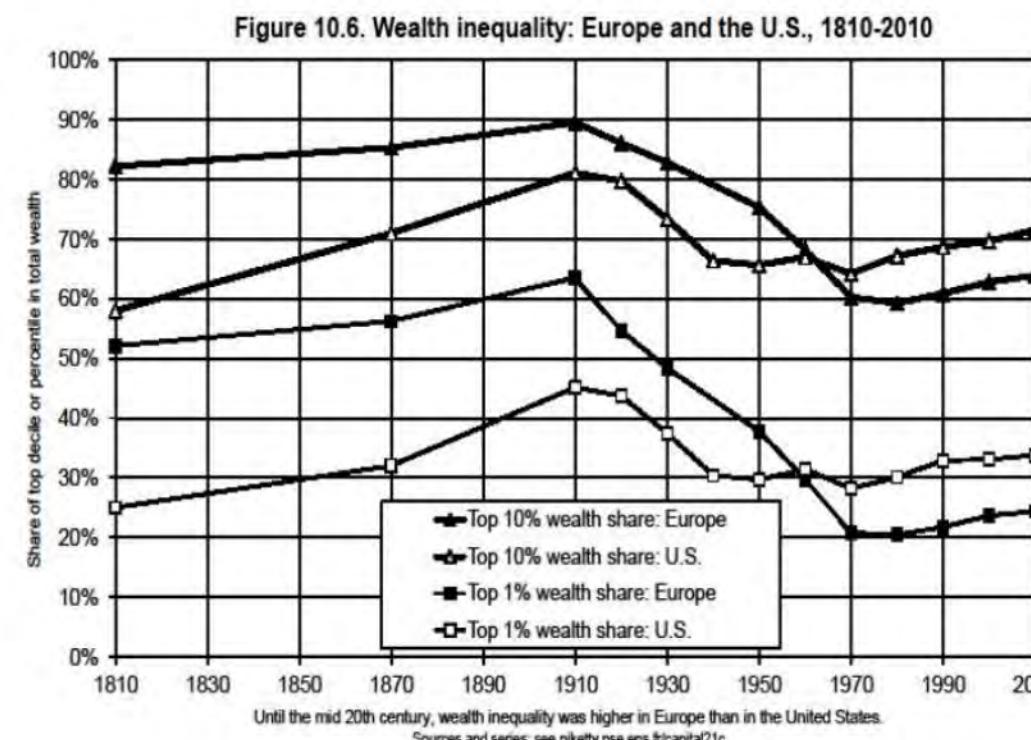


约翰·d·洛克菲勒，标
准石油公司(S.O. - Ess
o = Exxon)创始人



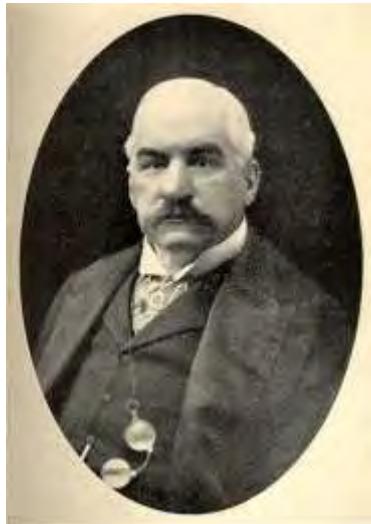
安德鲁·卡内基，
美国钢铁公司创始人

Inequality rose as Western economies
recovered prosperity from 1893 to WWI ☒

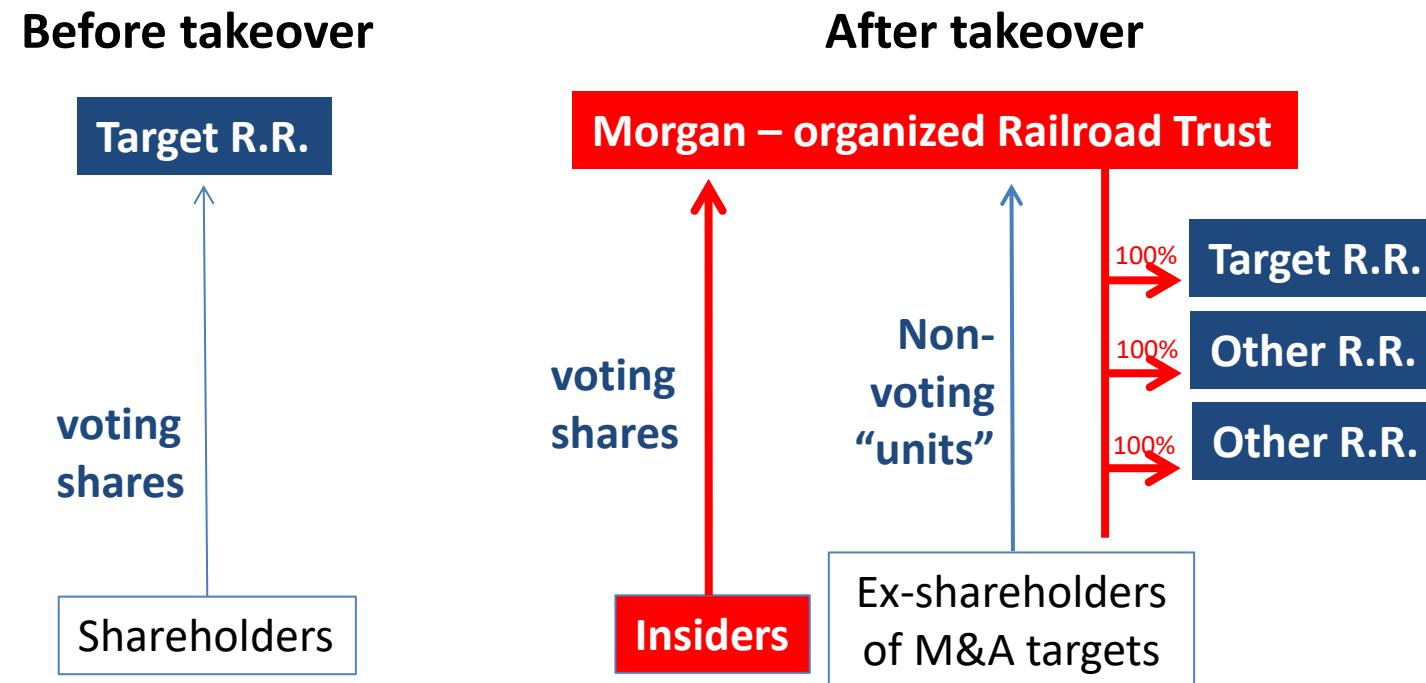


Voting Trusts & “Morganization” Mergers

- Morgan used “voting trusts” for mergers & acquisition (M&A)



John Pierpont Morgan



- Morgan sets up “trust” for acquirer (e.g. Edison, Rockefeller, ...) to take over small firms
- Trust pays small firms’ shareholders “units” worth more than their shares were worth
- Small firms generate more profits after taken over by “trust” because
 - Get new technology, better management (probably true)
 - Make monopoly profits (probably also true)
- US anti-monopoly law is called “anti-trust law” because its original purpose was to regulate Morgan organized “trusts”

Voting Trusts & “Morganization” Mergers

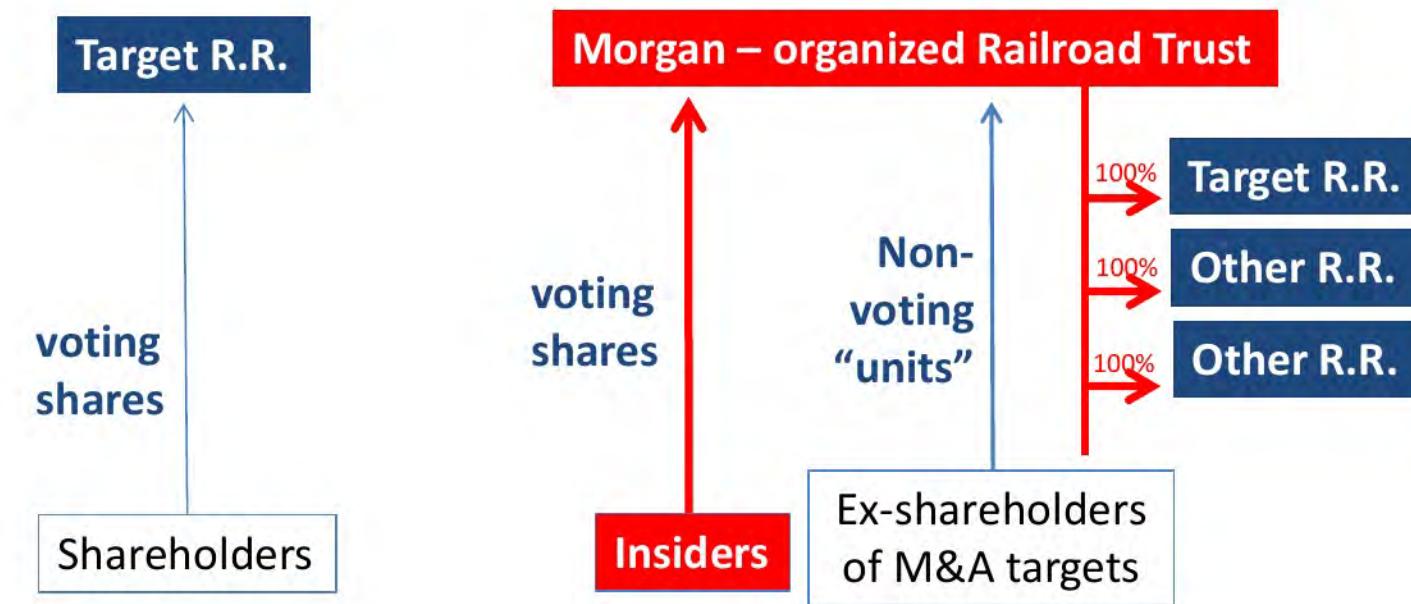
摩根大通使用“投票信托”进行并购(M&A)

在收购之前

收购后



约翰·皮尔庞特·摩根



摩根为收购者(如爱迪生、洛克菲勒等)设立了“信托”来接管小公司

“信托”支付给小公司股东的“单位”价值超过其股票的价值

小公司被“信托”接管后产生更多的利润，因为

获得新技术，更好的管理(可能是真的)

获得垄断利润(可能也是对的)

美国反垄断法之所以被称为“反托拉斯法”，是因为其最初的目的就是规范摩根组织的“托拉斯”。

Extreme Inequality

Veblen, Thorstein. 1899. *Conspicuous consumption*. Penguin

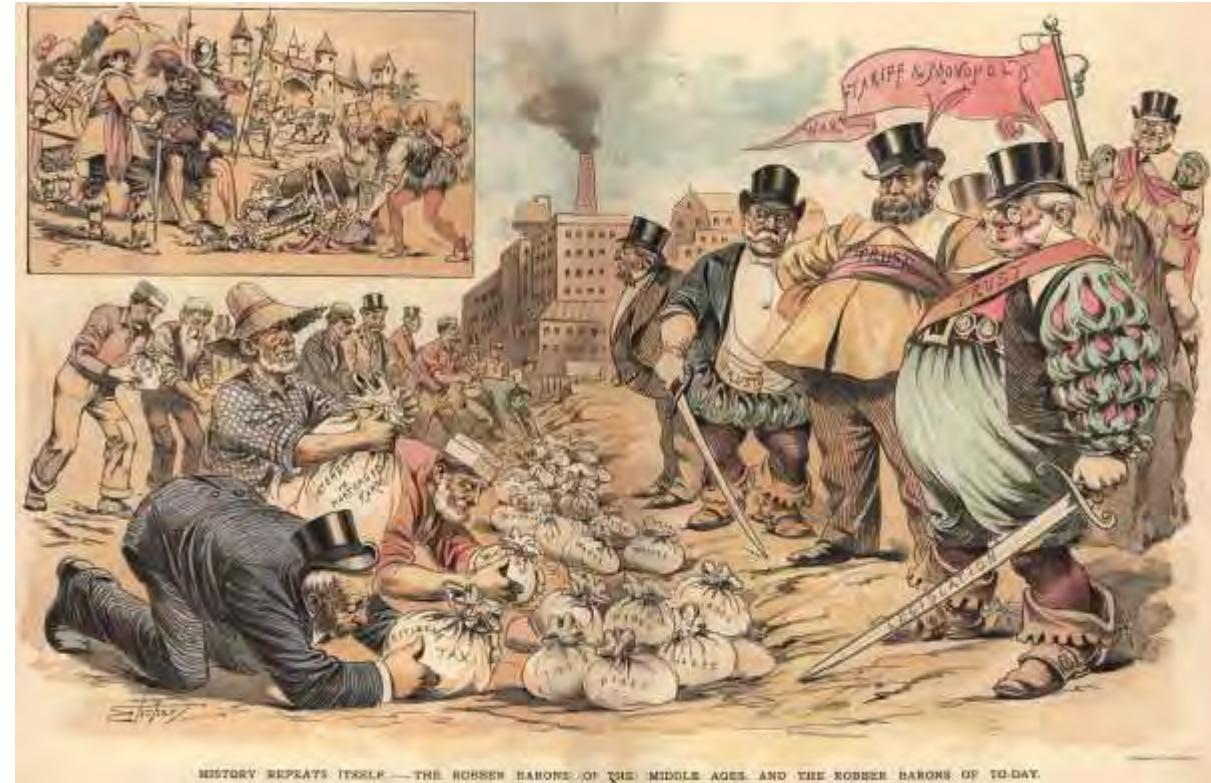
High inequality wastes resources by shifting production to “status goods”

- Necessary goods** = food, drink, shelter, medicine, etc.
- Status goods** = gourmet food, vintage wines, cosmetics, etc.
- Status goods induce “consumption races”
 - Buy a Louis Vuitton bag → status!
 - All friends also buy Louis Vuitton bag → no status!
 - The more people spend, the richer status good producers become, yet status-seekers never achieve higher status (resources wasted)

Carnegie, Andrew. 1901. *The gospel of wealth and other timely essays*. Century

Should be 2 parts to a rich person’s life

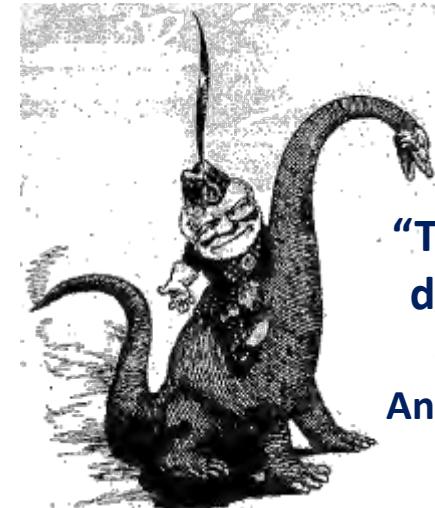
- Getting rich = innovate, build a great company, make a fortune
- Philanthropy = give away all your money to change the world as you want it changed



Robber barons



Thorstein Veblen



“The man who dies rich dies disgraced”
Andrew Carnegie

极端不平等

托尔斯泰·凡勃伦，1899。炫耀性消费。企鹅

高度不平等通过转移来浪费资源
生产转向“身份商品”

必需品=食物、饮料、住所、药品等。

身份商品=美食、陈年佳酿、
化妆品等。

<s:1>身份商品引发“消费竞赛”

购买路易威登包包

所有朋友也购买路易威登包的账号无状态!

钱花得越多，身份越富越好

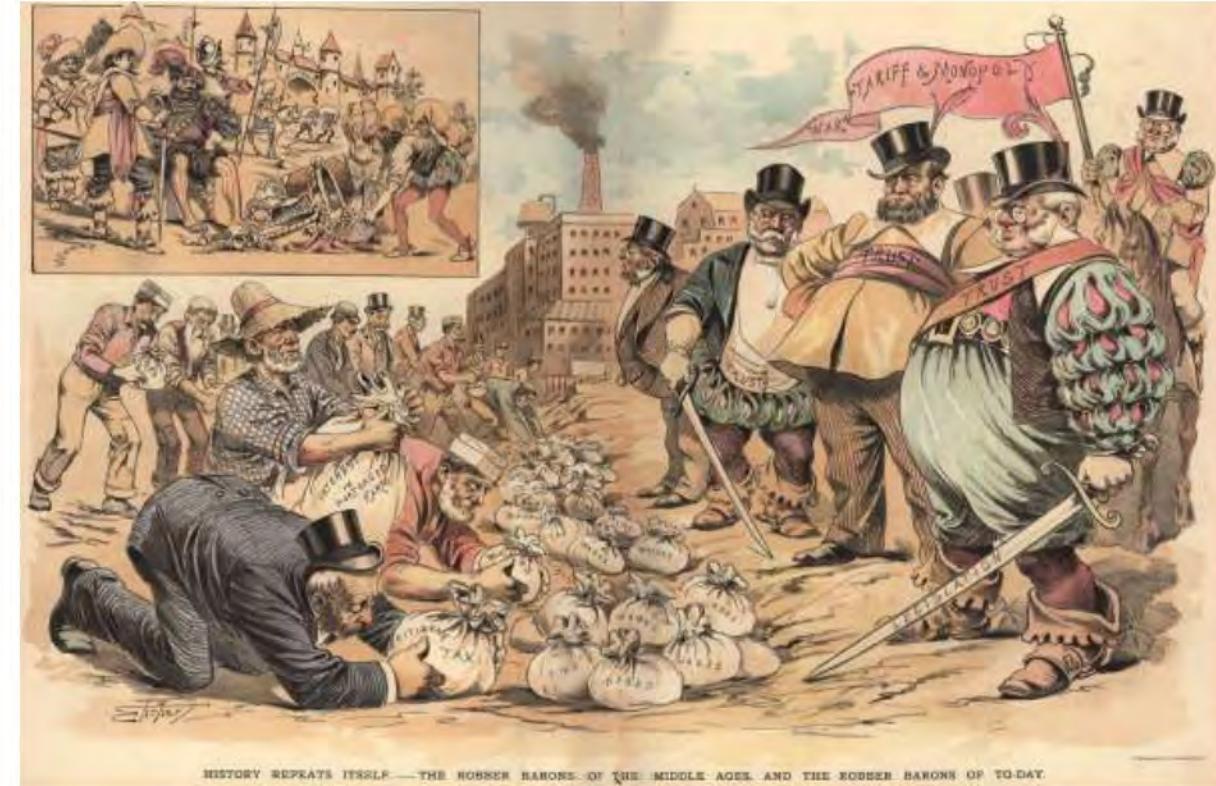
生产者变得富有，但地位追求者永远不会成功
更高的地位(资源浪费)

安德鲁·卡内基，1901。《财富的福音》及其他适时的随笔。世纪

富人的生活应该分成两部分吗

致富=创新，建立一家伟大的公司，创造
一大笔钱

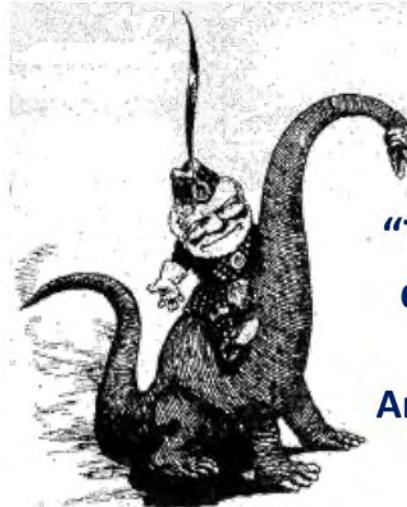
慈善=捐出你所有的钱去改变
按照你的意愿去改变世界



强盗大亨



Thorstein Veblen



**"The man who
dies rich dies
disgraced"**
Andrew Carnegie

Twin Financial Crises

The rich man's panic of 1903

- Stock market crash
- Crisis ends at end of summer when JP Morgan returns from Europe & calms markets

The Crash of 1907

- Stock market crash stopped by massive Morgan stock purchases
- Bank failure stopped by Morgan forcing bankers to agree to bail each other out
- Morgan told US government to establish Federal Reserve Bank so a central bank could organize such things in the future (previously, US had no central bank; private banks printed their own dollars)



John Pierpont Morgan

双重金融危机

1903年的富人恐慌

·股市崩盘

当摩根大通从欧洲归来并安抚市场时，危机在夏末结束

1907年的大崩盘

摩根大通大量购买股票阻止了股市崩盘

摩根大通迫使银行家们同意互相救助，从而阻止了银行倒闭

摩根告诉美国政府建立联邦储备银行，这样中央银行就可以在未来组织这些事情(以前，美国没有中央银行;私人银行自己印美元)



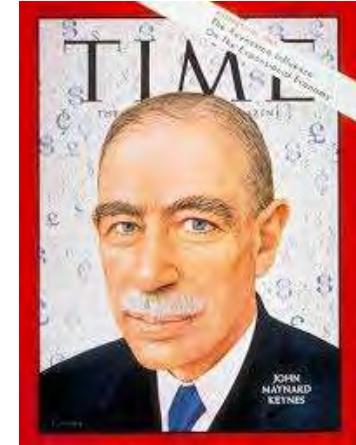
John Pierpont Morgan

Early 1920s Crisis

Keynes, John Maynard. 1920. *The Economic Consequences of the Peace*

After World War I (& 1918/19 pandemic), two major problems

1. Many countries tried economically unsound exchange rate policies
2. France, UK & USA forced losers (Germany, Austria, Hungary) to pay reparations (indemnity)
 - Keynes showed *reparations* > German GNP & concluded that Germany's economic collapse was inevitable
 - German's central bank (Reichsbank) was ordered to print enough money to pay indemnity anyway
 - Banking crises in many countries as loan defaults spread
 - Hyperinflation in Germany & other defeated countries



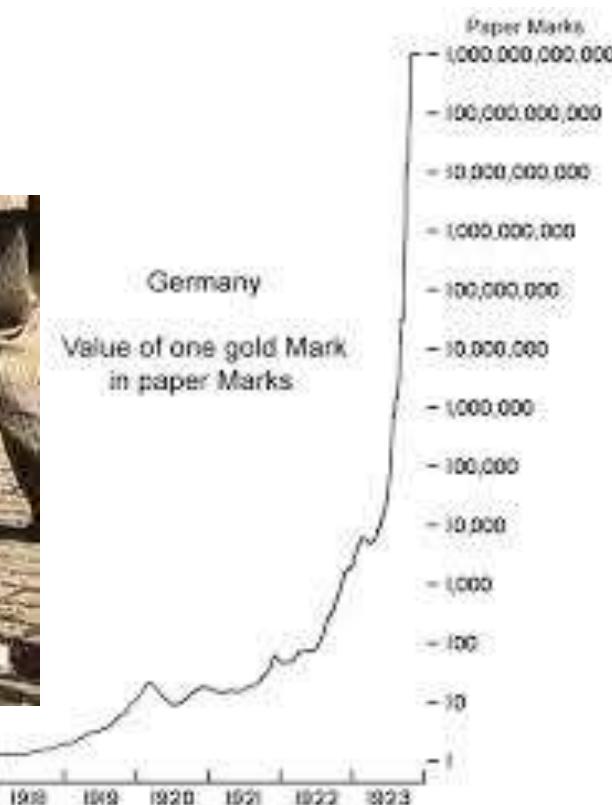
Shopping money



Lighting fireplace



Sweeping up useless money



20世纪20年代初的危机

约翰·梅纳德·凯恩斯，1920年。《和平的经济后果》

第一次世界大战后(& 1918/ 1919年大流行)，两大问题1。许多国家尝试了经济上不健全的汇率政策

2. 法国、英国和美国强迫输家(德国、奥地利、匈牙利)支付赔款(赔偿) _____

▣ 凯恩斯显示 $REPARATIONS > G \approx RMANGNP$ & 认为德国经济崩溃是不可避免的

德国中央银行(Reichsbank)被命令印足够的钱来支付赔款 贷款违约蔓延导致许多国家的银行危机

德国和其他战败国家的恶性通货膨胀



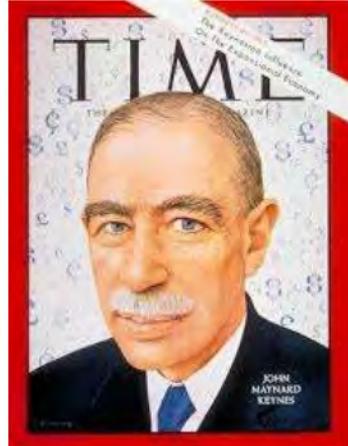
购物的钱



照明壁炉

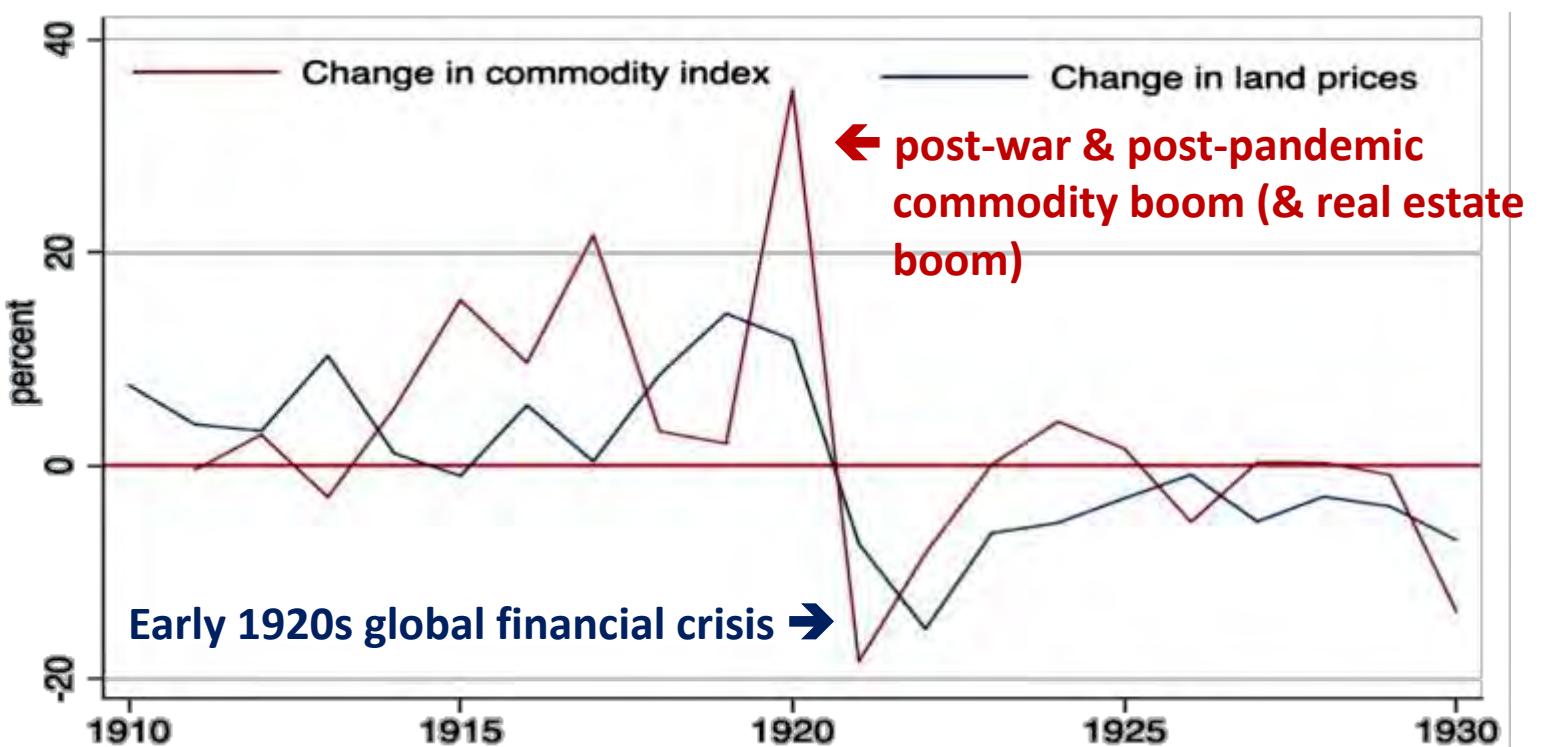


Sweeping up useless money



Early 1920s Real Estate Bubble & Crash

- Farmers grew rich during & immediately after WWI selling food
- Farm land prices rise & banks lend to farmers
- Banks lend to families to buy 2nd homes (reachable with their new cars or by railroad)
- Land prices rise & people buy land because land prices rise
- Experts explain that “real estate prices never go down”
- Farmers & families defaulted, banks seized properties
- Wave of bank failures



US data from Rajan, Raghuram & Rodney Ramcharan. 2012. The Anatomy Of A Credit Crisis: The Boom And Bust In Farm Land Prices In The United States in the 1920s. NBER wp 18027.



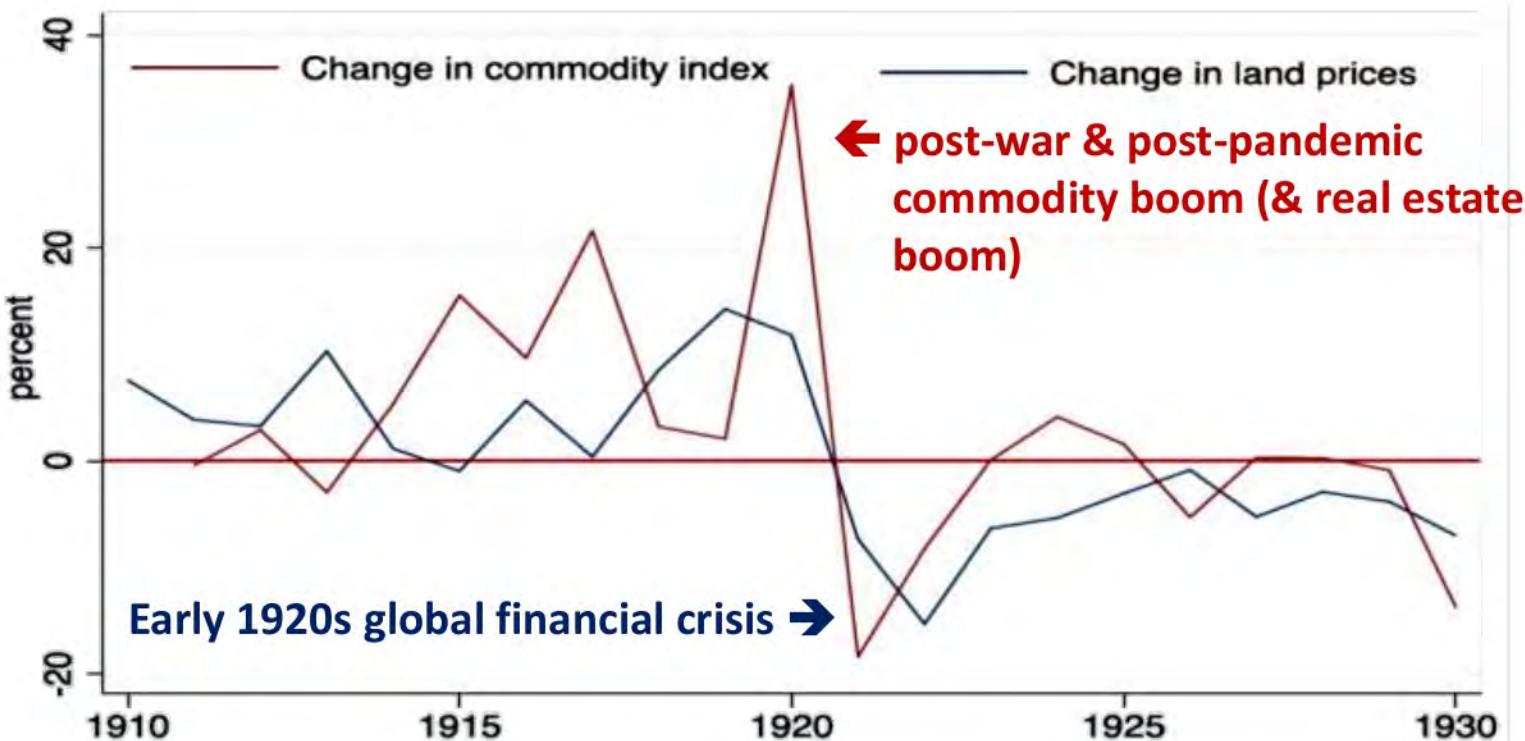
Advertising urging Americans to buy property in Florida



Much of the land sold was jungle, under water, or otherwise unsuitable for building

20世纪20年代初房地产泡沫与崩盘

- 农民在第一次世界大战期间和之后立即通过出售食品致富农地价格上涨，银行贷款给农民银行贷款给家庭购买2nd房屋(可以通过新车或铁路到达)土地价格上涨，人们购买土地，因为土地价格上涨专家解释说“房地产价格永远不会下降”
- 农民和家庭违约，银行没收财产银行倒闭浪潮



美国数据来自Rajan, Raghuram & Rodney Ramcharan, 2012。《信贷危机剖析:20世纪20年代美国农场土地价格的盛衰》。NBER wp 18027。



Advertising urging Americans to buy property in Florida



出售的大部分土地都是丛林、水下或其他不适合建筑

建筑

The Roaring Twenties

“Roaring Twenties” high-tech stock market boom (1924 to 1929)

- Electricity, telephone, natural gas networks connect most houses in cities
- Huge new market in electric lights & electric consumer appliances
- Businesses make electric office equipment, electricity-powered machinery, ... that other businesses buy
- Radio stations, radio networks, radio makers, radio program makers,
- Recorded music, record players, recording studios, ...
- Movies, talking movies, film studios, sound & light technologies, projector makers, ...
- Automobiles now reliable enough to use for personal transportation, shipping, ...
- Road builders, road repair companies, roadside restaurants & hotels, ...
- Magazines delivered by truck to millions of subscribers
- Radio, magazine & movie advertising, advertising agencies,
- Airplanes still too dangerous for passengers, but new companies for air mail & air shipment of goods



Compact home radio

Early refrigerator

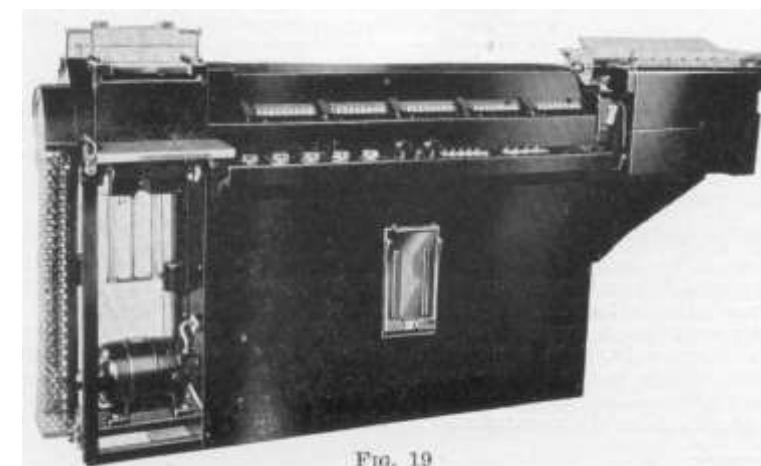


Fig. 19

IBM Hollerith Type 3-S tabulator
First machine to subtract as well as add

咆哮的二十年代

“咆哮的二十年代” 高科技股票市场繁荣(1924年至

1929年)电力、电话、天然气网络连接了城市中的大多数房屋
企业生产电动办公设备、电动机器，其他企业购买
广播电台、广播网、广播制造商、广播节目制造商，....录制音乐、
唱机、录音棚.....

电影、有声电影、电影制片厂、声光技术、放映机制造
商.....

汽车现在足够可靠，可以用于个人运输、航运.....

道路建设者、道路维修公司、路边餐馆和酒店、

广播、杂志和电影广告、广告代理商、

飞机对乘客来说仍然太危险，但是航空邮件和航空货物运输的新
公司



Compact home radio



Early refrigerator

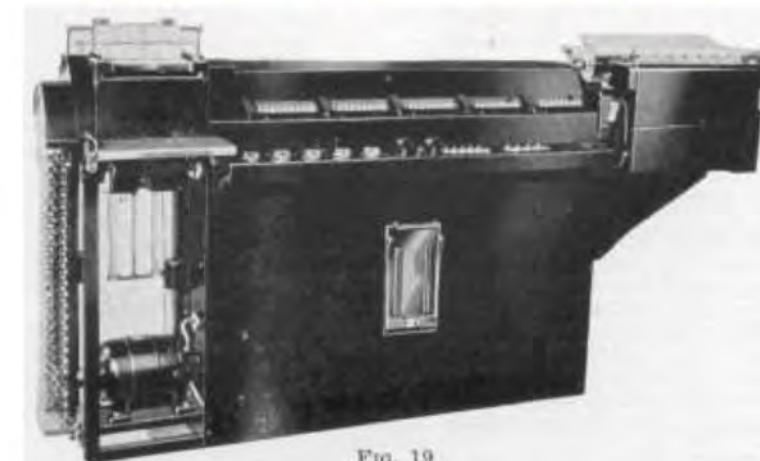


Fig. 19

IBM Hollerith Type 3-S制表机第一
台既能做加法也能做减法的机器

“New Age Thinking”

Seem too high so experts invent reasons to justify very high stock prices

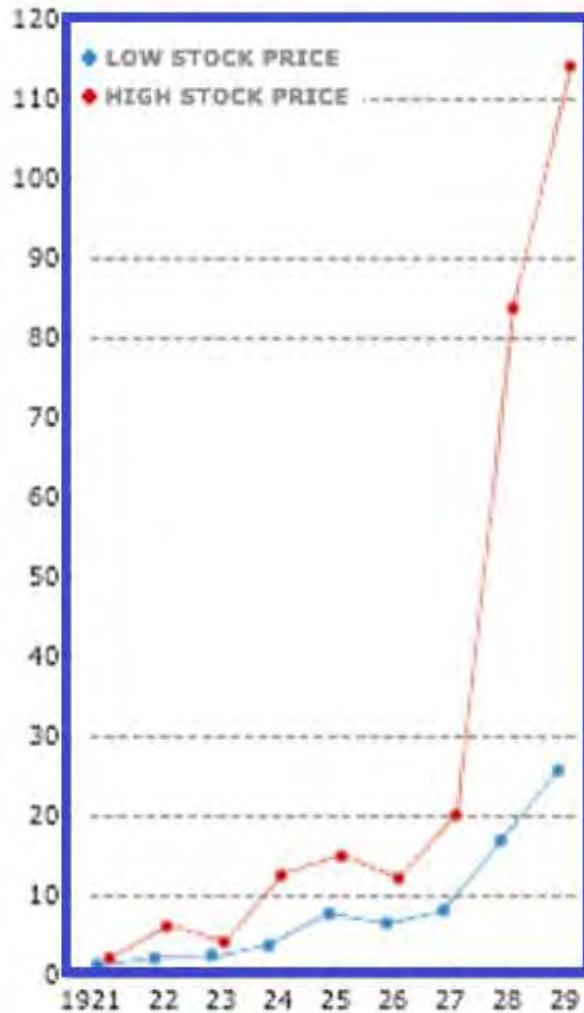
- Soon there will be no more universities, only “universities of the air”
 - The best professors at the best universities will read lectures over the radio
 - If visual lessons are needed, professors’ lectures can be shown in cinemas
 - Students will listen to radio lectures from their own homes or in nearby cinemas
- Soon there will be no more shops, only “catalog shopping”
 - People will receive catalogs by mail that show color photographs of all possible goods
 - People will order things over the telephone from their own homes
 - Goods will be delivered by car, truck or even by airplane directly to buyers’ homes
- Stock market vastly better now than in the past

“In 1719, there was practically no way of finding out the facts about the Mississippi venture. How different the position of the investor in 1929! Today it is inexcusable to buy a bubble; - inexcusable because unnecessary. For now every investor ... has at his disposal facilities for obtaining the facts”

-- Saturday Evening Post. September 14. 1929

“Stock prices have reached what looks like a permanently high plateau. I do not feel there will be soon if ever a 50 or 60 point break from present levels, such as they have predicted. I expect to see the stock market a good deal higher within a few months.”

-- Irving Fisher, Professor of Economics, Yale University, October 17, 1929



Radio Corporation of America (RCA) stock rose almost every day for a decade with no dividends & no earnings

《新时代思维》

似乎太高了，所以专家们发明理由来证明非常高的股价是合理的不久后将没有更多的大学，只有“空中大学”

如果需要视觉课程，教授的讲座可以在电影院播放

在自己家里或附近的电影院，学生可以收听广播讲座。在不久的将来，商店将不复存在，只有“目录购物”

人们将通过邮件收到目录，其中显示所有可能商品的彩色照片。人们将在自己家中通过电话订购商品

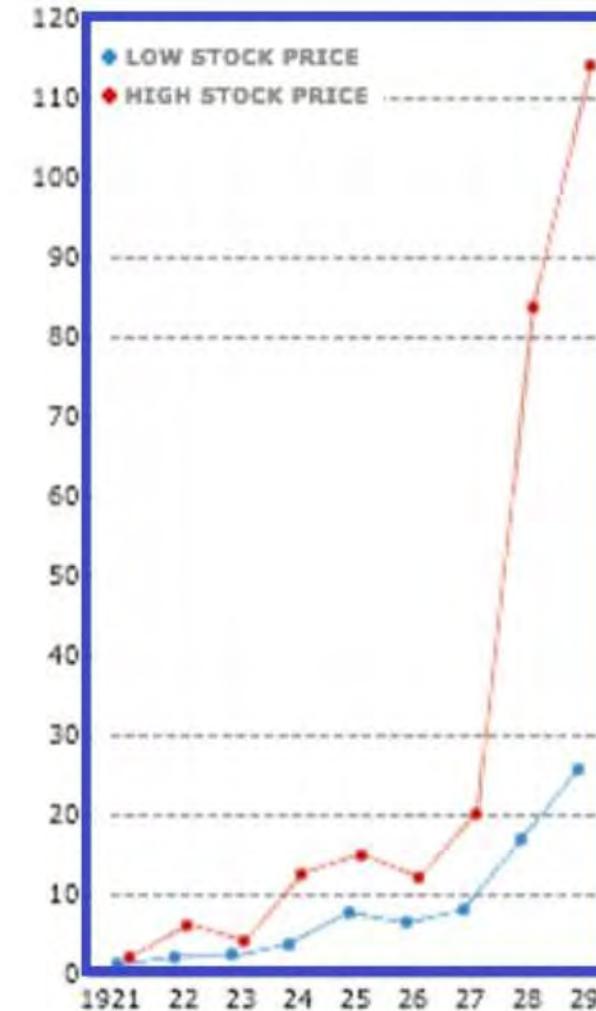
商品将通过汽车、卡车甚至飞机直接送到购买者家中现在的股票市场比过去好得多

“在1719年，几乎没有办法了解密西西比冒险的事实。1929年投资者的立场是多么不同啊！今天，买泡沫是不可原谅的；不可原谅，因为不必要。现在每个投资者……都有获取事实的工具。”

——《星期六晚报》9月14日。1929

“股票价格似乎已经达到了一个永久的高位。我不认为股价会像他们预测的那样，很快从目前的水平上突破50或60点。我预计股市会在几个月内大幅上涨。”

——欧文·费雪，耶鲁大学经济学教授，1929年10月17日



美国无线电公司
(RCA)的股票几乎每天都在上涨
十年来没有分红&
没有收益

The Crash of 1929



The Wall Street Journal, Oct 29 1929



The Crash of 1929



《华尔街日报》1929年10月29日



People Furious at Financiers



Angry Mob tries to break into NYSE



Police protect NYSE workers from the people

People Furious at Financiers



Angry Mob tries to break into NYSE

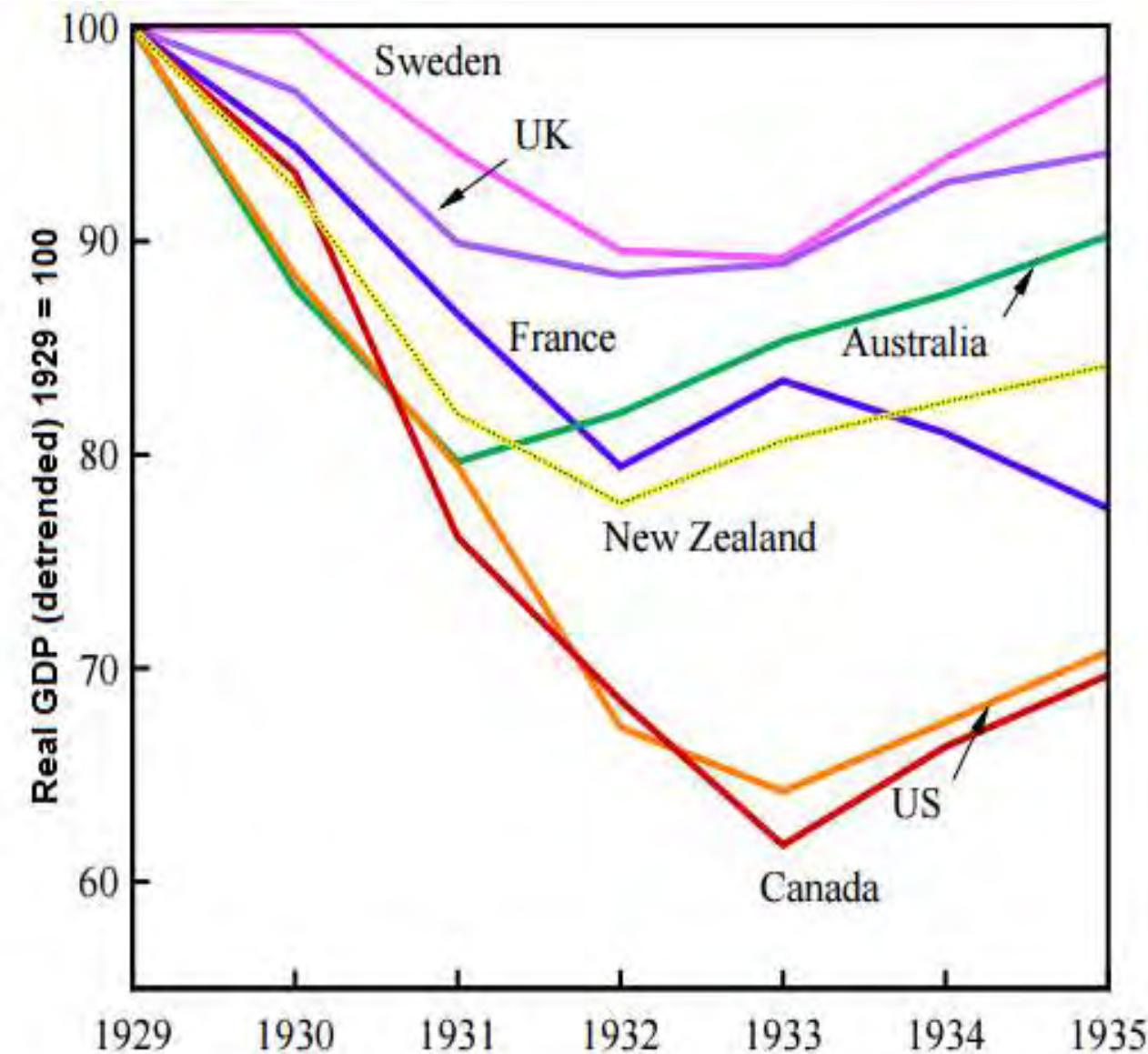


Police protect NYSE workers from the people

The Great Depression of the 1930s

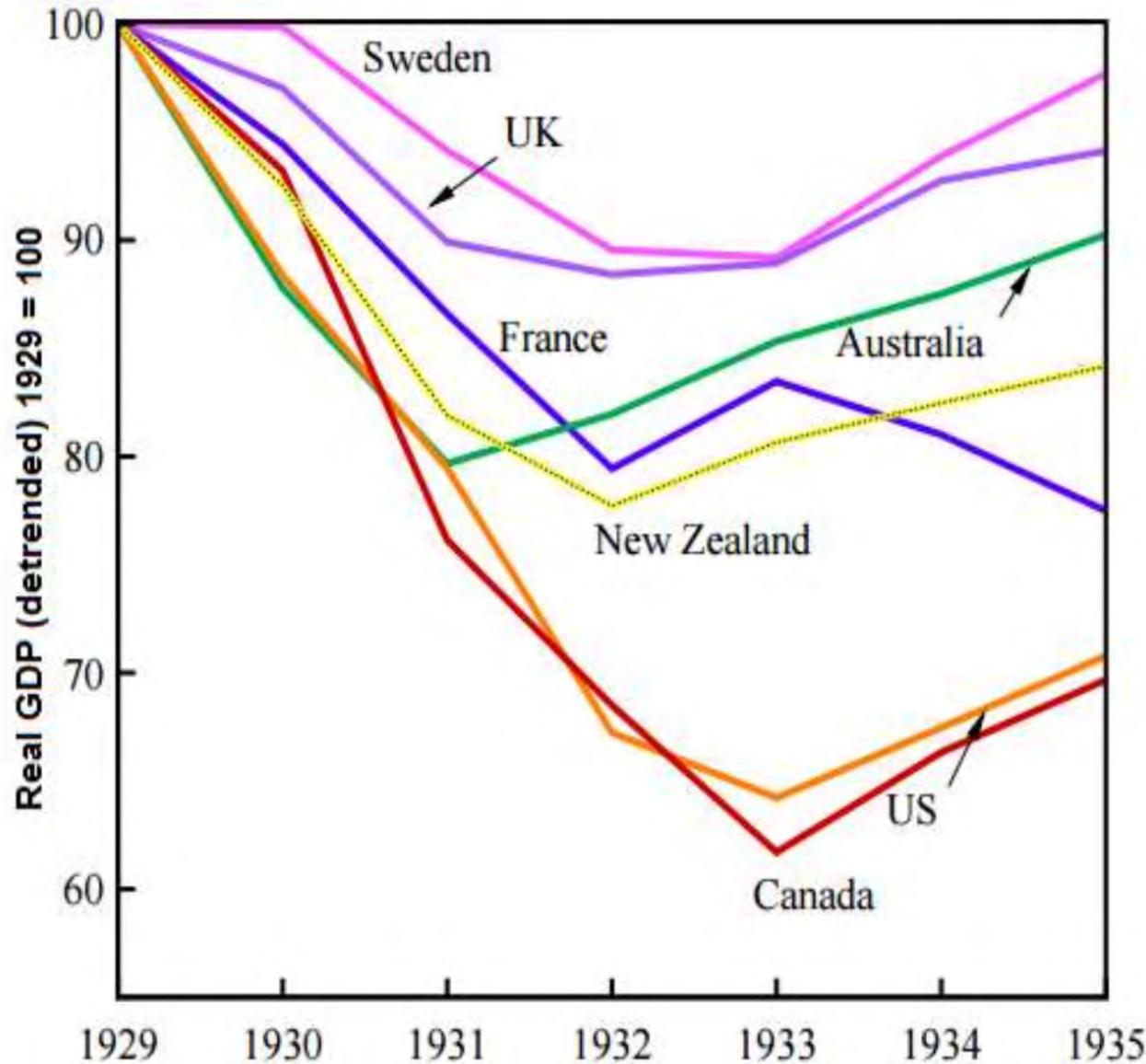
Millions who thought they were “middle class” abruptly living in 3rd world poverty

- People lost 90% of savings in stock market crash
- Businesses close, workers lose jobs, unemployment rate rises to 28% in USA
- Unemployed cannot repay loans, failing banks demand immediate loan repayments
- Borrowers cannot repay, so lose their homes, cars, farms, ...
- Banks go bankrupt and close
- People often lost 100% of their savings in banks



20世纪30年代的大萧条

数百万人认为自己是“中产阶级”
中产阶级突然生活在3rd世界贫困中
在股市崩盘中，人们损失了90%的积蓄
企业倒闭，工人失业，
 美国失业率上升到28%
失业者无法偿还贷款，银行倒闭
 要求立即偿还贷款
借款人无法偿还贷款，因此失去了房屋、汽车、
 农场，…
银行破产倒闭
人们在银行的存款通常会损失100%



Economic Collapse

Americans who lost their
jobs, houses, farms
moved to slums

Hungry Children in USA



Suburban Seattle, mid-1930s

Economic Collapse

失去工作的美国人

工作，房子，农场都搬
到了贫民窟

USA的饥饿儿童



Suburban Seattle, mid-1930s

Economic Collapse



American migrant slum dwellers



American rural poor



Canadian Government camp for unemployed

Economic Collapse



美国移民贫民窟居民



美国农村贫民



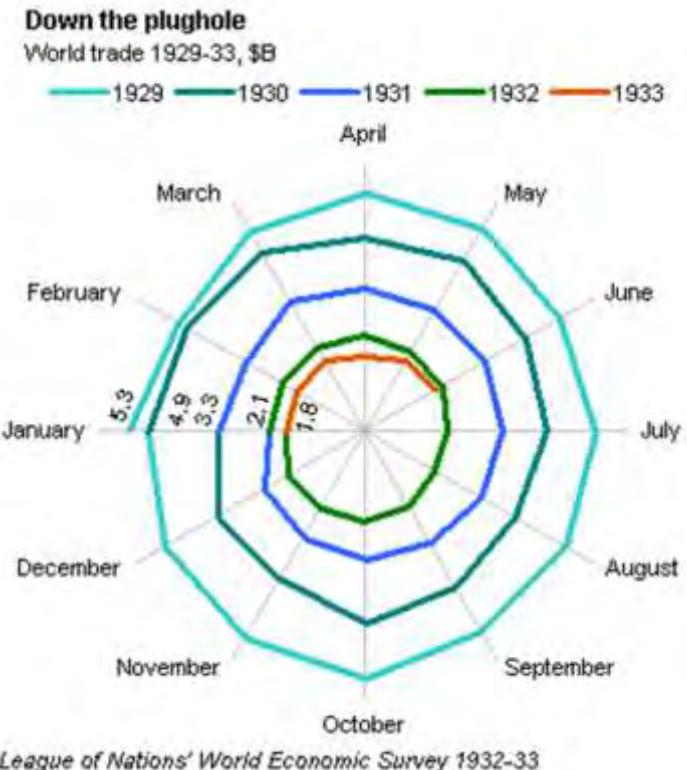
加拿大政府为失业者设立的营地

Why Did the Global Economy Collapse?

USA starts global trade wars

- International trade fell rapidly & ceased in many sectors
 - US raises trade barriers “to protect US jobs”
 - Other countries retaliate against US & each other
 - Global “trade war” begins
- Trade falls sharply in most sectors, esp. farm products
 - Main exception is luxuries: caviar, wine, ...
- US farms previously exported most of their output
 - Farm prices collapse
 - Farmers default on mortgages
 - Farmers lose farms & migrate to cities
 - Urban unemployment rises
 - Rural banks fail

World trade
collapse →



Rural Americans
migrate to cities →



全球经济为什么会崩溃?

USA发动全球贸易战

国际贸易迅速下降，许多行业停止了贸易

美国提高贸易壁垒“以保护美国就业”

其他国家对美国和彼此进行报复

全球“贸易战”开始

大多数部门的贸易急剧下降，尤其是农产品

主要例外是奢侈品:鱼子酱、葡萄酒……

此前，美国农场的大部分产量用于出口

农产品价格暴跌

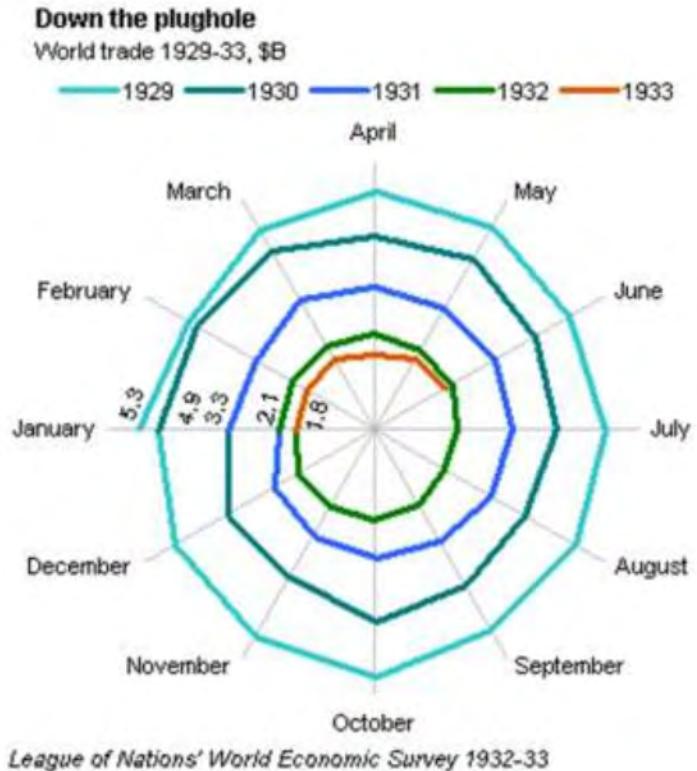
农民拖欠抵押贷款

农民失去农场，迁移到城市

城市失业率上升

<:1>农村银行倒闭

世界贸易
☒崩溃



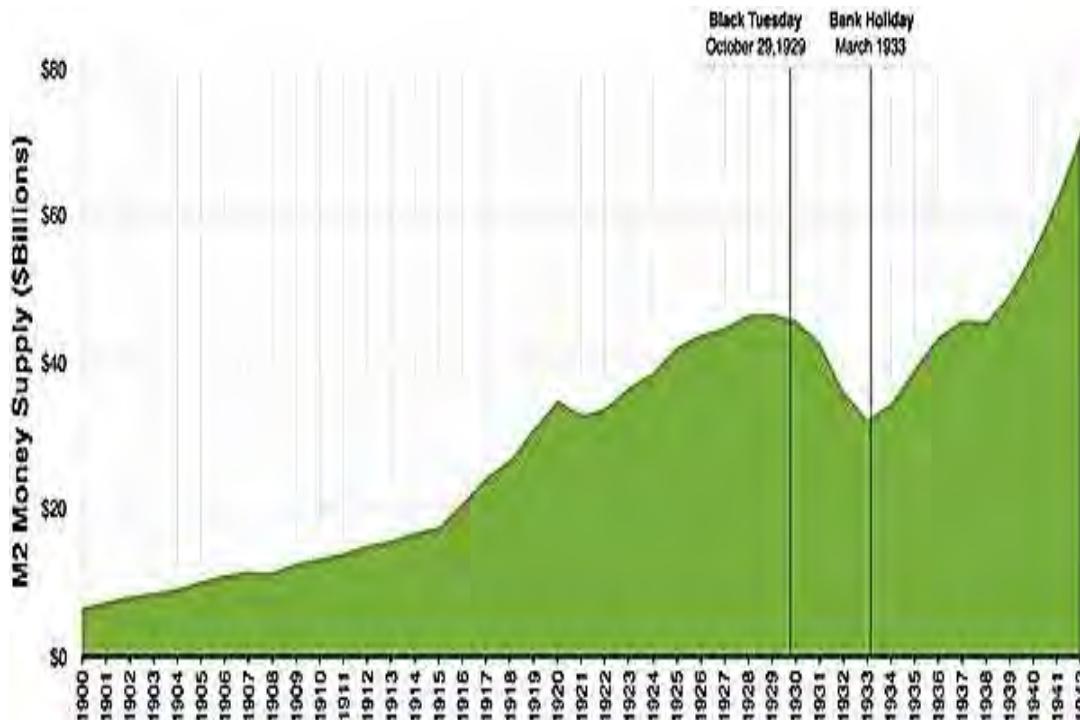
Rural Americans
migrate to cities ☒

Why Did the Global Economy Collapse?

The incompetence of central bankers

Friedman, Milton & Anna Schwartz. A Monetary History of the United States, 1867-1960

- Federal Reserve thought it was increasing money supply, but money supply actually fell from 1929 – 1933
- Falling money supply caused prices to fall (deflation)
- Deflation → people delay purchases waiting for prices to fall → falling production & rising unemployment
- Higher real labor costs if wages cannot be cut → business failures
- Higher real costs of outstanding loans with fixed nominal interest rates → loan defaults



Prices of goods & service fell & unemployment Rose, 1929 - 33
Falling money supply 1929 – 33



全球经济为什么会崩溃?

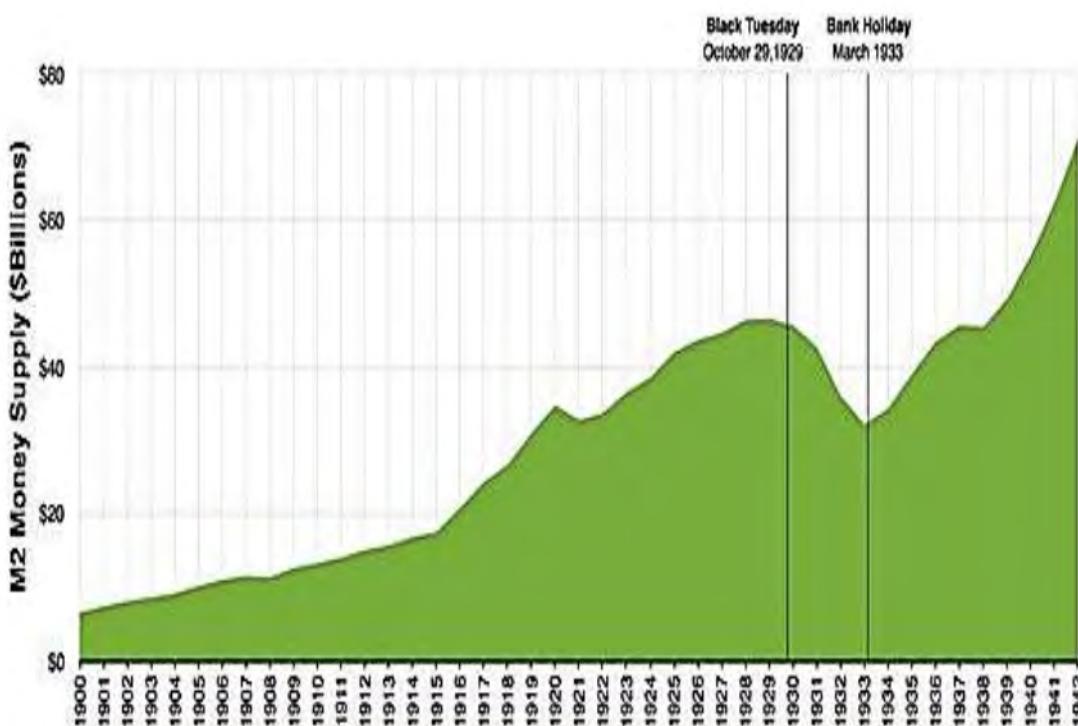
央行官员的无能

弗里德曼、米尔顿和安娜·施瓦茨。《美国货币史，1867-1960》

美联储认为是在增加货币供应量，但实际上1929 - 1933年货币供应量下降了

通货紧缩，人们推迟购买，等待价格下降，产量下降，失业率上升，如果不能削减工资，实际劳动力成本更高，企业倒闭

固定名义利率的未偿贷款更高的实际成本



Prices of goods &
Service fell &
失业
罗斯(1929 - 1933)
下降的钱
供给1929 - 33



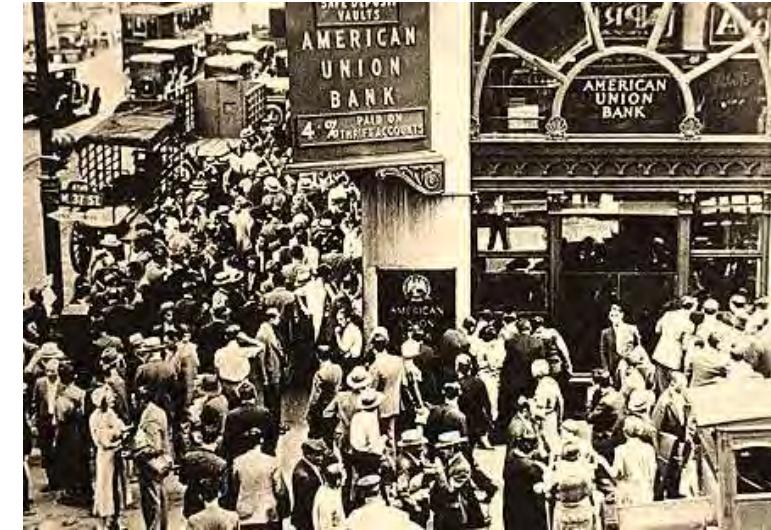
Why Did the Global Economy Collapse?

Frozen banking system

Diamond, Douglas & Philip H. Dybvig. 1983. Bank runs, deposit insurance & liquidity. *Journal of political economy* 91(3)401-19

A bank run is a Nash equilibrium problem

- Depositors worry that their bank might fail
- Each depositor realizes that the first person to withdraw all her money will get all her money, but depositors who wait to withdraw might come too late, after the bank has run out of money
- Nash equilibrium = Each depositor tries to be the first to withdraw
- Even the healthiest bank cannot survive if all of its depositors insist on withdrawing all their money at once (banks lend out most of the money people deposit, only keeping a small fraction on hand to meet withdrawal requests)
- Healthy banks reduce lending to keep more money in their vaults to be prepared for a possible bank run



A bank run

全球经济为什么会崩溃?

冻结的银行体系

道格拉斯·戴蒙德和菲利普·h·迪布维格, 1983。银行挤兑、存款保险与流动性。政治经济学杂志91(3)401-19

银行挤兑是一个纳什均衡问题

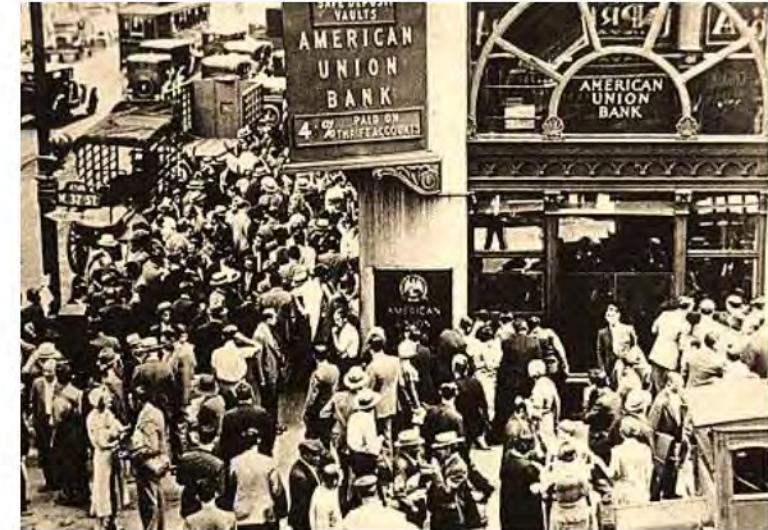
存款人担心他们的银行可能倒闭

每个存款人都意识到, 第一个取出所有钱的人将得到她所有的钱, 但等待取出的存款人可能来得太晚, 因为银行的钱已经花光了

纳什均衡=每个存款人都想第一个取钱

如果所有存款人都坚持一次性取出所有的钱, 即使是最健康的银行也无法生存(银行将人们存入的大部分钱贷出去, 只保留一小部分以满足提款要求)

健康的银行减少贷款, 以便在金库中保留更多的钱, 为可能发生的银行挤兑做好准备



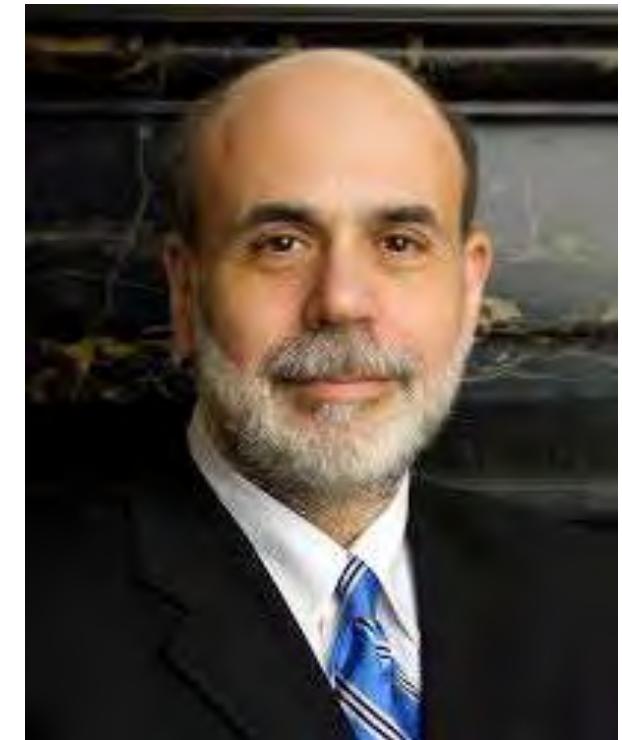
A bank run

Why Did the Global Economy Collapse?

Frozen banking system

Bernanke, Ben. 1983. Nonmonetary effects of the financial crisis in the propagation of the Great Depression. American Economic Review 73(3)237-76

- One third of banks in US failed by 1933
 - Rural banks failed because farmers could not repay loans
 - City banks failed because borrowers can't pay interest costs (increased in real terms by deflation)
 - No deposit insurance, so bank failure → lose life savings
 - Depositors, fearing bank failures, try to withdraw all their money, causing bank runs, which cause more bank failures
 - Remaining banks stop lending to keep cash on hand to stop runs
 - Healthy firms fail because can't borrow to finance inventory, working capital, ...
 - Their owners & ex-employees default on loans & mortgages, lose their houses, causing more banks to fail
- Bernanke argued that the government should have bailed out the banks in the 1930s to prevent all this
- He did bail out the banks in the 2008 US financial crisis



Ben Bernanke
U.S. Federal Reserve Chair

Why Did the Global Economy Collapse?

冻结的银行体系

本·伯南克，1983。大萧条蔓延过程中金融危机的非货币效应。《美国经济评论》73(3)237-76

到1933年，美国有三分之一的银行倒闭

农村银行倒闭是因为农民无法偿还贷款

城市银行倒闭是因为借款人无法支付利息成本(通货紧缩导致实际利率上升)

没有存款保险，所以银行倒闭咯咯输掉了一生的积蓄

因担心银行倒闭，储户试图取出所有存款，造成银行挤兑，进而导致更多银行倒闭

剩余的银行停止放贷，以保持手头的现金，以防止挤兑

健康的公司倒闭是因为无法借钱来为库存、营运资金融资……

他们的所有者和前雇员拖欠贷款和抵押贷款，失去房子，导致更多的银行倒闭

伯南克认为，政府应该在20世纪30年代救助银行，以防止这一切

他确实在2008年美国金融危机中拯救了银行



本·伯南克 美国联邦储备委员会主席

Why Did the Global Economy Collapse?

Huge decrease in wealth

Pigou, Arthur. 1943. The Classical Stationary State. *Economic Journal* 53(212)343–51



Arthur Pigou

- “Pigou Effect”: People who become poorer spend less, reducing demand & causing even more firms to fail & more people to lose jobs
- Mishkin, Frederic. 1976. Illiquidity, Consumer Durable expenditure, and Monetary Policy. *American Economic Review* 66 642-54
- In 1930s, people lost their life savings (in the stock market crash & waves of bank failures) and their houses and farms, so there was a massive Pigou Effect
 - A stock portfolio worth \$1M in 1929 was worth ~ \$91K in 1933
 - Many peoples bank accounts had vanished by 1933 because their banks closed

全球经济为什么会崩溃? 财富大幅缩水

阿瑟·庇古1943。《经典静止态》。《经济杂志》53(212)343-51

“庇古效应”：越穷的人消费越少，需求就越低
导致更多的公司倒闭，更多的人失去工作

弗雷德里克·米什金，1976。流动性不足、消费者持久支出与货币政策。《美国经济评论》66 642-54

在20世纪30年代，人们失去了一生的积蓄(在股市崩盘和一波又一波的银行倒闭)和他们的房子和农场，所以有大量的庇古效果

1929年价值100万美元的股票投资组合到1933年价值9.1万美元
许多人的银行账户到1933年就消失了，因为他们的银行关门了



Arthur Pigou

Why Did the Global Economy Collapse?

Frauds exposed

Ponzi's 1920s scheme

- Take in investor's money
- Buy nice things for self & family
- Tell investors they are earning high returns, so they keep depositing more & tell others to invest their money with you
- Use newly deposited funds to reimburse any investors who withdraw money, use the rest of the money to ...



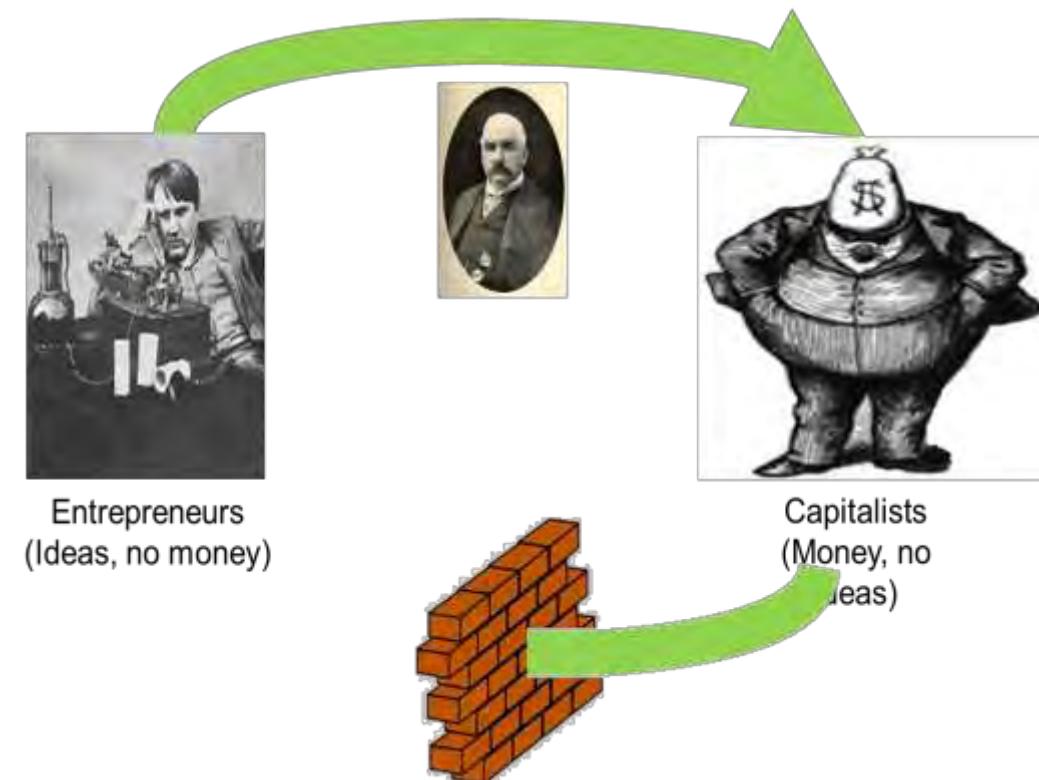
Charles Ponzi



Bernie Madoff

Loss of trust in financial system

- Ponzi schemes (& other frauds) are often exposed during crashes
- Schumpeter's circular flow shrinks, stops



Why Did the Global Economy Collapse?

欺诈暴露

庞氏20世纪20年代的骗局

获取投资者的资金

为自己和家人买好东西

告诉投资者他们赚得很高

回报，所以他们继续存更多&

告诉别人把钱投给你

使用新存入的资金进行报销

任何提取资金的投资者，使用

剩下的钱给…



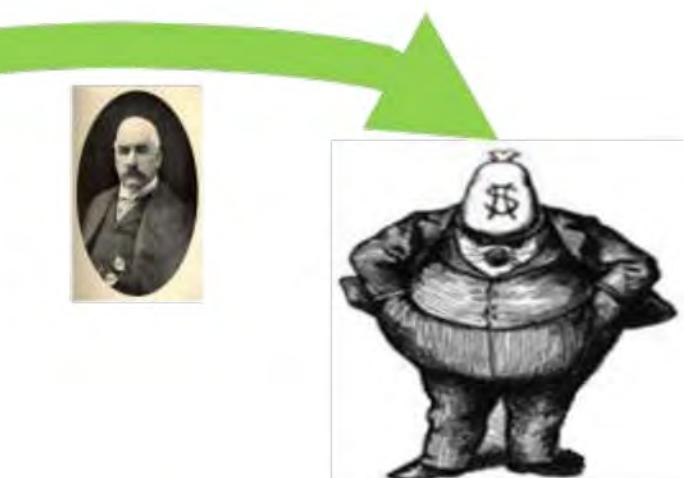
Charles Ponzi



Bernie Madoff



Entrepreneurs
(Ideas, no money)



Capitalists
(Money, no
ideas)

对金融体系失去信任

庞氏骗局(及其他欺诈)经常发生

在崩溃期间暴露

熊彼特的循环流收缩，停止

Why Did the Global Economy Collapse?

- Loss of trust in free markets in almost all Western countries & Japan
- In the 1930s, these countries abandon free-markets & use central planning, government-set prices, etc.
- Loss of support for traditional Western forms of government, legal systems, ...



National Socialist Party (NAZI) rally, Madison Square Garden, New York



In the 1930s, shops in USA displayed a “blue eagle” sticker in their windows to show that their prices were set by the government, not by free markets

Why Did the Global Economy Collapse?

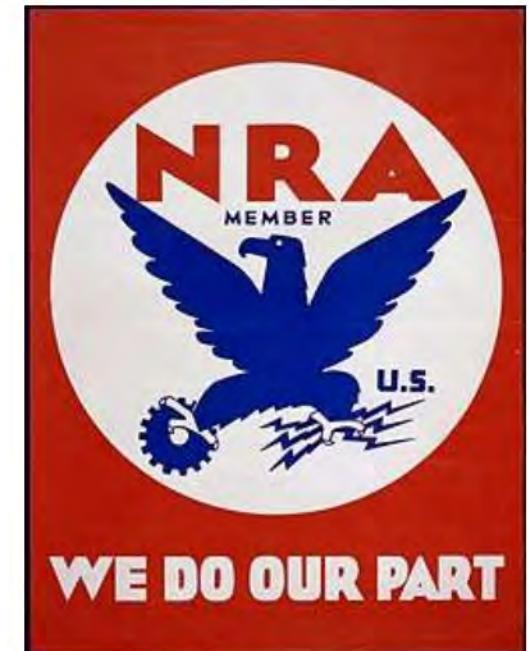
几乎所有西方国家和日本都失去了对自由市场的信任

在20世纪30年代，这些国家放弃了自由市场，使用中央计划，政府设定价格等。

失去对传统西方形式的政府、法律体系、……



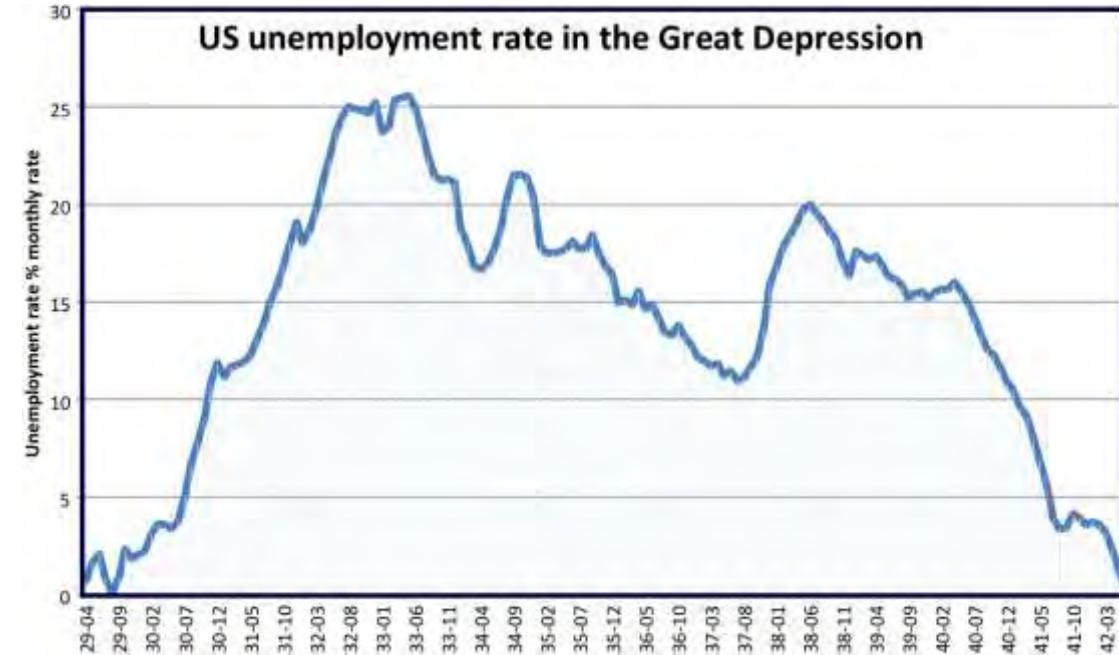
国家社会主义党(纳粹)集会，纽约麦迪逊广场花园



在20世纪30年代，美国的商店在橱窗里展示了一个“蓝鹰”的贴纸，以表明他们的价格是由政府制定的，而不是自由市场

Why Did the Global Economy Collapse?

- Global trade wars
 - International trade ceased in many sectors
- The incompetence of central bankers
 - Deflation → delay purchases
- Frozen banking system
 - No lines of credit forced sound firms to close
- Huge decrease in wealth
 - People became poorer and so spent less
- Loss of trust in the financial system & in free markets, etc.
 - Schumpeter's circular flow shrinks, perhaps stops
 - People were more risk averse after living through a huge crisis
 - Decline of free markets, increase in government regulation of business, state intervention in markets, etc. helped some firms and some people, but may have made the overall situation worse



Why Did the Global Economy Collapse?

<s:1>全球贸易战

许多行业的国际贸易停止

央行行长的无能

通货紧缩延迟购买

<s:1>冻结银行系统

没有信贷额度迫使稳健的公司倒闭

财富大幅缩水

人们变得更穷，因此消费更少

对金融体系和自由市场失去信任，等等。

熊彼特的循环流动收缩，甚至可能停止

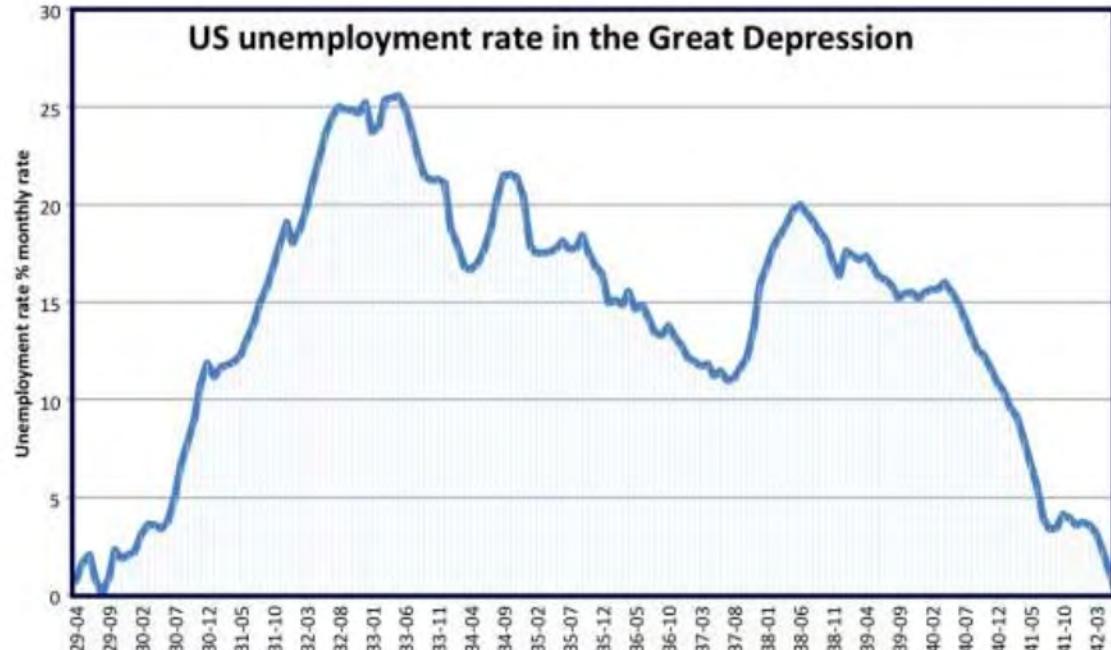
人们在经历了一场

巨大的危机

自由市场的衰落，政府的增加

商业监管，国家干预市场，

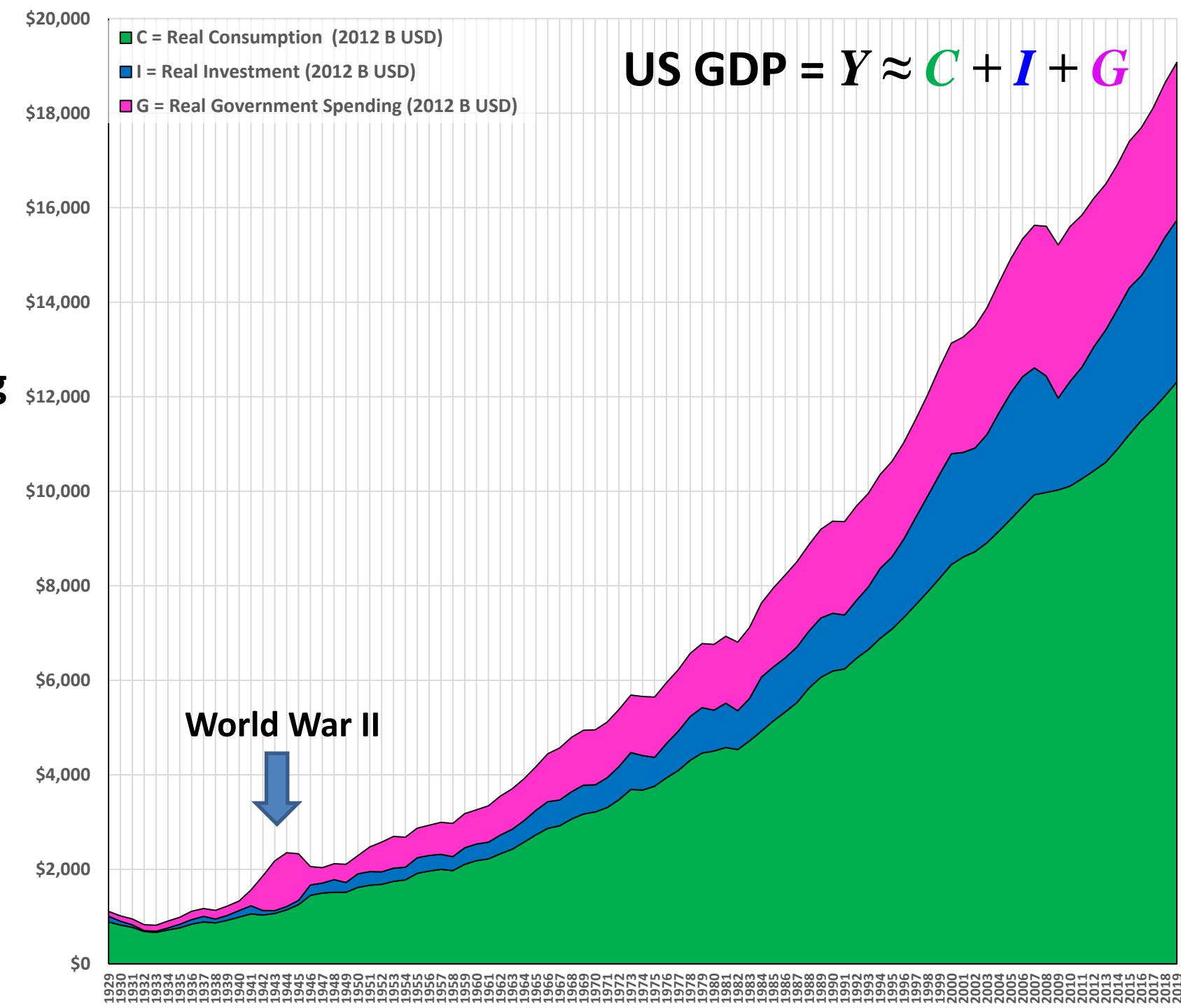
等等，帮助了一些公司和一些人，但可能没有使整体情况变得更糟



World War II

Economic implications

- Wartime command economy (government intervention to direct private companies)
- Companies stopped making ordinary products & made airplanes, missiles, warships, etc. which were destroyed in the war
- Huge increase in government spending and in government debt
- Huge number of people taken away from their normal work (to serve as soldiers)



第二次世界大战

经济影响

⊗ 战时命令

经济(政府
干预导向
私营企业)

企业停止制作

普通产品& made

飞机、导弹,
军舰等

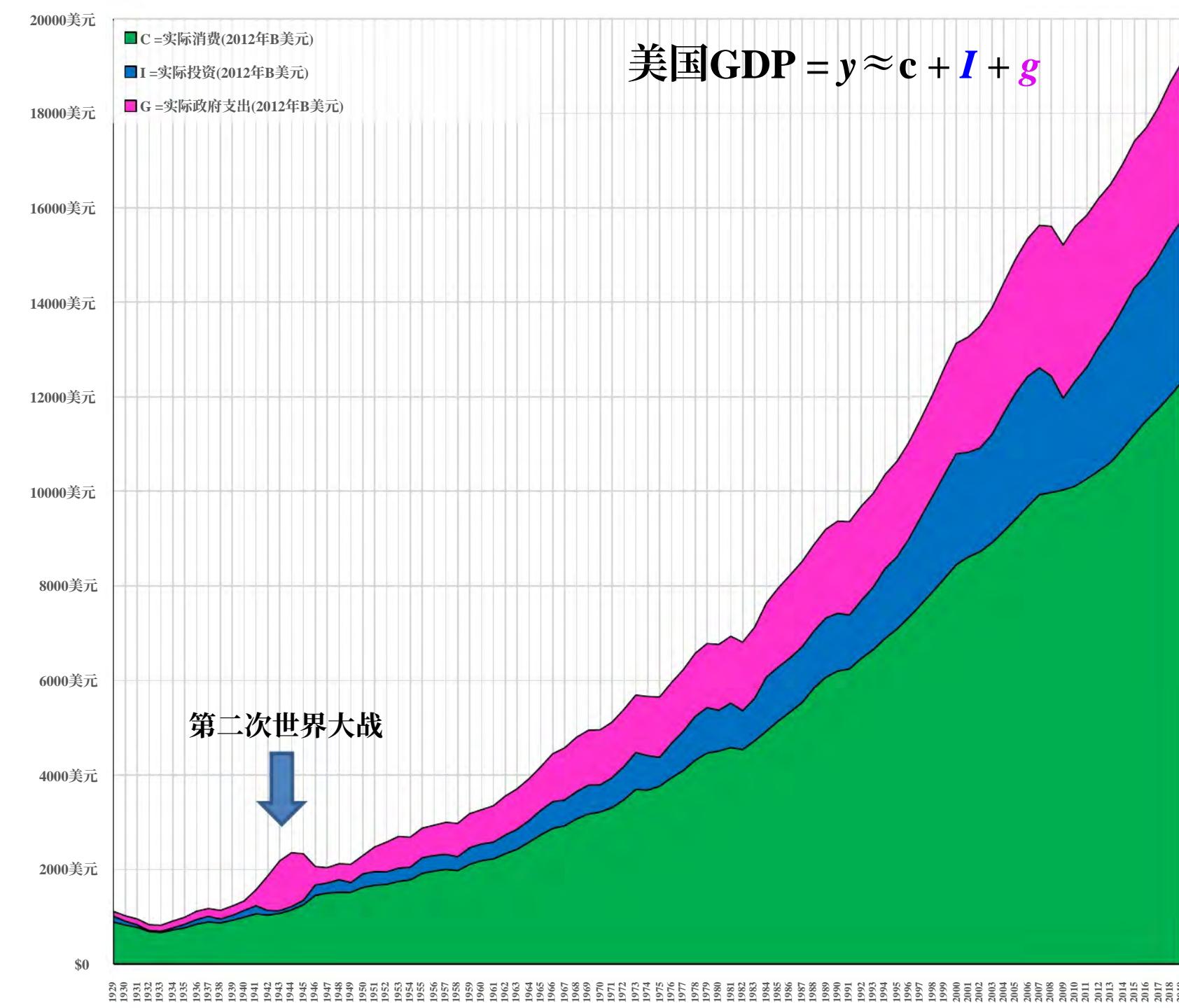
在战争中被摧毁

大幅增加

政府支出和
政府债务

人数庞大

从他们的
正常工作(担任
士兵)



The 1950s & 1960s

1950s boom

- ❑ Europe & Japan in ruins after World War II
- ❑ Firms in Europe and Japan focused on rebuilding infrastructure, factories, cities destroyed during WWII
- ❑ USA firms had no major foreign competitors
- ❑ USA was center of global economy & innovation

Return to pre-1930s globalization

- ❑ By 1960s, 1930s “Trade War” seen as a huge mistake
- ❑ Successive rounds of “General Agreement on Tariffs & Trade” (GATT) international agreements cut trade barriers, in stages, to restore 1920s global integration
- ❑ Resumption of international trade created new $NPV > 0$ opportunities for firms to source cheaper inputs from abroad and to sell outputs abroad



Tokyo in 1945



“Kennedy Round of the GATT

1950年代和1960年代

1950年代繁荣

第二次世界大战后[欧洲](#)和日本成为废墟

欧洲和日本的[公司](#)专注于重建

二战期间被摧毁的基础设施、工厂和城市

USA公司没有主要的外国竞争对手

USA是全球经济和创新的中心

回到20世纪30年代前的全球化

在20世纪60年代，30年代的“贸易战”被视为巨大的错误

连续几轮的“关税总协定”

“关贸总协定”(GATT)国际协定削减贸易壁垒，

分阶段，恢复20世纪20年代的全球一体化

恢复国际贸易创造了新的 $NPV > 0$

企业有机会从其他国家获得更便宜的投入

并向国外销售产品



Tokyo in 1945



"Kennedy Round of the GATT"

The 1960s High-tech Stocks

1960 Bull market in stocks of new high-tech sectors

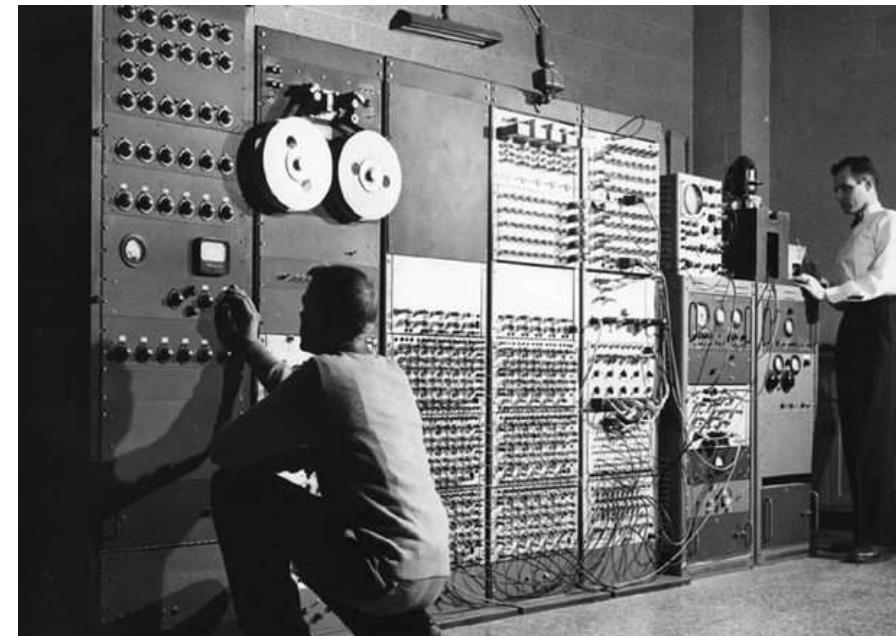
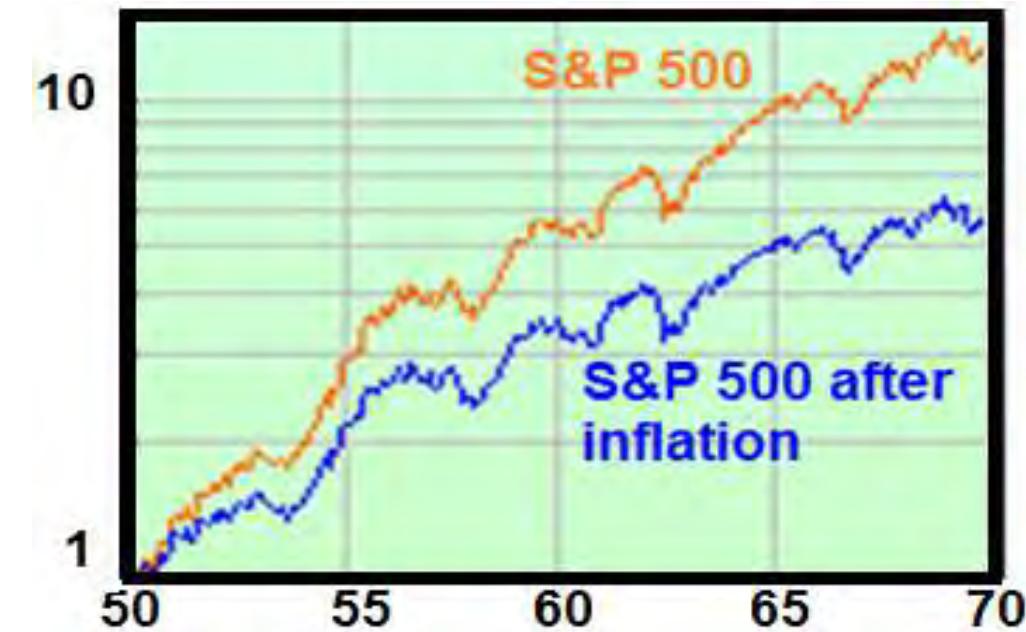
- Airplanes, helicopters, space satellites (航空航天)
- Automobiles & auto parts
- Plastics
- Electronics: transistors, integrated circuits, color TVs, "electronic" computers

More "new age" thinking in the late 1960s

- "Everything will be made of plastic! Dishes, cups, countertops, walls, floors, ceiling, tabletops, shelves and cabinets."
- "Universities will close. People will attend lectures by TV"
- "Soon, we will fly to work in our family helicopters"



Computers working at a US company in the 1950s



"Electronic" computers at a US company in the 1960s

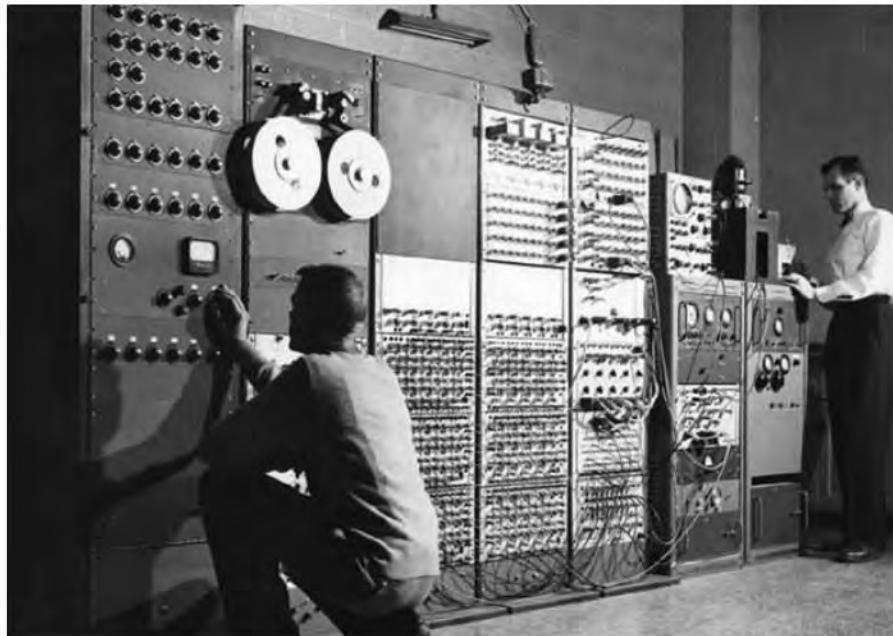
60年代的高科技股

1960新兴高科技板块股票牛市

飞机、直升机、太空卫星(航宇)、上世纪50年代，美国一家公司的电脑汽车及汽车零部件、塑料制品

电子产品:晶体管、集成电路、彩电、“电子”电脑更多的是60年代末的“新时代”
思维盘子、杯子、台面、墙壁、地板、

天花板、桌面、架子和橱柜。“<1>大学将关闭”。人们将通过电视听讲座“不久后，我们将乘坐我们的家庭直升机去上班”



20世纪60年代，美国一家公司的“电子”电脑

“Slow Motion” Crash of the 1970s

Oil shocks

- ❑ Oil price up in 1973 – OPEC cuts exports to punish West for supporting Israel
- ❑ Oil price up in 1979 – Iranian Islamic Revolution, US trade embargo against Iran

Rapid & huge expansion in size of government

- ❑ 1960s expansion of social programs (+ cost of Vietnam War for USA)
- ❑ Increased government intervention to counter oil shock disruptions
- ❑ Larger government paid for by increasing money supply → high inflation
- ❑ Macroeconomic models said lowering inflation would cause unemployment
- ❑ Central banks increased inflation but unemployment remained high anyway

Corruption scandals in USA

- ❑ President Nixon forced to resign → people said “US model doesn’t work”

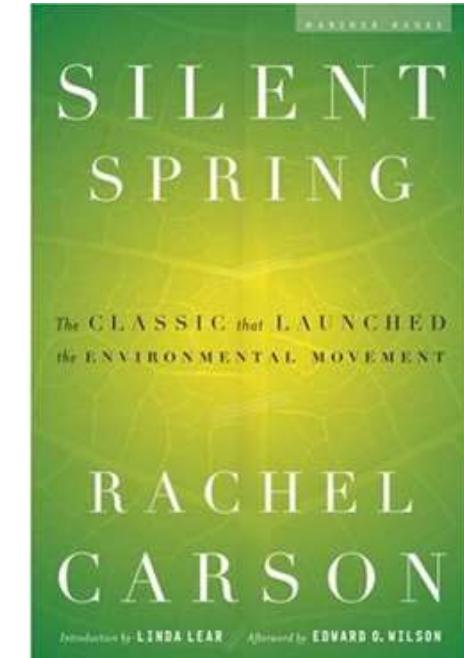
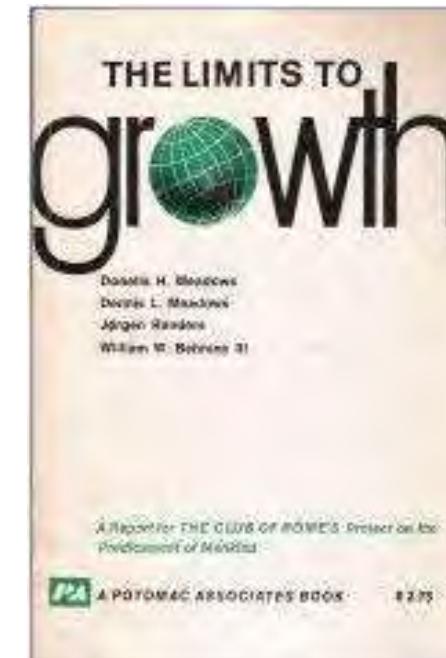
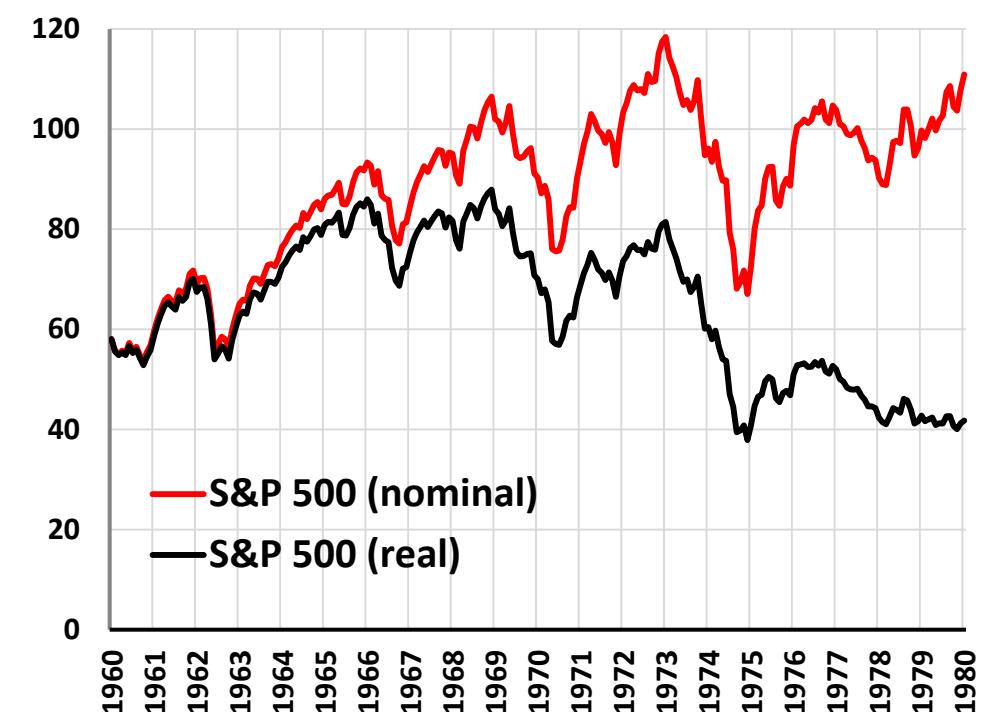
Anti-technology anti-free-markets books best-sellers

Medows et al. 1972. *The Limits to Growth*

- ❑ Experts: Oil & minerals nearly gone
- ❑ Population rising so fast that global starvation inevitable by 1980s unless governments stop people from having children
- ❑ Unless governments control technology & free-markets , global disaster!

Carson, Rachel. 1962. *Silent Spring*

- ❑ Chemicals are killing people, technology out of control
- ❑ Unless governments control technology & free-markets , global disaster!
- ❑ Started as fringe ideas, became mainstream “green” movement in 1970s



“Slow Motion” Crash of the 1970s

石油危机

1973年油价上涨-欧佩克削减出口以惩罚西方支持以色列

1979年油价上涨-伊朗伊斯兰革命，美国对伊朗实施贸易禁运

政府规模迅速而巨大地扩张

- ☒ 1960社会事业的扩大(+USA的越南战争费用)
- ☒ 增加政府干预以应对石油冲击的破坏
- ☒ 更大的政府通过增加货币供应量来支付;高通胀
- ☒ 宏观经济模型显示，降低通胀会导致失业
- ☒ 央行增加了通货膨胀，但失业率仍然居高不下

USA的腐败丑闻

尼克松总统被迫辞职被告人称“美国模式行不通”

反科技反自由市场的书籍畅销书

Medows et al. 1972。增长的极限

专家:石油和矿产资源即将耗尽

人口增长如此之快，到20世纪80年代全球饥荒不可避免，除非

政府阻止人们生孩子

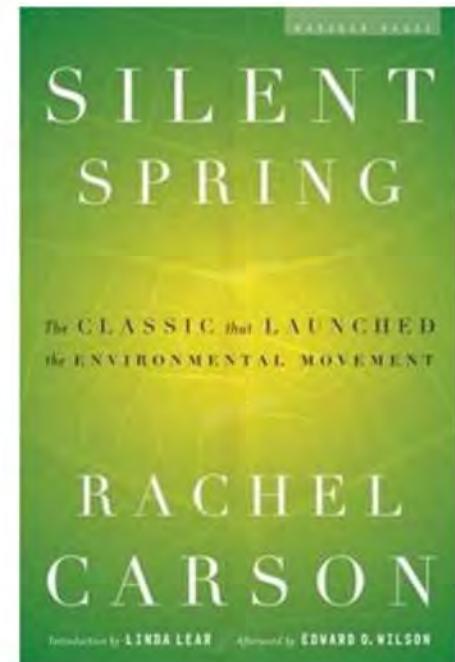
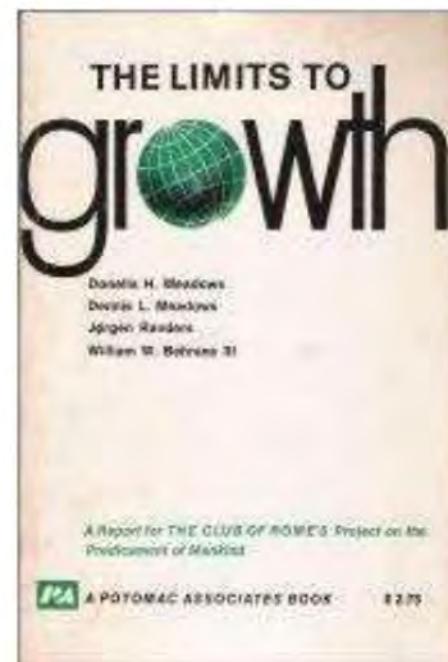
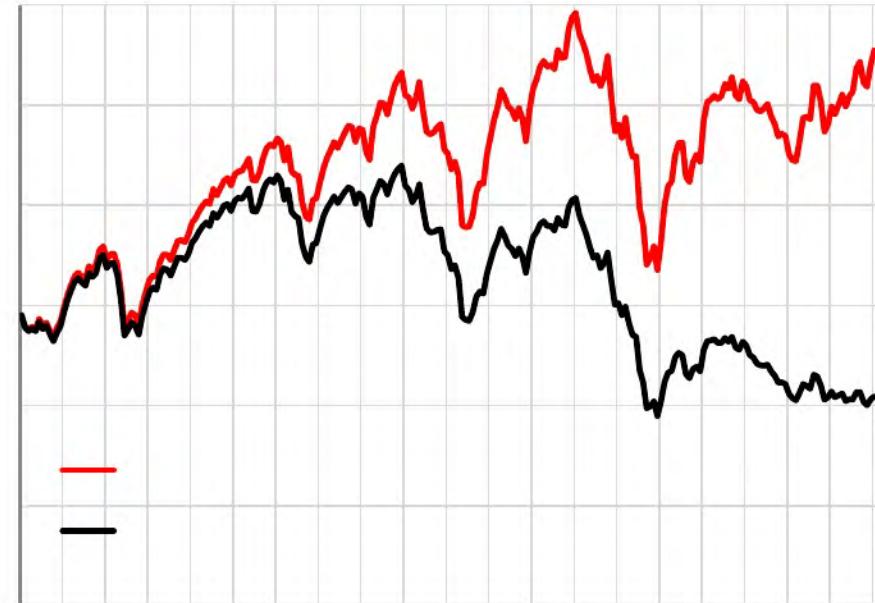
除非政府控制技术和自由市场，否则将是全球灾难!

雷切尔·卡森，1962年。寂静的春天

化学品在杀人，科技失控

除非政府控制技术和自由市场，否则将是全球灾难!

开始是边缘思想，在20世纪70年代成为主流的“绿色”运动



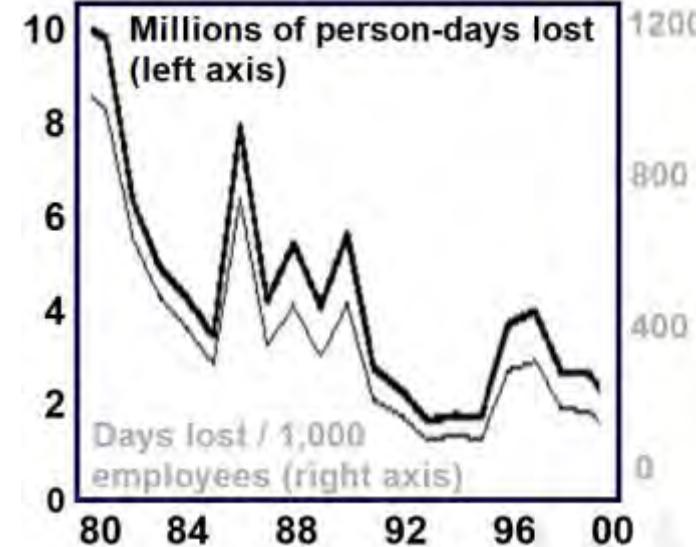
High Inflation & Big Government Politically Unpopular

Costs of high inflation became obvious

- Money in bank accounts loses real value as inflation rises
- Firms criticized for raising prices, but inflation was raising firms' costs
- Workers "on strike" everywhere because everyone believes their wages not rising enough (often this was true)
- Individuals & firms have higher incomes → higher taxes



US Public Housing Projects



British Prime Minister
Margaret Thatcher



Milton Friedman
Nobel Prize 1976

1980s free market reforms

- In UK first, then in USA, Australia, Canada, ...
- Sharp interest rate increase in 1980 stopped inflation
- Smaller government (deregulation, SOE privatization, reduce no. of bureaucrats → slower money supply growth possible)
- Even smaller government → lower taxes, deregulation, ...
- These reforms were very popular across Western countries

Source: Human Resources Canada Historical Data

High Inflation & Big Government Politically Unpopular

高通胀的代价变得显而易见

随着通货膨胀的加剧，银行账户里的钱失去了实际价值
企业因提高价格而受到批评，但通货膨胀却在加剧

公司的成本

到处都有工人“罢工”，因为每个人都相信
他们的工资涨得不够(通常这是真的)

个人和公司的收入较高;较高的税收

大政府社会效益不明显

政府的社会政策管理不善，而且经常被制定

事情变得更糟

国有企业(许多成立于20世纪70年代)被认为经营不善

社会各阶层的犯罪和腐败现象都在增加

人们愤怒是因为“被当做实验中的老鼠”被

政府专家

1980s自由市场改革

先在英国，然后是美国、澳大利亚、加拿大……

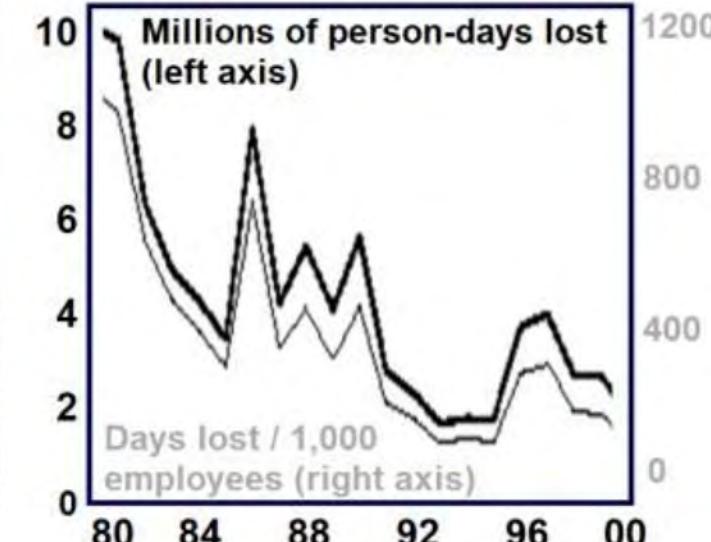
1980年大幅加息阻止了通货膨胀

更小的政府(放松管制，国有企业私有化，减少)

不。官僚的可能是货币供应增长放缓

甚至更小的政府、更低的税收、放松管制……

这些改革非常



Sustained Bull Market 1980 - Now

1980s Bull market

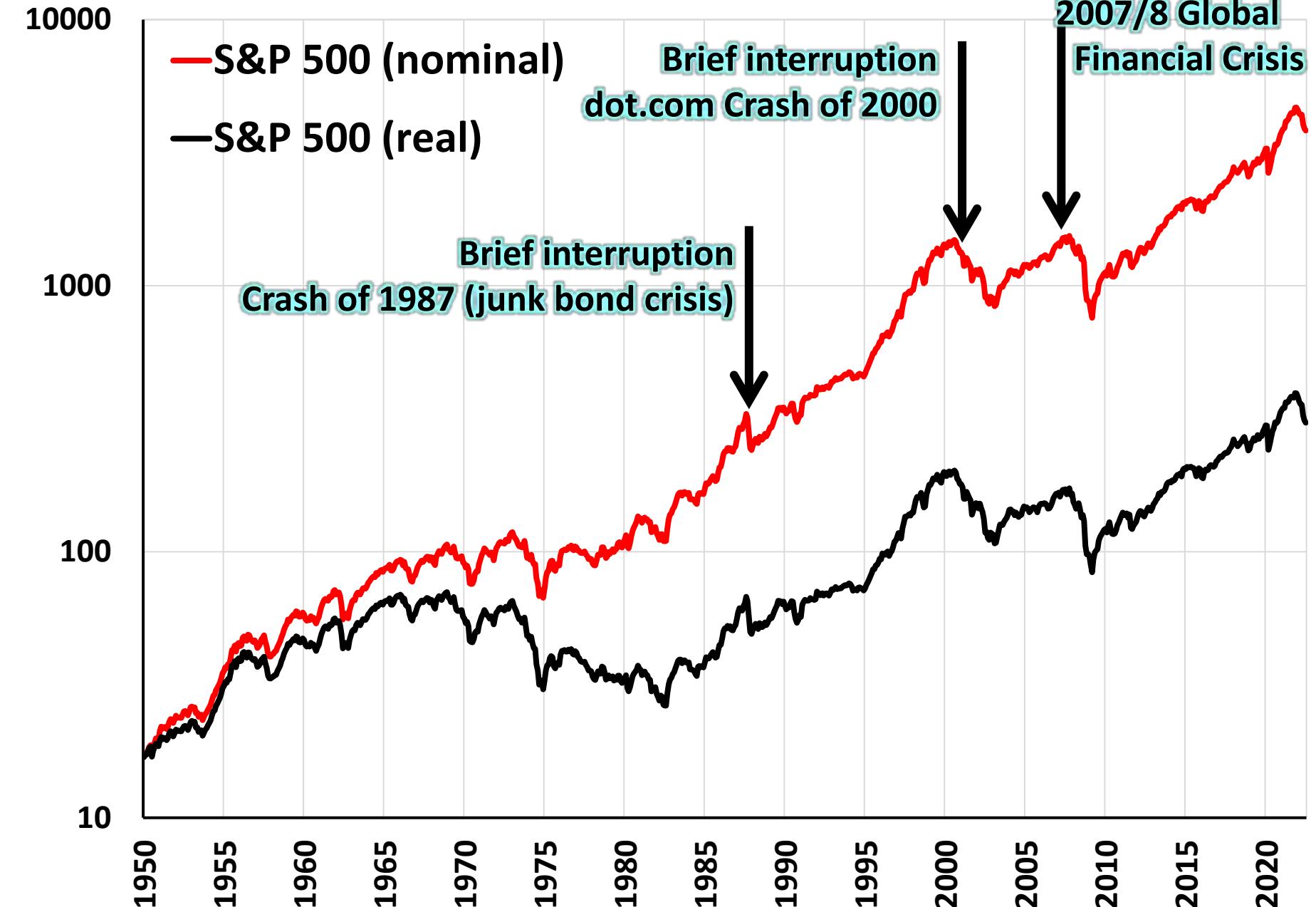
Repairing sick firms

- Buy old broken firms, damaged in the 1970s, at low share price
- Issue “junk bonds” (high risk) to pay for this
- Fix them & sell fixed firm at a high price

1990s Bull market

More like prior booms

- New high technology sectors: computers, cell phones, internet, ...
- New age thinking
 - Universities will close & people will study by internet
 - Shops will close, everyone will just use internet



Sustained Bull Market 1980 - Now

1980s牛市

修复病态公司

购买破产的老公司;

70年代受损，在
低股价

发行“垃圾债券”(高
风险)来为此买单

修复它们并出售固定公司
高价出售

1990s牛市

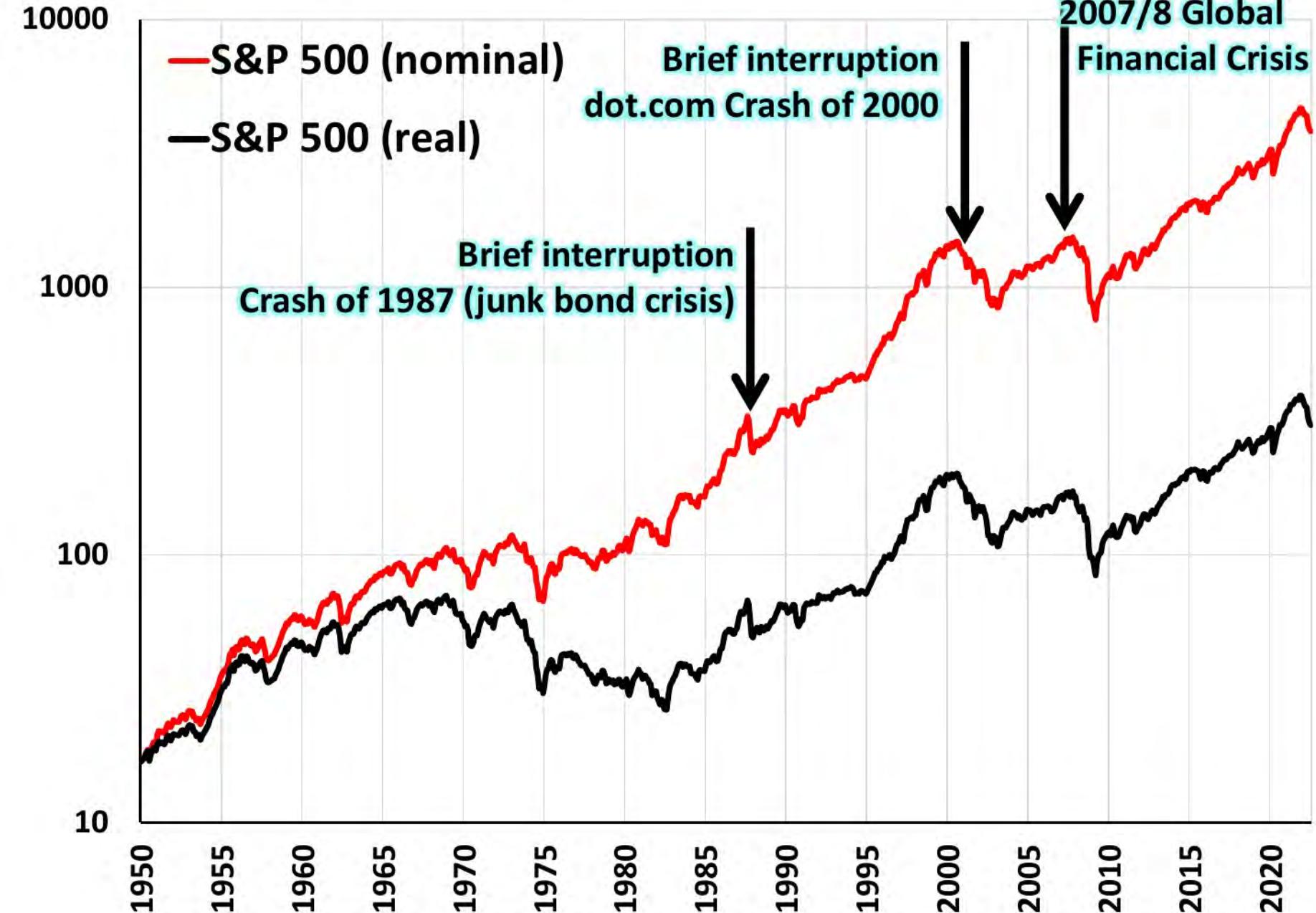
更像之前的繁荣

<:1>新型高科技

行业:电脑、手机
电话、互联网……

·新时代思维

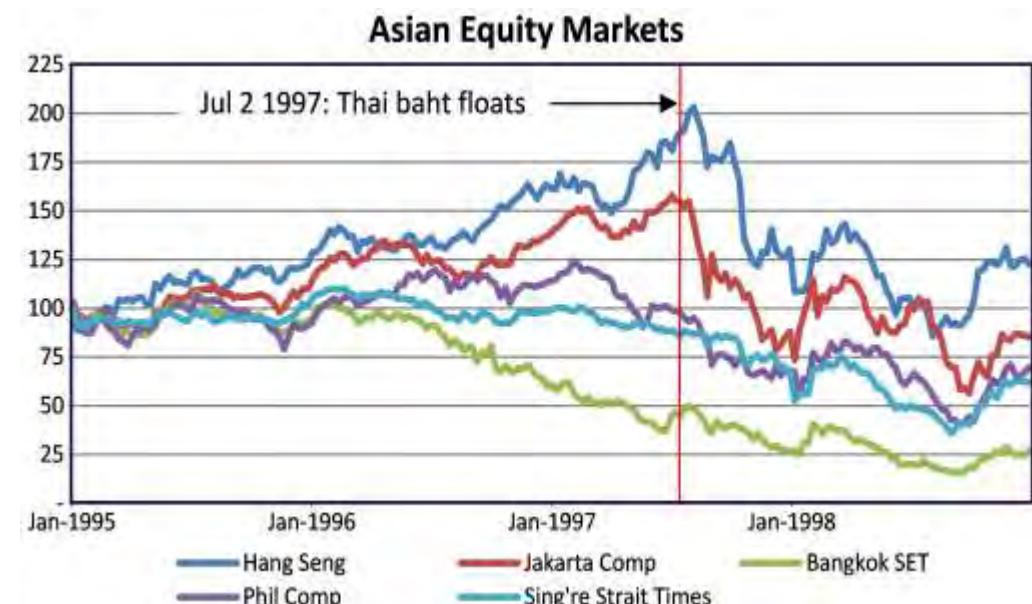
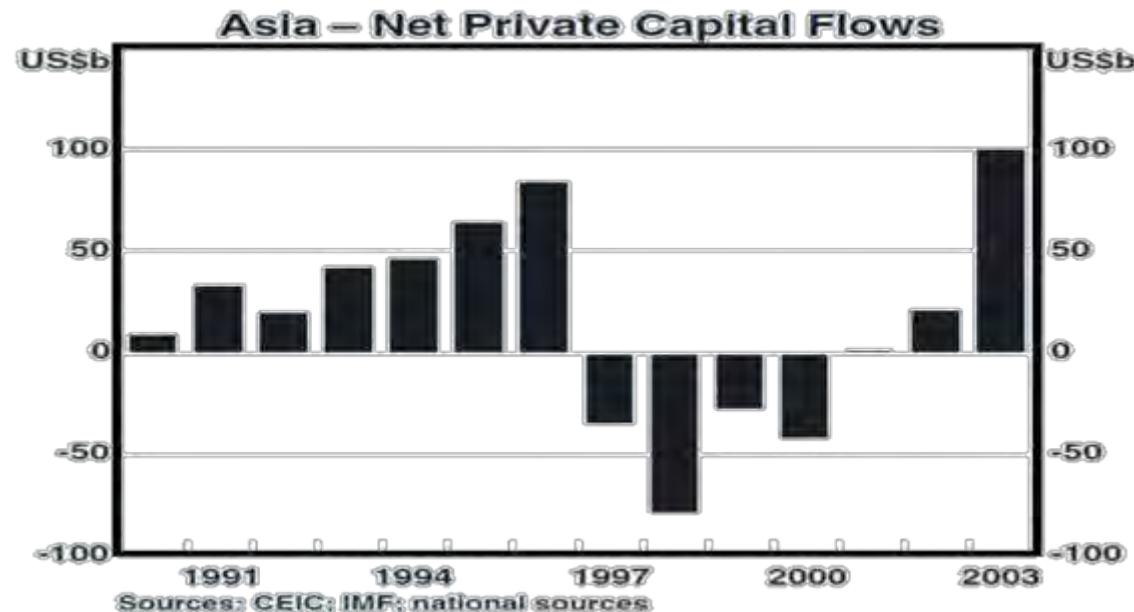
<:1>大学将关闭&
人们将通过互联网学习
商店会关门，各位
只会使用互联网



The East Asian Crisis of 1997

1990s Bull market

- New high-income economies in South Korea, Taiwan (China), Singapore, Malaysia, ... looked like as good an investment as new technologies
- Investors who bought stocks in these economies early became very rich & uninformed investors wanted “in” too!
- Big inflow of capital from uninformed domestic & foreign investors wanting to do the same thing
 - Belief that buying any stocks in these economies can't lose!
 - Belief that Thailand, Vietnam, India, Philippines, .. will be the “next” South Korea or the “next” Singapore!
- Overinvestment in new high-income economies (just like in new high-tech industries)



The East Asian Crisis of 1997

1990年代牛市

韩国、台湾出现新的高收入经济体

(中国)、新加坡、马来西亚……看起来也一样好

投资和新技术一样

早期在这些经济体购买股票的投资者

变得非常富有，穿制服的投资者也想“加入”！

大量资金从不知情的国内外流入

投资者也想做同样的事情

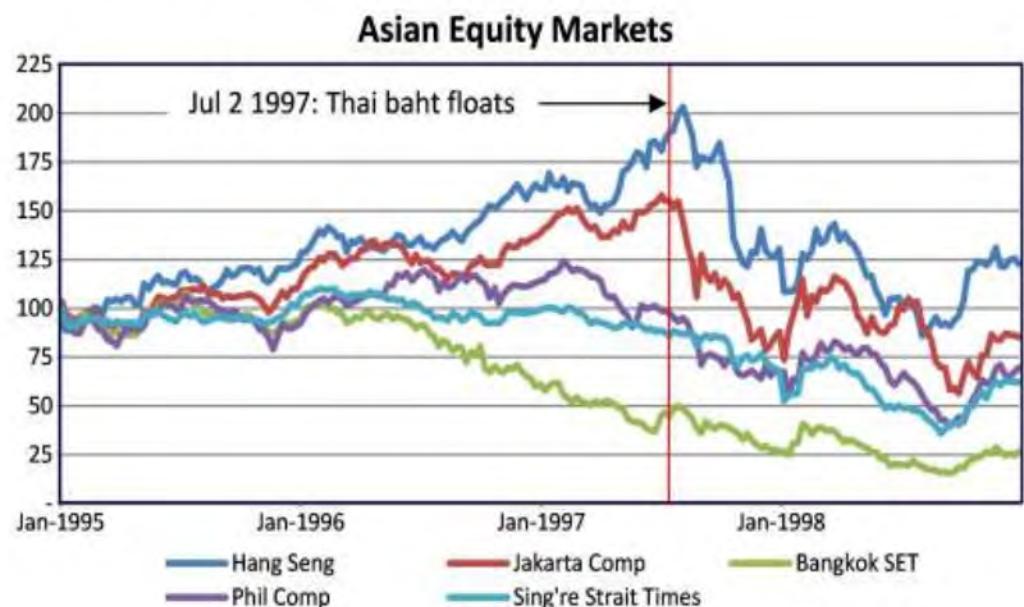
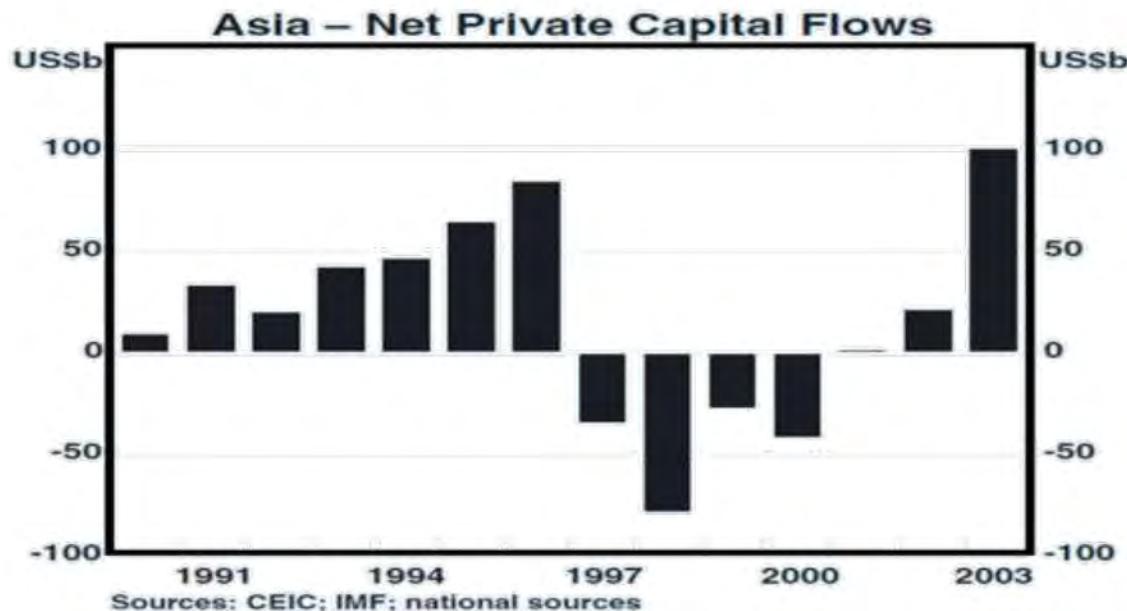
相信购买这些经济体的任何股票都不会输！

相信泰国、越南、印度、菲律宾……将是“下一个”

韩国或“下一个”新加坡！

新兴高收入经济体过度投资(就像在

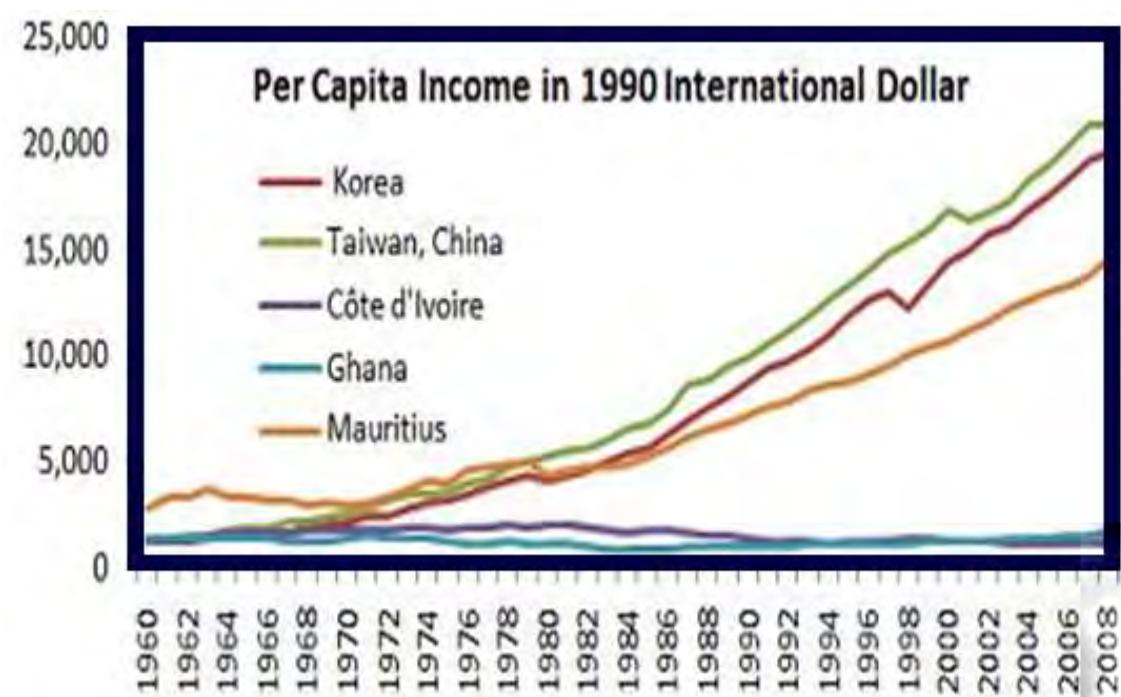
高新技术产业)



New High-income Asian Economies Crash & Fast Recovery

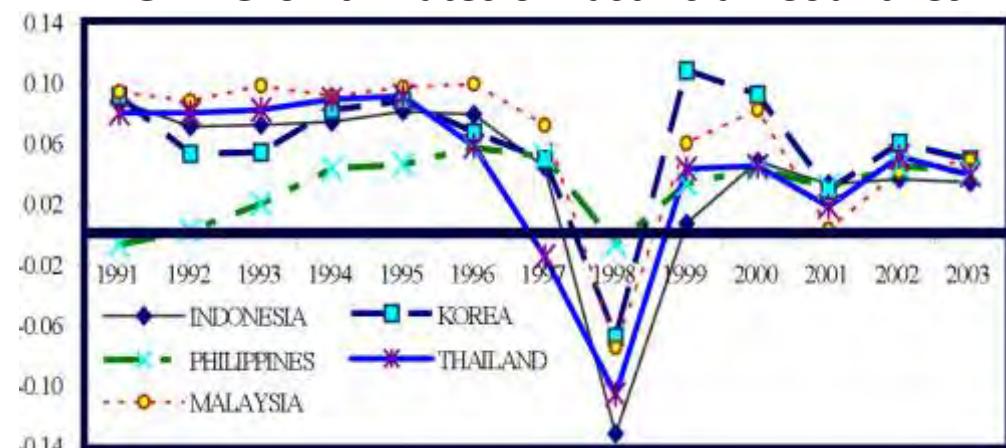
1997 East Asian Financial Crisis not very harmful?

- Affected East Asian economies GDP growth was negative going into 1998
- Positive GDP growth resumed in 1999
- High GDP growth continued in affected East Asian economies
- Their per capita GDP converged to per capita GDP of high-income Western economies

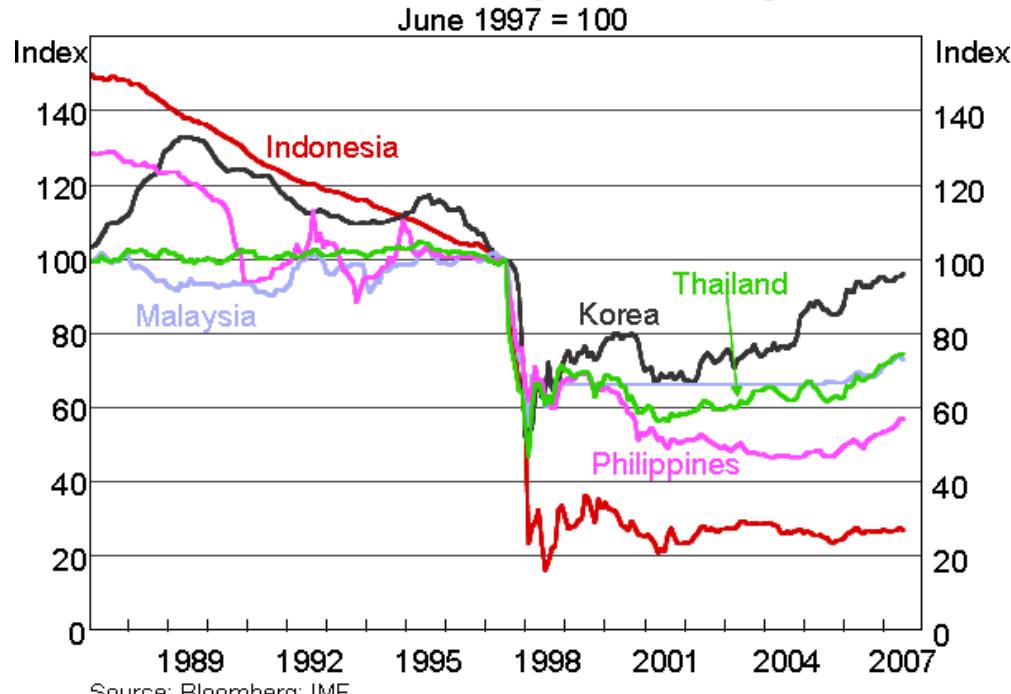


← Affected East Asian economies recovered quickly and continued getting richer

GDP Growth Rates of East Asian Countries



Selected Asian Exchange Rates Against US\$



Source: Bloomberg; IMF

New High-income Asian Economies Crash & Fast Recovery

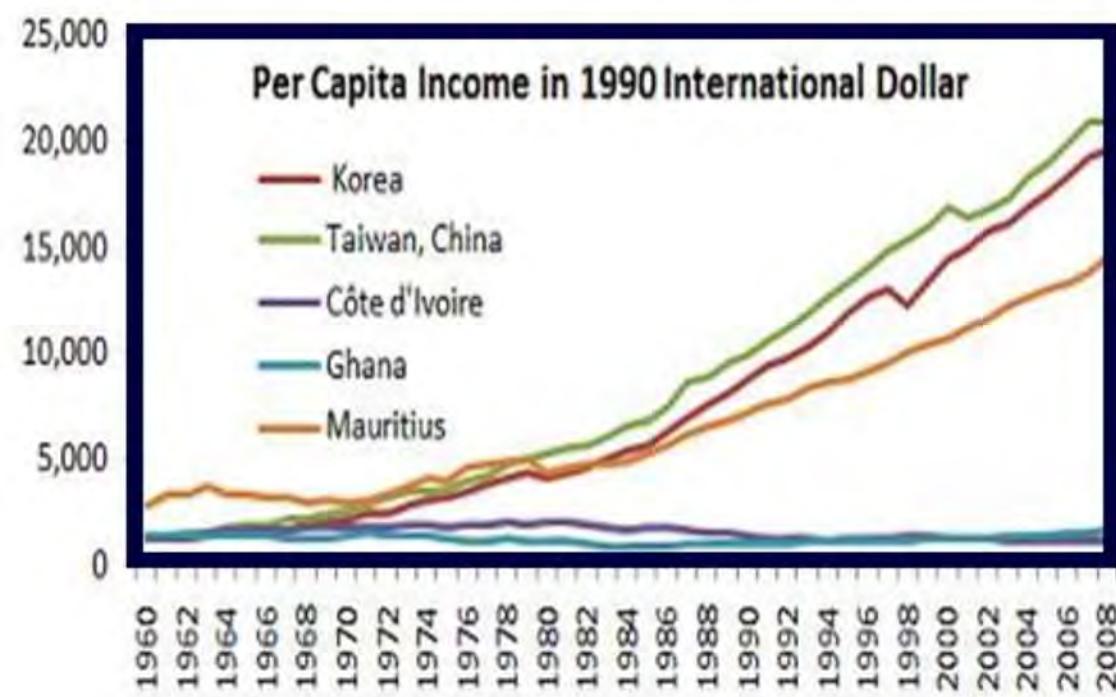
金融危机不是很有害吗?

受影响的东亚经济体GDP增长呈负增长
到1998年

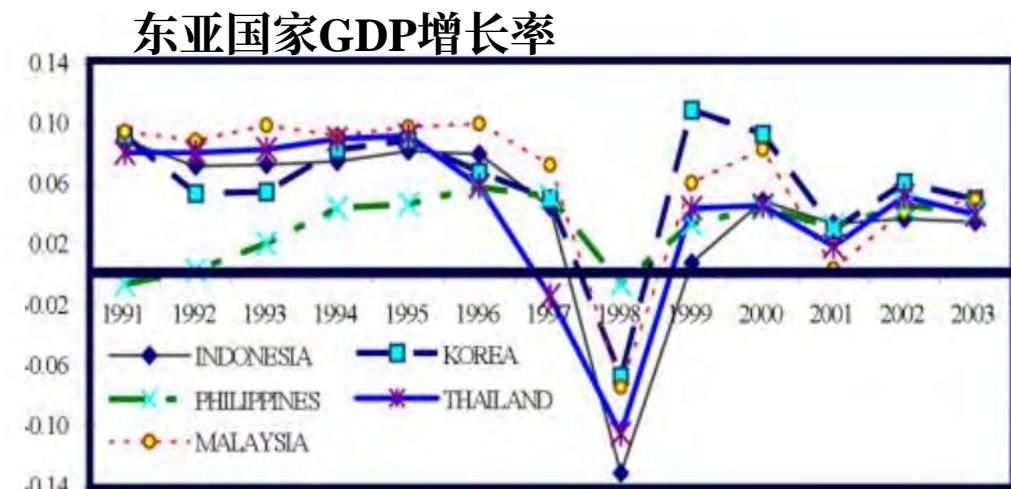
1999年GDP恢复正增长

受影响的东亚经济体继续保持高GDP增长

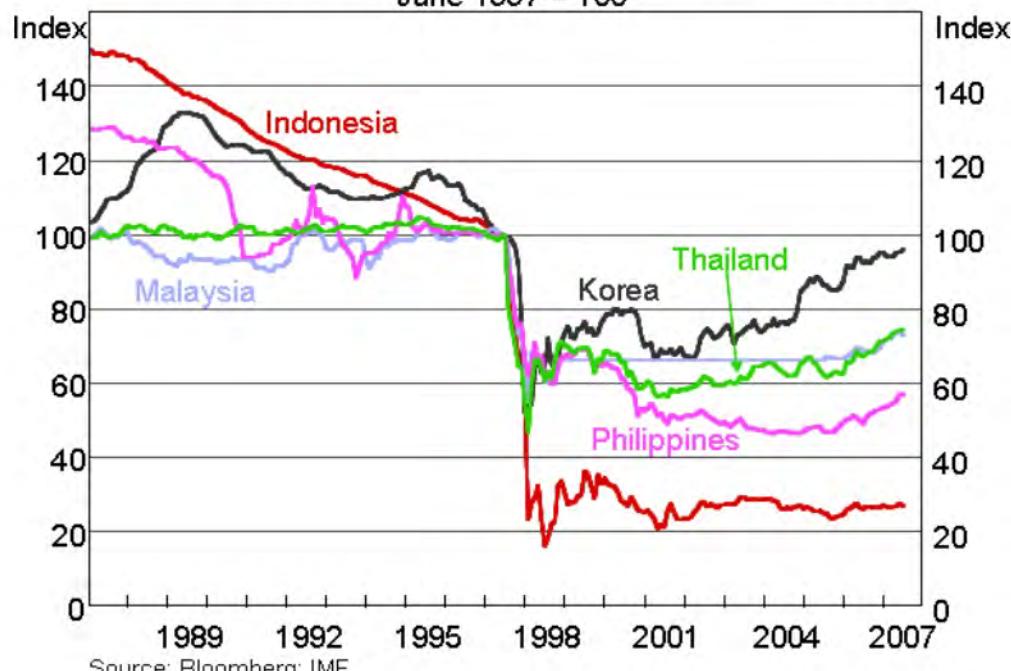
他们的人均GDP收敛到人均GDP的高-
高收入西方经济体



受影响的东亚经
济体迅速复苏，
并继续变得更
加富裕



Selected Asian Exchange Rates Against US\$
June 1997 = 100



1990s High-tech Boom & Crash

1990s: Dot.com Boom

- Huge investment in new high-tech information technology (IT) firms, mostly trading on the NASDAQ stock exchange in the USA
 - Personal computers
 - Software
 - Internet infrastructure
 - Websites
 - Cell phones, smart phones
 - Mobile phone towers & networks
- NPV > 0 innovations in other industries from IT
 - IT-based logistics in retailing
 - IT in automobiles
 - IT (robots) in factories
 - IT in power grid management
 - IT in accounting



20世纪90年代高科技繁荣与崩溃

1990s: Dot.com热潮

对高新技术信息的巨额投资

技术(IT)公司，大多在纳斯达克交易

美国的证券交易所

个人电脑

软件

互联网基础设施

网站

手机、智能手机

移动电话信号塔和网络

IT在其他产业的创新

零售业中基于it的物流

汽车中的IT

工厂中的IT(机器人)

电网管理中的IT

会计中的IT

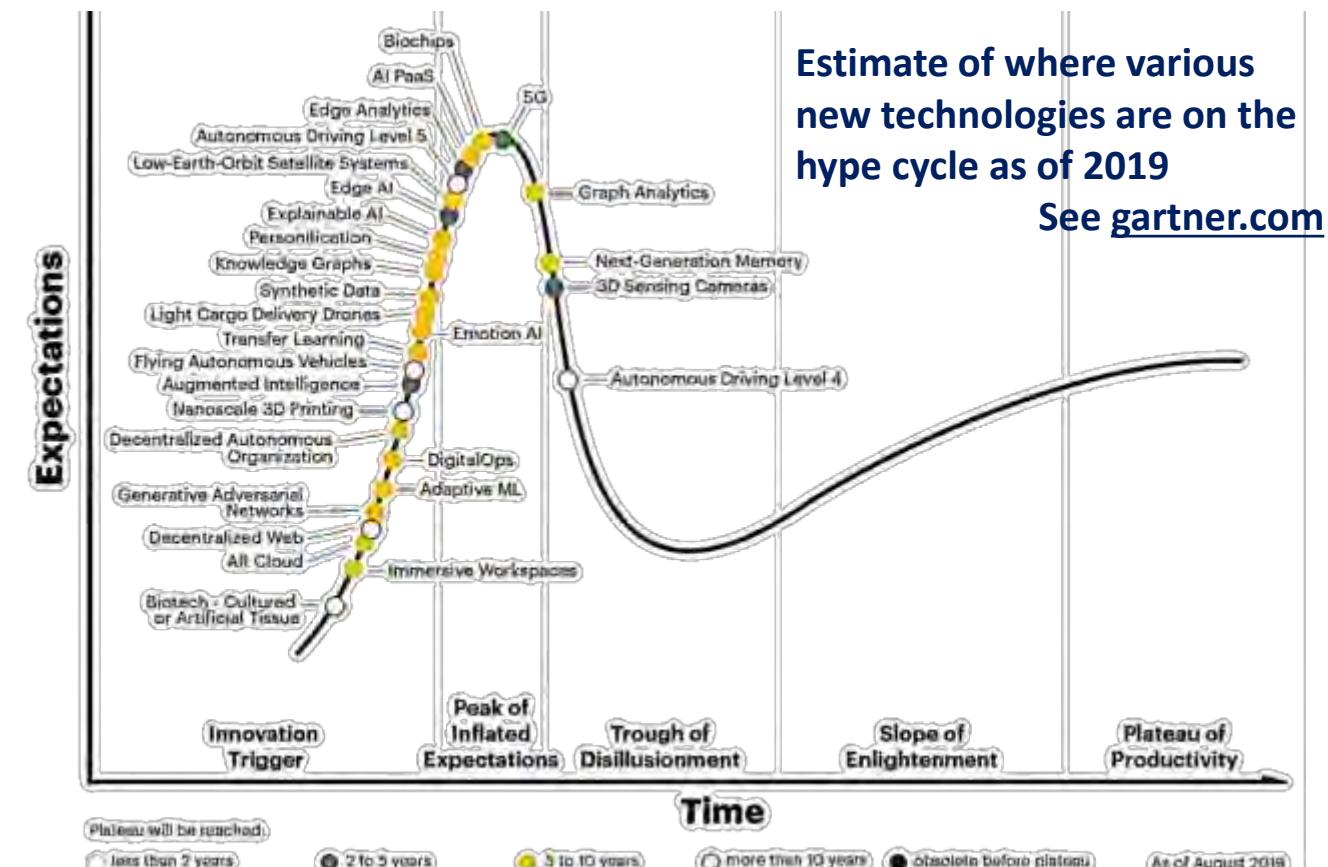
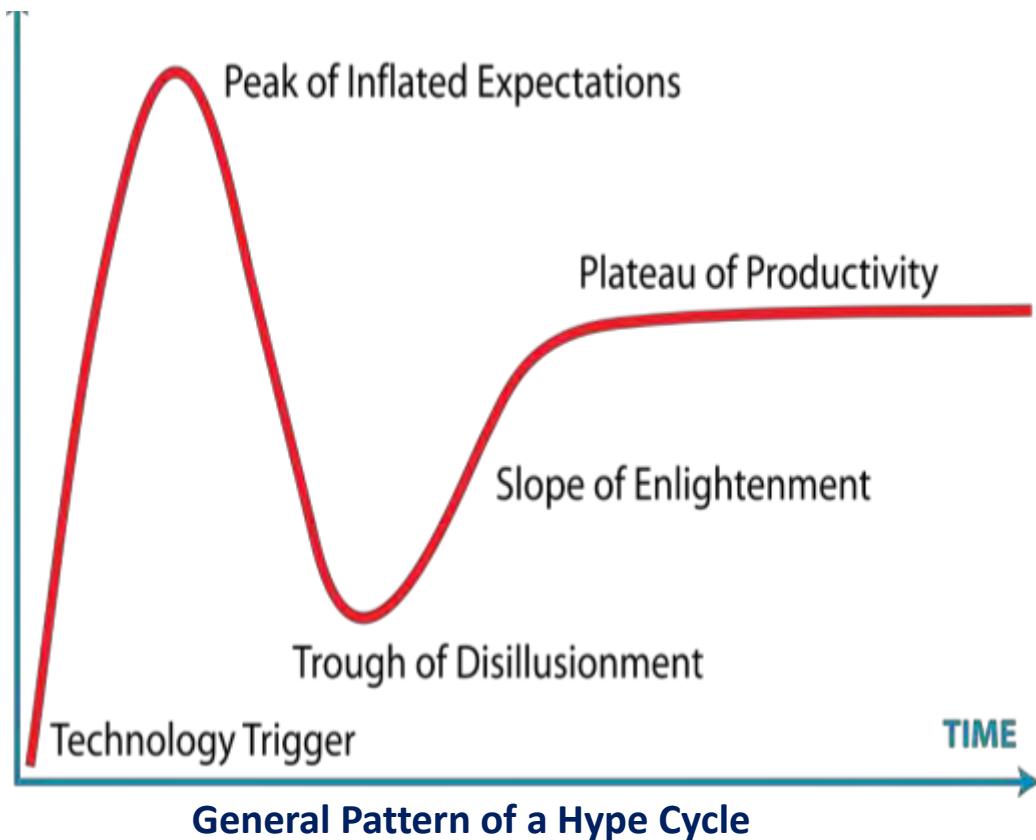


New Age Thinking – The “Hype Cycle”

Jackie Fenn & Mark Raskino. 2008. Mastering the Hype Cycle: How to Choose the Right Innovation at the Right Time. Harvard Business Press

New technologies typically have a “hype cycle”

1. The new technology attracts attention (early IPOs, early investors start to get rich, this attracts attention)
2. People become irrationally optimistic about new technology (uninformed investors rush to buy, stocks rise too high)
3. Overoptimistic expectations do not come true & people become pessimistic (stocks crash)
4. Realistic uses of the new technology are put into use (new technology spreads through economy)

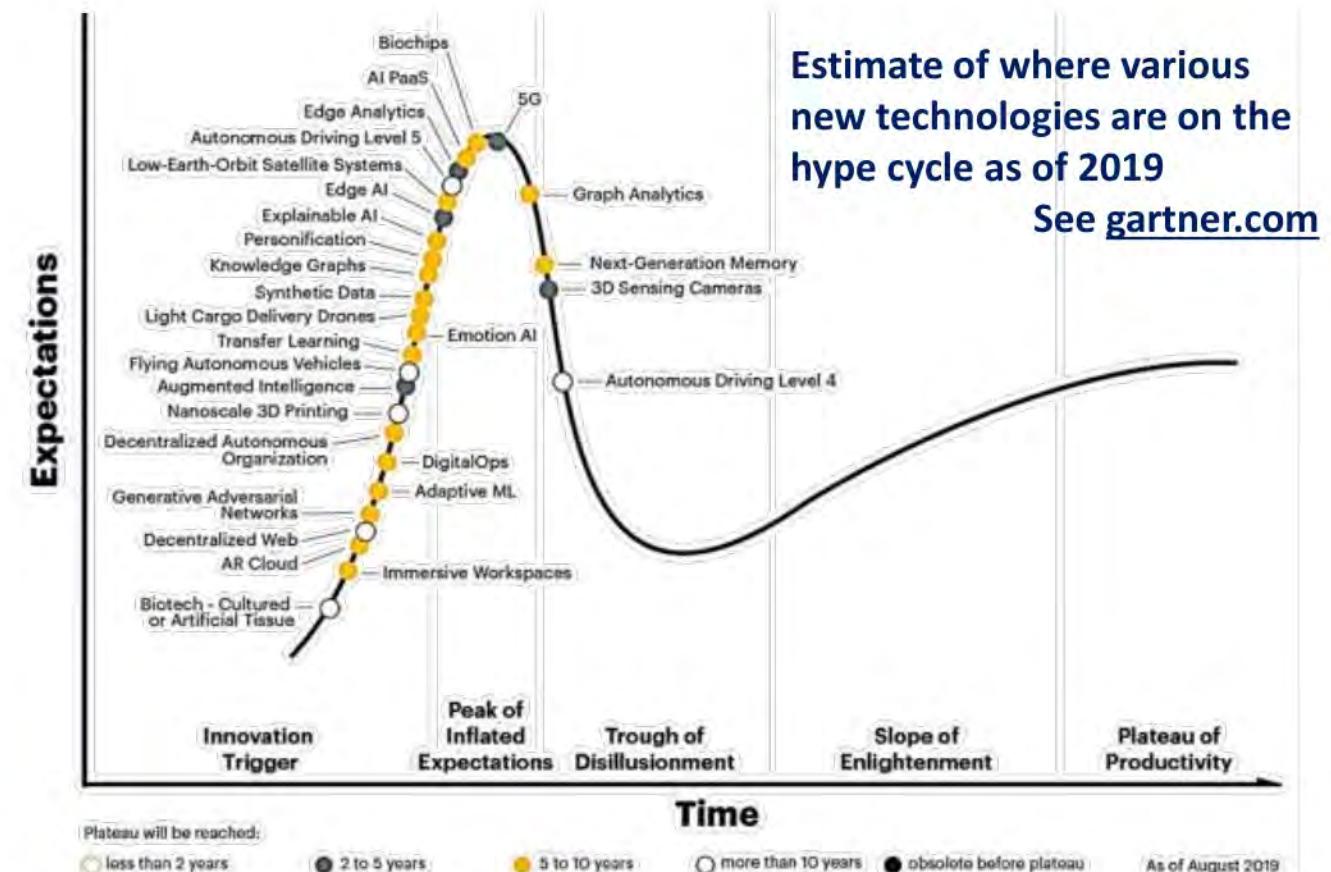


Estimate of where various new technologies are on the hype cycle as of 2019
See gartner.com

New Age Thinking – The “Hype Cycle”

杰基·芬恩和马克·拉斯基诺, 2008。掌握炒作周期:如何在正确的时间选择正确的创新。哈佛商业出版社
新技术通常有一个“炒作周期”

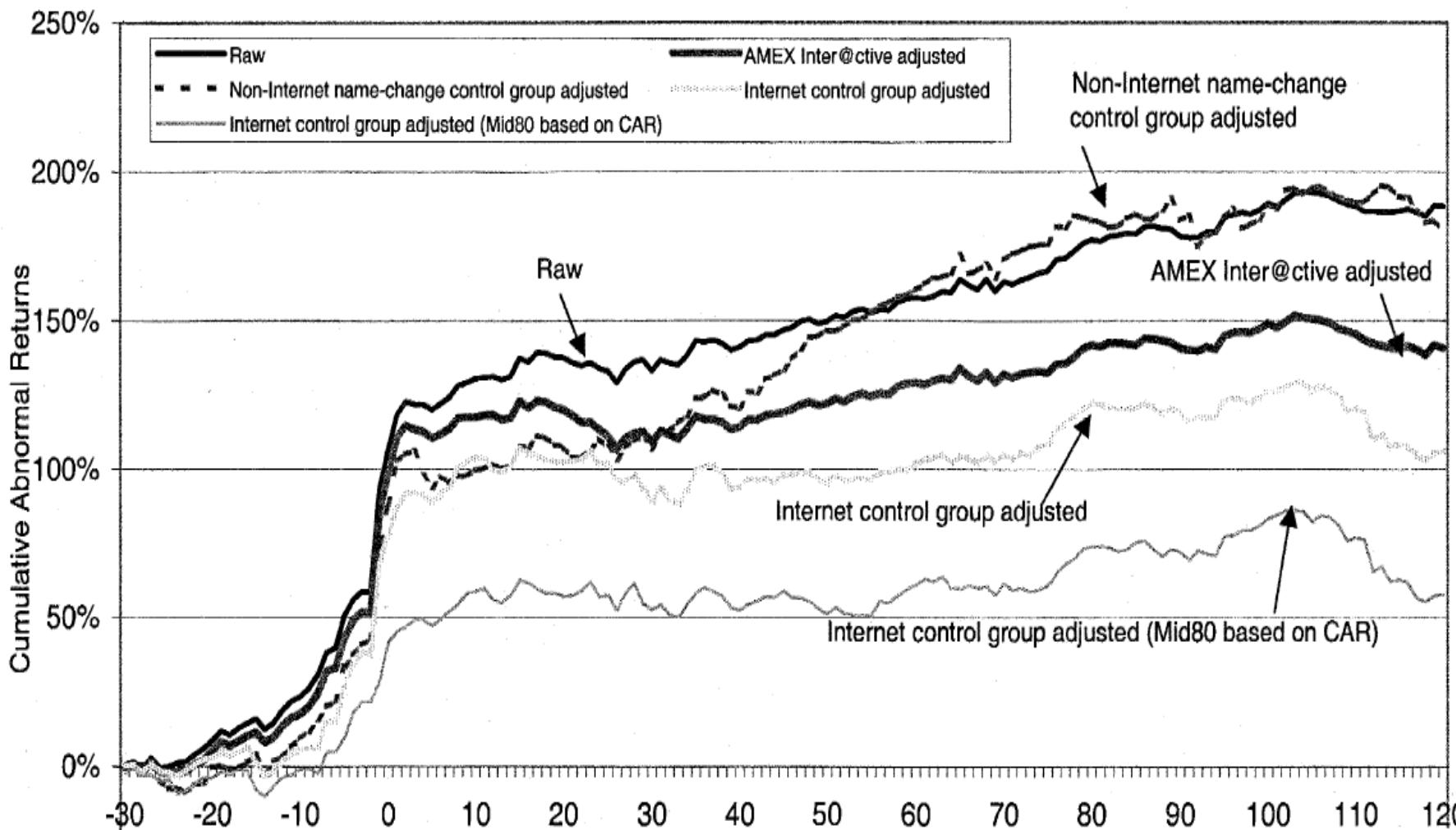
1. 新技术吸引眼球(早期ipo, 早期投资者开始致富, 这吸引眼球)
2. 人们对新技术变得非理性乐观(不知情的投资者争相买入, 股价涨得过高)
3. 过度乐观的期望不会实现, 人们会变得悲观(股市崩盘)
4. 新技术的实际用途被投入使用(新技术通过经济传播)



Taking Advantage of Hype

Cooper, Michael, Orlin Dimitrov and P. Raghavendra Rau 2001. A Rose.com by Any Other Name. Journal of Finance 56(6)2371-2388

In the late 1990s, 59 old economy US firms changes their names to end in “.com”



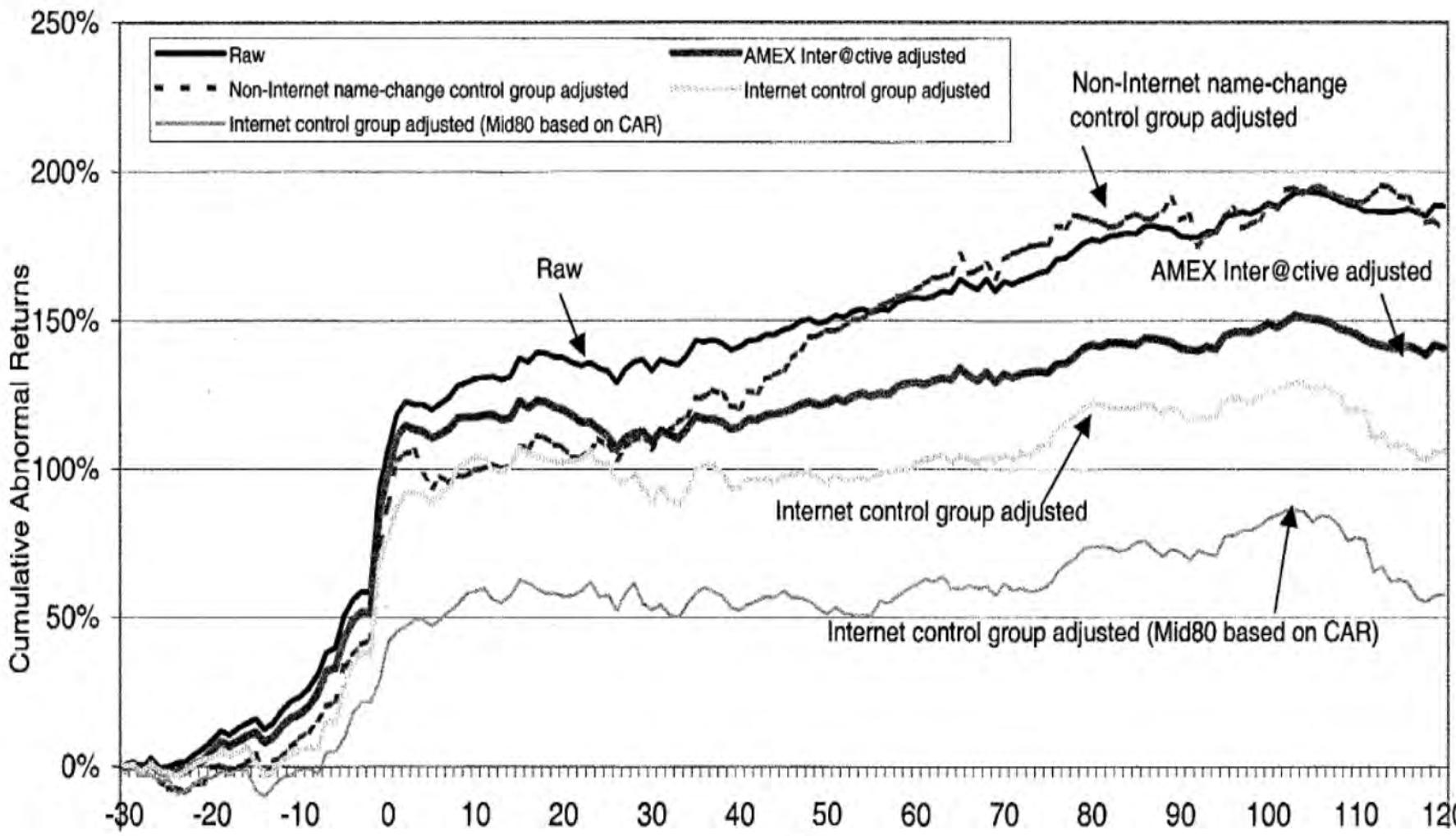
“A Rose by Any Other Name
Smells as Sweet”

- Juliet, In Shakespeare’s
Romeo and Juliet

Taking Advantage of Hype

Michael Cooper, Orlin Dimitrov和P. Raghavendra Rau 2001。A Rose.com by Any Other Name。Journal of Finance 56(6)2371-2388

上世纪90年代末，59家老经济美国公司将公司名称改为以“。com”结尾



“玫瑰换了名字闻起来一样甜”

——莎士比亚《罗密欧与朱丽叶》中的朱丽叶

Central Bank Credit Bubbles in the 2000s?

In 1990s, investors had become accustomed to very high returns

- In 2000s, information technology older, IRRs seemed “too low” to many investors
- The world needed some new high return investment to replace information technology stocks!

In 2000s, high-income central banks adopted rapid money supply growth policies

1. Central banks increased money supply rapidly & used money to buy government (& sometimes firm) bonds
2. Rapid rise in borrowing by individuals, governments & firms because high bond prices → low interest rates

$$P_{bond} = \sum_{t=1}^T \frac{c_t}{(1+r)^t} + \frac{F}{(1+r)^T} \Rightarrow \frac{\partial P_{bond}}{\partial r} = \sum_{t=1}^T \frac{-tc_t}{(1+r)^{t+1}} + \frac{-TF}{(1+r)^{T+1}} \Rightarrow \frac{\partial P_{bond}}{\partial r} < 0$$

3. Banking reforms (Basel 2, 3, 4) replaced rules limiting bank lending with ineffective new rules
 - Reforms also encouraged unregulated “shadow banks” (non-bank firms acting like banks) to lend more
4. People & firms borrowed money to invest in real estate, the new “high return” investment
 - Real estate prices rose rapidly as a real estate “hype cycle” led more uninformed investors to borrow more and invest more in real estate
 - Many banks (& shadow banks) engaged in fraud or near-fraud to profit from rapidly expanding lending
 - Real estate prices crashed in 2008. People & firms who borrowed to buy real estate cannot repay loans
5. Banking crises spread as non-performing loans reduced banks’ income → banking crisis
 - Central banks created more money to buy even more bonds governments issued to raise money for bail outs of troubled banks
6. Sovereign debt crises spread as many governments defaulted (failed to repay bondholders)
 - “Global financial crisis” not truly global: Australia, Canada, Denmark, ... & other countries that limited bank lending & borrowing had only small recession



2000年代的央行信贷泡沫?

上世纪90年代，投资者已经习惯了非常高的回报

在2000年代，信息技术老了，内部收益率对很多投资者来说似乎“太低了”

世界需要一些新的高回报投资来取代信息科技股!

2000年代，高收入央行采取了货币供应快速增长的政策

1. 中央银行迅速增加货币供应，用货币购买政府债券(有时是公司债券)
2. 由于债券价格低迷，个人、政府和企业借贷迅速增加

利

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F

$$PBOND = +\square = +\square <4?? - 55+RT5+RT RT = 55+RT + 55+RT + 5??R$$

() () ——————

3. 银行业改革(巴塞尔协议2,3,4)用无效的新规则取代了限制银行放贷的规则。改革还鼓励了不受监管的“影子银行”(非银行公司，像银行一样行事)~~R~~发放更多贷款

4. 人们^N和公司借钱投资房地产，这是一种新的“高回报”投资

房地产“炒作周期”导致更多不知情的投资者更多地借贷，更多地投资于房地产，房地产价格迅速上涨

许多银行(&影子银行)从事欺诈或近乎欺诈的行为，以从迅速扩张的放贷中获利借钱购买房地产的个人和公司无法偿还贷款

TCT-TF PBOND

5. 银行危机蔓延不良贷款减少银行收入银行危机

央行创造了更多的货币来购买政府发行的更多债券，以筹集资金来救助陷入困境的银行

6. 主权债务危机蔓延，许多政府违约(未能偿还债券持有人)

“全球金融危机”并非真正的全球性:澳大利亚、加拿大、丹麦等限制银行借贷的国家只出现了小规模的衰退



Central Bank “Asset Price” Bubbles in the 2010s

In 2010s, central banks created more money

- Theory = create money to buy bonds → ↑bond prices → ↓ interest rates → ↓ firms' WACCs → more projects have NPV > 0 → ↑ firms' investment → prosperity!
- Interest rates actually became negative in a few countries (e.g. Japan)
- Investment did not increase much, but bond prices became very high
- This increased stock prices too, because

$$P_{stock} = \sum_{t=1}^{\infty} \frac{d_t}{(1 + r_f + \beta(r_m - r_f))^t} \Rightarrow \frac{\partial P_{stock}}{\partial r_f} < 0$$

- Big debate: Were central banks deliberately trying to create financial bubbles with bank regulations & interest rate policies?



2010年代的央行“资产价格”泡沫

2010年代，央行创造了更多的钱——理论=创造了更多的钱来购买债券——债券价格——利率——公司的WACCs——更多的项目NPV > 0——公司的投资——繁荣!

在少数几个国家，利率实际上变成了负值

(如日本)投资并没有增加太多，但债券价格却变得
这也提高了股票价格，因为



PK

PSTOCK =

$$\frac{\text{所得所得的所得，所得所得的所得，}}{\text{所得，所得所得的所得，所得所得的所得，所得所得的所得，所得所得的所得}}$$

大辩论:央行是否故意试图通过银行监管和利率政策制造金融泡沫?

Central Bank Money Creation in COVID Crisis → Inflation

Central banks & governments respond to COVID

- Businesses closed partly or completely & people ordered to stay home → production of goods & services fell
- Governments issued even more bonds to pay subsidies to people & businesses hurt by COVID (& to pay for vaccines, hospitals, ...)
- Central banks created money to buy government bonds to keep interest rates on government bonds low

A big difference: new money used differently

- In 2000s & 2010s: New money used mostly to buy bonds → mostly made bond and stock prices higher
- In COVID Crisis: New money used to help people & firms hurt by COVID buy goods & services, but business closures caused production of goods and services to fall
- More money + fewer goods & services to buy = inflation

Complications: The velocity of money v might also change

- Each dollar is reused many times in a year
- This is because each seller (dollar receiver) buys things (reuses dollars received)
- If money is reused more often, a given M can support a higher Q or cause higher goods and services prices

Inflation basics

$$P_{g\&s} = \frac{\text{money to buy goods}}{\text{things to buy}}$$
$$P = \frac{Mv}{Q}$$

$Q = \text{GDP}$

$M = \text{Money supply}$

$v = \text{velocity (circulation) of money}$

$P_{g\&s} = \text{goods \& services price level}$

Low inflation in 2000 to 2019

$$\uparrow M + \uparrow GDP = \text{small } \Delta P_{g\&s}$$

Main effect = $\uparrow P_{bonds}$ & $\uparrow P_{stocks}$

High inflation in COVID crisis

$$\uparrow\uparrow M + \downarrow\downarrow GDP = \uparrow\uparrow P_{g\&s}$$

Main effect = inflation

COVID危机中的央行货币创造

中央银行和政府应对COVID - 19

企业部分或完全关闭，人们被命令呆在家里

商品和服务的生产下降

政府发行了更多的债券来补贴受到伤害的民众和企业

被COVID - 19感染(并支付疫苗，医院…)

央行印钱购买政府债券以维持利率

政府债券低

一个很大的区别:新钱的用途不同

2000年代和2010年代:新增资金主要用于购买债券，主要用于制造债券

股价走高

在COVID危机中:新的资金用于帮助受COVID伤害的人和公司购买

商品和服务，但企业关闭导致了商品和服务的生产

服务业下降

更多的钱+更少的商品和服务购买=通货膨胀

并发症:货币流通速度Vmight也会发生变化

每一美元在一年中会被重复使用很多次

这是因为每个卖家(美元接收者)买东西(重复使用收到的美元)

如果钱被更频繁地重复使用，一个给定的Mcan支持一个更高的Qor原因

更高的商品和服务价格

通货膨胀的基本知识

MONEYTOBUYGOODS

PG&S=

THINGSTOBUYMV

P=

Q

Q=国内生产总值

M=货币供给

<s:2> =货币的流通速度PG& <s:2> =商品和服务的价格水平

2000年至2019年的低通胀

↑ M+ ↑ GDP=SMALL Δ PG&S主要影

响=↑ PBONDS& ↑ PSTOCKS

COVID危机中的高通胀

↑ ↑ ↑ M+ ↓ ↓ ↓ GDP=↑ ↑ ↑ PG&S主要影响=通货膨胀

Kindleberger Cycles

Kindleberger, Charles. 1977. *Manias, Panics and Crashes*. Wiley.

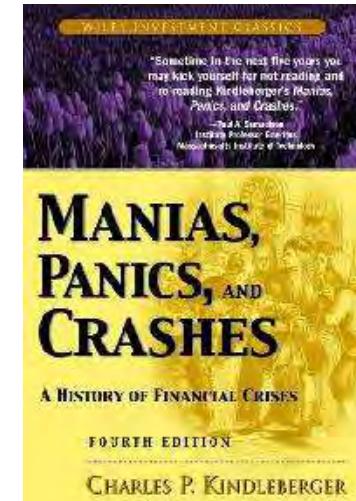


Charles Poor
Kindleberger

All these historical episode have common “mania, panic, crash” trajectory

1. Exogenous shock or displacement

- Something jolts economy out of equilibrium → big new $NPV > 0$ opportunities
 - Usually a new technology (trans-ocean trade, canals, railroads, steel, electricity, internet, ...)
 - Sometimes a new market (Latin America, high-income Asia, ...)
 - Sometimes the start or end of a war that forces changes in trade patterns



Kindleberger Cycles

Charles Kindleberger . 1977。《狂躁、恐慌与崩溃》。威利。

所有这些历史事件都有共同的“狂躁、恐慌、崩溃”轨迹

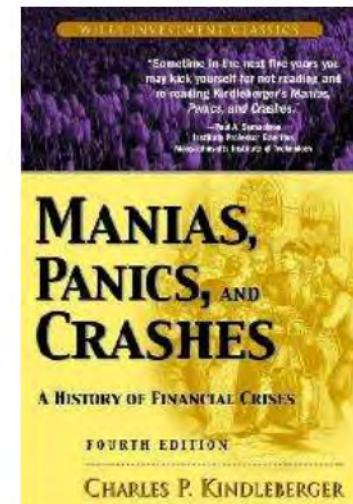
1. 外生冲击或位移

某物使经济失去平衡大的新 $NPV > 0$ 机会通常是新技术(跨洋贸易、运河、铁路、钢铁、电力、互联网, …)有时是新市场(拉丁美洲、高收入的亚洲, …)

有时战争的开始或结束会迫使贸易模式发生变化



Charles Poor
Kindleberger



Often, Cause Is a New General Purpose Technology

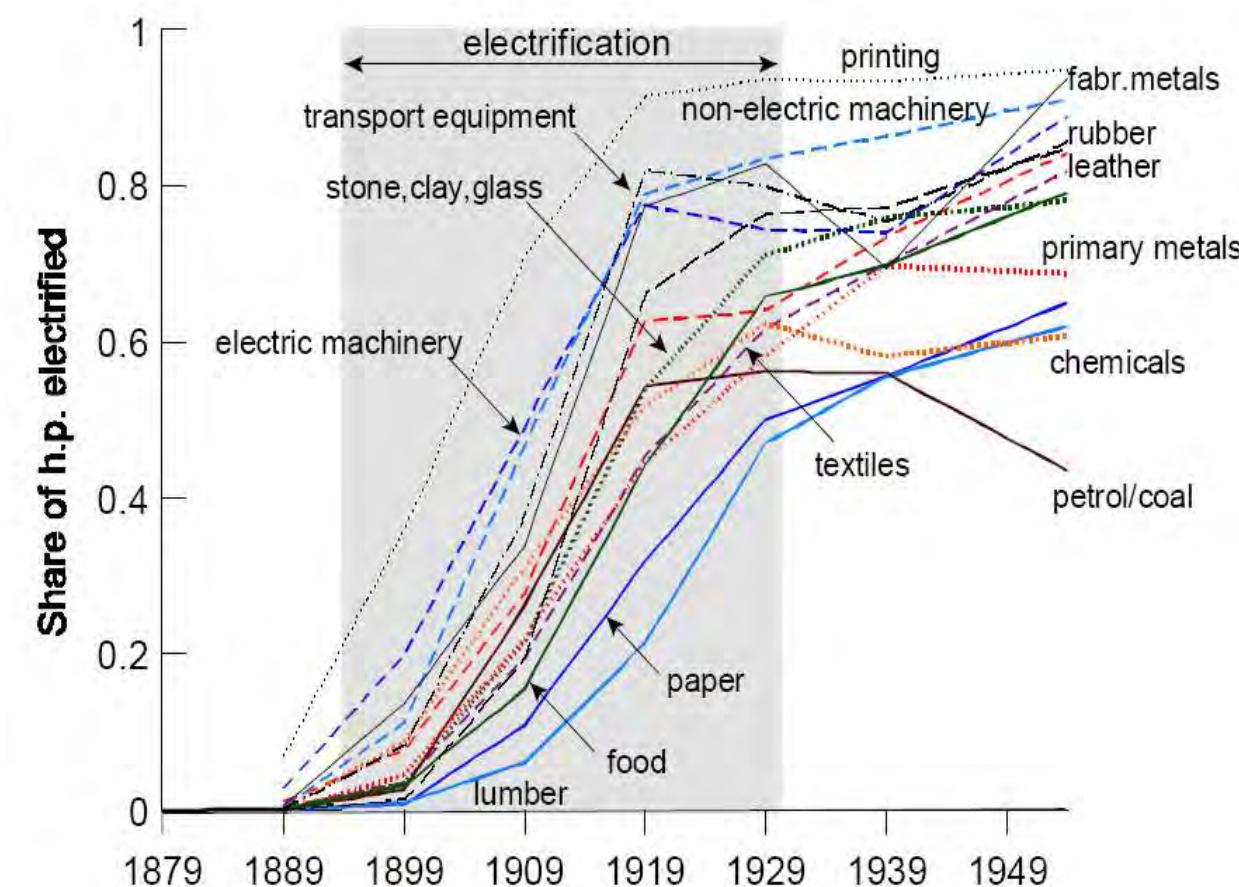
Bresnahan, T.F. & Trajtenberg, M. 1995. General purpose technologies 'Engines of growth'? *Journal of Econometrics* 65(1):83-108

Helpman, Elhanan, ed. 1998. General purpose technologies & economic growth. MIT Press

Jovanovic, Boyan & Peter L. Rousseau. 2005. General purpose technologies. In *Handbook of Economic Growth* V. 1, 1181-1224. Elsevier

Lipsey, Richard G., Kenneth I. Carlaw & Clifford T. Bekar. 2005. Economic transformations: general purpose technologies & long-term economic growth. Oxford University Press.

- The new high tech industries in both the 1920s & 1990s are called general purpose technologies because they created lots of $NPV > 0$ investment opportunities for firms in many other industries
 - 1920s Electric power grids → electric home appliances, electric machinery, sale of food needing refrigeration, record players, recorded music, home radios, ...
Radio → advertising, radio program making, radio stations, electric starters in automobiles, ...
Automobiles → road building, motels, roadside restaurants, rubber production, trucking, ...
 - 1990s Personal computer → computer inventory control, word processing, statistical analysis, internet, ...
Internet → streaming audio & video, blogs, Amazon.com, Cell phones → better communication, apps, social media, Google maps, ...
- This may also have been true for previous high-tech industries prominent in financial market manias – e.g. trans-ocean shipping, canals, railroads, steam engines, ...



通常, Cause是一种新的通用技术

Bresnahan, T.F. & Trajtenberg, M. 1995。通用技术“增长引擎”?计量经济学学报(Journal of Econometrics) 65(1)83-108

Helpman, Elhanan, 主编。1998。通用技术与经济增长。麻省理工学院出版社

Jovanovic, Boyan & Peter L. Rousseau. 2005。通用技术。见《经济增长手册》V. 1,1181 -1224。爱思唯尔

Lipsey, Richard G., Kenneth I. Carlaw & Clifford T. Bekar, 2005。经济转型:通用技术与长期经济增长。牛津大学出版社。

20世纪20年代和90年代的新兴高科技产业被称为通用技术, 因为它们为许多其他行业的公司创造了大量NPV>0的投资机会

<1>电力网络、家用电器、电气

机械, 需要冷藏的食品的销售, 记录
播放器、录制好的音乐、家用收音机……

收音机:广告、广播节目制作、收音机

电台、汽车上的电动启动器、……

汽车—道路建设、汽车旅馆、路边

餐馆、橡胶生产、卡车运输……

<1> 1990年代个人电脑→电脑库存控制、文字

加工, 统计分析, 互联网, …

互联网—流媒体音频和视频、博客、亚马逊网站、

手机-更好的沟通, 应用程序, 社交媒体,

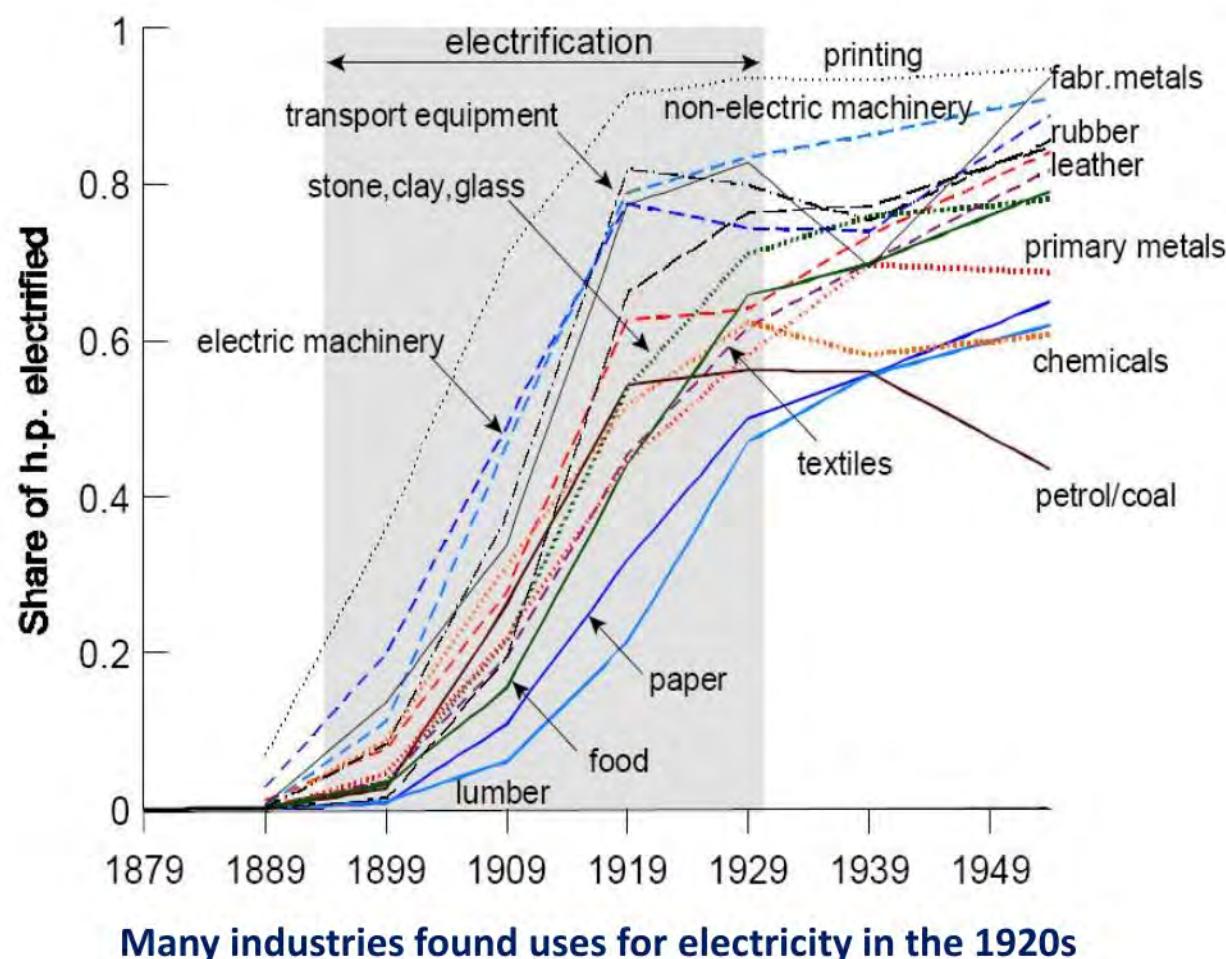
谷歌地图, ……

之前的高科技可能也是如此

金融市场狂热中突出的行业——

如跨洋航运、运河、铁路、蒸汽

引擎, …



Kindleberger Cycles

Kindleberger, Charles. 1977. *Manias, Panics and Crashes*. Wiley.

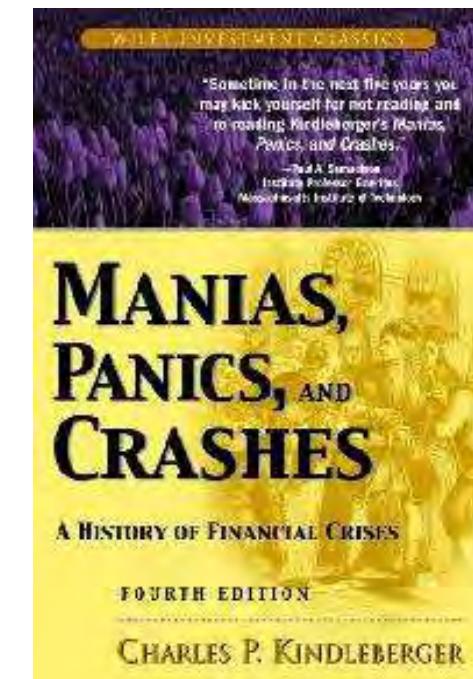
All these historical episode have common “mania, panic, crash” trajectory

1. Exogenous shock or displacement
2. Overexpansion

- Capital flows to fund new $NPV > 0$ projects
 - Initial investors' in $NPV > 0$ firms earn high returns, attract uninformed investors' attention
- Uninformed investors want to get rich too (“envy” rather than “greed” driven?)
 - They buy stocks they view as related to the new technology e.g. the “next Microsoft”
 - They often borrow money to do this; lenders lend too much money to uninformed investors
- Uninformed investors do not consider risk (risk = OFF thinking)
 - Risk misperception: “Bill Gates got rich, so it can't be that risky!”
 - Actually, most early PC firms went broke; Microsoft was one of the few survivors
- Uninformed investors pressure politicians for financial deregulation
 - Financial regulations stop uninformed people from investing in high-risk securities
 - At this time, uninformed investors very much want to invest in high risk securities
 - Regulators respond to popular pressure & deregulate
 - Even more borrowing lets uninformed investors buy even more high-risk securities



Charles Poor Kindleberger



Kindleberger Cycles

Kindleberger, Charles. 1977. Manias, Panics and Crashes. Wiley.

所有这些历史事件都有共同的“狂躁、恐慌、崩溃”轨迹1。
外生冲击或位移

2. 过度膨胀

资本流向新的NPV大于0的项目

NPV > 0的公司的初始投资者获得高回报，吸引不知情的投资者的注意(“嫉妒”而不是
“贪婪”驱动?)

他们经常借钱来做这件事;放款人把太多钱借给不知情的投资者。不知情的投资者不
考虑风险(风险= OFF思维)

风险误区: “比尔·盖茨发财了，所以不可能有那么大的风险!”

实际上，大多数早期的PC公司都破产了;微软是为数不多的幸存者之一

金融监管阻止不知情的人投资高风险证券

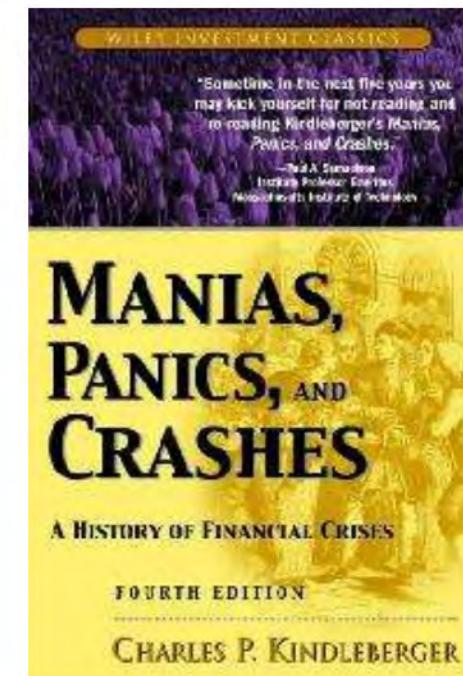
在这个时候，不知情的投资者非常想投资高风险证券

监管机构回应大众压力，放松监管

更多的借贷让不知情的投资者购买更高风险的证券



Charles Poor Kindleberger



Kindleberger Cycles

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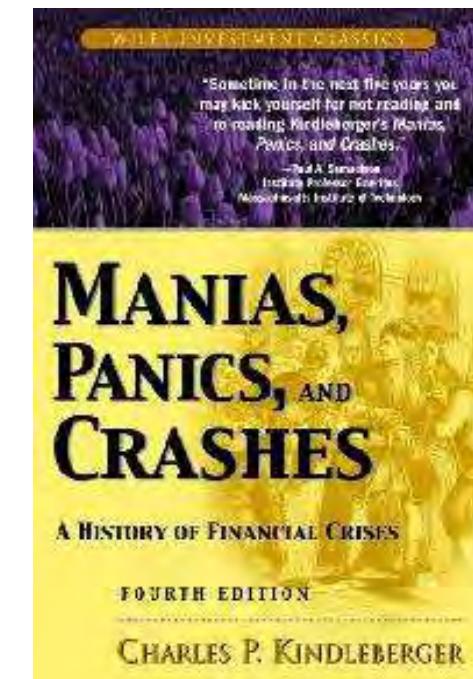
All these historical episode have common “mania, panic, crash” trajectory

1. Exogenous shock or displacement
2. Overexpansion
3. Overtrading

- Investor buying raises security prices, which increases investor buying, which increases securities prices, which increases investor buying, which ...
- Rising securities prices make uninformed investors feel richer, so they borrow more to buy even more securities to push securities prices up even more, which causes them to borrow more, which ...
- New “financial innovations” are developed to let people borrow even more money and more easily buy high-risk securities
 - Buying on margin invented in 1920s bull market
 - Closed end funds invented in 1920s bull market
 - Mutual funds invented in 1960s bull market
 - Junk bonds invented in 1980s bull market
 - ETFs invented in 1990s bull market
 - Mortgage-backed securities, credit default swaps, etc. invented in early 2000s bull market



Charles Poor Kindleberger



Kindleberger Cycles

查尔斯·金德尔伯格，1977。《狂躁、恐慌与崩溃》。威利。

所有这些历史事件都有共同的“狂躁、恐慌、崩溃”轨迹

1. 外源性冲击或位移
2. 过度膨胀
3. 过量交易

投资者买入推高了证券价格，进而推高了投资者买入，进而推高了证券价格，进而推高了投资者买入，这……

→上涨的证券价格让不知情的投资者觉得自己更有钱了，于是他们借更多的钱去买更多的证券，从而把证券价格推得更高，这又导致他们借更多的钱，这……

新的“金融创新”被开发出来，让人们借到更多的钱，更容易买到高风险证券

在20世纪20年代的牛市中发明的保证金购买

20世纪20年代牛市中发明的封闭式基金

共同基金发明于20世纪60年代的牛市

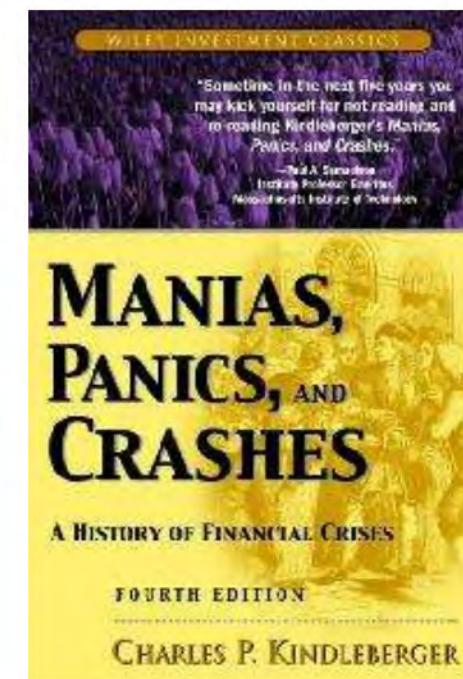
20世纪80年代牛市中发明的垃圾债券

etf是在上世纪90年代牛市中发明的

00年代初牛市发明的抵押贷款支持证券、信用违约掉期等



Charles Poor Kindleberger



Kindleberger Cycles

Kindleberger, Charles. 1977. *Manias, Panics and Crashes*. Wiley.

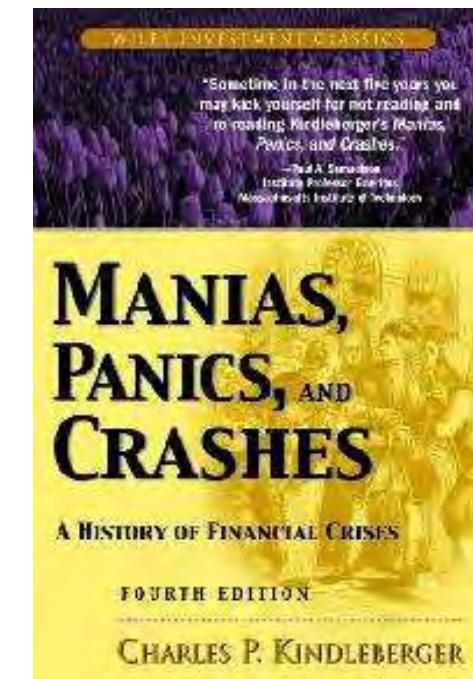
All these historical episode have common “mania, panic, crash” trajectory

1. Exogenous shock or displacement
2. Overexpansion
3. Overtrading
4. Mania

- Prices keep rising on wishful thinking & fraudulent accounting
- Hype becomes extreme, “new age” thinking about how “this changes everything”
 - Groupthink (people want to believe what their friends believe)
 - TV “experts” want to appear to understand what is happening, devise many explanations
- Firms receiving investors’ money start doing obviously foolish things
 - Huge corporate takeovers, multinational expansions, etc. with $E[NPV] < 0$
 - Firms whose actual profits are low try to keep investors happy by engaging in small accounting frauds. Small accounting frauds covered up with bigger frauds
- Criminals see opportunities to cheat over-enthusiastic uninformed investors. Ponzi schemes grow rapidly



Charles Poor Kindleberger



Kindleberger Cycles

查尔斯·金德尔伯格，1977。《狂躁、恐慌与崩溃》。威利。

所有这些历史事件都有共同的“狂躁、恐慌、崩溃”轨迹

1. 外源性冲击或位移
2. 过度膨胀
3. 过量交易
4. 躁狂

由于一厢情愿的想法和欺诈的会计，价格不断上涨

炒作变得极端，“新时代”思维如何“这改变了一切”

TV “专家”想要表现得明白正在发生的事情，设计出许多解释

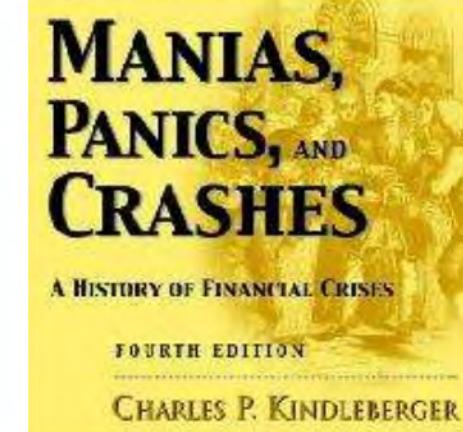
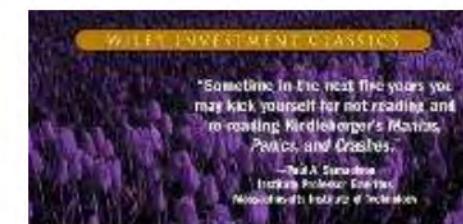
获得投资者资金的公司开始做一些明显愚蠢的事情。通过 $E[NPV] <$ 进行大规模的公司收购、跨国公司扩张等

实际利润较低的公司试图通过一些小的会计欺诈来取悦投资者。用更大的欺诈掩盖小的会计欺诈

犯罪分子看到了欺骗过于热情的不知情投资者的机会。庞氏骗局迅速增长



Charles Poor Kindleberger



Kindleberger Cycles

Kindleberger, Charles. 1977. *Manias, Panics and Crashes*. Wiley.

All these historical episode have common “mania, panic, crash” trajectory

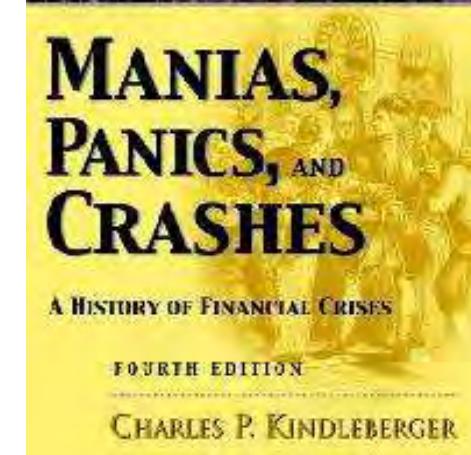
1. Exogenous shock or displacement
2. Overexpansion
3. Overtrading
4. Mania
5. Minsky moment

Minsky, Hyman. 2015. *Can "it" happen again?* Routledge

- At some point, everyone realizes the world is crazy
- There is usually no news of any importance on the day the bubble bursts.



Charles Poor Kindleberger



Kindleberger Cycles

Kindleberger, Charles. 1977. Manias, Panics and Crashes. Wiley.

所有这些历史事件都有共同的“狂热、恐慌、崩溃”轨迹

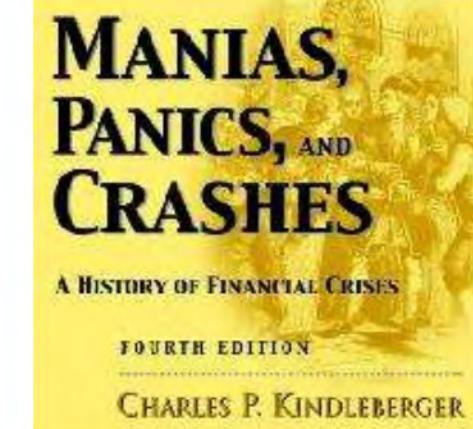
1. 外源性冲击或位移
2. 过度膨胀
3. 过量交易
4. 躁狂
5. 明斯基时刻

海曼·明斯基, 2015。 “它”会再次发生吗?劳特利奇

在某些时候, 每个人都意识到这个世界是疯狂的
在泡沫破裂的那一天, 通常不会有任何重要的消息。



Charles Poor Kindleberger



Kindleberger Cycles

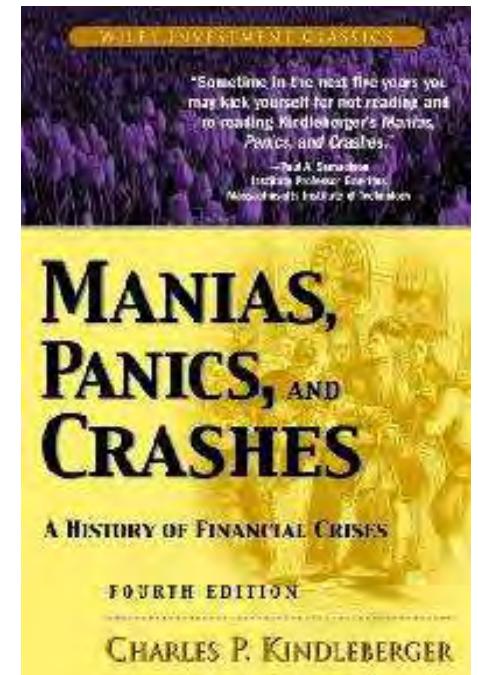
Kindleberger, Charles. 1977. *Manias, Panics and Crashes*. Wiley.

All these historical episode have common “mania, panic, crash” trajectory

1. Exogenous shock or displacement
2. Overexpansion
3. Overtrading
4. Mania
5. Minsky moment
6. Panic
 - Investors very suddenly hyper-aware of risk (Risk = ON thinking)
 - Reasoning = If I sell first, price will not have gone down very much
 - If I wait to sell, price will have gone down and I will lose more money
 - Everyone wants to be the first to sell, so everyone sells immediately
 - Securities prices that went up slowly (in 2, 3 & 4) now fall all at once
 - Ponzi schemes are exposed when people try to sell fraudulent securities
 - Investors, now concerned about risk and fraud, pay more attention and more frauds are discovered



Charles Poor Kindleberger



Kindleberger Cycles

查尔斯·金德尔伯格，1977。《狂躁、恐慌与崩溃》。威利。

所有这些历史事件都有共同的“狂躁、恐慌、崩溃”轨迹

1. 外源性冲击或位移
2. 过度膨胀
3. 过量交易
4. 躍狂
5. 明斯基时刻
6. 恐慌

投资者非常突然地高度意识到风险(风险= ON思维)

如果我先卖出，价格就不会下跌太多

如果我等着卖，价格就会下降，我会损失更多的钱

每个人都想成为第一个卖出的人，所以每个人都会立即卖出

缓慢上涨(2、3、4年)的证券价格现在同时下跌

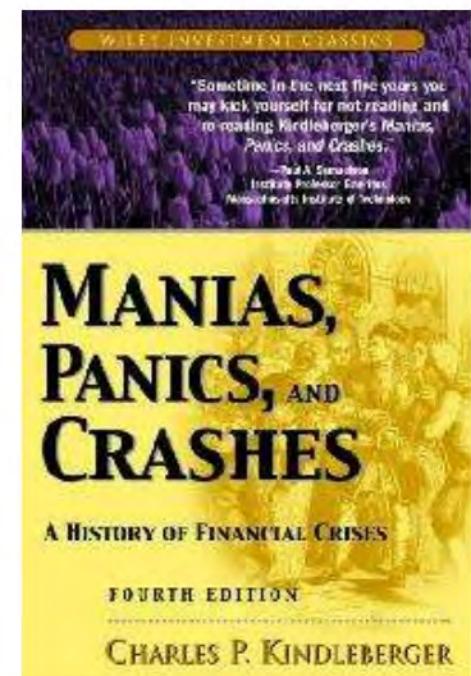
当人们试图出售欺诈性证券时，庞氏骗局就暴露了

投资者，现在担心风险和欺诈，关注越来越多

欺诈被发现



查尔斯·可怜的金德尔伯格



Kindleberger Cycles

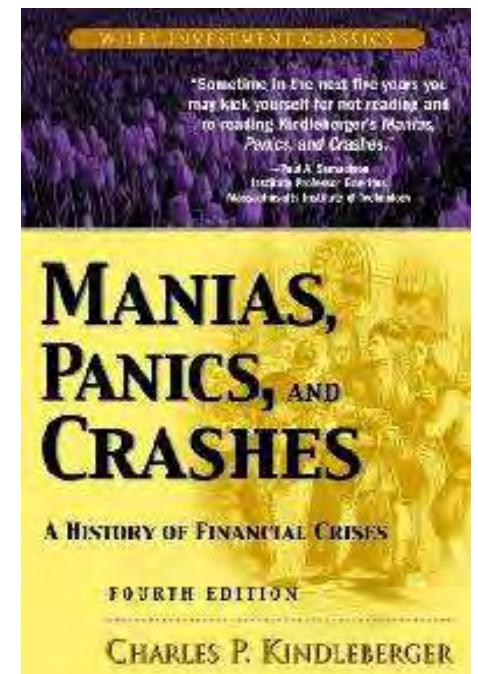
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All these historical episode have common “mania, panic, crash” trajectory

1. Exogenous shock or displacement
 2. Overexpansion
 3. Overtrading
 4. Mania
 5. Minsky moment
 6. Panic
 7. Crash
- Investors selling → prices fall → more selling → more price declines → ...
 - Groupthink (I do what my friends do) → more selling
 - Same TV “experts” devise new explanations about why prices must fall
 - Investors who borrowed to buy stocks (bought on margin) cannot repay loans
 - Borrowers default & lenders (ultimately banks) lose money, cut lending even to healthy firms
 - Banks and healthy firms are both in trouble, at risk of going bankrupt
 - Banks & firms ask for government bailouts
 - Governments issue T-bills, T-notes, T-bonds to get money to bail out banks
 - Governments find they cannot pay bondholders (sovereign debt crisis)



Charles Poor Kindleberger



Kindleberger Cycles

查尔斯·金德尔伯格，1977。《狂躁、恐慌与崩溃》。威利。

所有这些历史事件都有共同的“狂躁、恐慌、崩溃”轨迹

1. 外源性冲击或位移

2. 过度膨胀

3. 过量交易

4. 躍狂

5. 明斯基时刻

6. 恐慌

7. 崩溃

投资者卖出、价格下跌、卖出、价格下跌、

群思(我做我朋友做的事)更多卖

同样是电视上的“专家”，对于价格为什么一定会下跌，想出了新的解释

借钱购买股票(保证金购买)的投资者无法偿还贷款

借款人违约，贷款人(最终是银行)赔钱，甚至减少对健康公司的贷款

银行和健康的公司都陷入困境，面临破产的风险

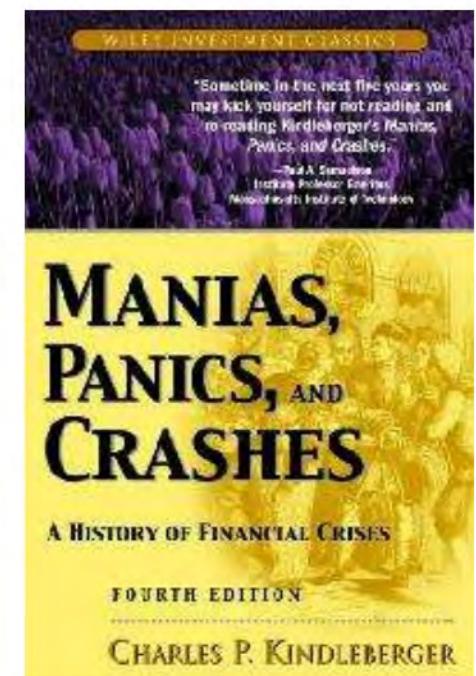
银行和公司要求政府救助

政府发行短期国库券、短期国库券、短期国库券以获得资金来救助银行

政府发现他们无法支付债券持有人(主权债务危机)



Charles Poor Kindleberger



Moral Hazard Problem (another Prisoner's Dilemma)

Holmstrom, Bengt. 1979. Moral hazard and observability. Bell journal of Economics 10(1)74-91

Should governments bail out banks that lent too much money to high-risk borrowers?

- Optimal government bank bailout policy = “Do bank bailouts” (avoid economy collapse)
- Banks know this, so banks’ optimal lending policy is high-risk high-return lending (high profits if no crisis, government bailout if there is a crisis), which increases probability of a crisis
- Moral hazard = promise of bailout causes people to take more risks & need more bailouts

| | | Government policy on bank bailouts | |
|---------------------|-------------------------------|---|--|
| | | Do bank bailouts | No bank bailouts |
| Bank lending policy | High-risk high-return lending | No crisis: bank profits high economy OK Crisis: bailout money from government economy not so bad | No crisis: bank profits high economy OK Crisis: banks close economy collapses |
| | Low risk low-return lending | No crisis: bank profits low economy OK Crisis: banks OK economy not so bad | No crisis: bank profits low economy OK Crisis: banks OK economy not so bad |

道德风险问题(另一种囚徒困境)

本特·霍姆斯特罗姆, 1979。《道德风险与可观察性》。贝尔经济学杂志10(1)74-91

政府是否应该救助那些向高风险借款人放贷过多的银行?

最优的政府银行救助政策=“是否救助银行”(避免经济崩溃)

银行知道这一点, 所以银行的最优贷款政策是高风险的高回报贷款(无危机时高利润, 有危机时政府救助), 这增加了危机发生的概率

道德风险=救助承诺导致人们承担更大风险&需要更多救助

政府对银行救助的政策

| | | Do bank bailouts | No bank bailouts |
|---------------------|-------------------------------|---|--|
| | | No crisis: bank profits high economy OK | No crisis: bank profits high economy OK |
| Bank lending policy | High-risk high-return lending | Crisis: bailout money from government economy not so bad | Crisis: banks close economy collapses |
| | Low risk low-return lending | No crisis: bank profits low economy OK | No crisis: bank profits low economy OK |
| | | Crisis: banks OK economy not so bad | Crisis: banks OK economy not so bad |

Kindleberger Cycles

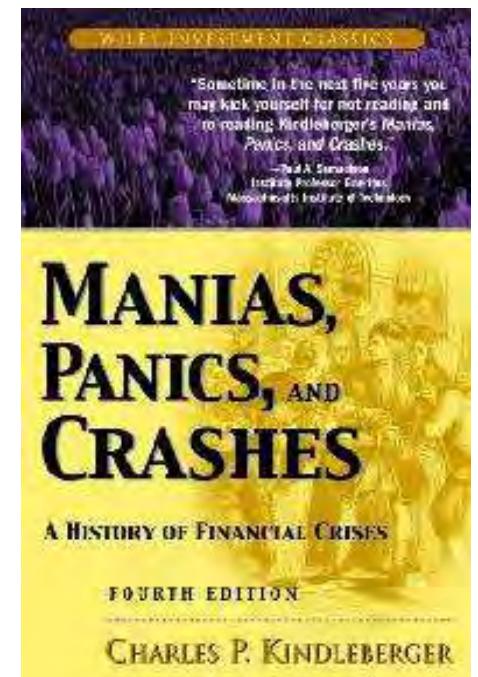
Kindleberger, Charles. 1977. *Manias, Panics and Crashes*. Wiley.

All these historical episode have common “mania, panic, crash” trajectory

1. Exogenous shock or displacement
2. Overexpansion
3. Overtrading
4. Mania
5. Minsky moment
6. Panic
7. Crash
8. Collapse & regulatory overreaction
 - Economic downturn makes people poorer & hyper-aware of risk
 - Investors avoid high-risk assets, flight to safety
 - Capital no longer available for high-risk sound ($NPV > 0$) projects, so growth slows
 - Investors blame government for not protecting them, demand tough new regulations
 - Governments enact complicated new regulations (costly to firms & investors)
 - Governments raise taxes to pay off government debts from bailouts



Charles Poor Kindleberger



Kindleberger Cycles

查尔斯·金德尔伯格，1977。《狂躁、恐慌与崩溃》。威利。

所有这些历史事件都有共同的“狂热、恐慌、崩溃”轨迹

1. 外源性冲击或位移

2. 过度膨胀

3. 过量交易

4. 躁狂

5. 明斯基时刻

6. 恐慌

7. 崩溃

8. 崩溃和监管反应过度

经济衰退使人们更穷，风险意识更强

投资者规避高风险资产，逃往安全地带

资金不再可用于高风险稳健($NPV > 0$)项目，因此增长放缓

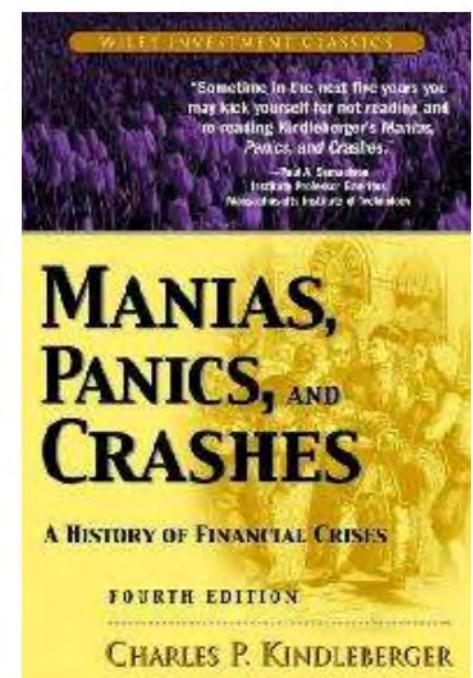
投资者指责政府没有保护他们，要求出台更严格的新规定

政府制定复杂的新法规(对公司和投资者来说代价高昂)

政府通过增税来偿还政府救助带来的债务

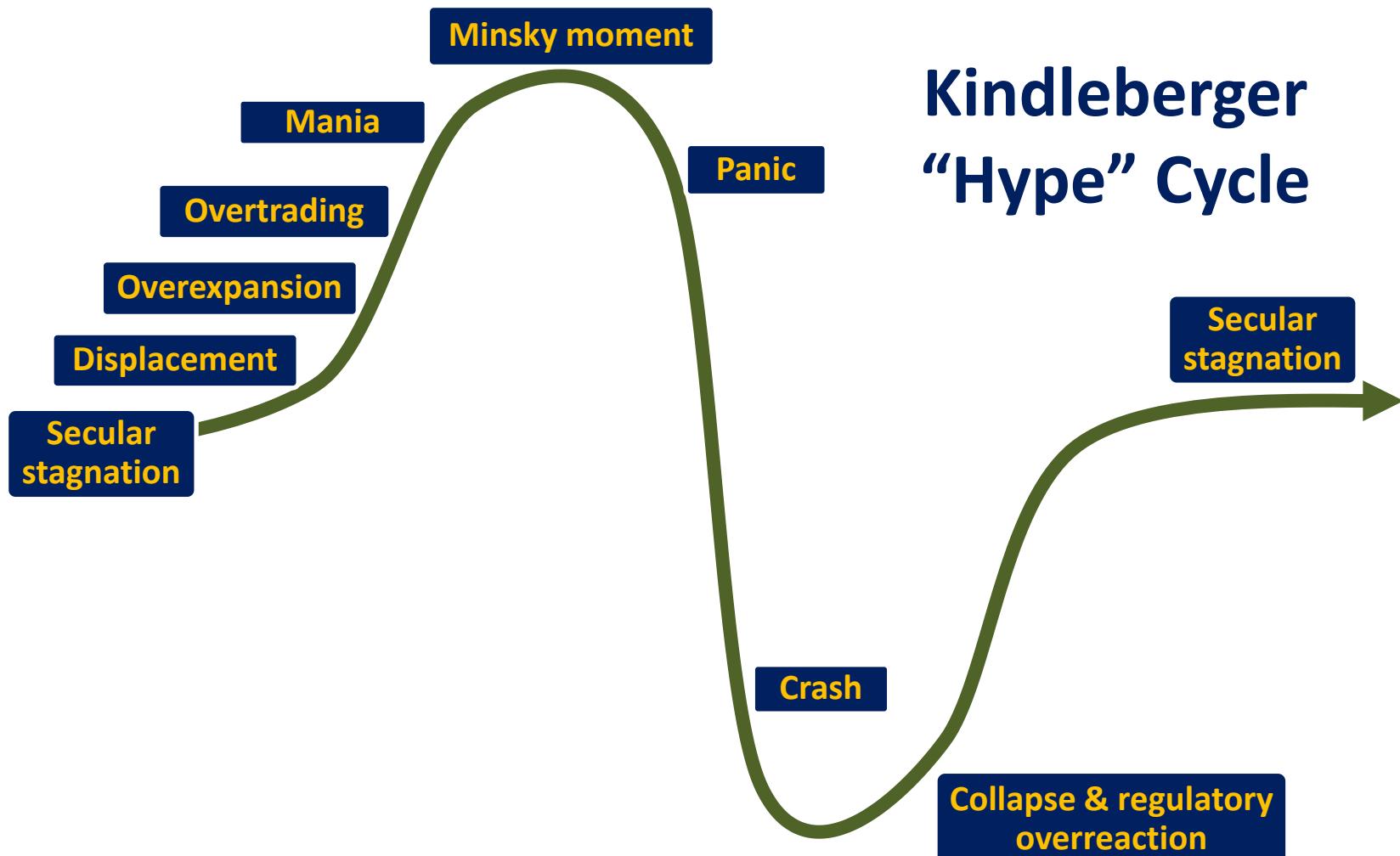


Charles Poor Kindleberger报道



How to Think about Inefficient Markets

- Behavioral Finance is the part of finance theory that tries to modify standard economics & finance equations to explain these historical patterns



Kindleberger “Hype” Cycle

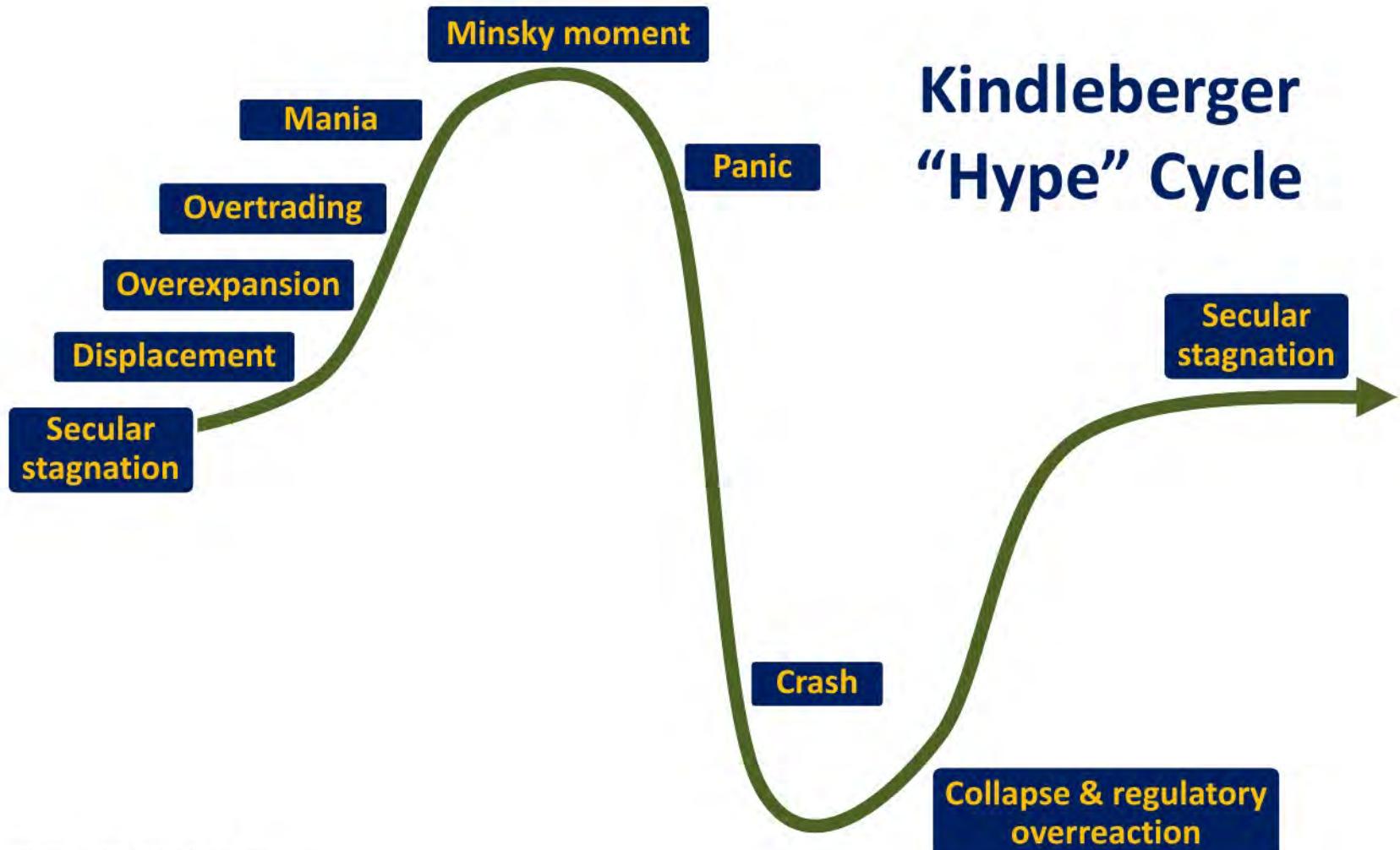


Yes, they're all fools, But the question remains - What kind of fools are they?

How to Think about Inefficient Markets

行为金融学是金融理论的一部分，它试图修改标准的经济学和金融学方程来解释这些问题

历史模式

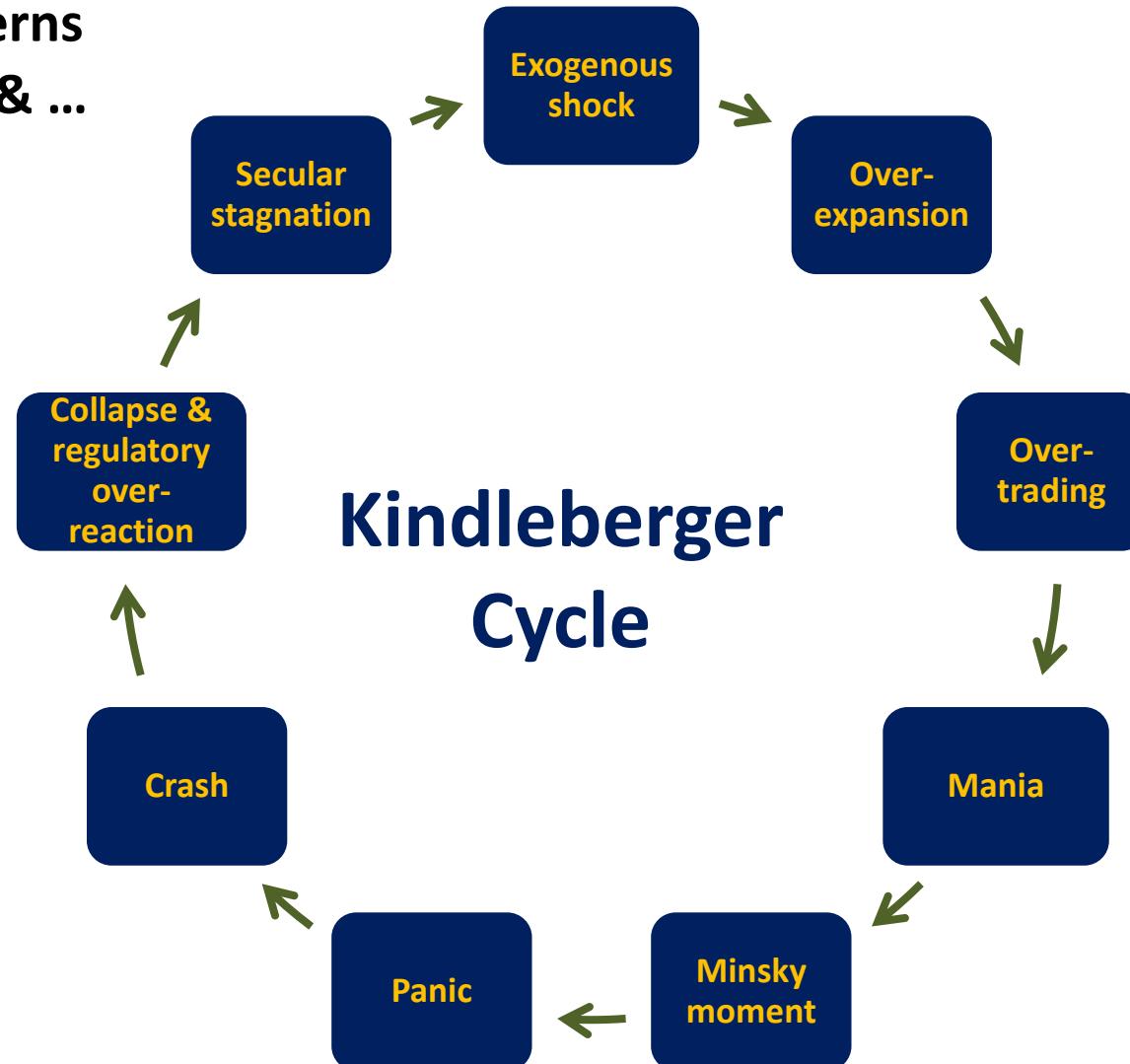


是的，他们都是傻瓜，但问题是——什么样的傻瓜

他们都是傻瓜吗？

How to Think about Inefficient Markets

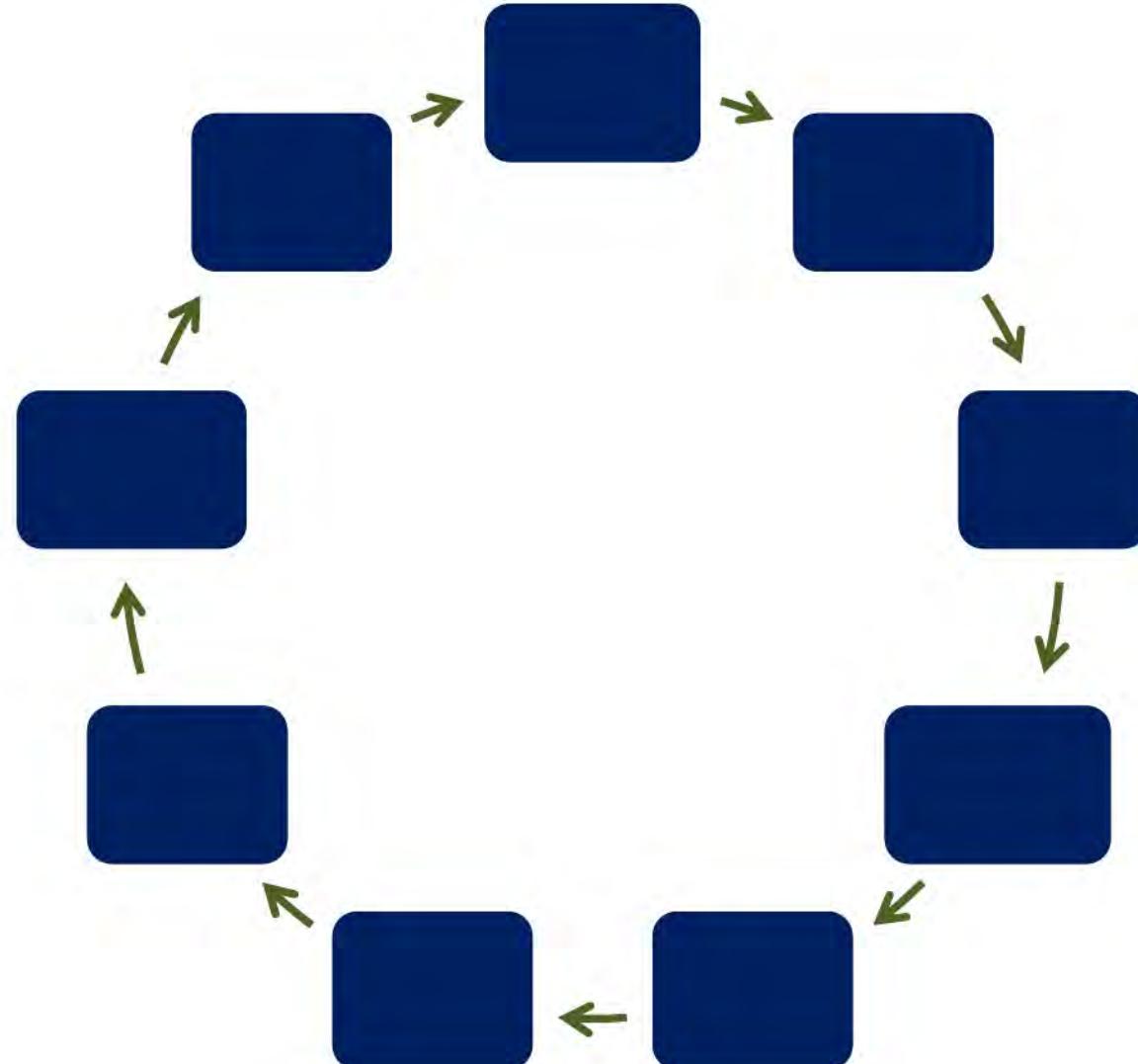
- Behavioral Finance is the part of finance theory that tries to modify standard economics & finance equations to explain these historical patterns
- Again & again & ...



Yes, they're all fools, But the question remains - What kind of fools are they?

How to Think about Inefficient Markets

行为金融学是金融理论的一部分，它试图
修改标准的经济学和金融学方程来解释这些

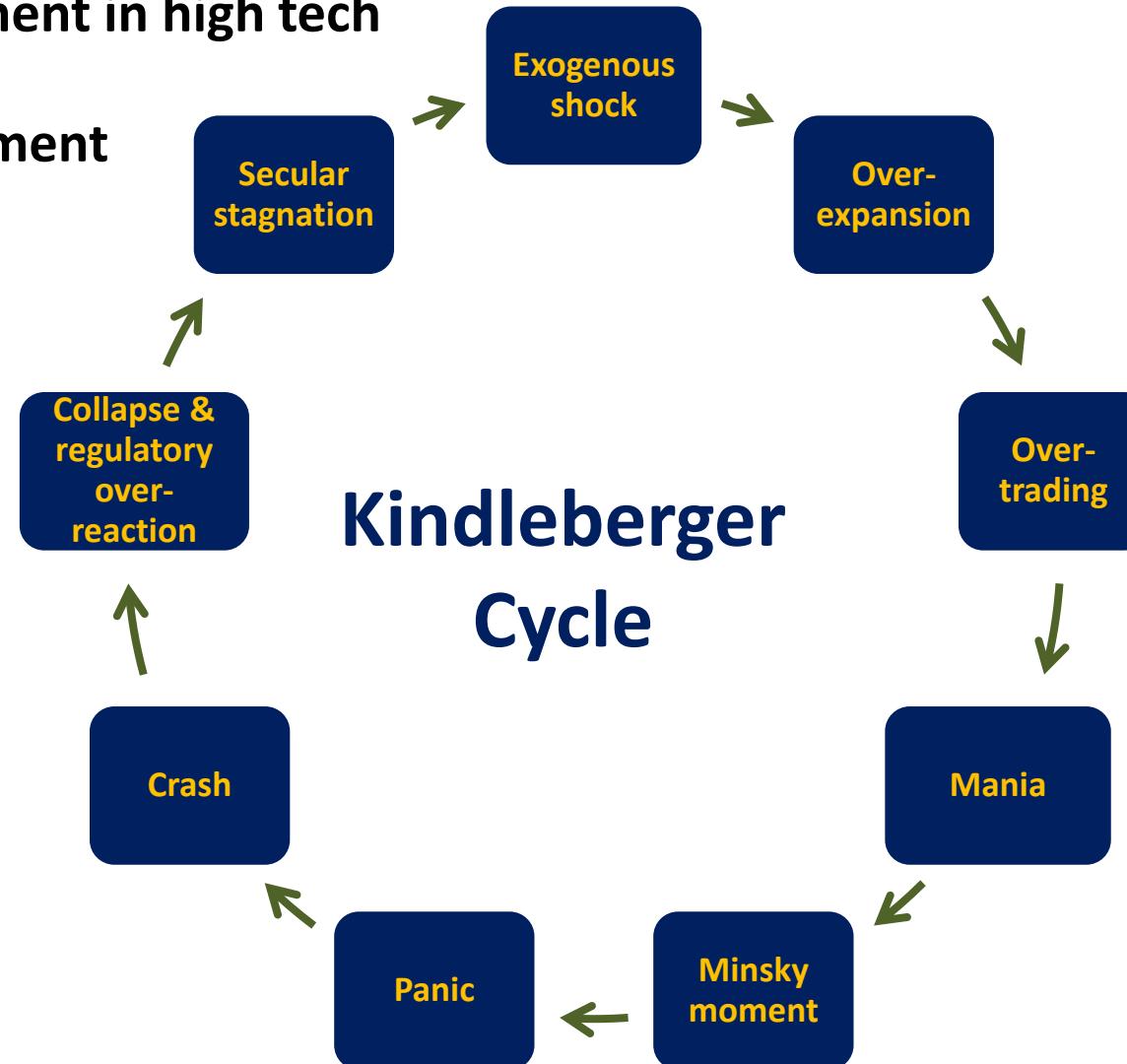


是的，他们都是傻瓜，但问题是——
什么样的傻瓜
他们都是傻瓜吗？

Pandemic Economy

Current global downturn is not part of a normal Kindleberger cycle

- We were not in a “mania” stage in December 2019, we were in a “secular stagnation” phase
- No overinvestment in high tech
- No overtrading
- No Minsky Moment

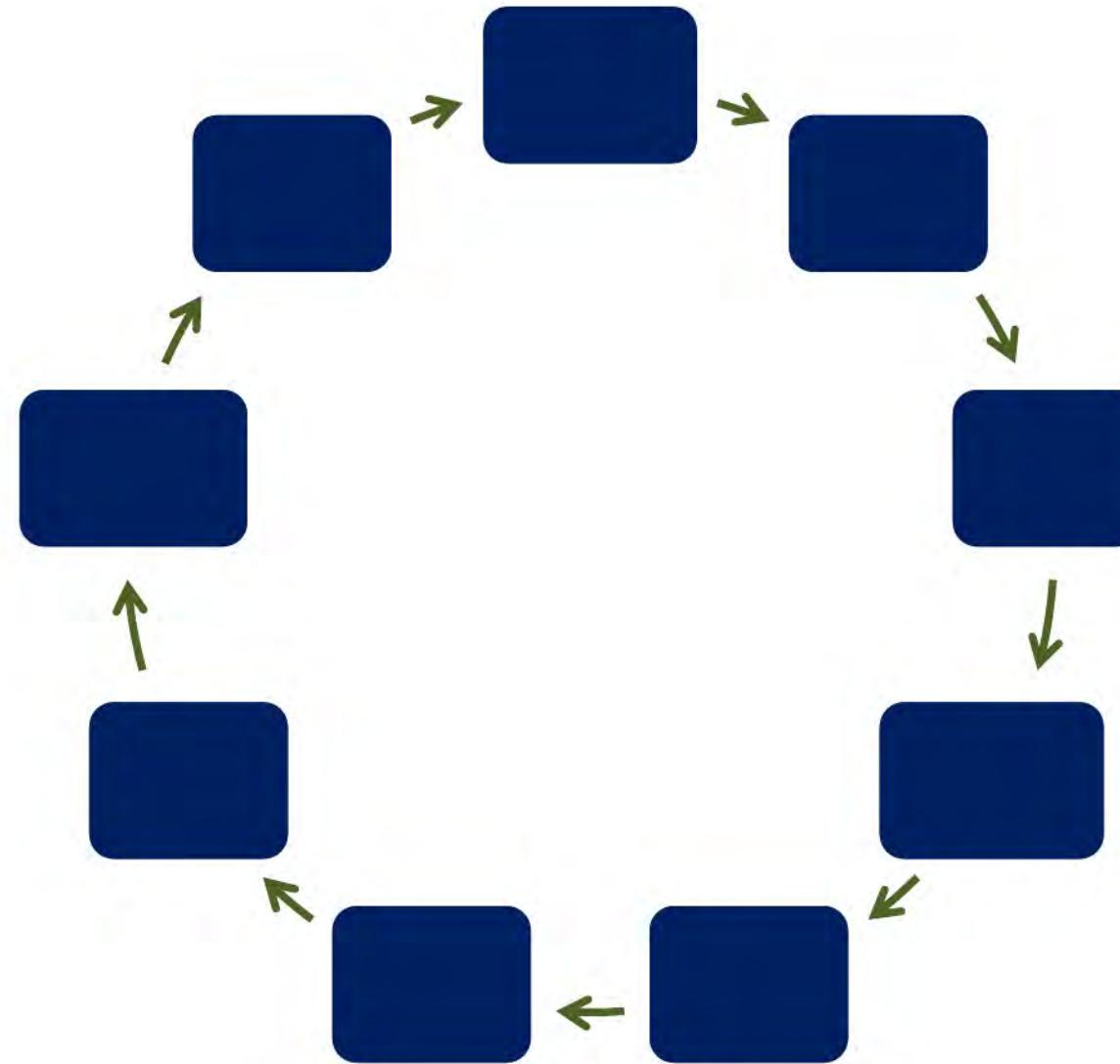


Realistic revaluation of stocks?
Or Panic & Fear?



流行经济

当前的全球经济低迷并非正常的金德尔伯格周期的一部分



Part 1: Behavioral Finance & Inefficient Markets



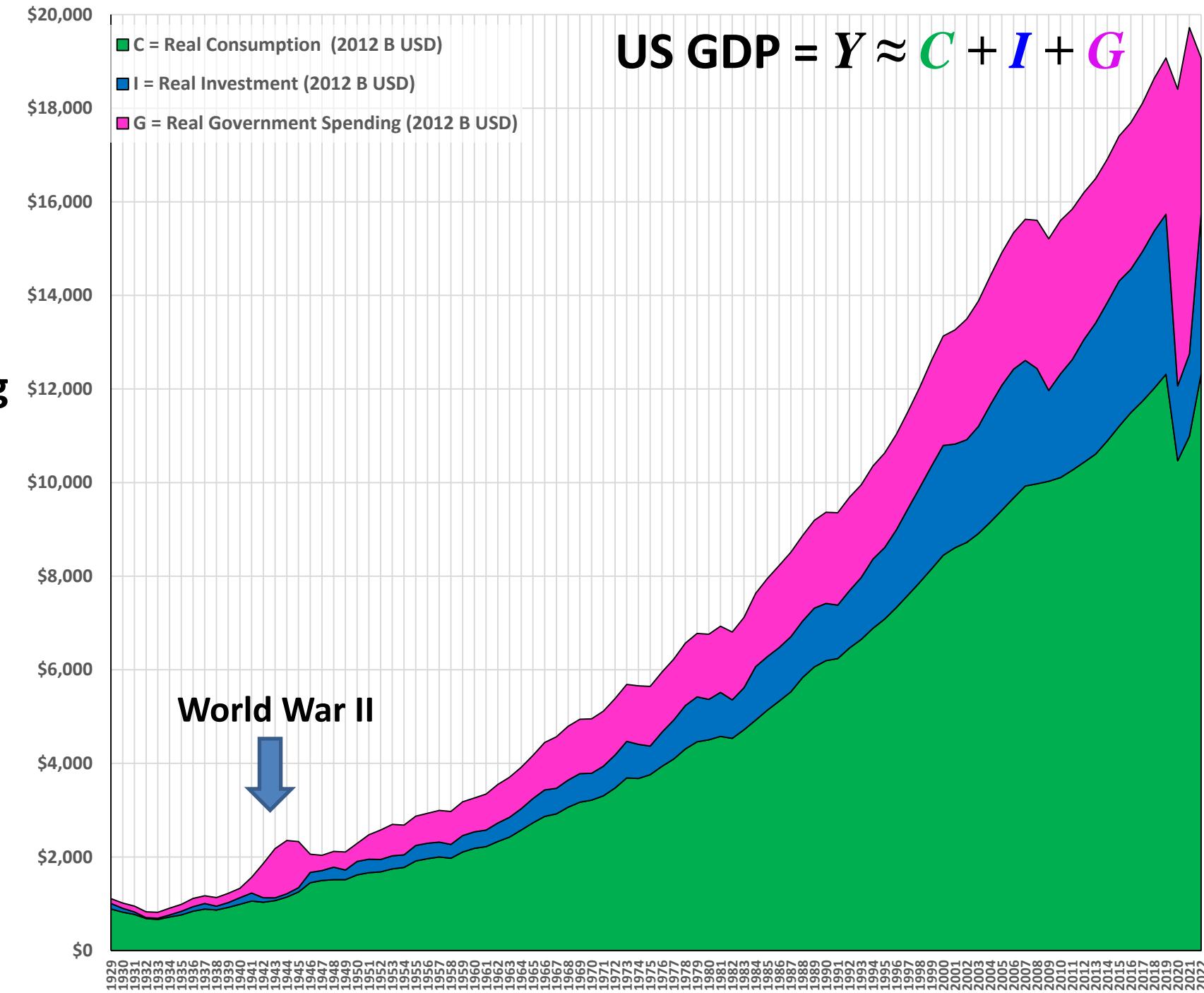
Part 1: Behavioral Finance & Inefficient Markets



World War II

Economic implications

- Wartime command economy (government intervention to direct private companies)
- Companies stopped making ordinary products & made airplanes, missiles, warships, etc. which were destroyed in the war
- Huge increase in government spending and in government debt
- Huge number of people taken away from their normal work (to serve as soldiers)



二战

经济影响

⊗ 战时命令

经济(政府
干预导向
私营企业)

企业停止制作

普通产品& made

飞机、导弹,
军舰等

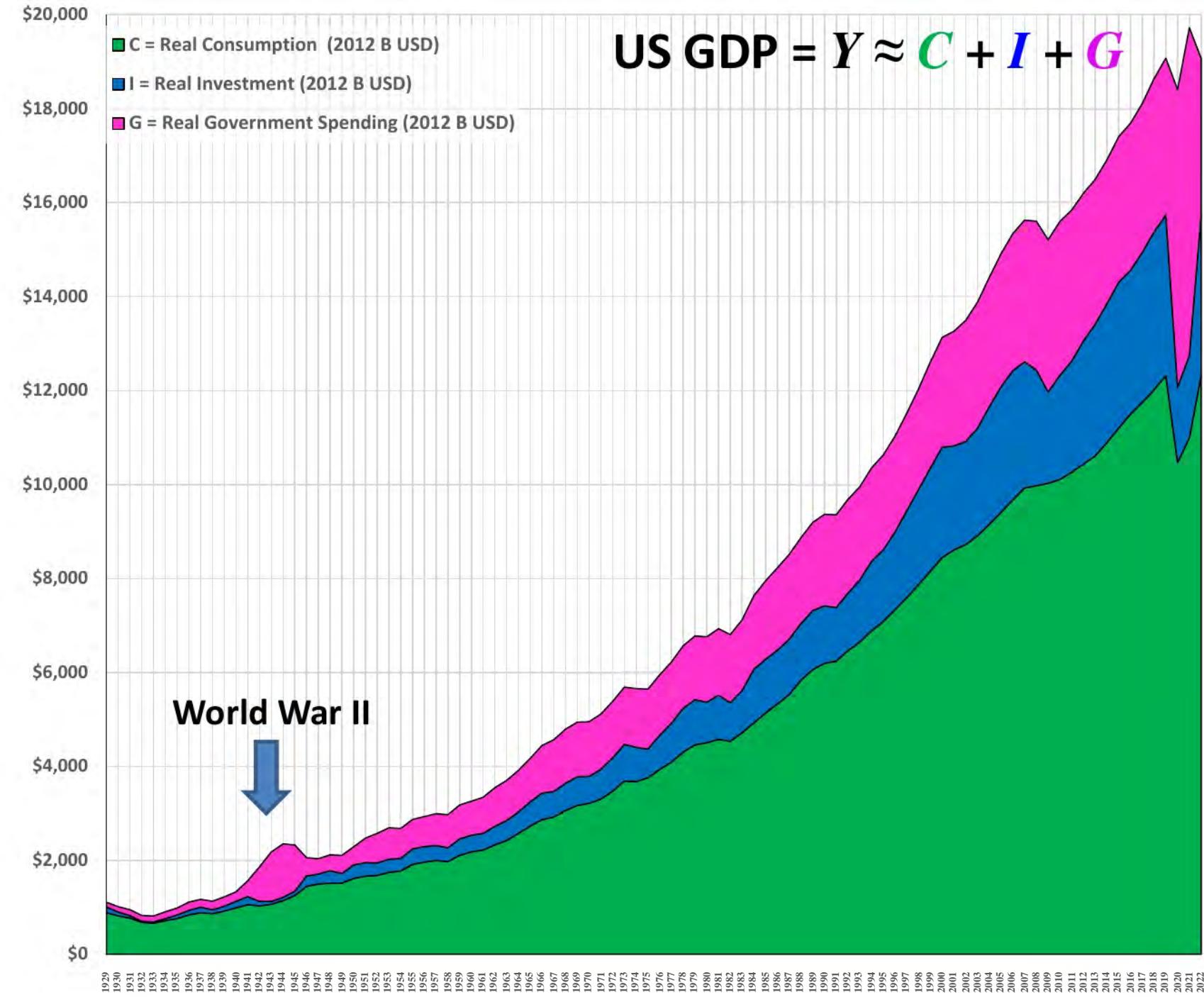
在战争中被摧毁

大幅增加

政府支出和
政府债务

人数庞大

从他们的
正常工作(作为
士兵)



World War II Pandemic

Economic implications

Pandemic

- ~~Wartime command economy (government intervention to direct private companies)~~
- ~~Companies stopped making ordinary products & made airplanes, missiles, nothing warships, etc. which were destroyed in the war~~
- ~~Huge increase in government spending and in government debt~~
- ~~Huge number of people taken away from their normal work (to serve as soldiers) stay home~~

Policy implications

- Traditional monetary & fiscal stimulus inappropriate**
 - Wrong to “stimulate” investment until virus is controlled
- Keep downturn from becoming a Kindleberger Cycle**
 - This is a “unique” crisis. Keep it “unique”
 - Prevent a normal financial panic, economic crash
 - Prevent banking system from freezing
 - Prevent people & firms from going bankrupt
 - Prevent regulatory overreaction
 - Quick return to normal after virus is defeated
- Similar to wartime financing**
 - Many people leave jobs to do work with no economic value, many companies making nothing of economic value
 - Huge government debts did not slow economic growth
 - Government borrowed high-duration debt, so locked in low interest rates for 30 years
 - Burden on government budget not unsustainable
 - Slow pay-down of government debts with higher economic growth, higher tax revenue,

World War II Pandemic

经济 ~~流感大流行~~ 影响
⊗ 战时命令

经济(政府
干预导向
私营企业)
企业停止制作

普通产品& made
飞机、导弹, 什么都没有

~~军舰等~~

~~在战争中被摧毁~~

大幅增加

政府开支和
政府债务

人数庞大

从他们的
正常工作(担任
士兵) ————— 呆在家里

政策影响
传统的货币和财政刺激措施不合适

在病毒得到控制之前“刺激”投资是错误的

防止低迷成为金德尔伯格周期

这是一场“独一无二”的危机。保持“独特”

防止正常的金融恐慌、经济崩溃

防止银行系统冻结

防止个人和公司破产

防止监管反应过度

战胜病毒后快速恢复正常

类似战时融资

很多人离职去做没有经济价值的工作,

许多公司不做任何有经济价值的工作

巨额政府债务并没有减缓经济增长

政府借入了高期限债务, 因此锁定了低利率

利率30年

政府预算负担并非不可持续

以较高的经济增长减缓政府债务的偿还,

更高的税收,

How to Think about Inefficient Markets

1. Noise trader models

DeLong, Shleifer, Summers & Waldman. 1990. Noise Traders in Financial Markets

Inefficient markets CAPM

$$r_{i,t} = \underbrace{r_{f,t}}_{\text{stock return}} + \underbrace{\beta_i}_{\begin{array}{l} \text{risk free rate} \\ \text{stock } i \text{'s sensitivity to rational systematic risk (market=1)} \end{array}} \underbrace{(r_{m,t} - r_{f,t})}_{\begin{array}{l} \text{theoretical equity risk premium under rational expectations} \end{array}} + \underbrace{\gamma_i}_{\begin{array}{l} \text{stock } i \text{'s sensitivity to noise trading} \\ \beta_n = 0 \text{ under market efficiency} \end{array}} \underbrace{\lambda_t}_{\begin{array}{l} \text{noise trader bias} \\ \frac{\lambda > 0 \text{ for irrational optimism}}{\lambda < 0 \text{ for irrational pessimism}} \end{array}}$$

Regular CAPM, but $r_{m,t}$ is what the expected market return would be if investors were all rational

How much noise traders affect the stock's return



Yes, they're all fools, But the question remains - What kind of fools are they?

How to Think about Inefficient Markets

1. 噪音交易者模型

DeLong, Shleifer, Summers & Waldman, 1990。《金融市场中的噪音交易者》

无效率市场CAPM

$$r_{i,t} = r_{f,t} + \underbrace{\beta_i}_{\begin{array}{l} \text{stock} \\ \text{return} \end{array}} \underbrace{(r_{m,t} - r_{f,t})}_{\begin{array}{l} \text{risk} \\ \text{free} \\ \text{rate} \end{array}} + \underbrace{\gamma_i}_{\begin{array}{l} \text{stock } i \text{'s} \\ \text{sensitivity} \\ \text{to} \\ \text{rational} \\ \text{systematic} \\ \text{risk} \\ (\text{market}=1) \end{array}} \underbrace{\lambda_t}_{\begin{array}{l} \text{theoretical} \\ \text{equity} \\ \text{risk} \\ \text{premium} \\ \text{under} \\ \text{rational} \\ \text{expectations} \end{array}} + \underbrace{\left(\begin{array}{l} \text{stock } i \text{'s} \\ \text{sensitivity} \\ \text{to noise} \\ \text{trading} \\ \beta_n=0 \\ \text{under} \\ \text{market} \\ \text{efficiency} \end{array} \right)}_{\begin{array}{l} \text{noise} \\ \text{trader} \\ \text{bias} \\ \lambda > 0 \text{ for} \\ \text{irrational} \\ \text{optimism} \\ \lambda < 0 \text{ for} \\ \text{irrational} \\ \text{pessimism} \end{array}}$$

正规的CAPM，不过是~~M~~，~~M~~是什么的
预期的市场回报将是
如果投资者都是理性的

噪音交易者对股票收益的影响有多大



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Inefficient markets CAPM

- $r_{i,t}$ is magnified by $\gamma_i \lambda_t$ & λ_t is market-wide
- Noise traders are all optimistic or all pessimistic at the same time, which increases stocks' systematic risk
- Rational investors want higher returns because noise trader increase systematic risk
- Noise traders therefore
 - Cause rational investors to avoid stocks because rationally expected stock returns are too low given their (noise trader elevated) systematic risk
 - Rational investors exit the market, noise traders dominate the market & noise traders alone drive prices



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无效率市场CAPM

$\nabla R_{I,T}$ 放大了 $\gamma I \lambda T + \lambda T \gamma s$ 整个市场

噪音交易者同时都是乐观的，或者都是悲观的

时间，这增加了股票的系统性风险

理性投资者希望获得更高的回报，因为噪音交易者

增加系统风险

因此，噪音交易者

导致理性投资者因为理性预期而回避股票

考虑到他们的(噪音交易者升高)，股票回报太低

系统性风险

理性投资者退出市场，噪音交易者占主导地位

只有市场和噪音交易者驱动价格



是的，他们都是傻瓜，但问题是——什么样的傻瓜
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Minsky, Hyman. 1986. Stabilizing an Unstable Economy, McGraw-Hill

Inefficient markets dividend growth model

$$P_{i,t} = \frac{D_{i,t}}{r_{i,t} - g_i} = \frac{\text{current dividend}}{\text{expected return} - \text{expected dividend growth rate}}$$

Noise traders are all either

- Overly optimistic about future dividend growth
- Overly pessimistic about dividend growth

Noise traders cause macroeconomic instability

- Noise traders get g too high → overvaluation → investors feel richer, spend more & boost actual corporate profits → seems to justify high prices for stocks (for a while) → firms issue shares & invest more
- Noise traders get g too low → undervaluation → investors feel poorer, spend less & lower actual corporate profits (for a while) → firms don't issue shares & put investment plans on hold
- This feedback loop causes booms and busts in the economy (i.e. makes it unstable)

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明斯基, 海曼, 1986。《稳定不稳定的经济》, 麦格劳-希尔

低效市场红利增长模型

$$P_{i,t} = \frac{D_{i,t}^{\text{CURRENT}} + E_{i,t}^{\text{EXPECTED DIVIDEND GROWTH}}}{r_{i,t} - g_i}$$

噪音交易者都是两者之一



对未来股息增长过于乐观

对股息增长过于悲观

噪音交易者造成宏观经济不稳定

噪音交易者获得过高的高估投资者觉得更有钱,
花费更多, 提高实际企业利润, 似乎证明高企是合理的
股票价格(一段时间内), 公司发行股票并进行更多投资

噪音交易者得到过低的、低估的、投资者感觉更穷的、
花费更少, 实际公司利润更低(一段时间内), 而公司不会
发行股票并搁置投资计划

这种反馈循环导致经济的繁荣和萧条(即制造)
它不稳定)

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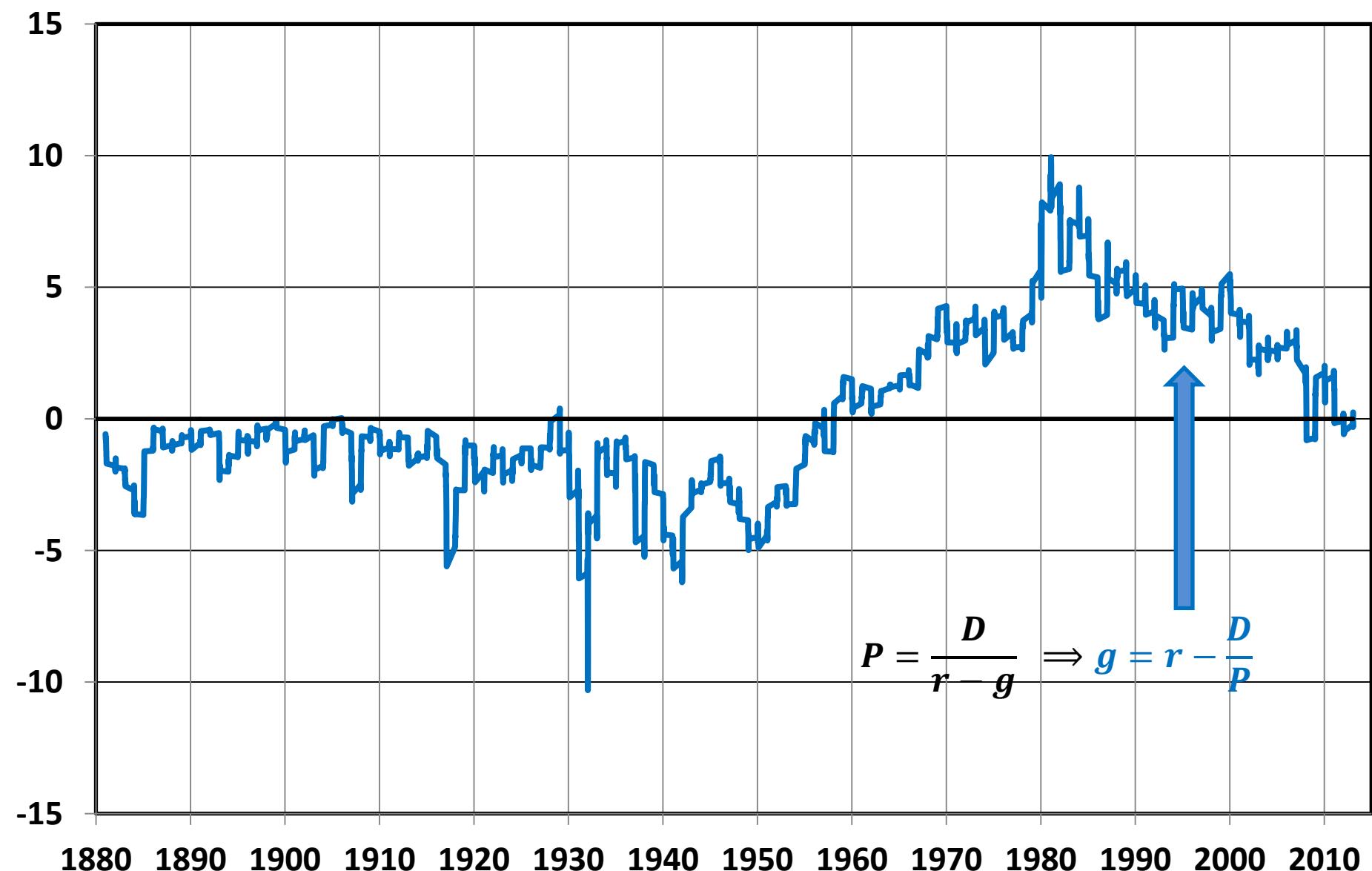
是的, 他们都是傻瓜, 但问题是——什么样的傻瓜

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Minsky's Implicit g Measure

Basic idea

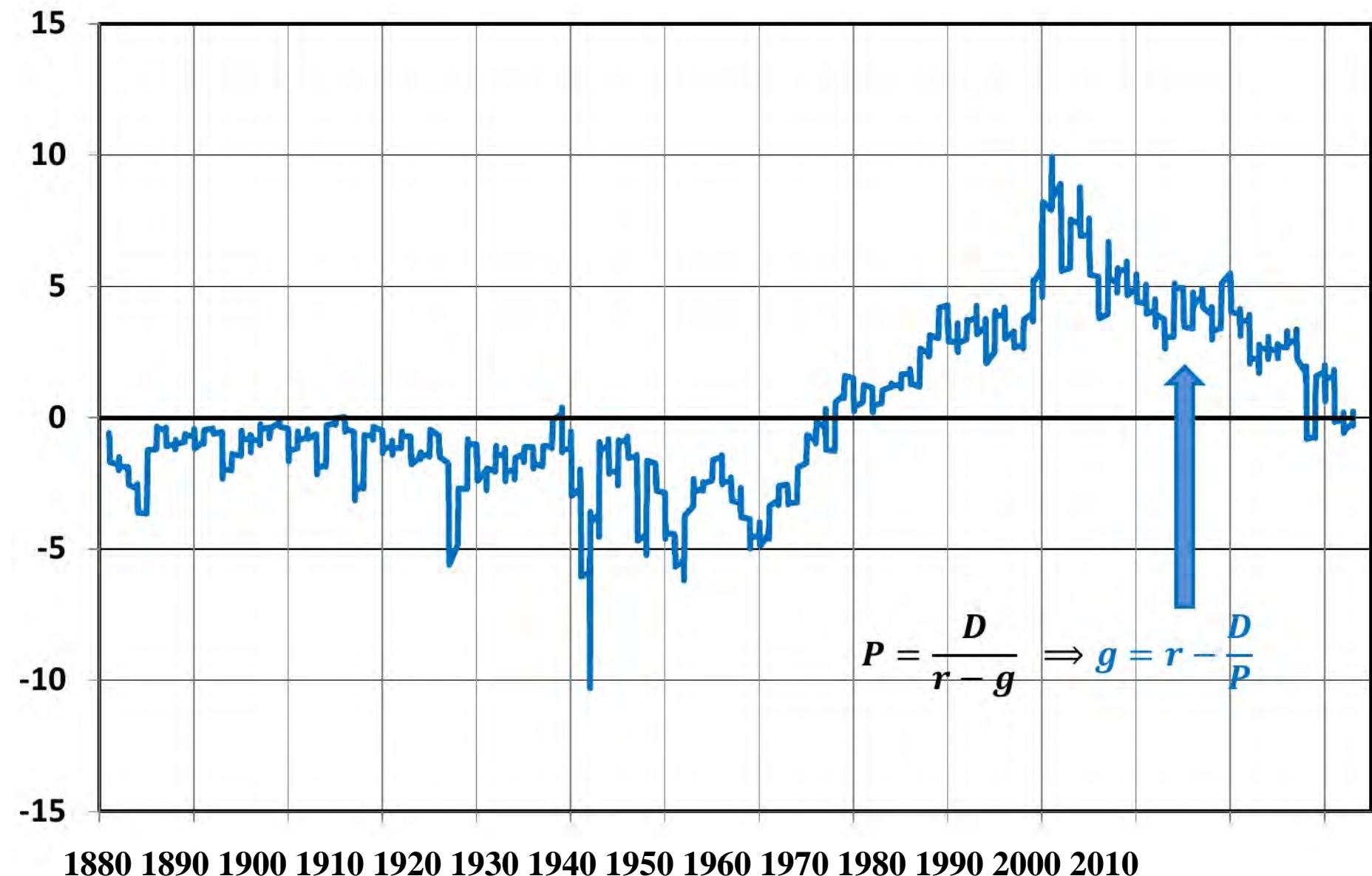
- Given what stock prices are, what current dividends are, and what rational investors should expect stock returns to be, what must noise traders think the dividend growth rate is?



Minsky's Implicit g Measure

基本思想

考虑到什么股票
价格是什么?
目前的股息
是，又是什么
理性的投资者
应该期待股票
回报率是多少
必须噪音交易员
想想红利
增长率是?



How to Think about Inefficient Markets

1. Noise trader models

Shiller, Robert J. 2015. Irrational exuberance: Revised and expanded third edition. Princeton university press.

Cyclically-adjusted price/earnings (CAPE) index,

$$CAPE = P/\tilde{E}$$

- CAPE is high when noise traders are too optimistic & low when they are too pessimistic. Historical average is $CAPE = 18$

From this point on, the reasoning as the same is with the dividend growth model for noise traders

- Noise traders are all either
 - Overly optimistic about future growth opportunities
 - Overly pessimistic about future growth opportunities
- Noise traders cause macroeconomic instability
 - Noise traders get CAPE too high → overvaluation → investors feel richer, spend more & boost actual corporate profits → seems to justify high prices for stocks (for a while) → firms issue shares & invest more
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How to Think about Inefficient Markets

1. 噪音交易者模型

Robert J. Shiller, 2015. 《非理性繁荣:修订扩充第三版》。普林斯顿大学出版社。

周期调整市盈率(CAPE)指数,

$$\text{CAPE} = \text{P/E}$$

当噪音交易者过于乐观时, CAPE高;当噪音交易者过于悲观时, CAPE低

过于悲观。历史平均是CAPE=2

从这一点开始, 同样的推理与分红是一样的
噪音交易者的成长模式

噪音交易者皆非

对未来的增长机会过于乐观

对未来增长机会过于悲观

噪音交易者造成宏观经济不稳定

噪音交易者CAPE过高, 估值过高, 投资者感觉更富有, 花费更多
提振实际企业利润的似乎可以证明股价高企(暂时)

公司发行股票并进行更多投资

噪音交易者CAPE过低, 低估, 投资者感觉更穷, 花费更少
实际企业利润较低(一段时间内), 公司不发行股票, 不进行投资

计划搁置

这种反馈循环导致经济的繁荣和萧条(即使其不稳定)



是的, 他们都是傻瓜, 但问题是——什么样的傻瓜

他们是傻瓜吗?

Shiller's Cyclically-adjusted Price-Earnings (CAPE) Index

Basic idea

- CAPE > 18 means the stock market is overvalued and will go down (or not go up much)
- CAPE < 18 means the stock market is undervalued and stocks will probably go up over the next years



Shiller's Cyclically-adjusted Price-Earnings (CAPE) Index

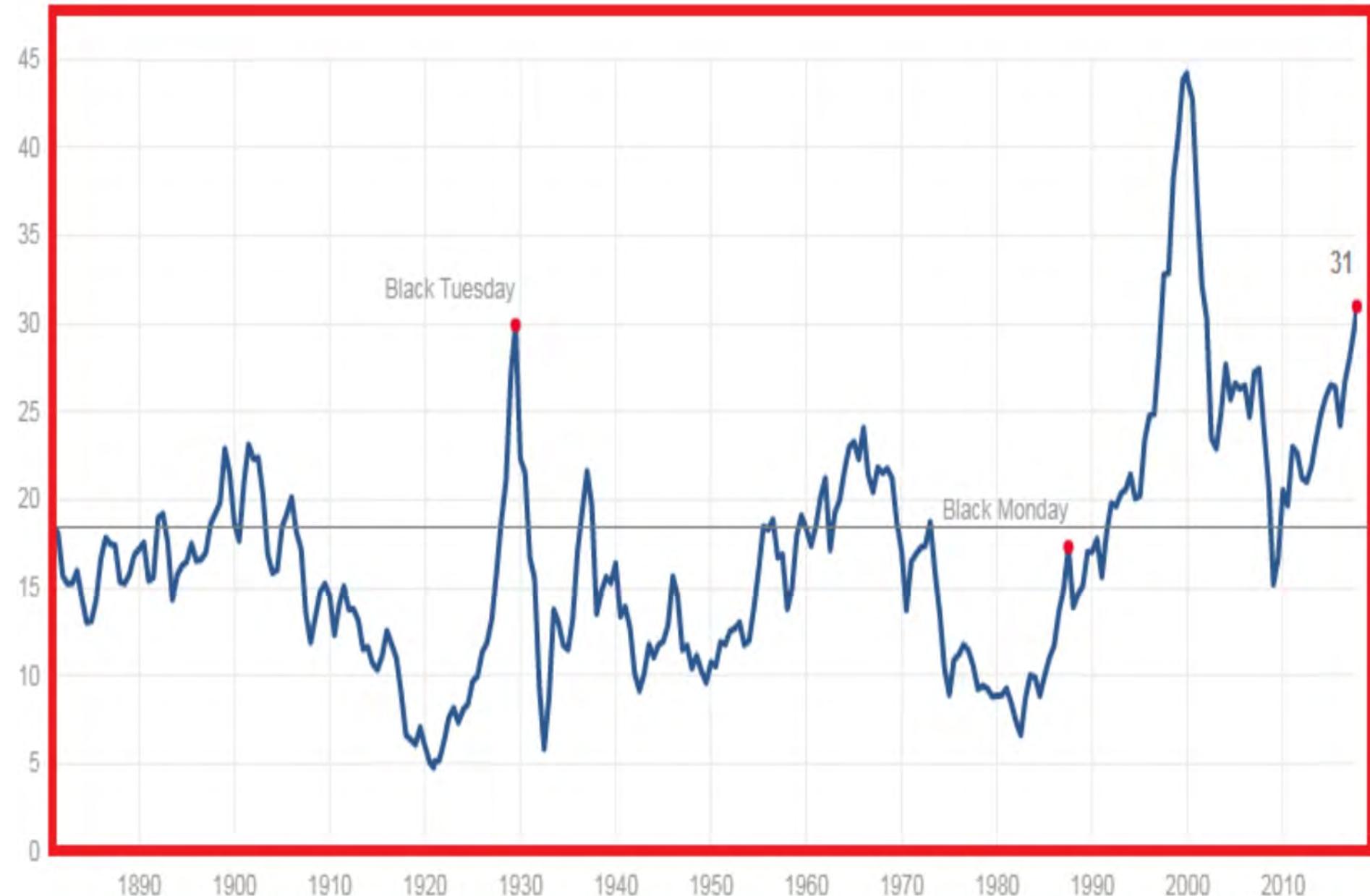
基本思想

CAPE > 18 表示

股市为
被高估了，会走的
跌(或不涨)
很多)

CAPE < 18 表示

股票市场为
低估，
股票可能会走
在未来几年上涨



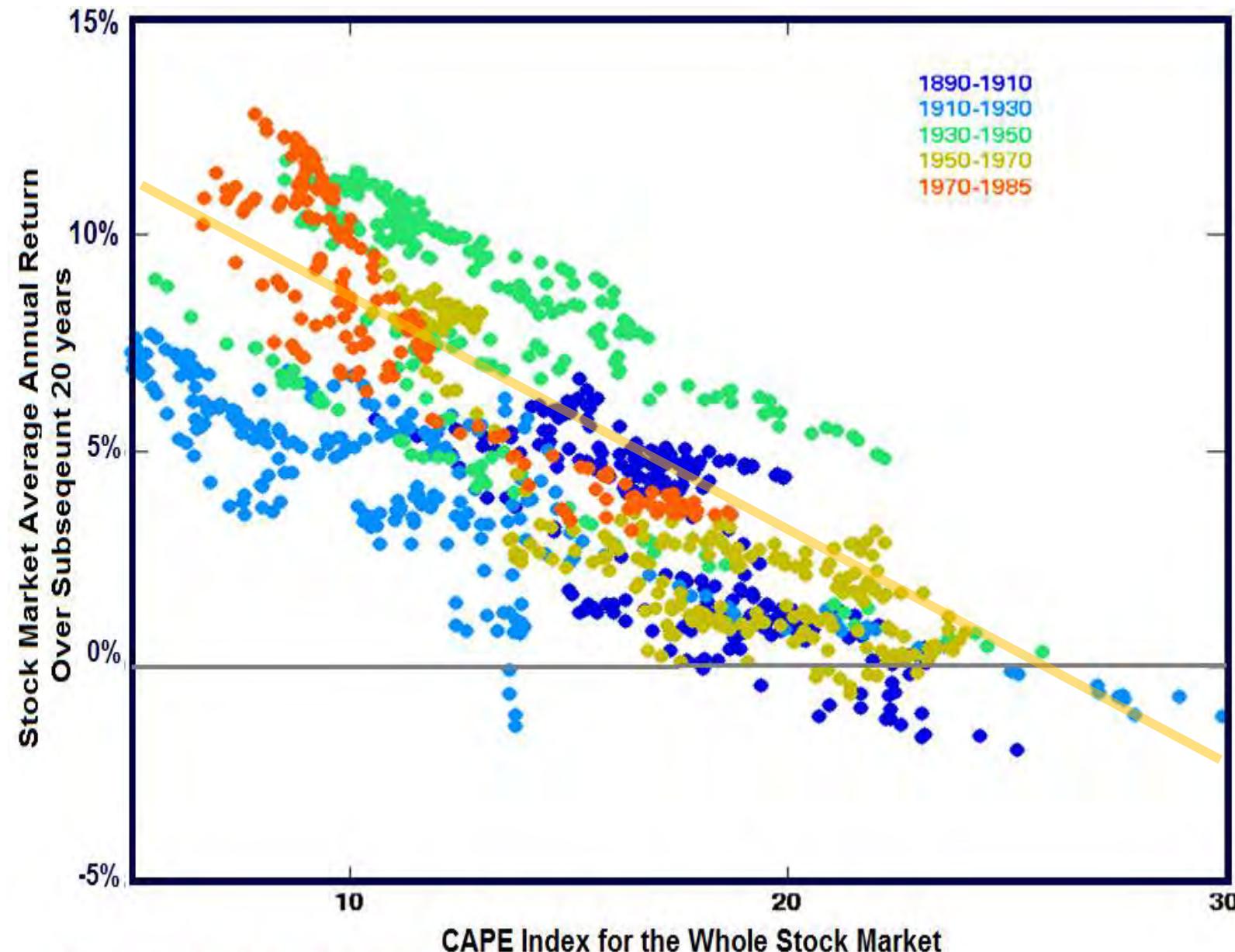
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It works!

- CAPE Index actually seems to be able to predict the stock market



Robert Shiller
Nobel Prize, 2013

Shiller's Cyclically-adjusted Price-Earnings (CAPE) Index

基本思想

CAPE > 18 表示

股市为
被高估了，会走的
跌(或不涨)
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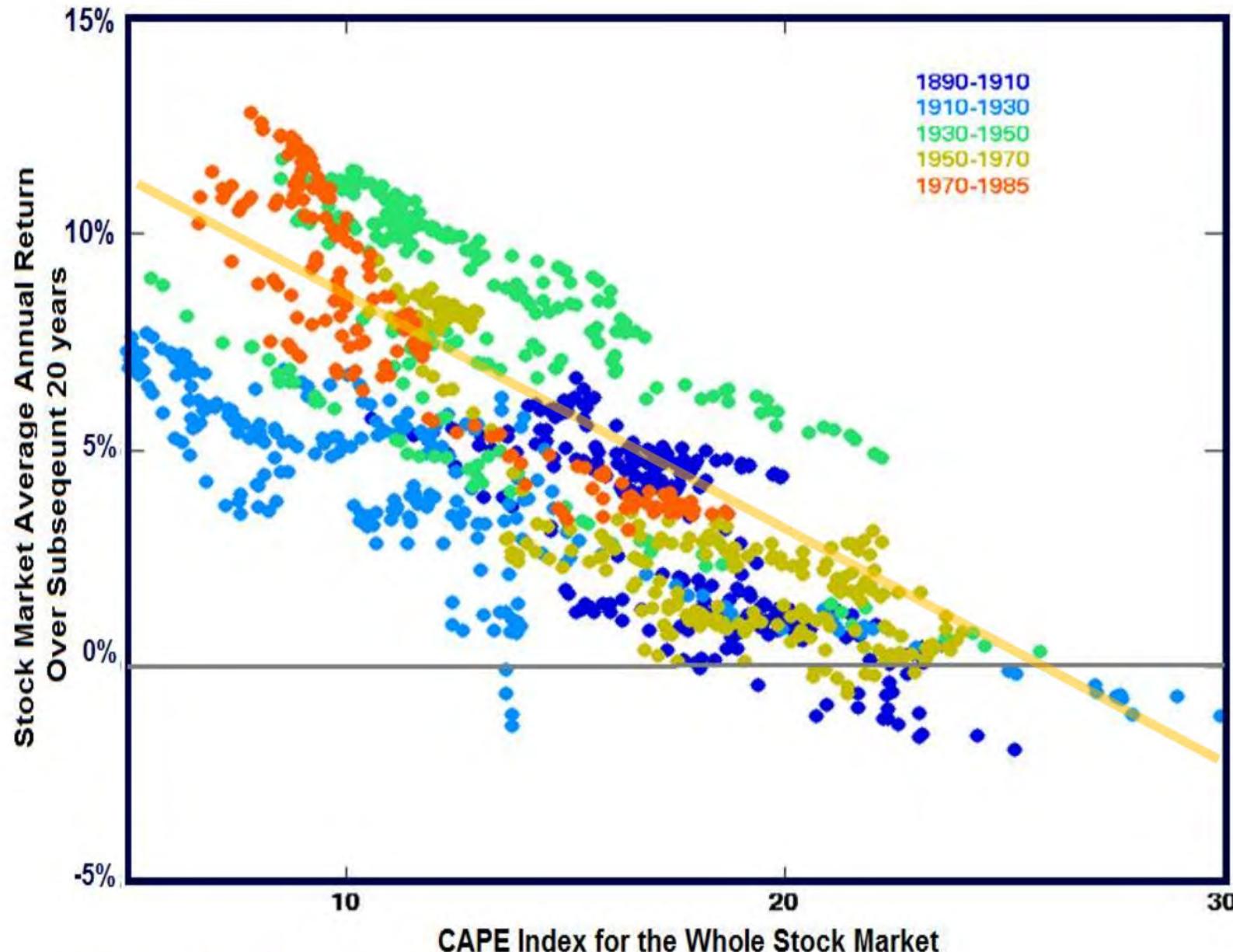
CAPE < 18 表示

股票市场为
低估，
股票可能会走
在未来几年上涨

它的工作原理!

CAPE 实际指数

似乎可以
预测股票
市场



罗伯特·席勒，2013年诺贝尔奖

How to Think about Inefficient Markets

1. Noise trader models
2. Rational herding models

- Information cascades: Bounded rationality models where investors deal with transcomputational problem of valuing stocks by imitating the trades of others, whom they think have solved these valuation problems



Yes, they're all fools, But the question remains - What kind of fools are they?

如何看待无效市场

1. 噪音交易者模型

2. 理性羊群模型

信息级联:投资者交易的有限理性模型

通过模仿的方法来评估股票的跨计算问题

其他人的交易,他们认为已经解决了这些估值问题



是的，他们都是傻瓜，但问题是——
什么样的傻瓜
他们都是傻瓜吗？

Rational Herding (Information Cascade Models)

Welch, Ivo. 1992. Sequential sales, learning, and cascades. *Journal of finance* 47(2)695-732

Anderson, Lisa R., and Charles A. Holt. 1997. Information cascades in the laboratory. *American economic review* 847-862.



Tom McHugh

Southern Bog Lemming
synaptomys cooperi

Logic

- You have a problem you cannot solve without a lot of time and expense (maybe it is transcomputational) and the time and expense only gives you an approximation anyway
- You see someone else who behaves as if they have solved the problem. You can
 1. Invest time & expense to solve it yourself
 2. Imitate the person you think has solved it
- If Option 1 is costlier, Option 2 looks better
- The rational decision can be to avoid the time & trouble of getting (or approximating) a solution & imitate someone you think has the solution

Problem

- If this works, great!!!
- But sometimes you follow someone who doesn't actually know the solution
- If everyone is rational in this way then everyone chooses Option 2 & everyone makes the same mistakes at the same time



"Just my luck! The second after I run off the cliff, the Fed lowers interest rates and the stock market soars!"

Rational Herding (Information Cascade Models)

伊沃·韦尔奇, 1992。顺序销售、学习和级联。《金融杂志》47(2)695-732 Anderson, Lisa R.和Charles A. Holt.
1997。实验室中的信息级联。美国经济评论847-862。

逻辑

- ☒ 你有一个问题, 如果没有大量的
时间和费用(可能是跨计算的)
而时间和费用只会给你一个
近似无论如何
- ☒ 你看到其他人表现得好像他们有
解决了问题。你可以
1. 投入时间和金钱自己解决问题
2. 模仿你认为解决了问题的人
- ☒ 如果选项1更昂贵, 选项2看起来更好
- ☒ 理性的决定可以是避免时间&
获得(或近似)解决方案的麻烦&
模仿你认为有解决办法的人

问题

如果这个有效, 太棒了!!

但有时你跟随的人实际上并不知道解决方案

如果每个人在这方面都是理性的, 那么每个人都会选择选项2, 每个人都会在同一时间犯同样的错误



How to Think about Inefficient Markets

1. Noise trader models

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- Information cascades: Bounded rationality models where investors deal with transcomputational problem of valuing stocks by imitating the trades of others, whom they think have solved these valuation problems

3. Evolutionary herding models

- Humans are social primates. We like doing what everyone else is doing.
- We don't like being out of step with the crowd
- This may be part of our inherited "human nature" because primitive humans who behaved this way survived & we are their descendants



Yes, they're all fools, But the question remains - What kind of fools are they?

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其他人的交易,他们认为已经解决了这些估值问题

3. 进化羊群模型

人类是社会性灵长类动物。我们喜欢做别人都在做的事情。

我们不喜欢与人群步调不一致

这可能是我们遗传的“人性”的一部分,因为原始

有这种行为的人类存活了下来,我们是他们的后代



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Evolutionary Herding Models

Nofsinger, John & Richard Sias. 1999. Herding & feedback trading by institutional & individual investors. *Journal of finance* 54.6.2263-2295

Raafat, Ramsey, Nick Chater & Chris Frith. 2009. Herding in humans. *Trends in cognitive sciences* 13.10.420-428

Prechter Jr, Robert R. 2001. Unconscious herding behavior as the psychological basis of financial market trends and patterns. *Journal of Psychology and Financial Markets* 2.3.120-125

Spyrou, Spyros. 2013. Herding in financial markets: a review of the literature. *Review of Behavioral Finance* 5.2.175-194

Logic

- Primitive humans genetically programmed to stay together survived better than did primitive humans who acted more independently
- Mathematical models in evolutionary psychology suggest this “selection” & “survival” effect might have been very powerful
- A genetic predisposition to do what other people do may be an inherited automatic reflex in many humans



Evolutionary Herding Models

Nofsinger, John & Richard Sias, 1999。机构和个人投资者的羊群和反馈交易。金融学报54.6.2263-2295

Raafat, Ramsey, Nick Chater & Chris Frith. 2009。人类的放牧。认知科学趋势13.10.420-428

Robert R. Prechter Jr . 2001。无意识羊群行为作为金融市场趋势和模式的心理基础。《心理与金融市场杂志》2.3.120-125 Spyrou, Spyros. 2013。金融市场中的羊群效应:文献综述。行为金融评论5.2.175-194

逻辑

与独立行动的原始人相比，被基因编程在一起的
原始人生存得更好

进化心理学中的数学模型表明，这种“选择”和
“生存”效应可能非常强大

做别人所做的事的遗传倾向可能是许多人遗传的
自动反射



How to Profit from Behavioral Finance

Kahneman, Daniel & Patrick Egan. 2011. Thinking, fast & slow. Farrar, Straus & Giroux

Everyone has two ways of thinking

1. Fast thinking = stimulus → response = heuristic (automatic) thinking

- Heuristics are part of human nature (genetic) because kept early humans alive (evolution)
- Researchers try to “discover a heuristic” to become famous. Various books now describe dozens of heuristics. But probably there are actually only a two basic heuristics:



Daniel Kahneman
(Nobel Prize 2016)

Reinforcement Response Heuristics

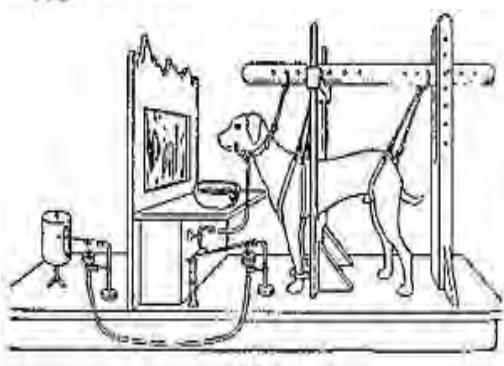
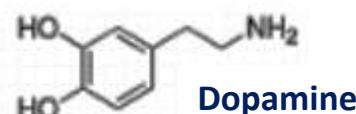
Pavlov, Ivan. 1928. Conditioned reflexes, transl. by GV Anrep. Oxford University Press.

Skinner, Burrhus Frederic. 1965. Science & human behavior. Simon & Schuster.

Watson, John. 2017. Behaviorism. Routledge

- Positive reinforcement: “If X → happy, do X again!”

- Negative reinforcement = “If X → sad, don’t do X again!”



Pavlov’s Dog

Neurotransmitter dopamine

- Unexpected reward or punishment → Δ dopamine levels in brain’s nucleolus accumbens → neural plasticity
- Dopamine system dysfunction causes mental problems e.g. drug addiction

Fight or Flight Response Heuristics

Seymour, Ben & Ray Dolan. 2008. Emotion, decision making & the amygdala. *Neuron* 58(5):662-71

De Martino, Benedetto, Colin Camerer & Ralph Adolphs. 2010. Amygdala damage eliminates monetary loss aversion. *Proceedings of the National Academy of Sciences* 107(8):3788-92

- “Danger → either flee or fight”

Hormones adrenaline & cortisol

- Perceived threat → ↑ blood flow to brain’s amygdala → cascade of hormones → ↑ adrenaline, also called epinephrine (↑ blood pressure, ↑ memory, ↑ mental focus, ↓ mood) & ↑ cortisol (↑ blood glucose & ↓ inflammation in damaged tissue)
- Perceived threat → ↑ energy, focus & memory and ↓ sensitivity to pain & wounds
- Fight or flight system dysfunction causes mental problems e.g. post-traumatic stress disorder



Amos Tversky

How to Profit from Behavioral Finance

丹尼尔·卡尼曼和帕特里克·伊根, 2011。《思考, 快与慢》。Farrar, Straus & Giroux

每个人都有两种思维方式

1. 快速思维=刺激被告人反应=启发式(自动)思维

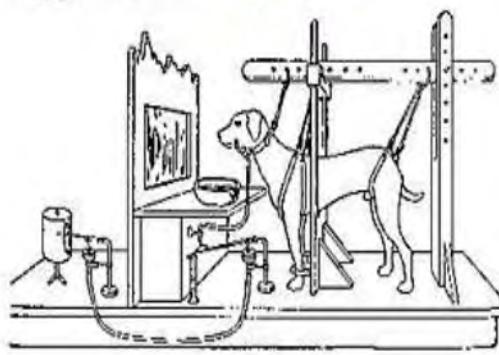
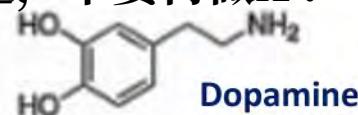
启发式是人性的一部分(遗传), 因为早期人类得以生存(进化)

研究人员试图通过“发现启发式”来成名。现在各种各样的书都描述了几十种启发式。但可能实际上只有两种基本的启发式:

强化反应启发式

伊万·巴甫洛夫, 1928。条件反射, 译。GV Anrep。牛津大学出版社。伯勒斯·弗雷德里克·斯金纳, 1965。《科学与人类行为》。西蒙与舒斯特。约翰·沃森, 2017。行为主义。劳特利奇

正强化: “如果X开心, 再做X!” 负强化= “如果X元难过, 不要再做X!”



巴甫洛夫的狗



丹尼尔·卡尼曼
(2016年诺贝尔奖)
阿莫斯·特沃斯基



战斗或逃跑反应启发式

Seymour, Ben & Ray Dolan, 2008。情感、决策与杏仁核。神经元
662 -71 58(5)

De Martino, Benedetto, Colin Camerer & Ralph Adolphs, 2010。杏仁核损伤
消除货币损失厌恶。美国国家科学院院刊
3788 -92 107(8)

“危险艾瑞斯要么逃跑要么战斗”

荷尔蒙肾上腺素&皮质醇

感知威胁: 流向大脑的血液

杏仁核, 荷尔蒙级联, 肾上腺素,
也叫肾上腺素(blood pressure,)
记忆, 精神集中, 情绪)和 皮质醇(血糖和 受损组织的炎症)

感知威胁: 精力、注意力和记忆力

对疼痛和伤口的敏感性

战斗或逃跑系统功能障碍导致精神

创伤后应激障碍等问题

How to Profit from Behavioral Finance

Kahneman, Daniel & Patrick Egan. 2011. Thinking, fast & slow. Farrar, Straus & Giroux

Everyone has two ways of thinking

1. Fast thinking = stimulus → response = heuristic (automatic) thinking
2. Slow thinking = gather data → solve mathematical problem → make optimal response
 - The sort of thinking taught in math and economics courses is hard, so people avoid it

How behavioral economists think people really think

- A. Stimulus (something happens) → activate fast thinking
- B. If fast thinking converges → response occurs
- C. If fast thinking doesn't converge (if 2 heuristics contradict or if no heuristic applies) → activate slow thinking → recall memories & gather information to solve an optimization problem → response occurs

Complications

1. Cognitive load
 - Do enough slow thinking → glucose levels in brain fall → can't do more slow thinking
 - Lower IQ people have lower threshold for cognitive load
2. Transcomputationality
 - Some economic/investment problems are transcomputational = we can write down an equation to solve the problem but the data needed to get the numbers to plug into the equation do not exist
 - Behavioral finance research suggests transcomputationality and/or cognitive load → reactivate fast thinking with deeper search for heuristics – i.e. for memories of past stimuli somehow like this stimulus and of past responses to it that one should either repeat or avoid → response



Daniel Kahneman
(Nobel Prize 2016)



Amos Tversky

如何从行为金融学中获利

丹尼尔·卡尼曼和帕特里克·伊根, 2011。《思考, 快与慢》。Farrar, Straus & Giroux

每个人都有两种思维方式

1. 快速思维=刺激被告人反应=启发式(自动)思维
2. 慢思维=收集数据、解决数学问题、做出最优反应

数学和经济学课程中教授的那种思维很难, 所以人们会回避

行为经济学家认为人们是如何思考的

- A. 刺激(某事发生): 激活快速思维
- B. 如果快速思维汇聚, 则出现反应
- C. 如果快速思维不收敛(如果2个启发式相互矛盾或者没有启发式适用), 则缓慢激活

有思维的name_recall memories & gather information以解决一个优化问题的name_response发生

并发症

1. 认知负荷

做足够的慢思维被告人脑内葡萄糖水平下降被告人不能再做更多的慢思维

智商越低的人认知负荷阈值越低

2. Transcomputationality

有些经济/投资问题是可跨计算性的=我们可以写下一个方程来求解

问题, 但需要的数据, 得到的数字, 代入方程不存在

行为金融学研究表明, 跨计算性和/或认知负荷会很快重新激活

用更深入的启发式搜索进行思考——即;对于过去刺激物的记忆就像这个刺激物以及过去对它的反应, 一个人应该重复或避免重复的反应



丹尼尔·卡尼曼(2016年诺贝尔奖)



How to Profit from Behavioral Finance

Kahneman, Daniel & Patrick Egan. 2011. Thinking, fast & slow. Farrar, Straus & Giroux

Two general kinds of heuristics

- Reinforcement response (saliency) heuristics.** One thing becomes "salient" (dominant in thoughts) of noise traders → other stimuli are interpreted as similar to the salient stimulus

e.g. New mineral discovery → "mining discoveries" salient! → news about any mining company seems to noise traders a likely new major new discovery → noise traders buy all mining stocks → mining stocks up on saliency bias. Rational trader knows such discoveries are very rare, buys mining stocks immediately on news of discovery and sells same stocks to noise traders at high prices. Noise traders lose money when mining stocks fall back to normal levels.

Examples of saliency heuristics

- Recency bias. More recent news is more salient
- Availability bias. Information that is more readily available is more salient
- Framing bias. Interpretation of new information is framed (i.e. interpreted using) prior recent information
- Confirmation bias. New information that confirms currently salient views is more salient
- Myside bias. After taking a "side" on an issue, new information favorable to that side is more salient
- There are many others

- Loss-aversion heuristics.** Prospective losses are usually more salient than prospective gains

A subdiscipline of behavioral finance (prospect theory) shows that e.g. the prospect of losing \$10,000 (prob = 10%) is more mentally important than prospect of gaining \$10,000 (prob = 10%). This may be because prospects of loss & gain can both activate dopamine system but fear of loss also activate fight or flight system

e.g. Negative rumors about a company can cause huge waves of panic selling by noise traders

Examples of loss aversion heuristics

- Panic selling. Minor bad news can lead to market crashes (Minsky moments?)
- Conservative bias. Information that justifies conserving things as they are is more salient
- Regret aversion bias. Prospect of future regret from "not receiving gains" framed as "future loss" so this form of loss aversion (avoid future regret) can make noise traders take big risks
- There are many others



Daniel Kahneman
(Nobel Prize 2016)



Amos Tversky

如何从行为金融学中获利

丹尼尔·卡尼曼和帕特里克·伊根, 2011。《思考, 快与慢》。Farrar, Straus & Giroux

两种一般的启发式

强化反应(显著性)启发式。一件事成为噪音的“突出性”(在思想中占主导地位)

交易员的其他刺激被解释为与突出刺激相似

例如新矿产发现(New mineral discovery) “矿业发现” 显著!任何矿业公司的新闻似乎都是噪音

交易员有可能出现新的重大新发现的聒噪交易员买入所有矿业类股票的显著性偏见。

理性交易者知道这样的发现非常罕见, 发现消息后立即买入矿业股并卖出

同样的股票高价卖给噪音交易者。当矿业股回落到正常水平时, 噪音交易者就会赔钱。

显著性启发式的例子

☒**近因效应** (或近期偏差)。更近期的新闻更突出

☒**可用性的偏见**。更容易获得的信息更突出

☒**框架的偏见**。对新信息的解释是框架化的(即使用)先前的最近信息进行解释

☒**确认偏见**。证实当前突出观点的新信息更加突出

☒**自我中心倾向**。在某一问题上表明“立场”后, 有利于该立场的新信息会更加突出

还有很多其他的

☒**取得的启发式**。预期损失通常比预期收益更显著

行为金融学的一个分支学科(前景理论)表明, 例如, 损失1万美元(概率= 10%)的前景是比获得10,000美元的前景(probb = 10%)在精神上更重要。这可能是因为损失和收益的前景是不是既能激活多巴胺系统, 但对失去的恐惧也能激活战斗或逃跑系统

关于一家公司的负面谣言会引起噪音交易者的恐慌性抛售

损失厌恶启发式的例子

☒**恐慌性抛售**。小的坏消息会导致市场崩溃(明斯基时刻?)

☒**保守的偏见**。证明保持事物现状是合理的信息更为显著

后悔厌恶偏见。将未来后悔的前景从“未获收益”框定为“未来损失”这样的形式

损失厌恶(避免未来后悔)会让噪音交易者冒很大的风险

还有很多其他的原因



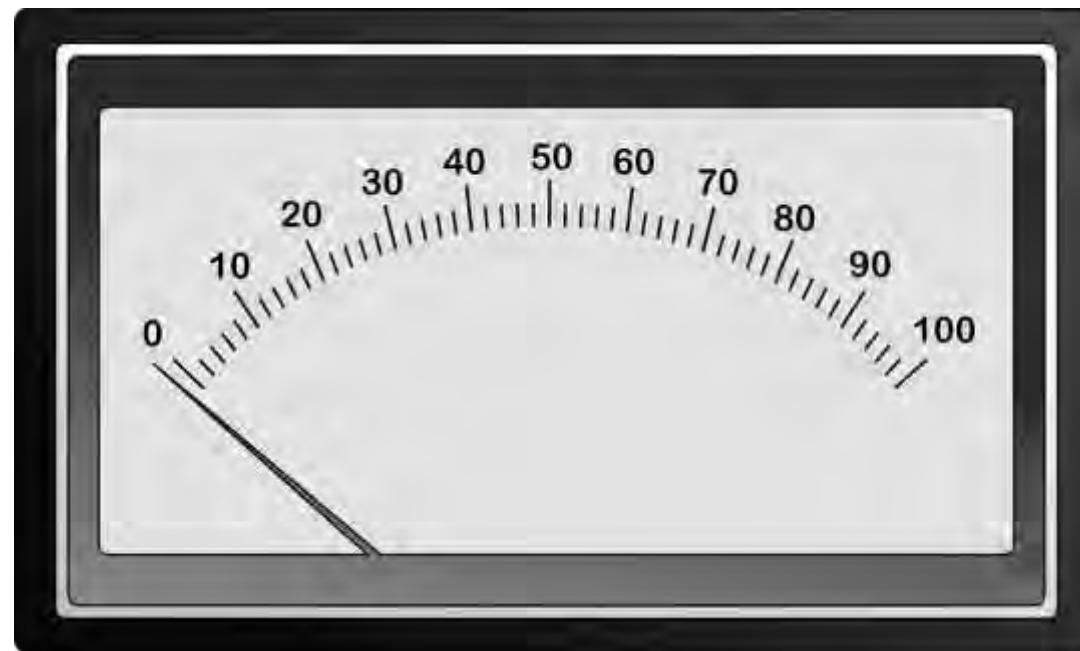
丹尼尔·卡尼曼(2016年诺贝尔奖)



阿莫斯·特沃斯基

Partially Efficient Stock Markets

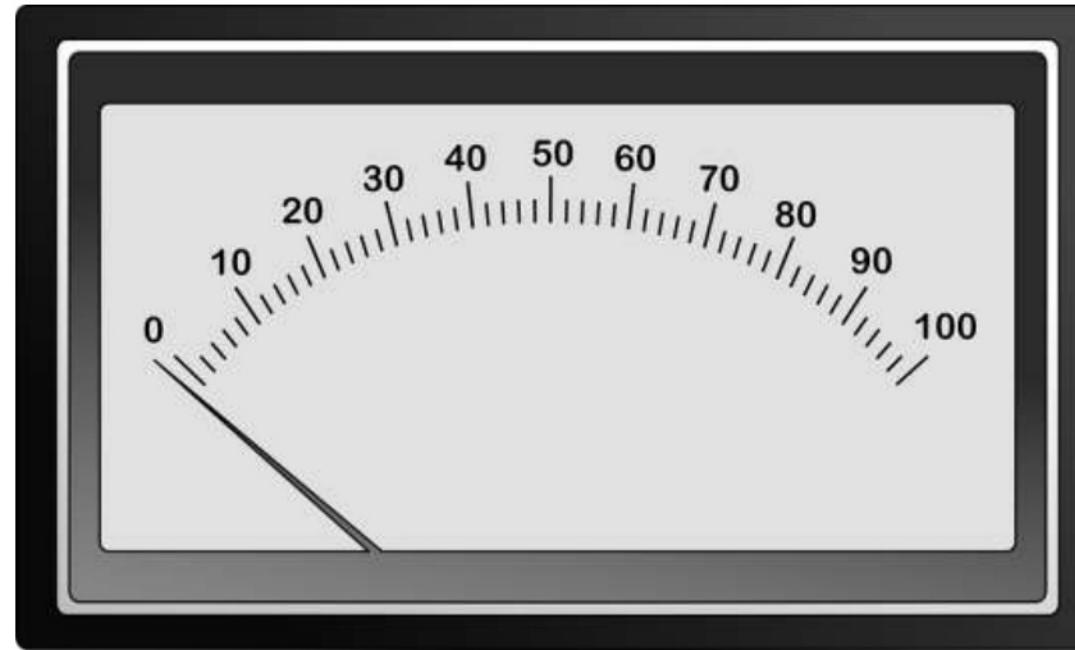
- Real stock markets are neither 100% efficient nor 0% efficient
- How to measure the degree of a stock market's efficiency?



Stock Market Efficiency Meter

部分有效股票市场

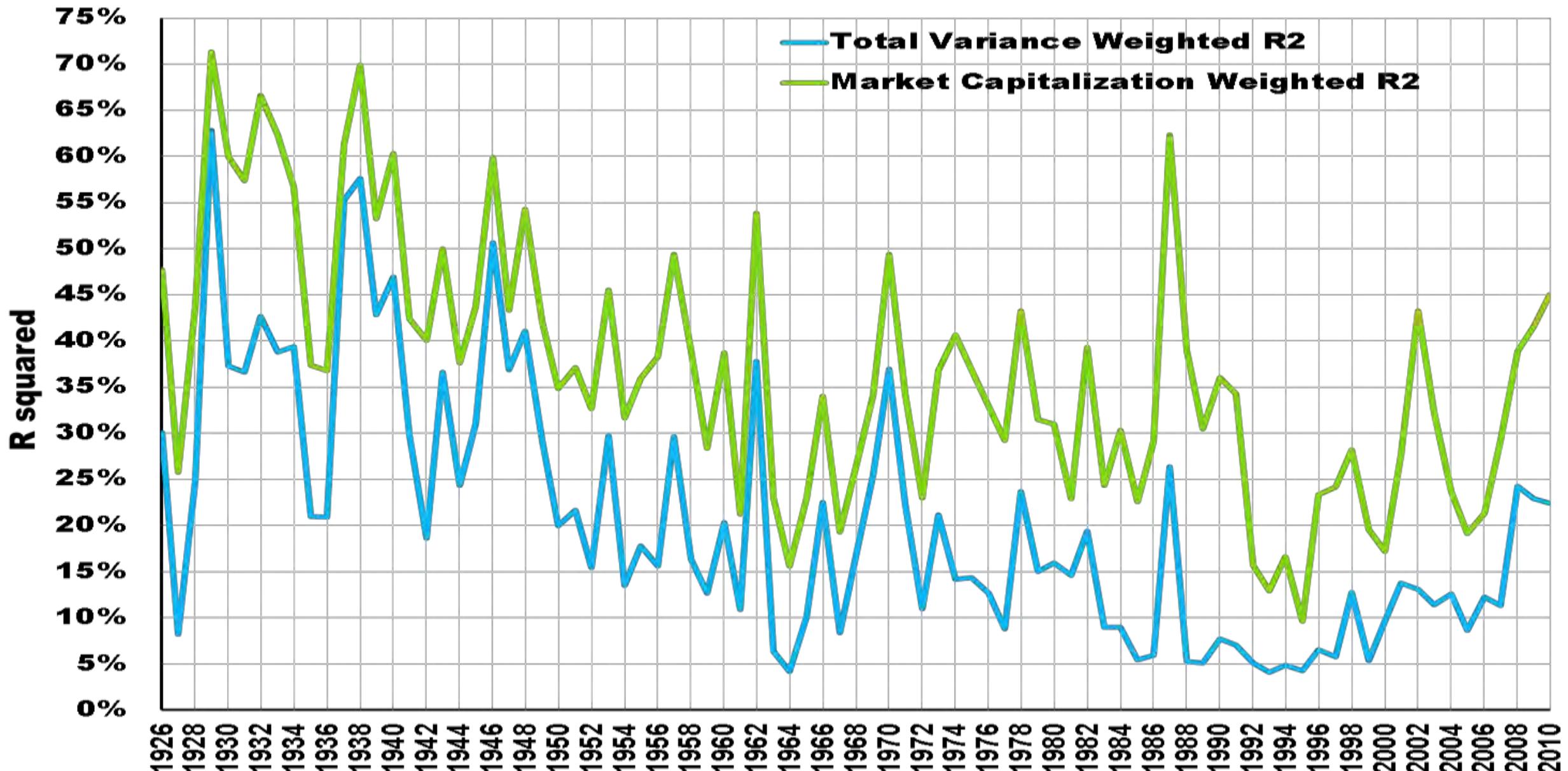
真实的股票市场既不是100%的效率也不是0%的效率如何衡量股票市场的效率程度?



股市效率计量表

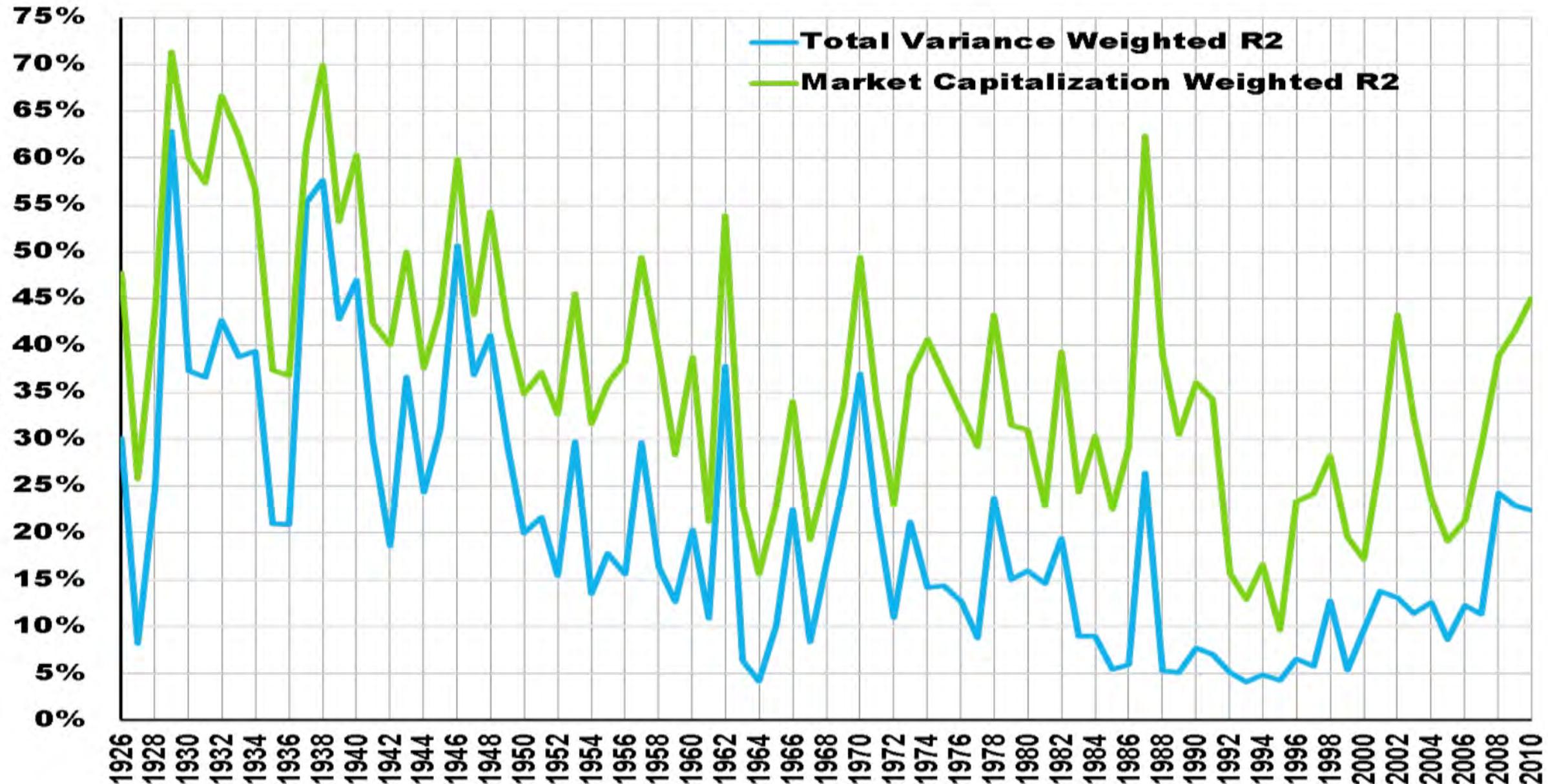
Declining Mean Market Model R² of US Stocks, by Quarter

Morck, Randall, Bernard Yeung & Wayne Yu. 2000. The Information Content of Stock Markets: Why Do Stocks in Emerging Markets Comove? Journal of Financial Economics 58 215-238

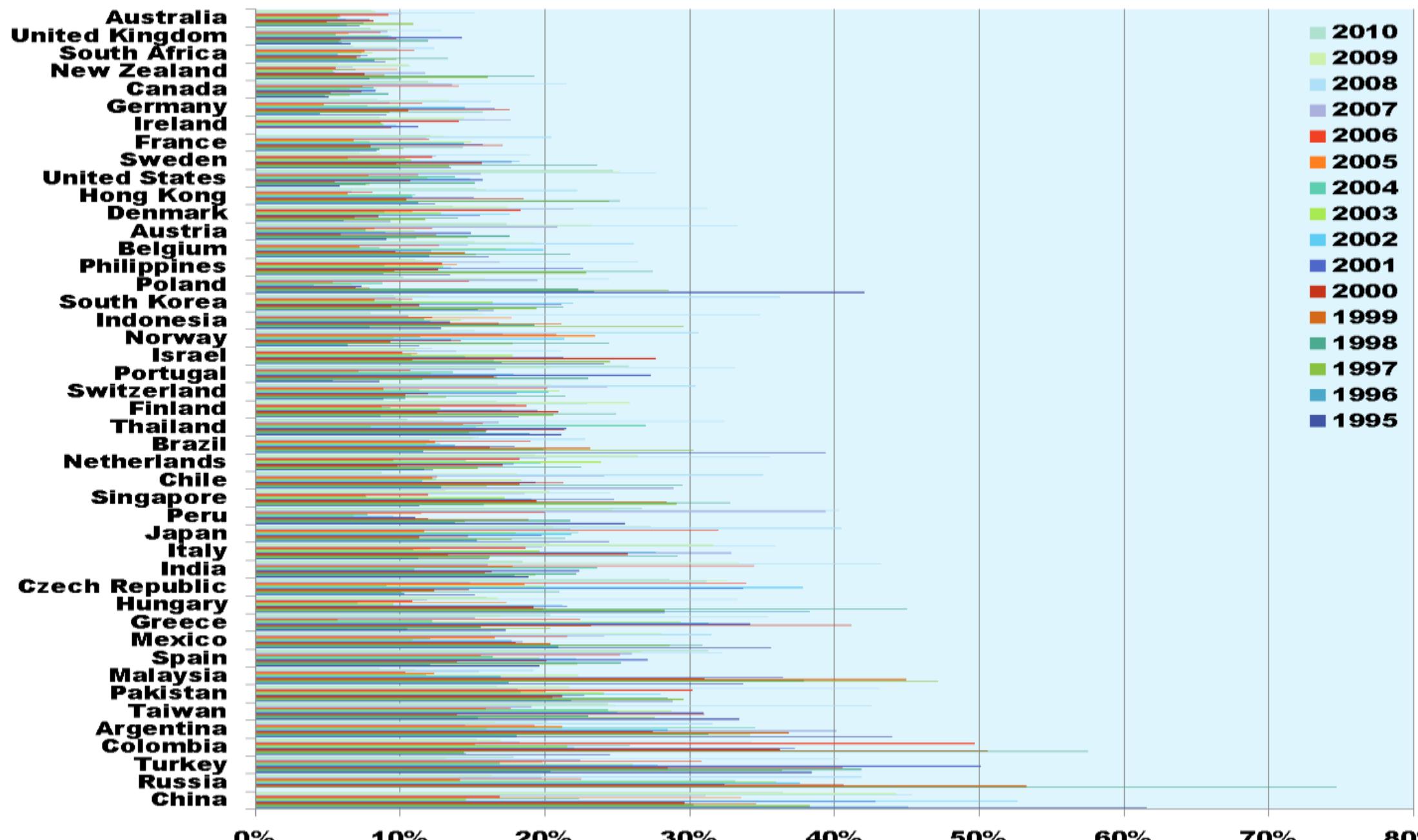


Declining Mean Market Model R² of US Stocks, by Quarter

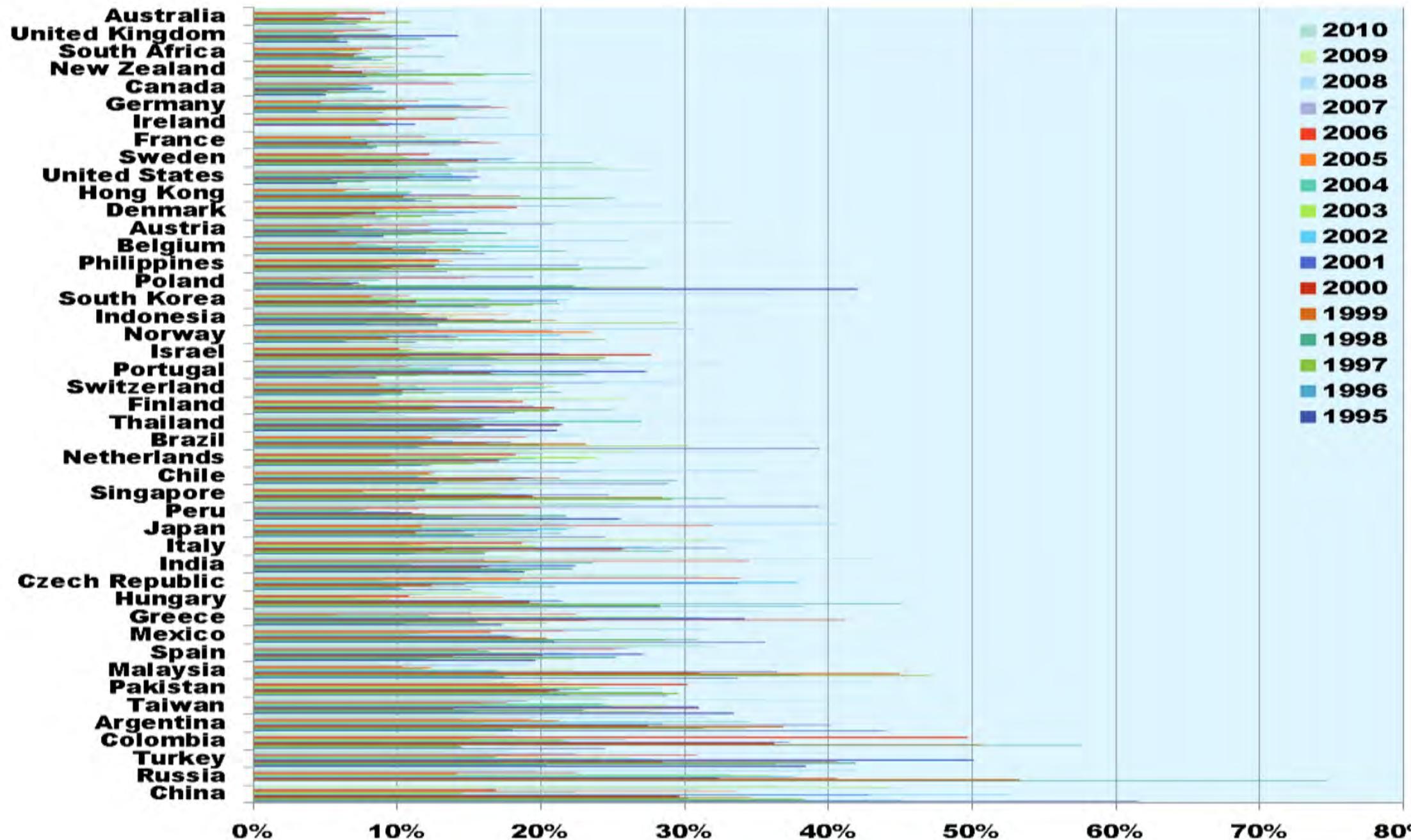
莫克, 兰德尔, 杨伯德, 余伟。2000。股票市场的信息内容:为什么新兴市场的股票会出现Comove?金融经济学报(英文版)58 215-238



Higher-income Economies' Stocks Have Lower Asset Pricing Model R²s



Higher-income Economies' Stocks Have Lower Asset Pricing Model R²s



Harmonious Stock Markets

Morck, Randall, Bernard Yeung & Wayne Yu. 2000. The Information Content of Stock Markets: Why Do Stocks in Emerging Markets Comove? Journal of Financial Economics 58 215-238

- Why do stocks in some economies rise & fall together, like voices in a choir?
- Stocks that go up and down all together also go up and down with the stock market index
- Asset pricing models, like the CAPM, explain stocks rising and falling using the market return
- Where stocks move more in accord with the market return, asset pricing models (e.g. the CAPM) “work better” (have higher R²)



Harmonious Stock Markets

莫克, 兰德尔, 杨伯德, 余伟。2000。股票市场的信息内容:为什么新兴市场的股票会出现Comove?金融经济学报(英文版)58 215-238

- ☒ 股票为什么在一些经济有涨有跌一起, 就像一个声音唱诗班吗?
- ☒ 上涨的股票一起跌也一起走上下同去股票市场指数
- ☒ 资产定价模型, 比如CAPM, 解释股票涨跌用市场回报
- ☒ 哪里的股票走势更大与市场一致回报, 资产定价模型(例如CAPM)“更好地工作”(有更高的R2)



Harmonious Stock Markets

Morck, Randall, Bernard Yeung & Wayne Yu. 2000. The Information Content of Stock Markets: Why Do Stocks in Emerging Markets Comove? Journal of Financial Economics 58 215-238

- Why do stocks in some economies rise & fall independently, like voices in crowded room?
- Stocks that go up and down independently don't go up and down with the stock market index
- Asset pricing models, like the CAPM, explain stocks rising and falling using the market return
- Where stocks move more independently, asset pricing models (e.g. the CAPM) "work worse" (have lower R²)



**Everyone Talking on Their Own
(White Noise)**

Harmonious Stock Markets

莫克, 兰德尔, 杨伯德和余伟, 2000。股票市场的信息内容:为什么新兴市场的股票会出现Comove?金融经济学报(英文版)58 215-238

- ☒ 为什么有些国家的股票会上涨
经济有涨有跌
像声音一样独立
在拥挤的房间里?
- ☒ 上涨的股票
独立了
不上下
随股市
指数
- ☒ 资产定价模型, 比如
CAPM, 解释股票
涨跌用
市场回报
- ☒ 哪里的股市波动更大
独立资产
定价模型(如
CAPM) “效果更差”
(R2较低)



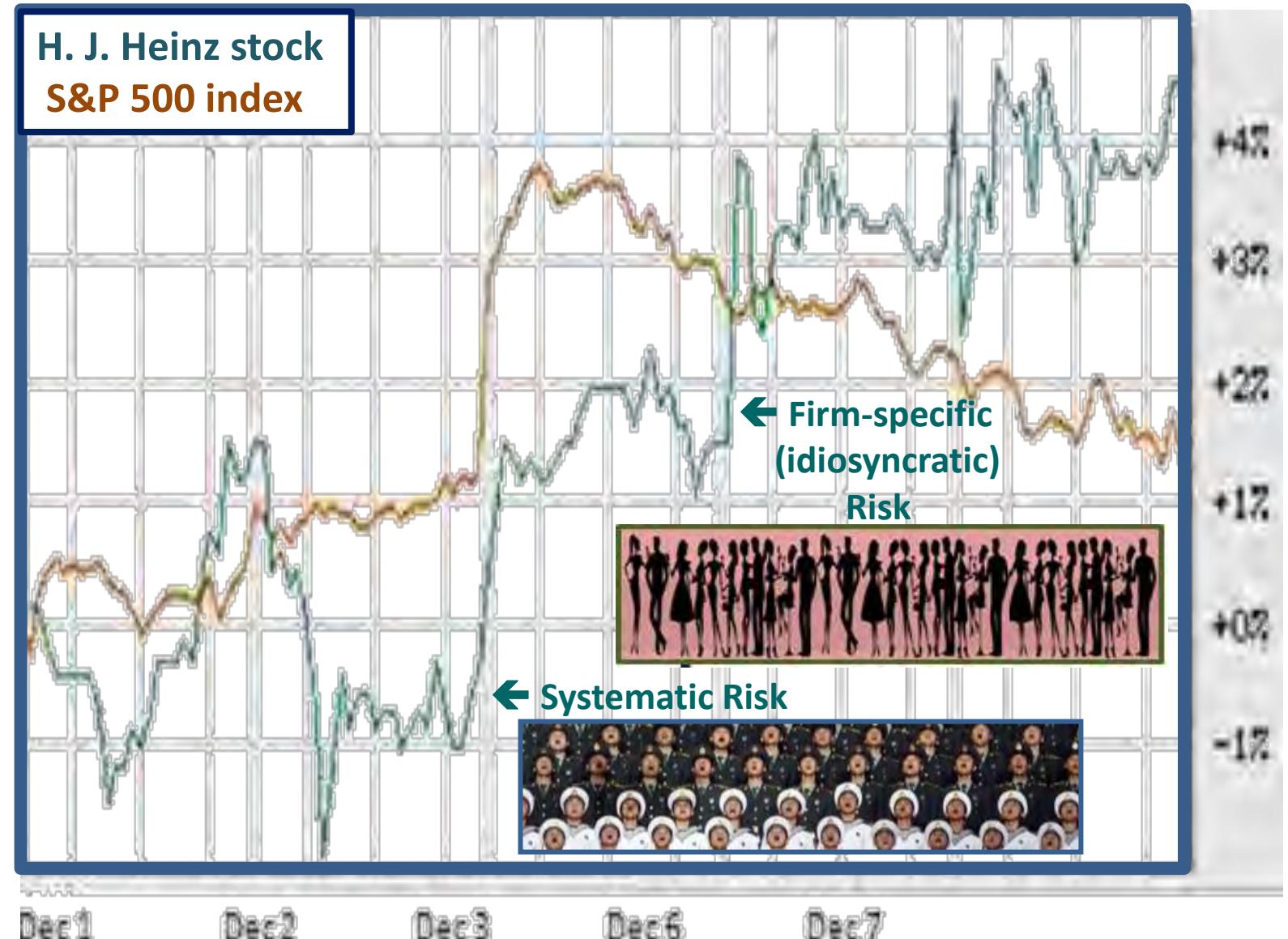
每个人都在自己说话
(白噪声)

What Asset Pricing Models Are For

Morck, Randall, Bernard Yeung & Wayne Yu. 2000. The Information Content of Stock Markets: Why Do Stocks in Emerging Markets Comove? Journal of Financial Economics 58 215-238

Asset pricing models divide risk into

- Systematic (market-wide, undiversifiable) risk: stock moves with market
- Firm-specific (idiosyncratic, diversifiable) risk –stock moves independently

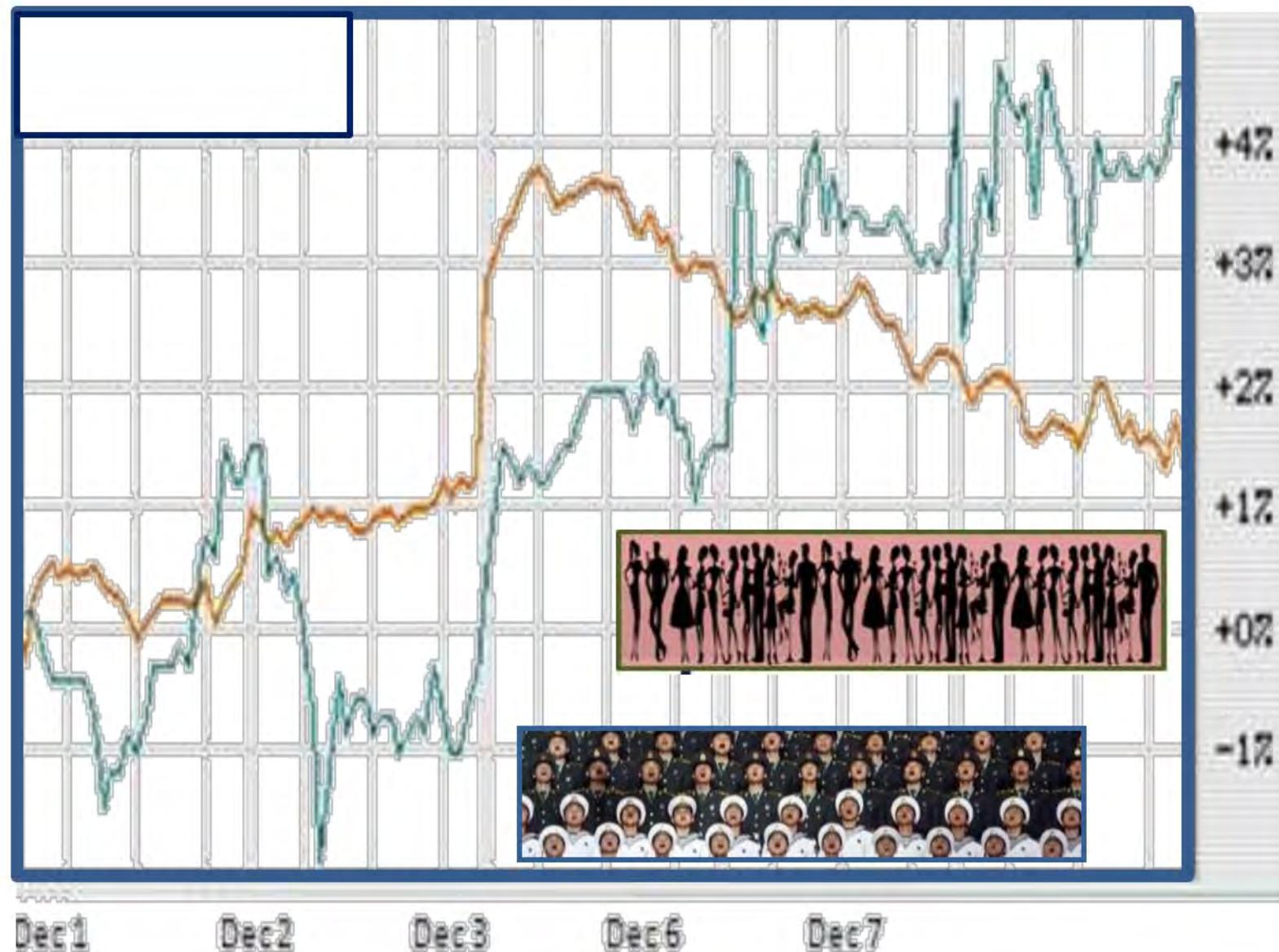


What Asset Pricing Models Are For

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资产定价模型划分风险 成

系统性(全市场的、不可分散的)风
险:股票随市场变动
公司特有(特质性的、可分散的)
风险——股票独立波动



Partially Efficient Stock Markets

Morck, Randall, Bernard Yeung & Wayne Yu. 2000. The Information Content of Stock Markets: Why Do Stocks in Emerging Markets Comove? *Journal of Financial Economics* 58 215-238

What if stock markets were neither 100% efficient nor 0% efficient

- How could we measure the degree of a stock market's efficiency?
- Capital asset pricing model

$$r_{it} = r_f + \beta_i(r_{mt} - r_f) + \epsilon_i$$

↑ ↑ ↑
Stock Risk-free Moves up & down with
return rate most other stocks Moves
 independently

Undiversifiable risk Diversifiable risk

- An asset pricing model's R^2 is NOT really a “goodness of fit”, but a comparison of the importance of these two kinds of risk

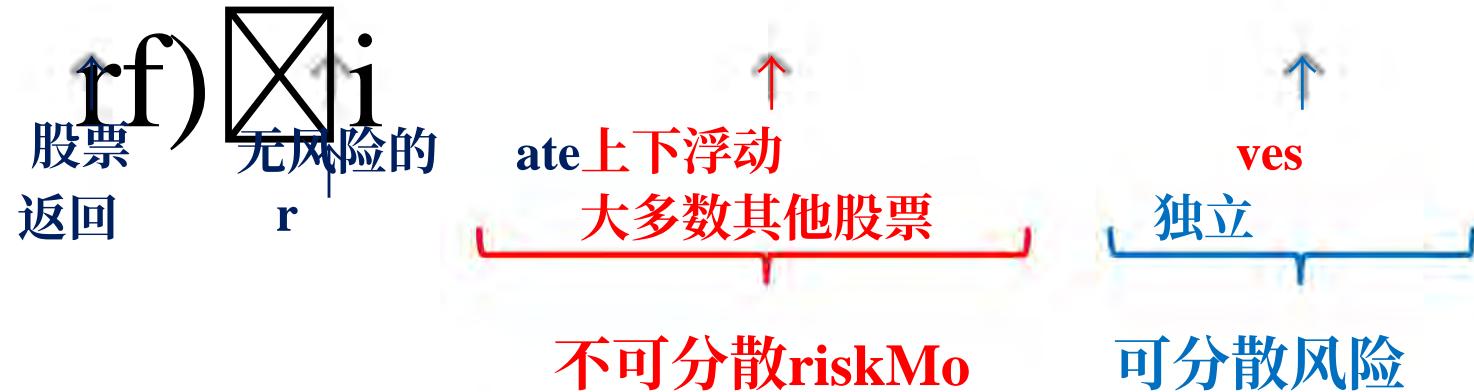
$$R_i^2 = \frac{\text{movement with market}}{\text{movement with market} + \text{movement on its own}}$$

Partially Efficient Stock Markets

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如果股票市场既不是100%效率, 也不是0%效率呢
我们如何衡量股票市场的效率程度?

资本资产定价模型 $r_{it} \times r_f \times i$ (rmt)



一个资产定价模型的 R^2 并不是真正意义上的“拟合优度”, 而是对这两种风险重要性的比较

$$R^2 = \frac{\text{随市场的变动}}{\text{运动随市场} \times \text{自行运动}}$$

Partially Efficient Stock Markets

Morck, Randall, Bernard Yeung & Wayne Yu. 2000. The Information Content of Stock Markets: Why Do Stocks in Emerging Markets Comove? Journal of Financial Economics 58 215-238

What if stock markets were neither 100% efficient nor 0% efficient

- How could we measure the degree of a stock market's efficiency?
- Capital asset pricing model

$$r_{it} = r_f + \text{[Image of a group of people]} + \text{[Image of a crowd of people]}$$

↑ ↑ ↑

Stock Risk-free Moves up & down with
return rate most other stocks

Moves independently

Undiversifiable risk Diversifiable risk

- An asset pricing model's R^2 is NOT really a “goodness of fit”, but a comparison of the importance of these two kinds of risk

$$R_i^2 = \frac{\text{[Image of a group of people]}}{\text{[Image of a group of people]} + \text{[Image of a crowd of people]}}$$

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如果股票市场既不是100%效率, 也不是0%效率呢
我们如何衡量股票市场的效率程度?

□ Capital asset pricing model

$$r_{it} = r_f + \text{Stock return} + \text{Risk-free rate}$$




↑ ↑
Moves up & down with
most other stocks Moves
independently

不可分散风险 可分散风险

一个资产定价模型的 R^2 并不是真正意义上的“拟合优度”, 而是对这两种风险重要性的比较

$$R^2 \times$$

运动随市场 \times 自行运动



Patterns of Comovement Across Countries & Over Time

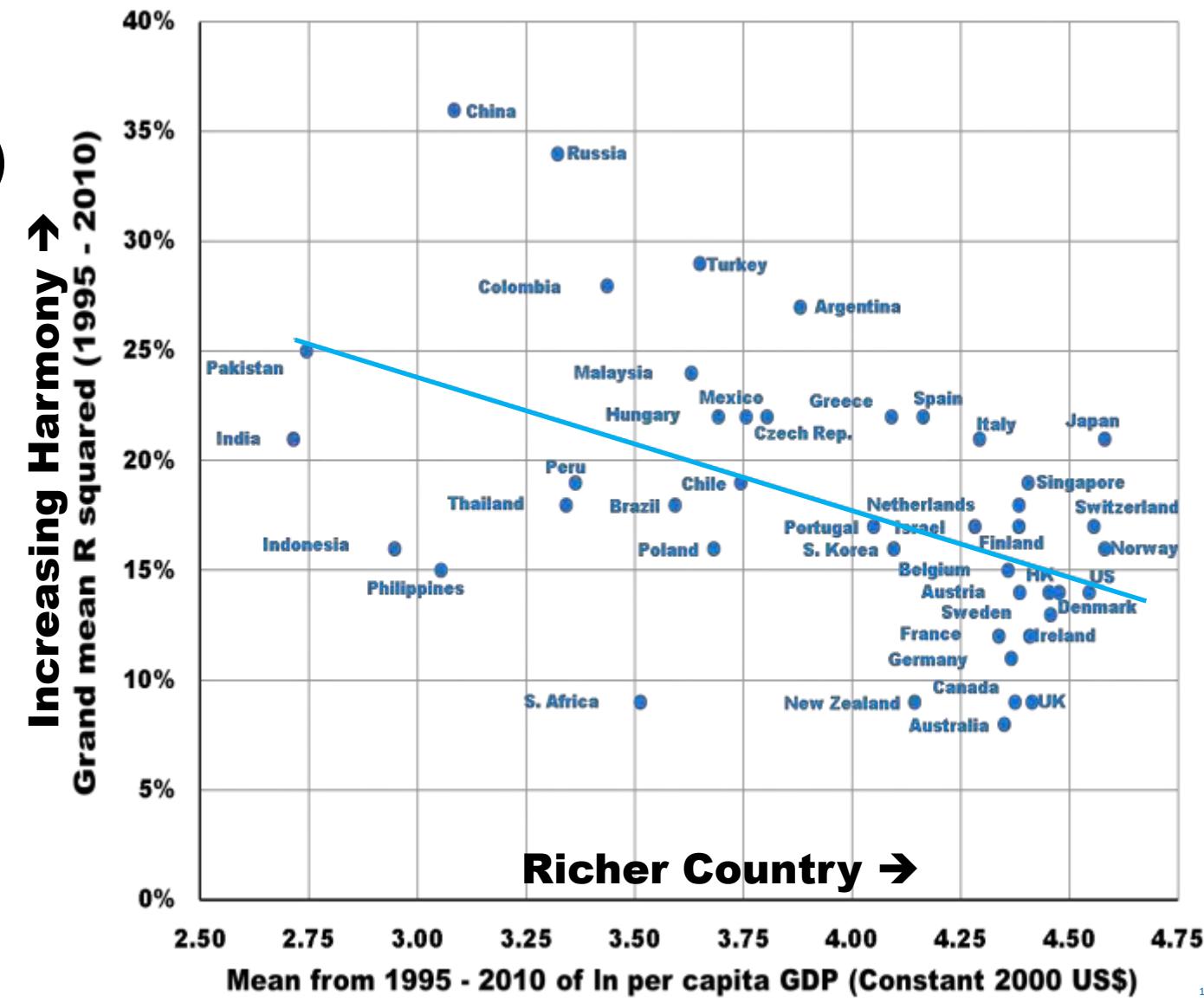
Morck, Randall, Bernard Yeung & Wayne Yu. 2000. The Information Content of Stock Markets: Why Do Stocks in Emerging Markets Comove? Journal of Financial Economics 58 215-238

Stocks move more independently in

- Richer countries
- Less corruption-prone countries
- In the last decades of 20th century (in USA)

Differences are not explained by

- Country size or stock market size
- Regional effect, i.e. Latin America
- Macroeconomic volatility, crises
- Country industrial diversification
- Mean firm diversification
- Natural resources dependence
- ...



Patterns of Comovement Across Countries & Over Time

莫克, 兰德尔, 杨柏德, 余伟, 2000。股票市场的信息内容:为什么新兴市场的股票会出现Comove?金融经济学报(英文版)58 215-238

股市在

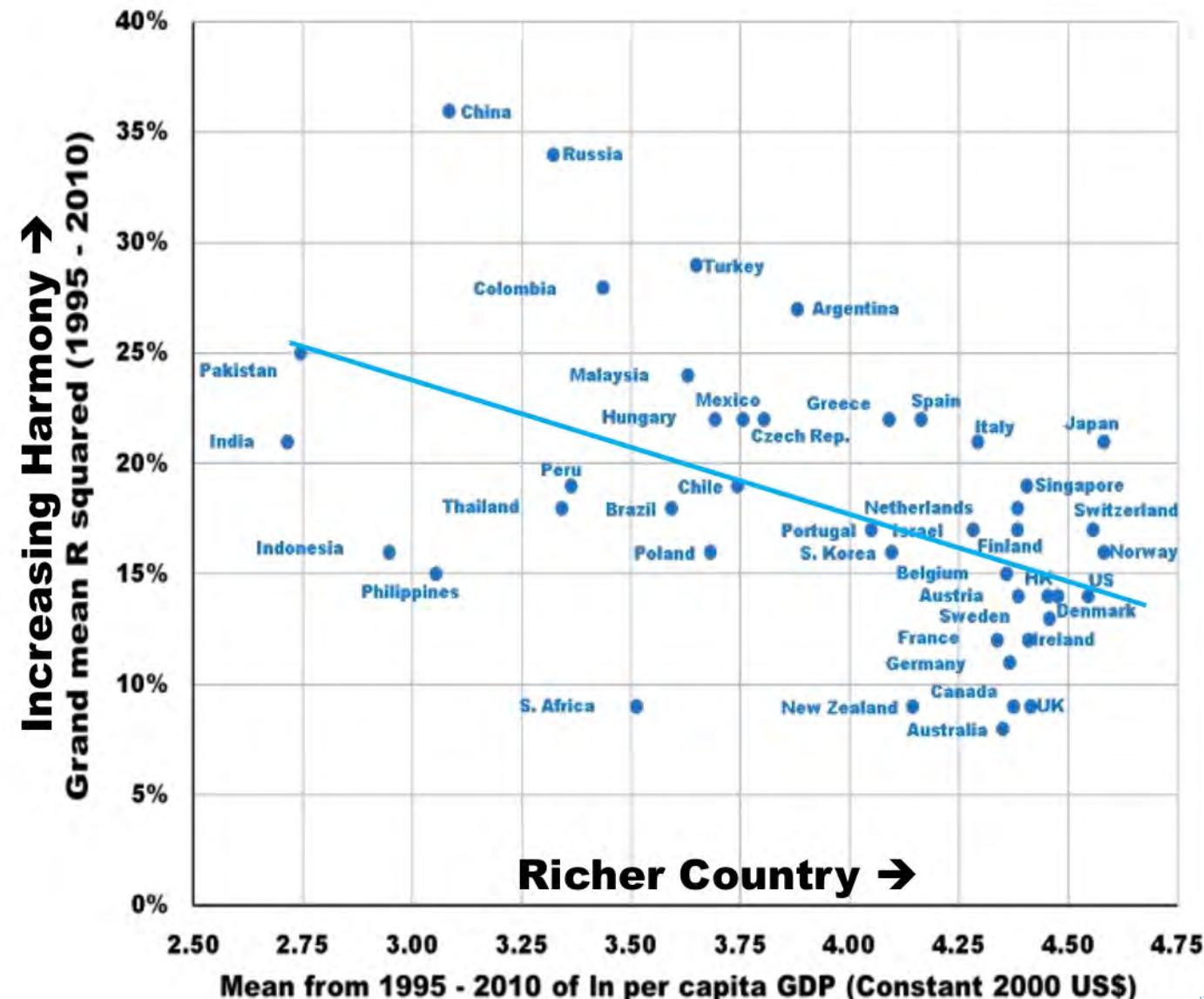
富裕国家

腐败倾向较低的国家

在20世纪最后几十年(在美国)

差异不能用。来解释

- 国家规模或股票市场规模
- 区域效应, 即拉丁美洲
- 宏观经济波动、危机
- 国家产业多元化
- 平均公司多元化
- 自然资源依赖
- ...



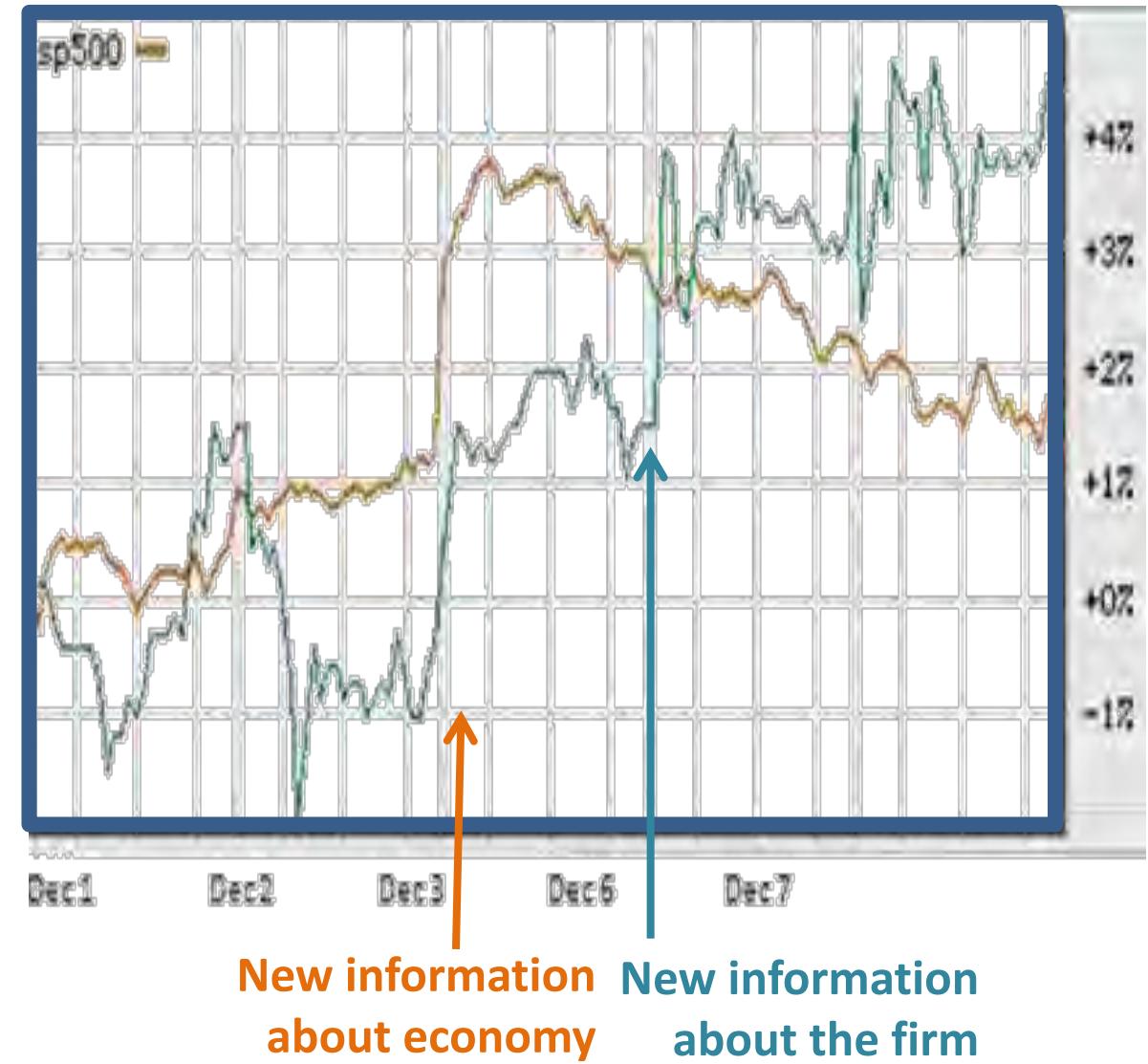
Information (Event) Intensity

Morck, Randall, Bernard Yeung & Wayne Yu. 2000. The Information Content of Stock Markets: Why Do Stocks in Emerging Markets Comove? Journal of Financial Economics 58 215-238

Stock prices move on information

- In Canada, Denmark, US ... most new information is about individual firms
 - Relatively transparent accounting
 - Relatively honest insiders
 - Relatively active financial media
- In China, India, Pakistan, Russia ... most new information is about economy
 - Relatively opaque accounting
 - Insider diversion of profits
 - Relatively loyal financial media

$$R^2 = \frac{\text{new information about the economy}}{\text{new information about the economy} + \text{new information about the firm}}$$



Information (Event) Intensity

莫克, 兰德尔, 杨伯纳德, 余伟, 2000。股票市场的信息内容:为什么新兴市场的股票会出现Comove?金融经济学报(英文版)58 215-238

股票价格随着信息而变动

在加拿大、丹麦、美国, 大多数是最新的

信息是关于单个公司的

相对透明的会计

相对诚实的内部人士

<s:1>相对活跃的财经媒体

在中国、印度、巴基斯坦、俄罗斯……大部分

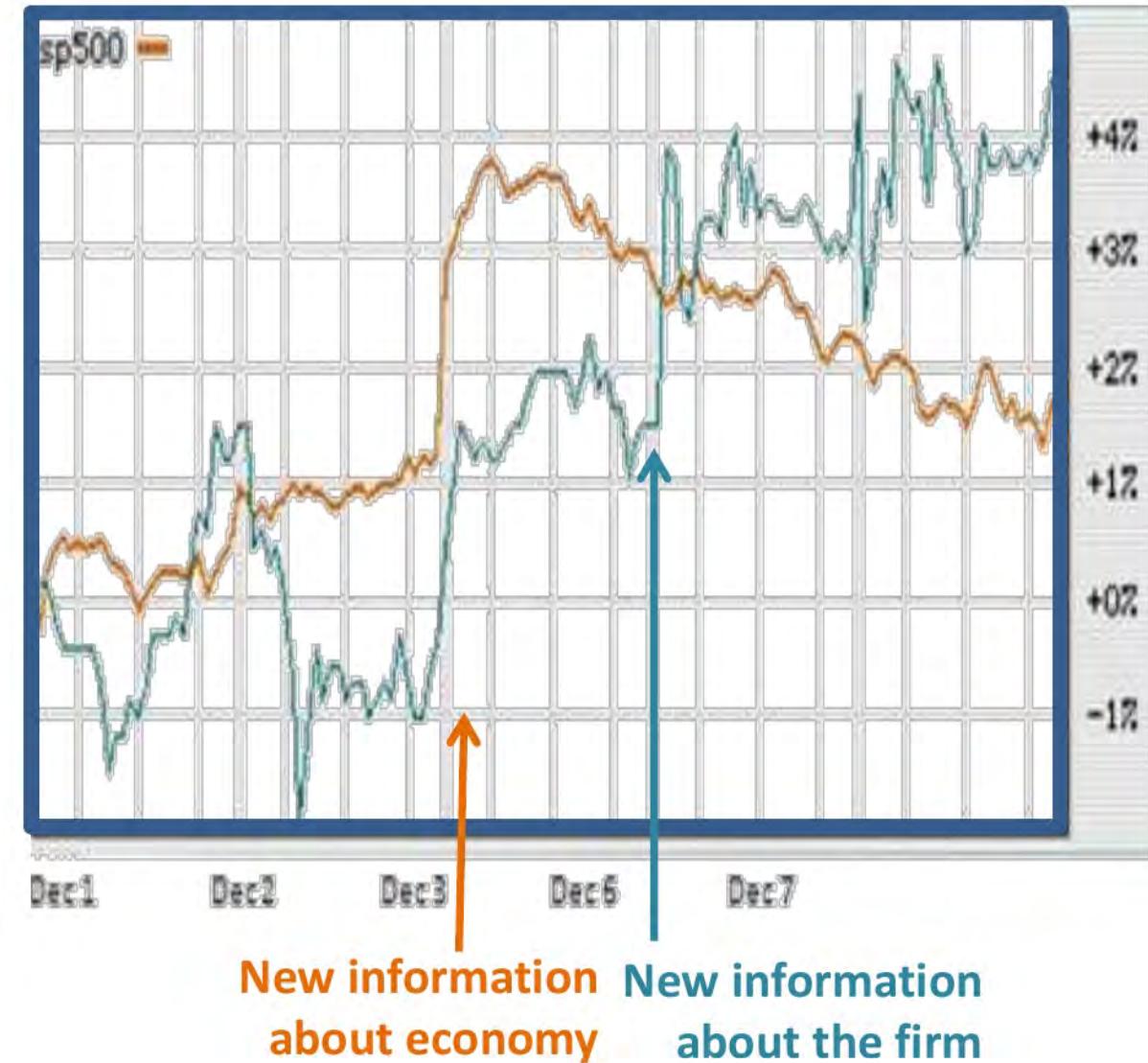
新的信息是关于经济的

相对不透明的会计

在内部转移利润

相对忠诚的财经媒体

$$R_6 = \frac{\text{NEW INFORMATION ABOUT THE ECONOMY}}{\text{NEW INFORMATION ABOUT THE ECONOMY} + \text{NEW INFORMATION ABOUT THE FIRM}}$$



Why Stocks Co-move More in Lower Income Economies?

1. Worse corporate corruption

Jin, Li & Stuart Myers. 2006, R2 Around The World: New Theory And New Tests," Journal of Financial Economics 79(2)257-292.

- Corporate insiders “divert” profits if they can
- Easier to divert firm-specific profits than market-wide profits
- If shareholders less protected, firm-specific profits more apt to go missing

Evidence

- Absence of corruption (Morck et al. 2000)
- Transparency, trustworthy accounting (Jin & Myers 2006; Haggard, Martin & Pereira 2008; Dasgupta, Gan & Gao 2010; Lau et al. 2012)
- Impact of IFRS adoption (Bissessur & Hodgson '12; Kim & Shi '12)
- 1980 FASB reform, affected firms only (Fox et al. 2003)
- Accruals management, pre-SOX only (Marcus & Tehranian '09)
- Voluntary enhanced disclosure in US (Haggard, Martin & Pereira 2008) & China(Gul, Kim & Qiu 2010)
- Before v. after new share issuances (Dasgupta, Gan & Gao 2010)



为什么低收入经济体的股市联动更大?

1. 企业腐败加剧

Jin, Li & Stuart Myers. 2006, R2环游世界:新理论和新测试, 《金融经济学杂志》79(2)257-292.

如果可能的话, 公司内部人士会“转移”利润

转移公司特定利润比转移整个市场的利润更容易

如果股东受到的保护更少, 公司的特定利润就更容易消失

证据

没有腐败(莫克等, 2000)

透明度, 可信赖的会计(Jin & Myers

2006;哈格德, 马丁&佩雷拉2008;Dasgupta, Gan &
高2010;Lau et al. 2012)

采用国际财务报告准则的影响(bisisssur & Hodgson '12;金
& Shi' 12)

1980年FASB改革, 仅影响公司(Fox et al. 2003)

应计项目管理, 仅限sox之前(Marcus &
Tehranian '09)

美国哈格德, 马丁

Pereira 2008)和中国(Gul, Kim & Qiu 2010)

在新股发行之前或之后(Dasgupta, Gan & .

高2010)



Why Stocks Co-move More in Lower Income Economies?

1. Worse corporate corruption 2. Worse corporate governance

- Poorly governed firms (i.e. firms whose top managers are untalented & don't really know what to do) just do what all the other firms are doing
- Stocks move up & down together because all firms' managers are doing what all the others are doing

Evidence

Adams, Scott. 2000. *The Dilbert Principle: A Cubicle's-Eye View of Bosses, Meetings, Management Fads & Other Workplace Afflictions*. Pan Macmillan

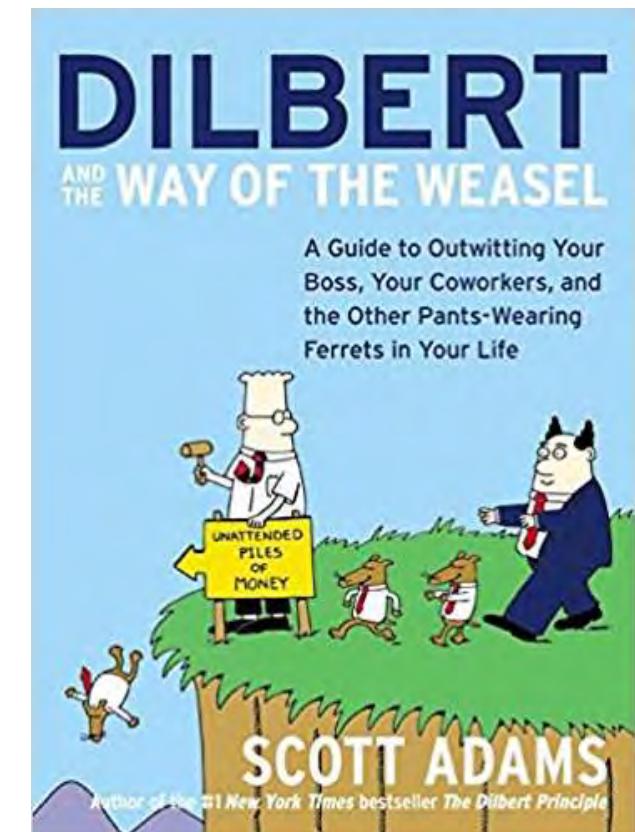
Adams, Scott. 1998. *The Dilbert future: thriving on business stupidity in the 21st century*. HarperBusiness

Feldman, Daniel. 2000. The Dilbert syndrome: How employee cynicism about ineffective management is changing the nature of careers in organizations. *American Behavioral Scientist* 43(8):1286-1300

Miles, Robert. 2000. Beyond the age of Dilbert: Accelerating corporate transformations by rapidly engaging all employees. *Organizational Dynamics* 29(4):313-13

Krueger, Jerry & Emily Killham. 2006. Why Dilbert is right. *Gallup Management*

- Scott Adams, who does the “Dilbert cartoon” for newspapers also writes management books that argue that many (most?) top corporate managers are Keynesian – they make decisions they think will make other people think they are up to date with the latest management fad, but really don’t really know what they are doing



为什么股票在低收入经济体中联动更多?

1. 更严重的企业腐败

2. 更严重的公司治理

治理不善的公司(即高层管理人员没有才能, 不知道该怎么做的公司)

做所有其他公司正在做的事情

股票同时上涨和下跌是因为所有公司的经理都在做其他人都在做的事情

证据

史考特, 亚当斯, 2000。呆伯特原则:从格子间的角度看老板、会议、管理潮流和其他工作场所苦难。潘麦克米伦

史考特, 亚当斯, 1998。呆伯特的未来:21世纪靠愚蠢的商业发展。HarperBusiness

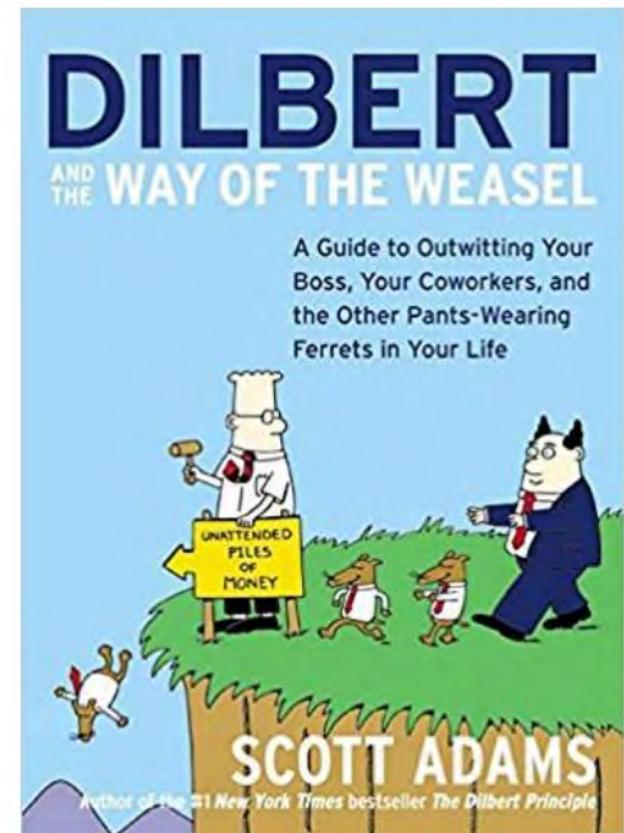
丹尼尔·费尔德曼, 2000。呆伯特综合症:员工对无效管理的玩世不恭正在改变公司的性质组织中的职业生涯。美国行为科学家43(8)1286-1300

罗伯特·迈尔斯。2000。超越呆伯特时代:通过迅速吸引所有员工来加速企业转型。

组织动力学29(4)313-13

Krueger, Jerry & Emily Killham. 2006。为什么呆伯特是对的。盖洛普管理

史考特亚当斯(Scott Adams)为报纸创作“呆伯特漫画”(Dilbert cartoon), 他也写管理学书籍, 认为许多(大多数?)公司高层管理者是凯恩斯主义者——他们做出决定, 认为会让其他人认为他们跟上了最新的管理潮流, 但实际上他们并不真正知道自己在做什么



Why Stocks Co-move More in Lower Income Economies?

1. Worse corporate corruption
2. Worse corporate governance

- Poorly governed firms (i.e. firms whose top managers are untalented & don't really know what to do) just do what all the other firms are doing
- Stocks move up & down together because all firms' managers are doing what all the others are doing

Evidence

- Valuations (Cao et al; Zhang 2010; Bekaert, Hodrick & Zhang 2012)
- Corporate governance scores (Ferreira & Laux 2007)
- Board size (Cheng 2011)
- Institutional investor presence (Malkiel & Xu 2002)
- Chinese firms with better corp. gov. (Ferreira & Laux '07), more foreign & less state ownership (Gul et al. '10)
- Cross-listing (Fernandes & Ferreira 2008)
- Founder control (Adams, Almeida & Ferreira 2005)
- Shareholder rights (Morck et al. 2000)
- Independence from business groups in Japan (Hamao, Mei,& Xu 2007) & elsewhere (Khana & Thomas 2009).

为什么低收入经济体的股票联动更大?

1. 更严重的企业腐败
2. 更严重的公司治理

治理不善的公司(即高层管理人员没有才能， 不知道该怎么做的公司)

做所有其他公司正在做的事情

股票同时涨跌是因为所有公司的经理都在做其他人都在做的事情

证据

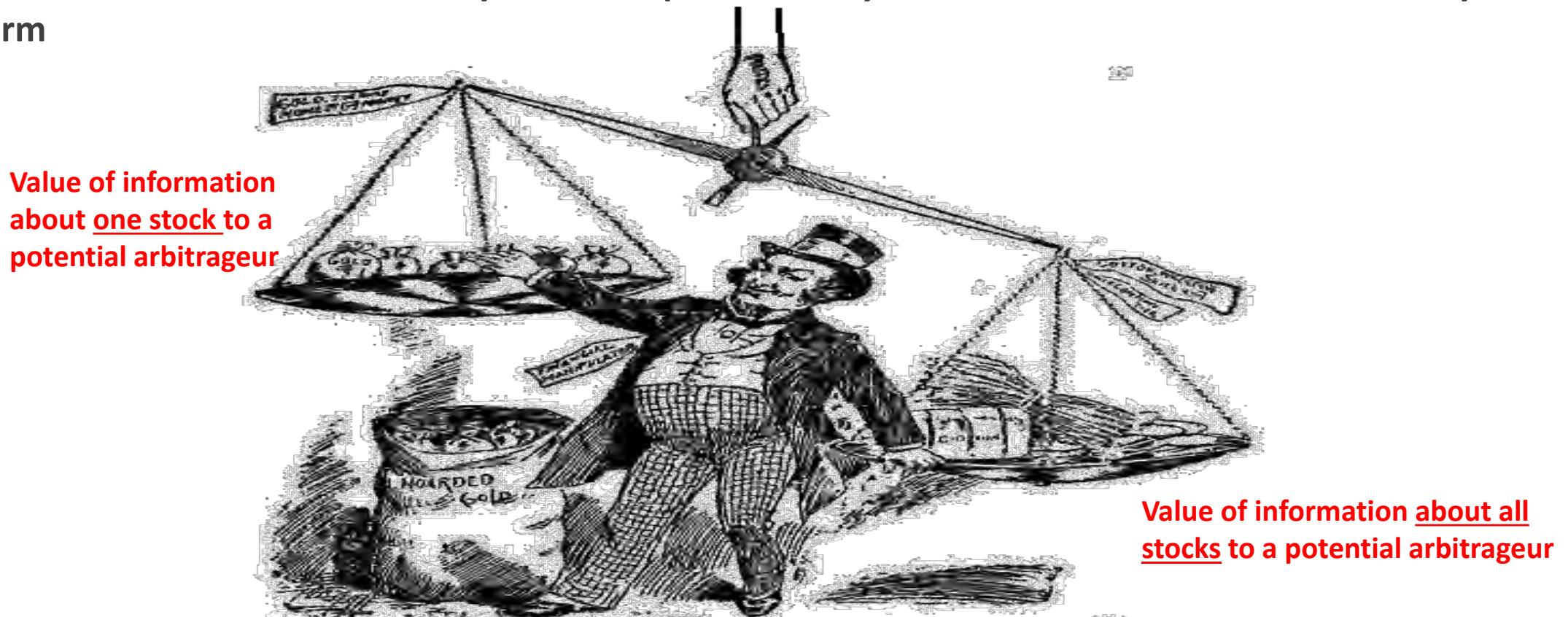
- ☒ 估值(曹等;张2010;Bekaert, Hodrick & Zhang 2012)
- ☒ 公司治理评分(Ferreira & Laux 2007)
- ☒ 板大小(Cheng 2011)
- ☒ 机构投资者的存在(Malkiel & Xu 2002)
- ☒ 中国公司拥有更好的公司治理(费雷拉 & Laux '07), 更多的外资和更少的国有(Gul等.)
“10)
- ☒ 交叉上市(Fernandes & 费雷拉, 2008)
- ☒ 创始人控制(亚当斯, 阿尔梅达和费雷拉2005)
- ☒ 股东权利(Morck et al. 2000)
- ☒ 独立于日本(Hamao, Mei, & Xu 2007)和其他地方(Khana & Thomas)的商业集团
2009).

Why Stocks Co-move More in Lower Income Economies?

1. Worse corporate corruption
2. Worse corporate governance
3. Costlier information

Veldkamp, Laura. 2006. Information markets & the comovement of asset prices. Review of Economic Studies 73(3)823-845

- Information about the economy has more potential buyers than does information about any individual firm



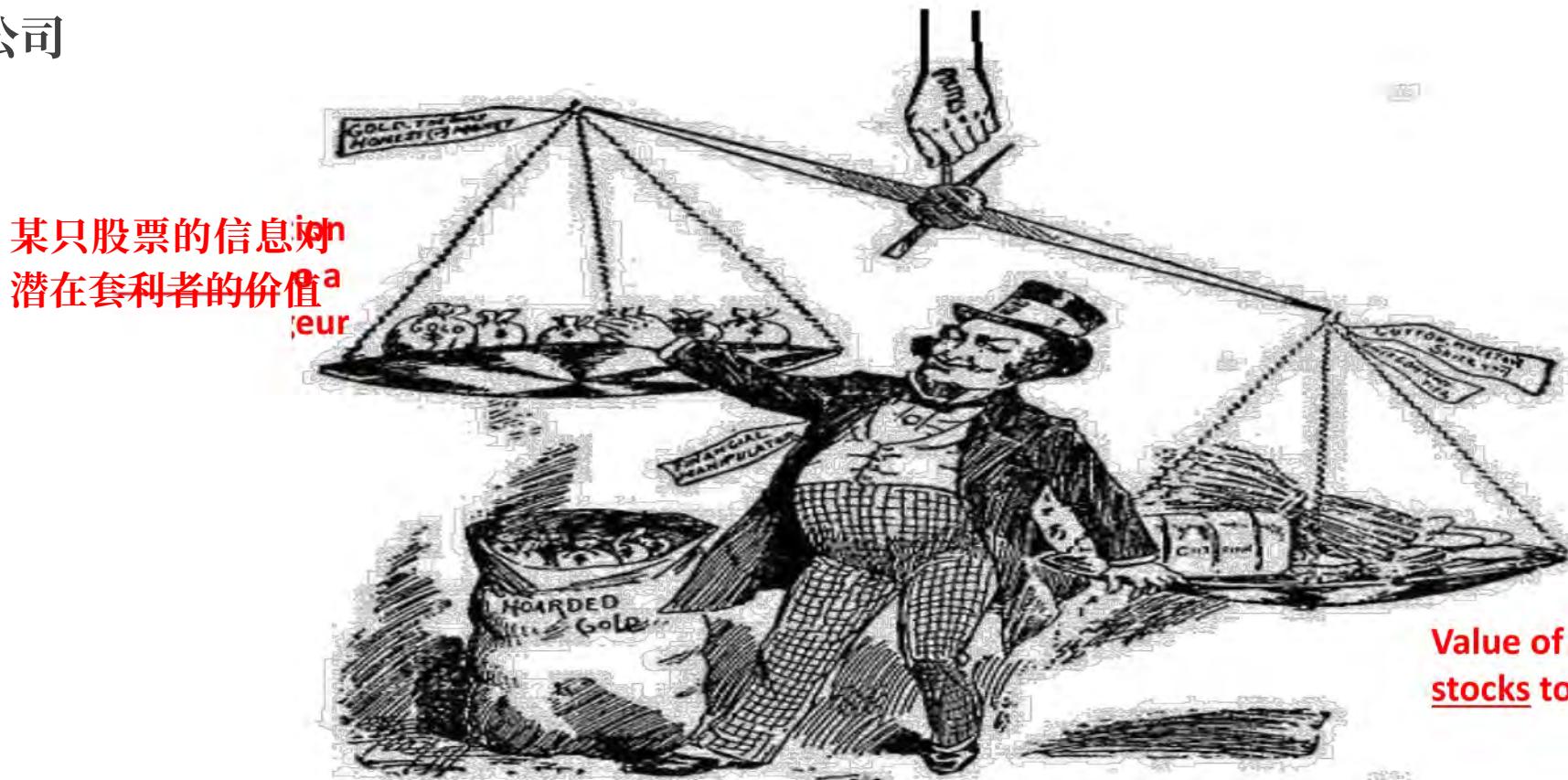
为什么低收入经济体的股市联动更大?

1. 企业腐败更严重
2. 公司治理恶化
3. 昂贵的信息

劳拉·维尔德坎普, 2006。《信息市场与资产价格的变动》。经济研究评论73(3)823-845

关于经济的信息比关于任何个人的信息有更多的潜在购买者

公司



Value of information about all stocks to a potential arbitrageur

Why Stocks Co-move More in Lower Income Economies?

1. Worse corporate corruption
2. Worse corporate governance
3. Costlier information

Veldkamp, Laura. 2006. Information markets & the comovement of asset prices. *Review of Economic Studies* 73(3)823-845

- Information about the economy has more potential buyers than does information about any individual firm

Evidence

- Stocks followed by more analysts co-move more (Piotroski & Roulstone 2004; Chan & Hameed 2006; Hameed, Morck & Yeung 2005).
- Analysts' forecasts contain mainly industry & economy-level information (Schutte & Unlu 2009; Crawford et al. 2012).
- Foreign investment barriers (Li, Morck, Yang & Yeung 2004; Bae, Bailey & Mao 2006), inflows (Bae et al. 2006), cross-listings into US (Bae et al. 2006) or HK (Gul, Kim & Qiu 2010)
- Short sale restrictions (Bris, Goetzmann & Zhu 2007)
- Institutional investors (Malkiel & Xu 2002; Chung, Fung, Shilling & Simmons-Mosley 2011), esp. hedge funds (Chun et al. 2011)
- More active institutional investors (Piotroski & Roulstone 2004)

为什么低收入经济体的股票联动更大?

1. 企业腐败更严重
2. 公司治理恶化
3. 昂贵的信息

劳拉·维尔德坎普, 2006。《信息市场与资产价格的变动》。经济研究评论73(3)823-845

关于经济的**信息**比关于任何单个公司的信息有更多的潜在购买者

证据

股票跟随更多的分析师共同移动更多(Piotroski & Roulstone 2004; Chan & Hameed 2006; Hameed, 莫克和杨2005)。

分析师的预测主要包含行业和经济层面的信息(Schutte & Unlu 2009; Crawford et al. 2012)。

外国投资壁垒(Li, 莫克, Yang & Yang 2004;

卖空限制(Bris, Goetzmann & Zhu 2007)

机构投资者(Malkiel & Xu 2002; Chung, Fung, Shilling & Simmons-Mosley 2011), 尤其是对冲基金
(Chun et al. 2011)

更活跃的机构投资者(Piotroski & Roulstone 2004)

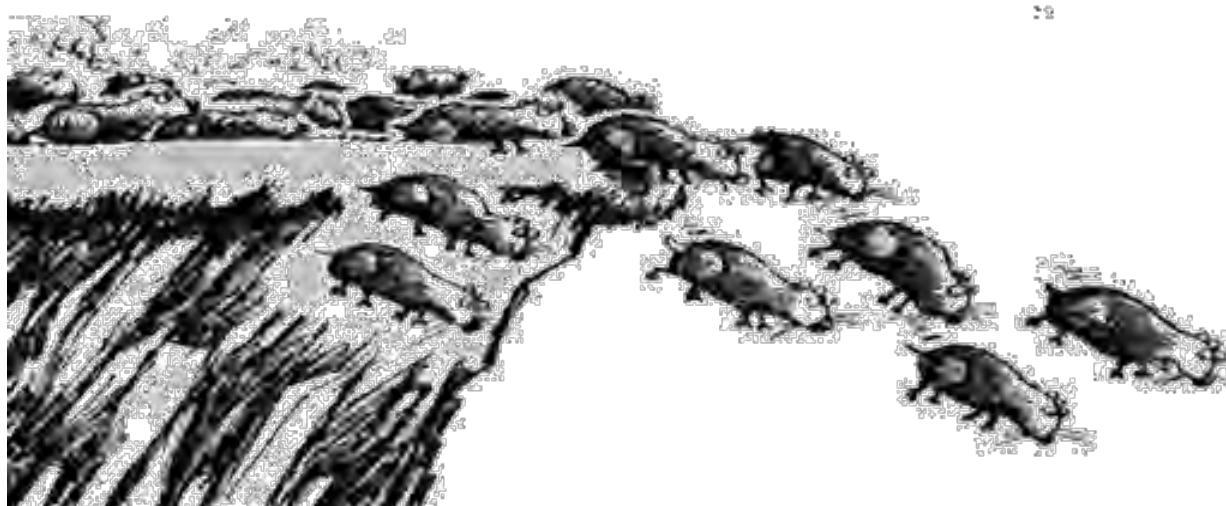
Why Stocks Co-move More in Lower Income Economies?

1. Worse corporate corruption
2. Worse corporate governance
3. Costlier information
4. More herding

Uninformed traders “herd” and this tends to move many stocks together, not just one (Keynes 1936; Kindleberger 1978; DeLong et al. 1990; Shiller 2000; Reinhart & Rogoff 2011)

Evidence

Behavioral economics studies on herding, conformity, crowds, etc.
 Despite 2008, financial crises are more frequent and severe in poorer countries



为什么低收入经济体的股市联动更大?

1. 企业腐败更严重
2. 公司治理恶化
3. 昂贵的信息
4. 更多的放牧

不知情的交易者“羊群”，这往往会使许多股票一起移动，而不仅仅是一只股票(凯恩斯1936;金德尔伯格1978;DeLong et al. 1990;希勒2000;Reinhart & Rogoff 2011)

证据

行为经济学研究羊群、从众、群体等。

尽管2008年，金融危机在较贫穷的国家更为频繁和严重



The Functional form of the Efficient Markets Hypothesis

Intro finance textbooks usually only discuss 3 forms of the efficient markets hypothesis, but there is a 4th form

Weak Form

- The market is weak-form efficient if past & present stock returns & volumes do not predict future stock returns

Strong Form

- The market is strong-form efficient if future stock returns cannot be predicted

Semi Strong Form

- The market is semi-strong-form efficient if public information cannot predict future stock returns

Tobin (inventor of CAPM) argues that a 4th form is by far the most important

Functional Form of the Efficient Markets Hypothesis

- The market is functionally efficient if it directs people's savings to firms with $NPV > 0$ projects
 - Stock prices determine firms weighted average costs of capital (remember from intro Finance that these depend on the market values of firms securities)
 - Firms' weighted average costs of capital are their "hurdle rates" for IRR analysis and discount rates for NPV analysis
 - If stock prices are seriously wrong, firms IRR and NPV decisions can be seriously biased and firms can end up wasting money of projects that truly have $NPV < 0$
 - A more functionally efficient stock market is one where this happens less often
- Tobin argues that the original 3 forms of the efficient markets hypothesis only matter to people running investment funds (who worry about "beating the market"), but that the functional form matters to everyone (because overall economic growth depends on firms financing $NPV > 0$ projects)



James Tobin
Nobel Prize, 1981

有效市场假说的功能形式

金融入门教科书通常只讨论有效市场假说的三种形式，但还有第四种形式

弱式

如果过去和现在的股票回报和交易量不能预测未来的股票回报，那么市场就是弱形式有效的

强烈的形式

如果未来的股票收益无法预测，那么市场就是强形式有效的

半强势形式

如果公开信息不能预测未来的股票收益，那么市场就是半强形式有效的

托宾(CAPM的发明者)认为4th形式是迄今为止有效市场假说中最重要的功能形式

如果市场将人们的储蓄引导到 $NPV > 0$ 的项目中，那么市场是有效的

股票价格决定了公司的加权平均资本成本(请记住，这些成本取决于公司证券的市场价值)

公司的加权平均资本成本是IRR分析的“门槛率”和NPV分析的贴现率

如果股票价格严重错误，公司的IRR和NPV决策可能会严重偏差，公司最终可能会浪费 $NPV < 0$ 的项目的资金

在一个功能更有效的股票市场中，这种情况发生的频率会更低

托宾认为，有效市场假说的最初三种形式只对经营投资基金的人(他们担心“击败市场”)有影响，但功能形式对每个人都有影响(因为整体经济增长取决于企业为 $NPV > 0$ 的项目融资)。



Eugene James

F.Tobin Fama

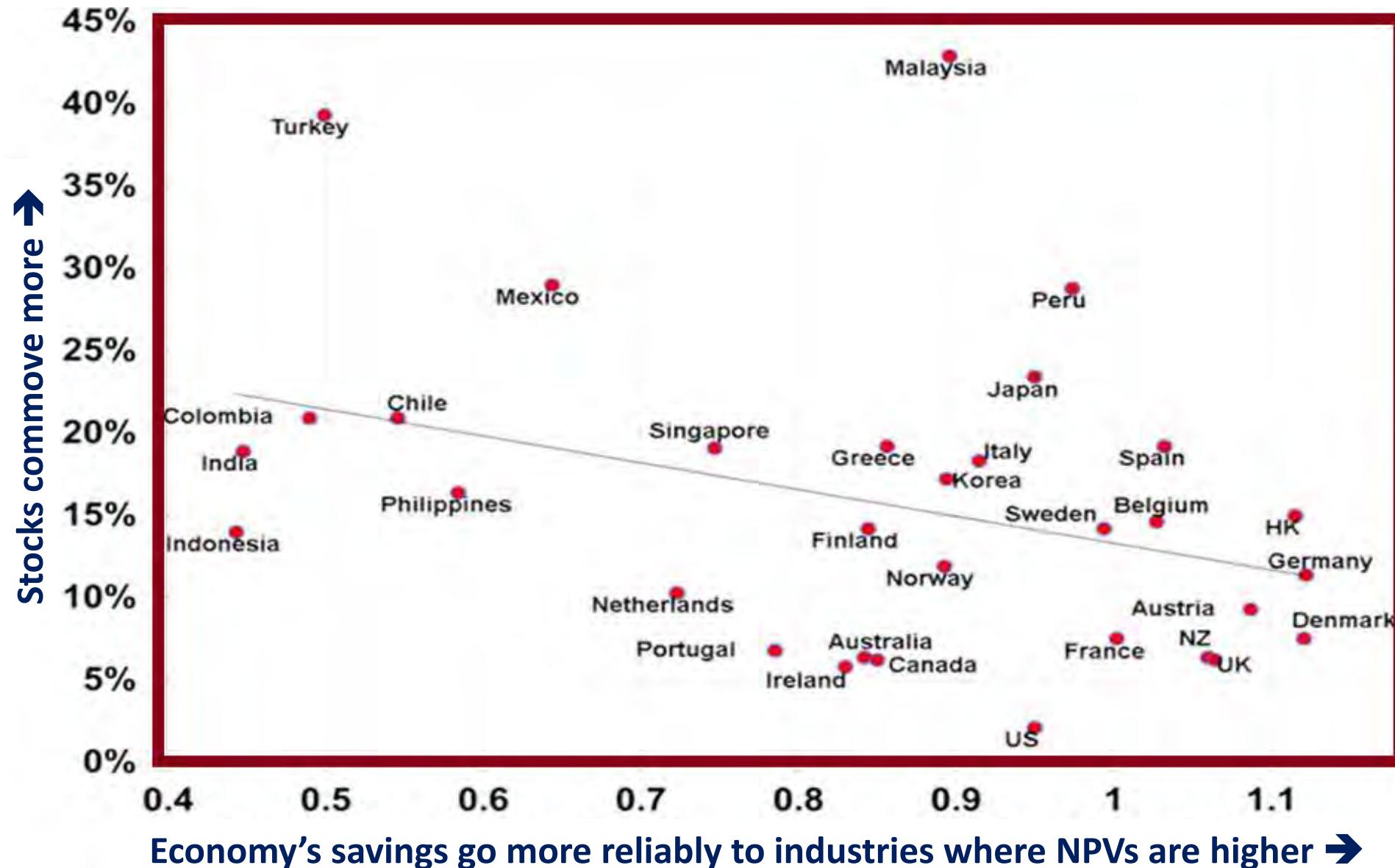
金融学教授，1981年芝
Dimensional Fund Advisors
加利福尼亚州投资管理
管理)

The Functional form of the Efficient Markets Hypothesis

Wurgler, Jeff. (2000) Do Stock Prices Guide Capital Allocation in the US? *Journal of Financial Economics*

Finding

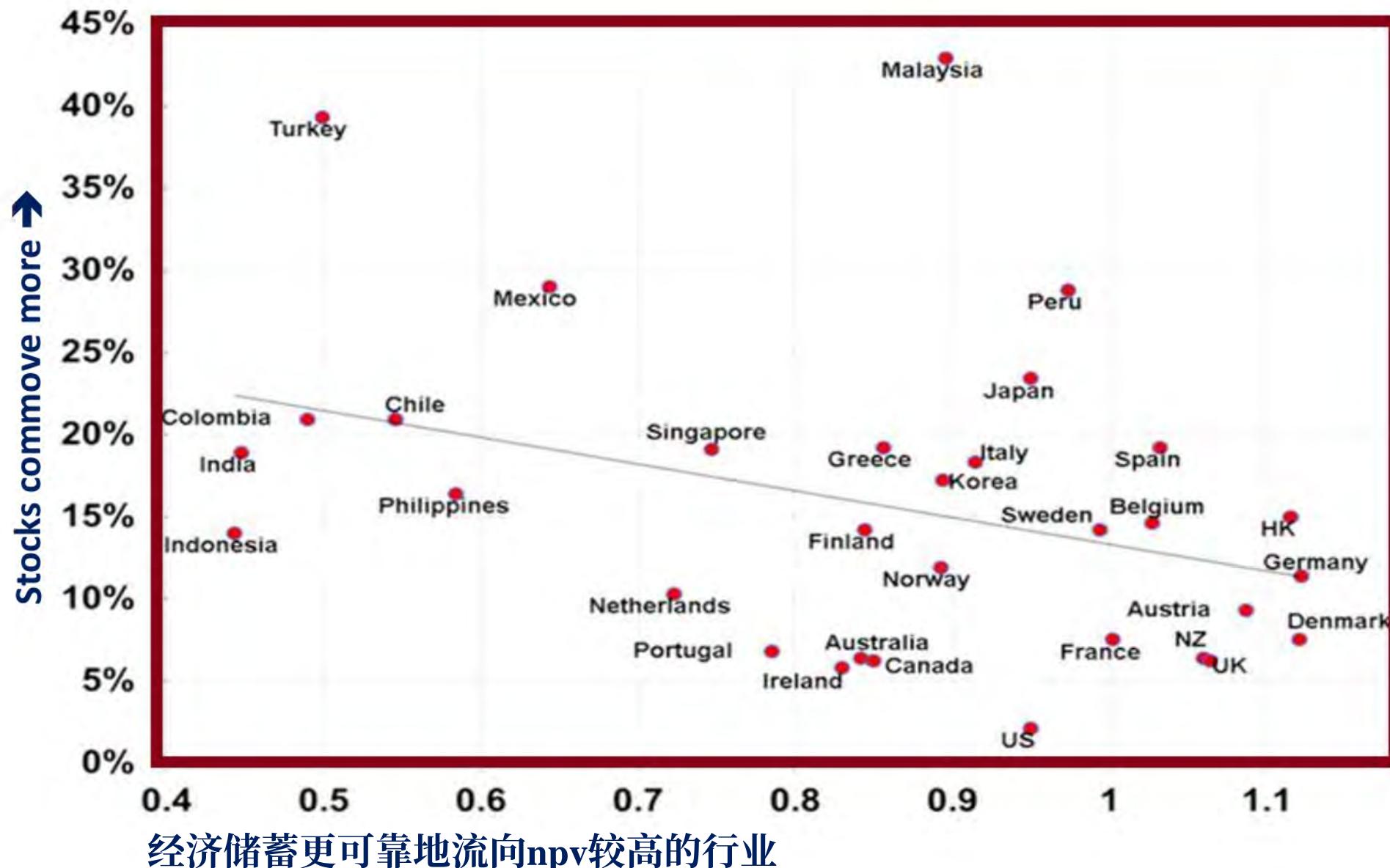
- Stocks co-move more where stock markets are less functionally efficient (which leaves incomes lower)



The Functional form of the Efficient Markets Hypothesis

Wurgler,杰夫。(2000)股票价格是否指导美国的资本配置?《金融经济杂志》

发现
股票在股票市场
功能效率较
低的地方波
动更大(这导
致收入较低)

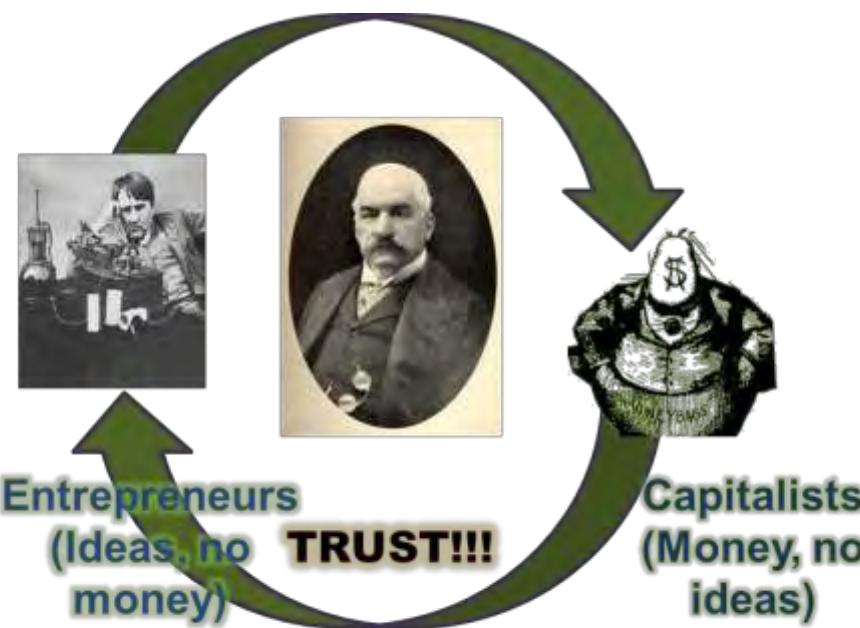


Why Stocks Co-move More in Lower Income Economies?

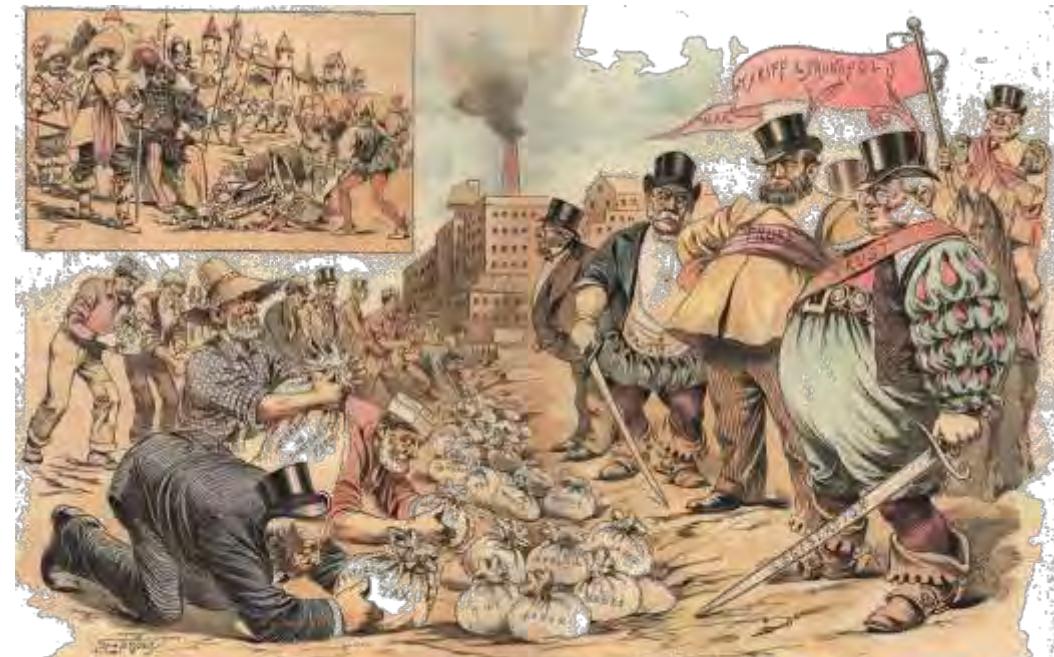
1. Worse corporate corruption
2. Worse corporate governance
3. Costlier information
4. More herding by investors



All of these are different ways of saying: “Worse functioning financial system”



Schumpeter's Circular Flow works better where stocks move more independently

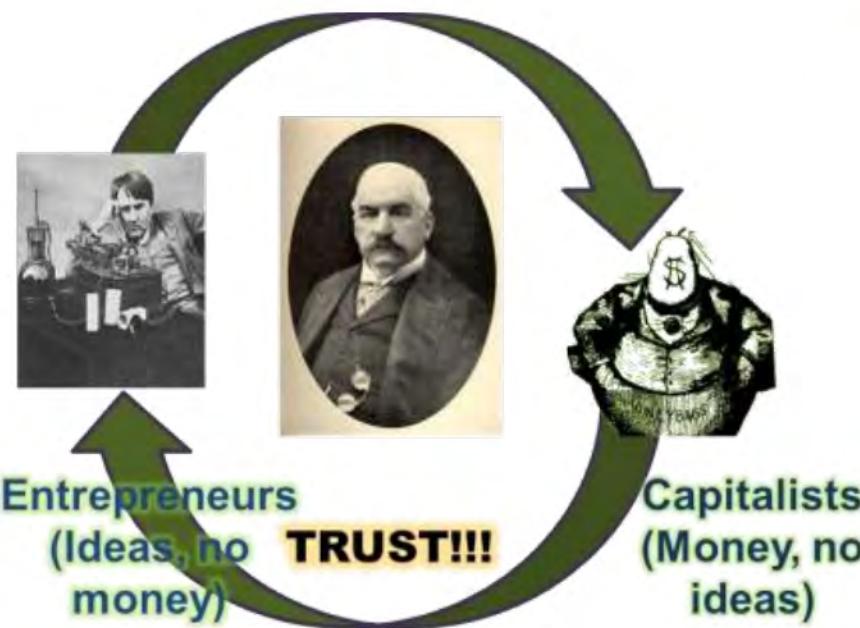


Where Schumpeter's Circular Flow works badly, there is poverty & elite entrenchment

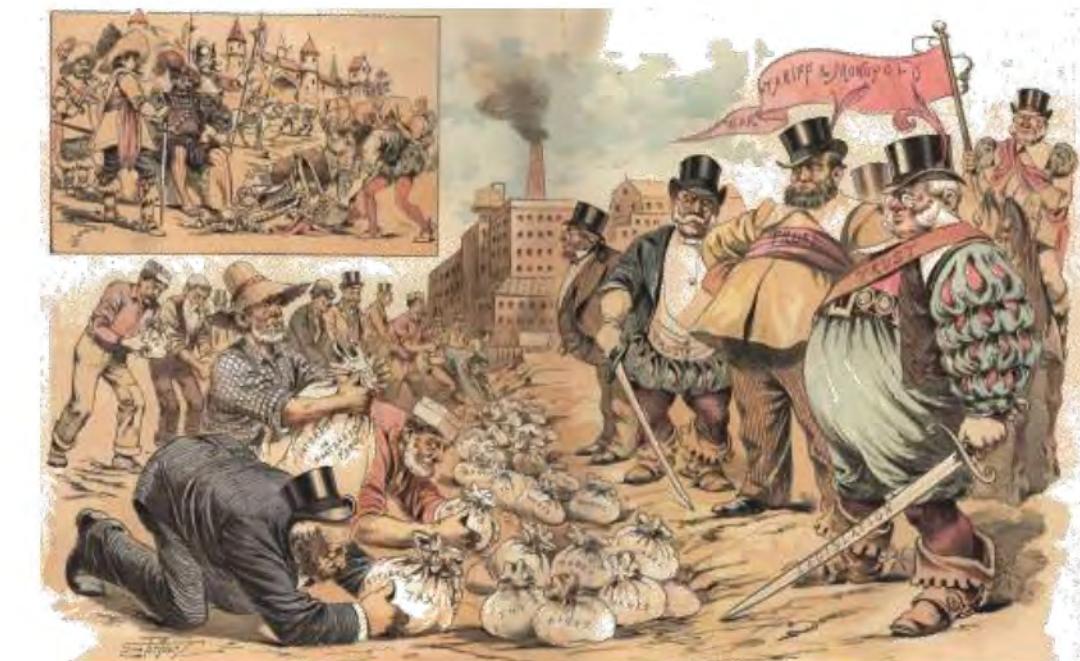
为什么低收入经济体的股票联动更大?

1. 企业腐败更严重
2. 公司治理恶化
3. 昂贵的信息
4. 投资者更多的羊群效应

所有这些都是“金融体系更严重”的不同说法。



熊彼特的循环流动理论在股票走势更加独立的地方效果更好



熊彼特的循环流动理论不起作用的地方，就有贫困和精英的壕沟

More Innovation Means Even Less Co-movement

Chun, Hyunbae, Jung-Wook Kim, Randall Morck & Bernard Yeung. 2008. Creative Destruction & Firm-Specific Performance Heterogeneity. JFE

- Innovation has big winners (whose shares go up) & big losers (whose shares go down)
- More intense innovation means more shares moving up & down, rather than just moving with the market



More Innovation Means Even Less Co-movement

Chun, Hyunbae, Jung-Wook Kim, Randall Morck & Bernard Yeung, 2008。《创造性破坏与企业特定绩效异质性》。JFE

创新有大赢家(其股价上涨)和大输家(其股价下跌)

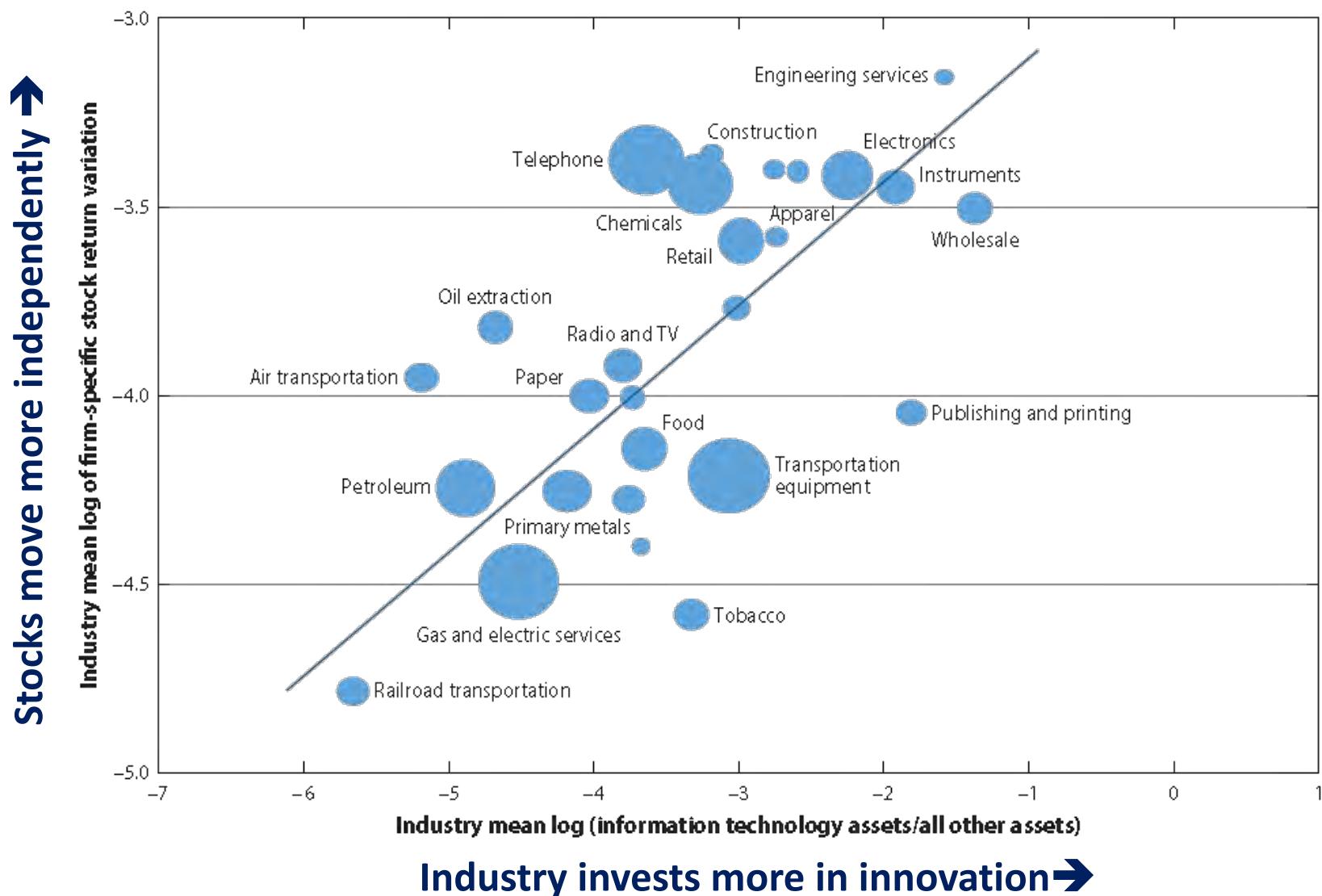
更激烈的创新意味着更多的股票上下波动,而不仅仅是随着市场波动



More Innovation Means Even Less Co-movement

Chun, Hyunbae, Jung-Wook Kim, Randall Morck & Bernard Yeung. 2008. Creative Destruction & Firm-Specific Performance Heterogeneity. JFE

- Stocks in US industries with more intense investment in information technology move more independently of the market



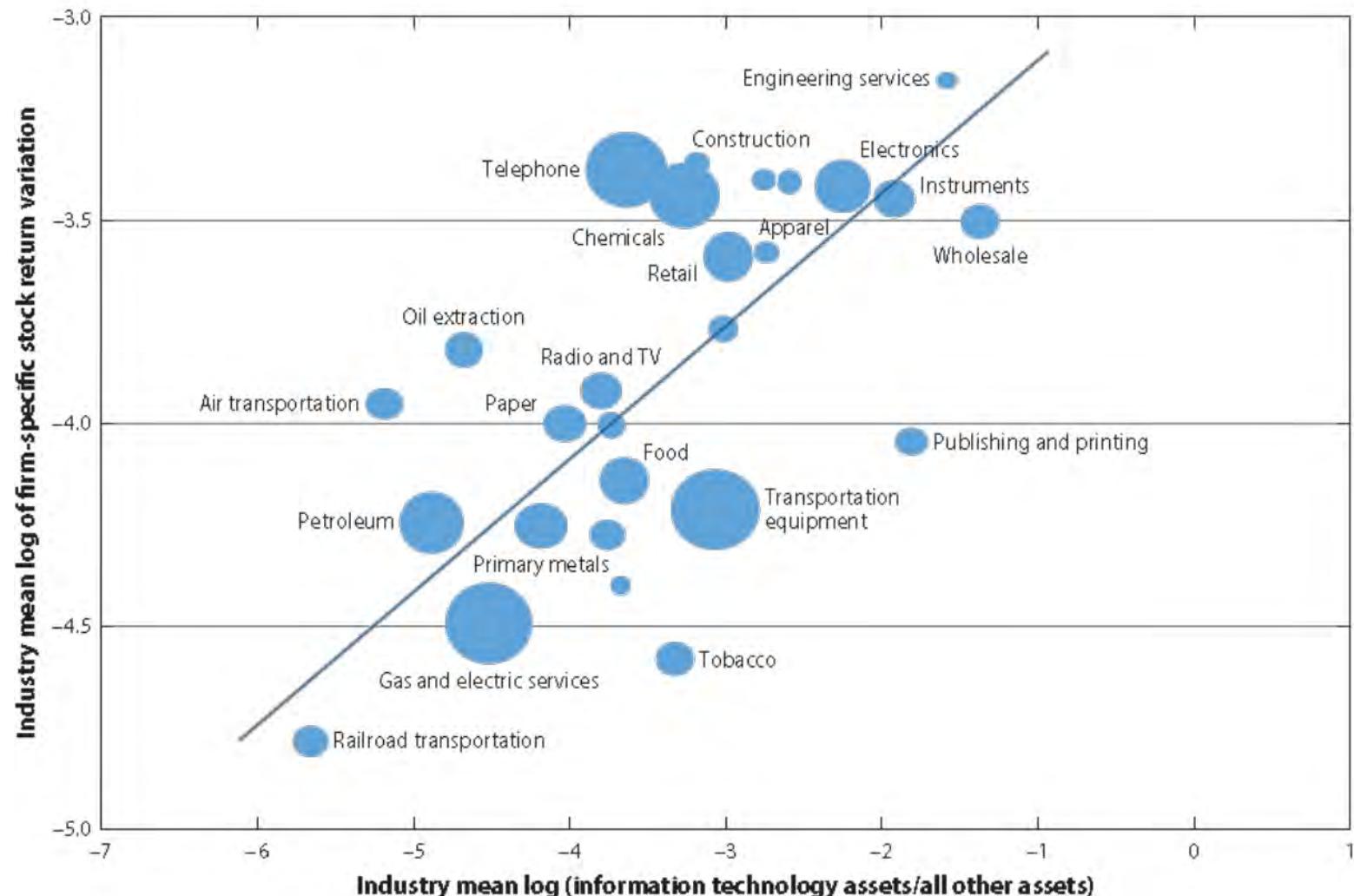
Source:

More Innovation Means Even Less Co-movement

Chun, Hyunbae, Jung-Wook Kim, Randall Morck & Bernard Yeung. 2008. Creative Destruction & Firm-Specific Performance Heterogeneity. JFE

在信息技术方面投资更密集的美国行业
股票的走势更独立于市场

股票走势更加独立



行业在创新领域投资较多

Source:

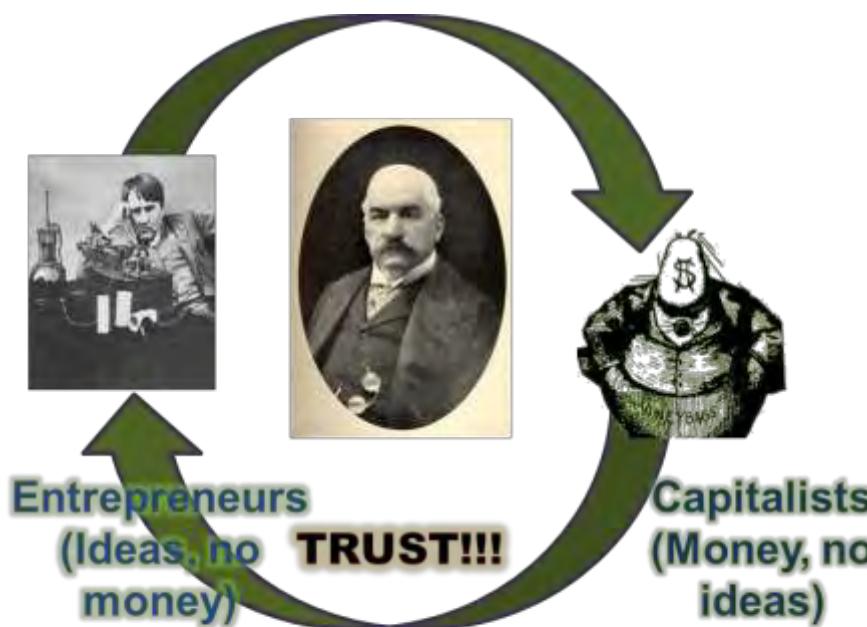
Why Stocks Co-move More in Lower Income Economies?

1. Worse corporate corruption
2. Worse corporate governance
3. Costlier information
4. More herding by investors
5. Slower pace of innovation



All of these are different ways of saying: "Worse functioning financial system"

This is the result of a weaker financial system
(worse functioning Schumpeterian circular flow)



Schumpeter's Circular Flow works better where stocks move more independently

Evidence

- Stocks move more independently where more innovation is happening (Chun et al. 2008, 2011; 2013)
- Firm age (Pastor & Veronesi 2003; Fama & French 2004)
- IPOs (Brown & Kapadia 2007)
- Younger firms doing IPOs (Fink, Fink, Grullon & Weston 2010) (age at IPO down from ca. 40 in early 60s to < 5 by 2000)
- Deregulation & competition (Gasper & Massa 2006; Irvine & Pontiff 2009)

为什么低收入经济体的股票联动更大?

1. 更严重的企业腐败
2. 功能更差的公司治理
3. 昂贵的信息
4. 投资者的羊群效应加剧
5. 创新步伐放缓



熊彼特的循环流动理论在股票更独立的地方更有效

所有这些都是“金融体系功能更差”的不同说法。

这是金融体系疲软的结果
(功能更差的熊彼特循环流)

证据

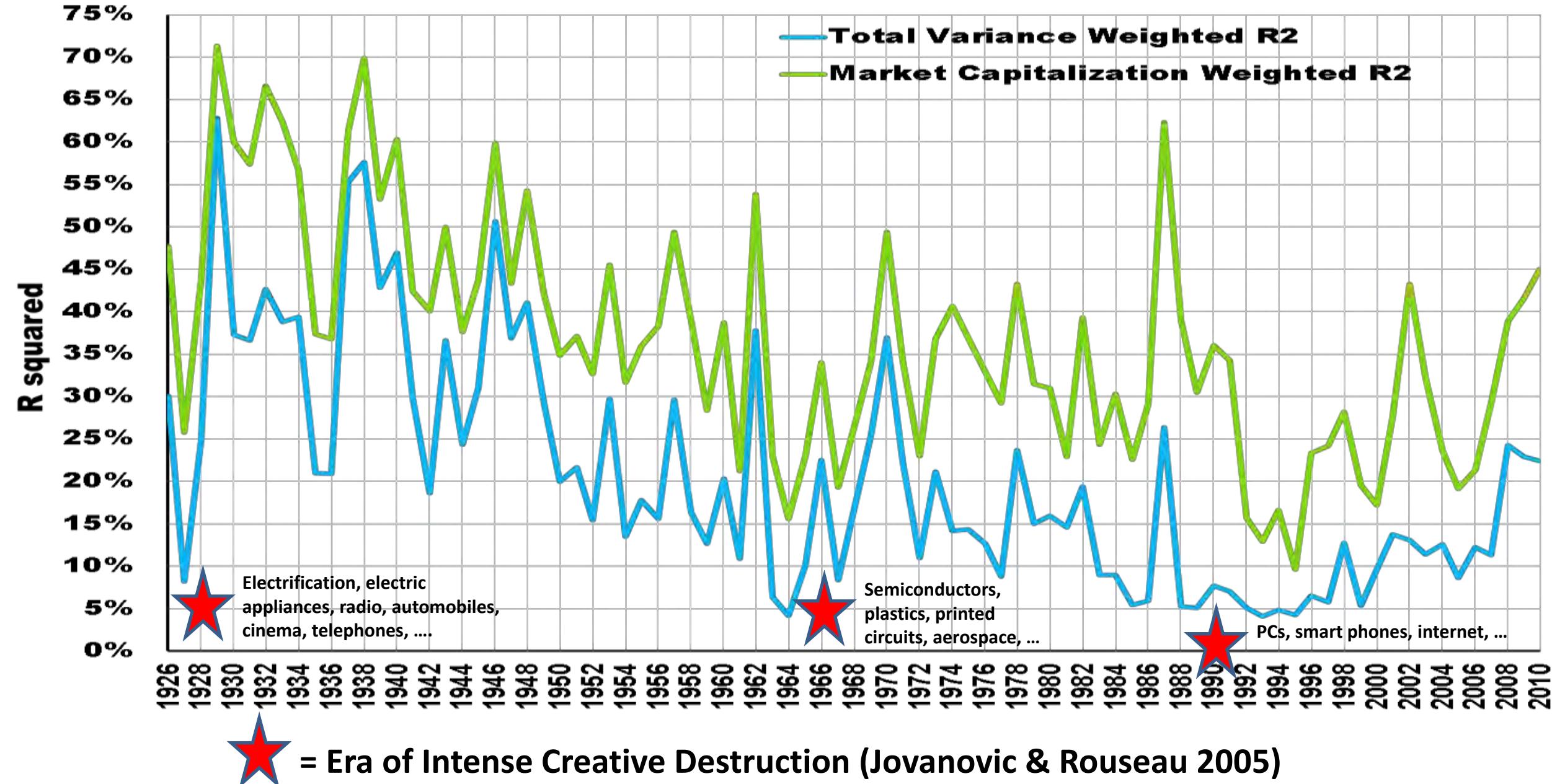
在更多的地方，股票的波动更加独立

创新正在发生(Chun et al. 2008, 2011;2013) Firm age (Pastor & Veronesi 2003;首次公开募股(Brown & Kapadia 2007)进行首次公开募股的年轻公司(芬克,芬克, Grullon & Weston 2010)(首次公开募股时的年龄从60年代初的40岁左右下降到2005年的5岁以下)

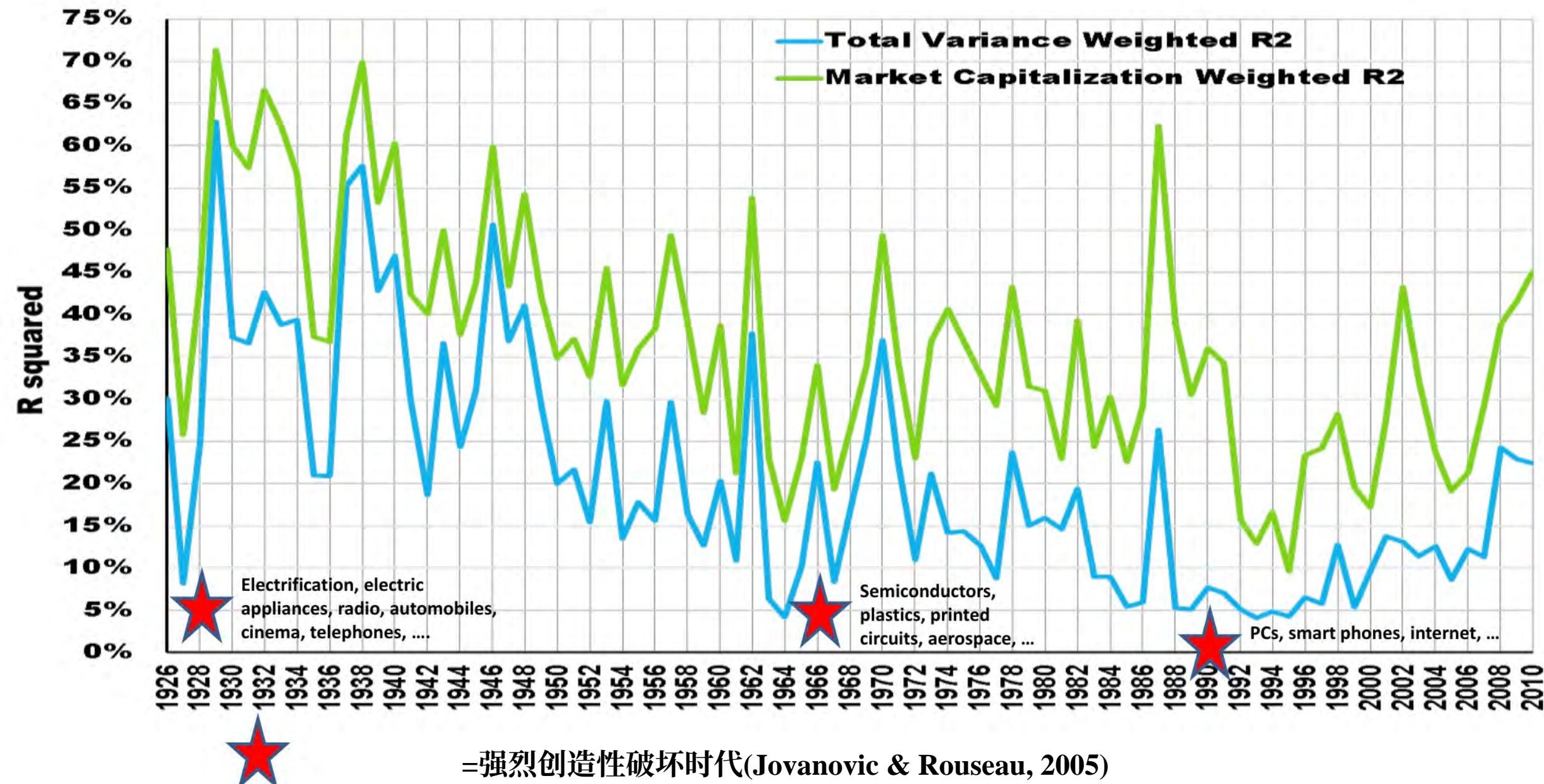
2000) 放松
管制与竞争

(Gasper & Irvine & Pontiff 2009)
Massa 200

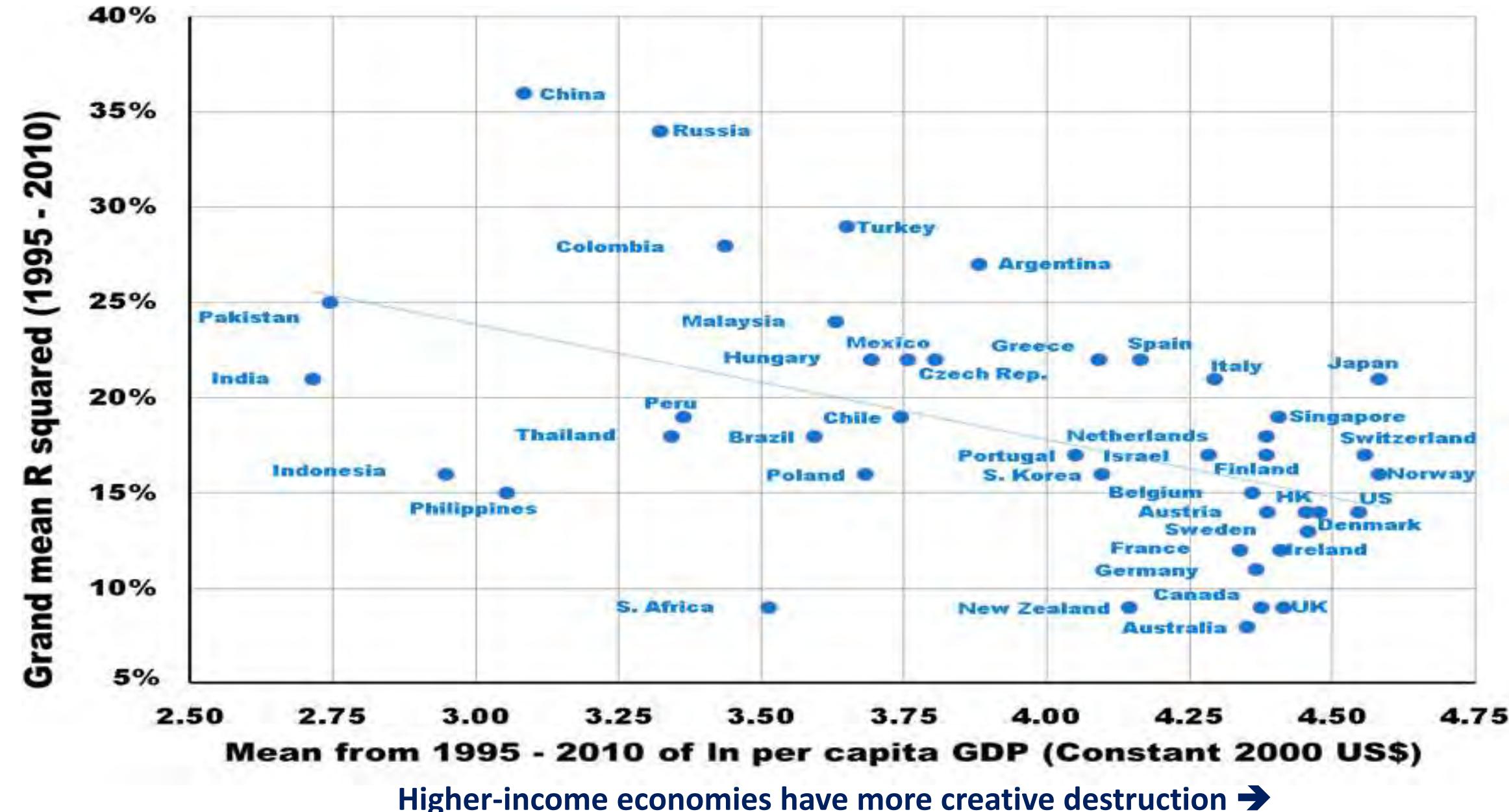
Stocks Co-move Least In Eras With Faster Innovation



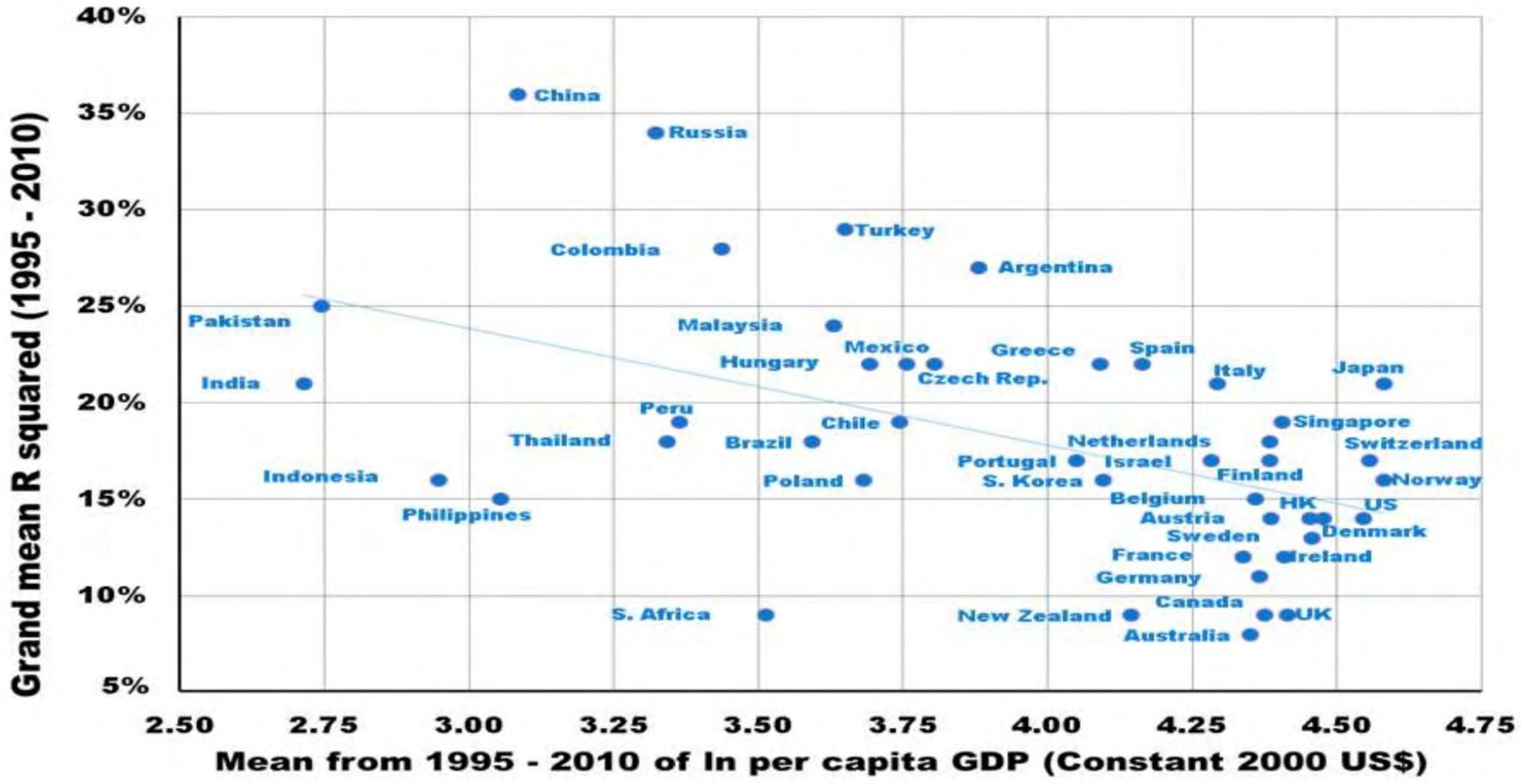
在创新更快的时代，股票的共同波动最小



Stocks Co-move Less In Countries With Faster Innovation



在创新速度更快的国家，股票联动较少



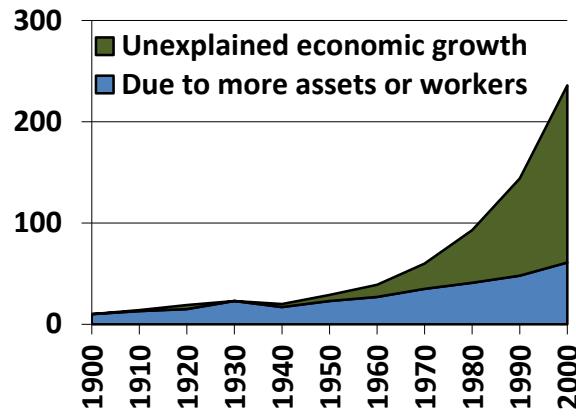
高收入经济体有更多的创造性破坏

Back to Needham's Question

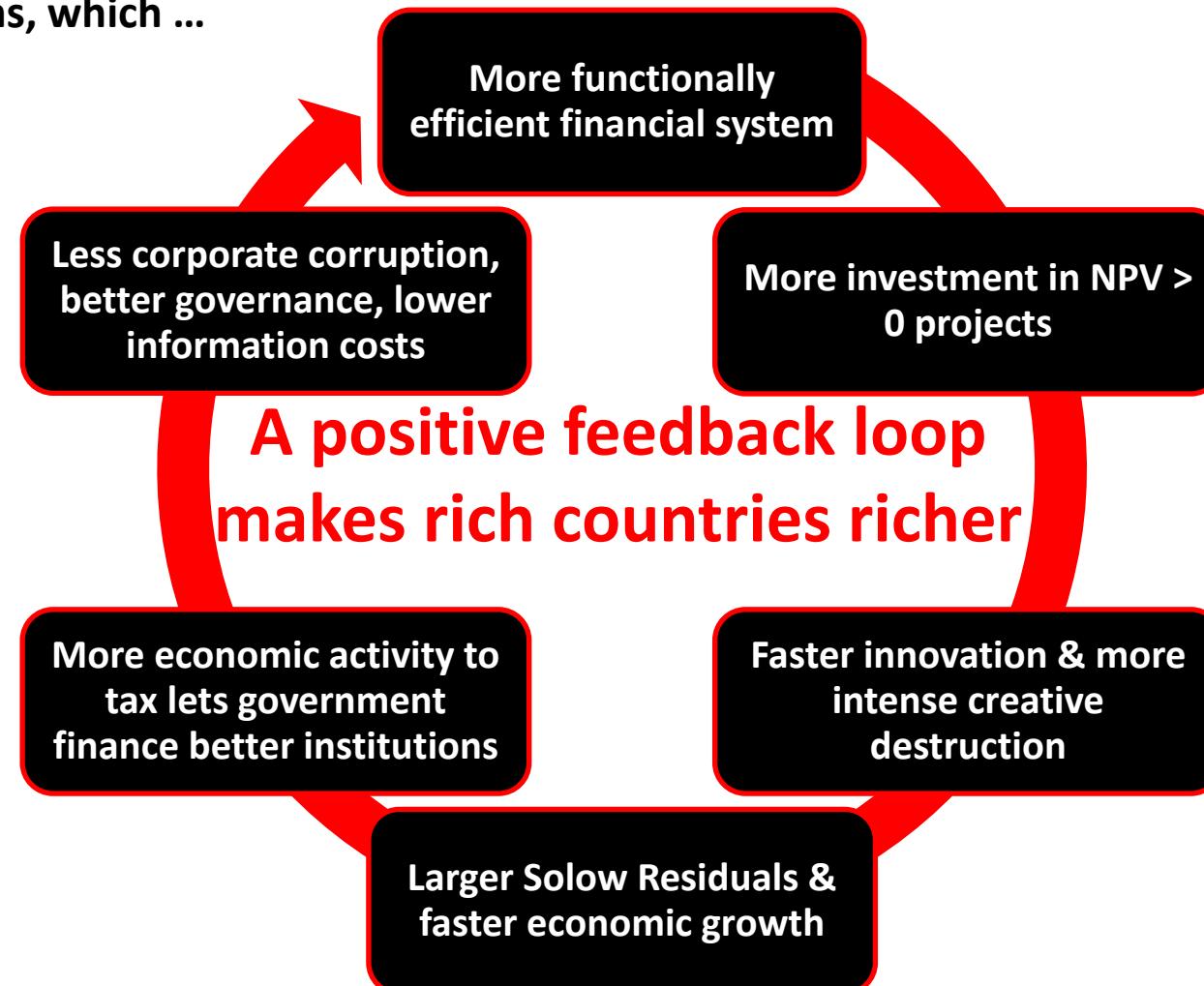
- Recall that > 2/3 of growth in high-income economies is due to Solow Residual (from innovation, not more old technology assets or workers)
- Establishing a more functionally efficient financial system better directs capital into $NPV > 0$ uses, which makes Solow Residuals bigger, which makes rich countries richer, which gives their governments more tax money, which pays for better institutions, which ...



Joseph Needham



The Solow residual (green) is growth from using capital & labor more productively – i.e. from innovation



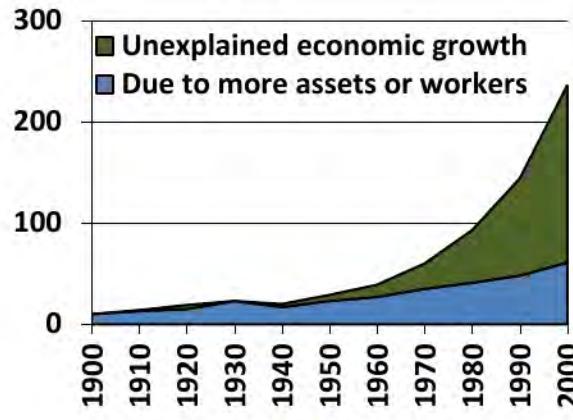
回到李约瑟的问题

回想一下，高收入经济体中超过2/3的增长是由于索洛剩余(来自创新，而不是更多的旧技术资产或工人)建立一个功能更有效的金融体系，更好地将资本引导到 $NPV > 0$ 的用途，这使得索洛残差更大，这使得富裕国家更富裕，这给他们的政府更多的税收

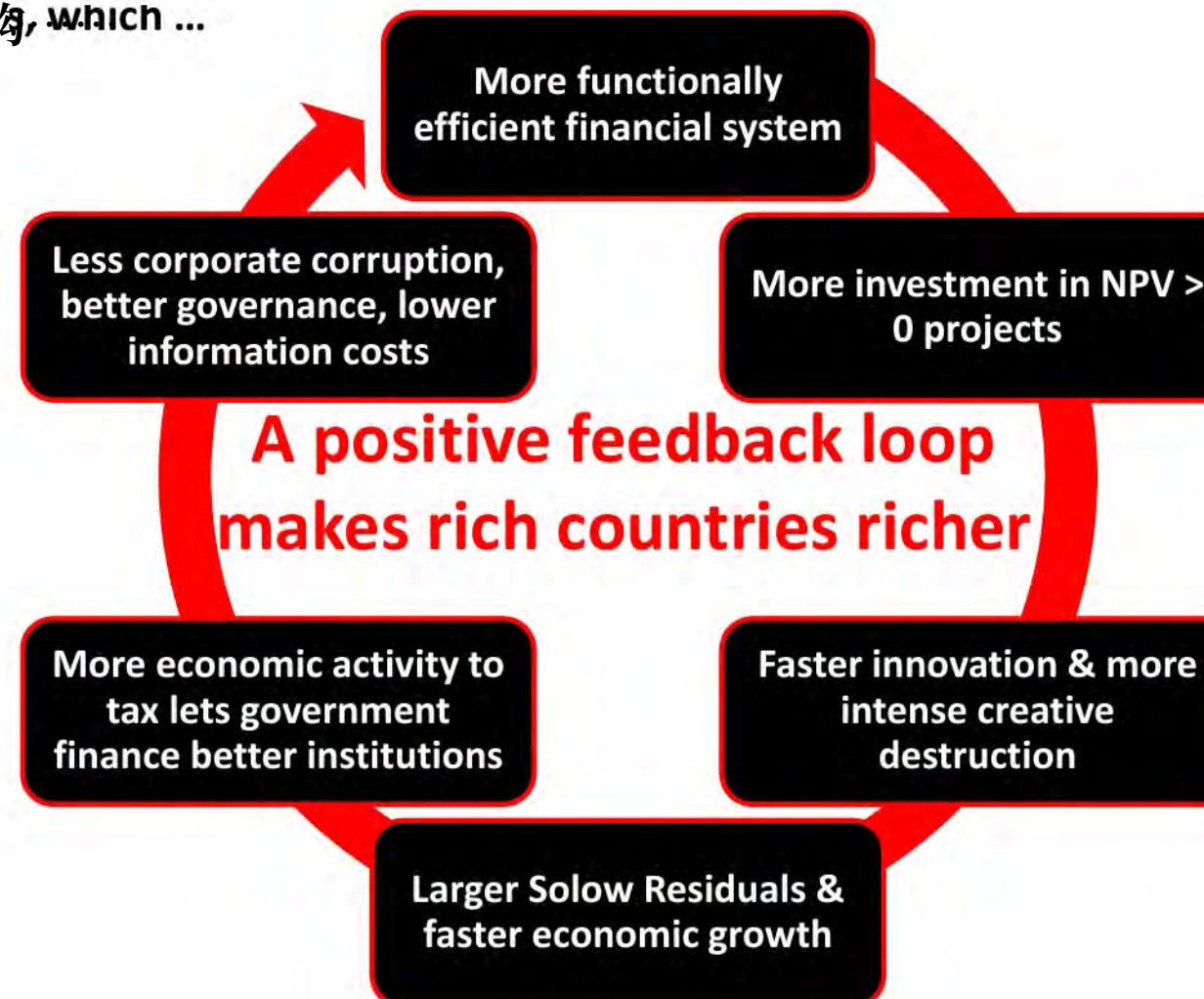


李约瑟

资金，为更好的机构买单，而这些机构，which ...



The Solow residual (green) is growth from using capital & labor more productively – i.e. from innovation



How Keynesian Is the World Overall?

Keynes, John Maynard. 1936. *The general theory of employment, investment & money*. Palgrave Macmillan

How crazy things happen in general?

- “It is not a case of choosing those which, to the best of one’s judgment, are really the prettiest, nor even those which average opinion genuinely thinks the prettiest. We have reached the third degree where we devote our intelligences to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practise the fourth, fifth and higher degrees.”

Keynesian finance as a lesson in life?

- “Successful investing is anticipating the anticipations of others” about what stocks will be seen as valuable

Keynesian sociology, arts, science, medical research, ... ?

- Success in life comes from anticipating the anticipations of others as to what opinions you should voice to make you seem highly ethical, loyal, smart, ... ?
- Do Keynesian beauty contests press researchers to produce actions, art, research, ... they think other researchers will think is important rather than what is genuinely important?



世界总体上有多凯恩斯主义？

约翰·梅纳德·凯恩斯，1936。《就业、投资与货币通论》。帕尔格雷夫麦克米伦

一般情况下会发生多疯狂的事情？

“**这**并不是选择那些根据自己的最佳判断是真正最漂亮的，甚至也不是选择那些一般意见真正认为最漂亮的。”我们已经达到了第三个阶段，我们把我们的智慧投入到预测一般意见对一般意见的期望上。我相信，还有一些人在实践第四、第五甚至更高的层次。”

把凯恩斯金融学作为人生的一课？

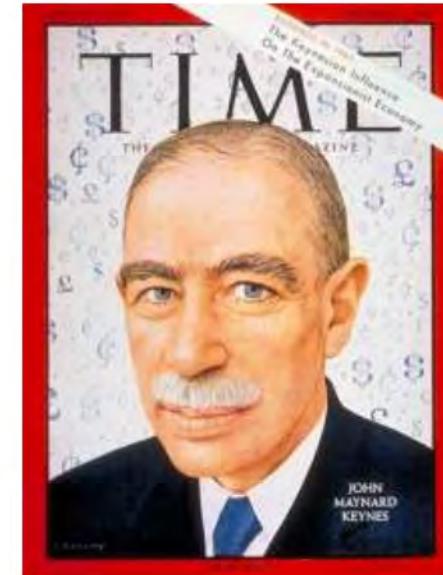
“**成功**的投资是预测别人的预期”关于什么股票将被视为有价值的

凯恩斯主义社会学、艺术、科学、医学研究……？

生活中的**成功**来自于预测别人对什么的期望

你应该表达自己的意见，让自己看起来很有道德、忠诚、聪明……

凯恩斯主义选美比赛是否会促使研究人员做出行动、艺术、研究、他们认为其他研究人员会认为重要，而不是什么是重要的真的重要吗？



Keynesian Explanation of Witch Burnings

Mackay, Charles. 1841. *Extraordinary Popular Delusions & the Madness of Crowds*. Richard Bentley: London

Witch Burnings

- Between 40 & 60,000 (mostly old & unpopular women) in Europe & N. America from 1480 to 1750
- Most were denounced by friends, neighbours, relatives, etc.

Keynesian reasoning?

- I am terrified of being accused of violating social norm against witchcraft
- My best protection = demonstrate my absolute & total adherence to the social norm (hatred of witches)
- Best signal of my virtue = loudly denounce someone else as a witch (better if she actually is a witch, but not really important)

Result

- A hysteria of witch burnings
- Is everyone secretly appalled at this, or do they somehow psych themselves into thinking it is right?



Burning of Three Witches in Baden, Switz.
Johann Jakob Wick (1585)

Keynesian Explanation of Witch Burnings

查尔斯·麦凯(1841年)《非凡的大众错觉与群体的疯狂》。理查德·本特利:伦敦

焚烧女巫事件

- ☒ 年龄在40 - 60岁之间(主要是老年和不受欢迎的女性)
1480年至 1750 的欧洲和北美
- ☒ 大多数都被朋友、邻居、亲戚等谴责.

凯恩斯主义推理?

- ☒ 我害怕被指责违反社会规范
对巫术
- ☒ 我最好的保护=展示我的绝对和全部
遵守社会规范(憎恨女巫)
- ☒ 我的美德的最好标志=大声谴责别人是
女巫(如果她真的是女巫就更好了, 但不是真的
重要)

结果

- ☒ 欣快地焚烧女巫
- ☒ 每个人都暗暗地对此感到震惊, 还是不知怎么的
让自己觉得这是对的?



瑞士巴登焚烧三女巫。Johann Jakob Wick (1585)

Keynesian Politics?

Willer, Robb, Ko Kuwabara & Michael W. Macy. 2009. The False Enforcement of Unpopular Norms. American Journal of Sociology 115(2)451-90

Keynesian theory of racism, etc.

- Why did Germans kill six million Jews?
- Why do people obey crazy governments in the Middle East, Latin America & elsewhere?
- Racism & discrimination of other kinds are very economically costly because talent in affected groups is wasted
- But very few people objected to these things when they were happening
- Objecting was dangerous. Friends, neighbors & relatives would report you to the police.
- People would avoid you for fear of getting into trouble from associating with you.

Speculative bubble?

- I am terrified of being socially excluded
- My best protection = demonstrate my absolute & total acceptance of social norms
- Best demonstration = aggressively & loudly affirm what I think everyone else thinks to be important social norms

Result

- Everyone acts to enforce norms that no-one really wants?
- Is everyone secretly appalled at this, or do they somehow psych themselves into thinking it is right?



Store owned by Jewish-German family
1933

Keynesian Politics?

罗柏·威勒、柯·库瓦原和迈克尔·W·梅西，2009。《不受欢迎的规范的错误执行》。《美国社会学杂志》115(2)451-90

凯恩斯的种族主义理论等。

为什么德国人要杀害600万犹太人？

为什么中东、拉丁美洲和其他地方的人们会服从疯狂的政府？

种族主义和其他类型的歧视在经济上是非常昂贵的，因为人才

受影响的群体被浪费了

但当这些事情发生时，很少有人反对

反对是危险的。朋友、邻居和亲戚会向警方举报你。

人们会避开你，因为害怕和你交往会惹上麻烦。

投机泡沫吗？

我害怕被社会排斥

我最好的保护=表明我完全接受社会规范

最好的展示=积极地、大声地肯定我认为每个人都是这样认为的

重要的社会规范

结果

每个人都执行没有人真正想要的规范？

是否每个人都暗暗地对此感到震惊，或者他们不知怎么地让自己这么想

是正确的？



1933年，一家德国犹太人的商店

Keynesian Art?

Crossland, Philip & Faye Smith. 2002. Value creation in fine arts: a system dynamics model of inverse demand & information cascades. *Strategic Management Journal* 23(5)417–434

Why is modern abstract art so “popular”? Or is it?

- Remarkable amounts paid
- Art critics compete to bestow lavish praise

Speculative bubble in abstract art?

- I am terrified of being thought stupid
- My best protection = demonstrate my sophistication
- Best demonstration = loudly & frequently praise what I think other people think (that other people think that ...) is sophisticated

Result

- Will people in the future laugh at how much people today pay for abstract art?
- Or is it truly great art?



Onement 1

Barnett Newman (1948)
Museum of Modern Art, New York

Keynesian Art?

菲利普·克罗斯兰德和费伊·史密斯2002。美术中的价值创造:逆向需求和信息级联的系统动力学模型。《战略管理杂志》23(5)417-434

现代抽象艺术为何如此“流行”?或者是?

支付的金额惊人

艺术评论家竞相给予慷慨的赞扬

抽象艺术的投机泡沫?

我害怕被人认为愚蠢

我最好的保护=展示我的老练

最好的证明=大声地、经常地赞美我认为别人会做的事情

认为(别人认为……)是复杂的

结果

未来的人会嘲笑今天的人为抽象花了多少钱吗

艺术吗?

或者它真的是伟大的艺术吗?



Onement 1

巴奈特·纽曼(1948)

纽约现代艺术博物馆

Keynesian Science, Medicine & Finance?

Ioannidis, John. 2005. Why most published research findings are false. PLoS medicine 2(8)124

Smolin, Lee. 2006. The trouble with physics. Houghton Mifflin

Woit, Peter. 2006. Not even wrong: The failure of string theory and the search for unity in physical law. Basic

Young, Neal, John Ioannidis & Omar Al-Ubaydli. 2008. Why current publication practices may distort science. PLoS medicine 5(10)201

Ionnides, John. 2016. Evidence-based medicine has been hijacked. Journal Of Clinical Epidemiology 73,82-6

- Are there Keynesian bubbles in university research? In research at business schools?
- Do many professors do research they think other people will think is beautiful, rather than just do good research?
- Growing concerns that much medical & science research funding is wasted because researchers do research they think reviewers at top medical & science journals will think is important & reviewers at top science journals approve publication of research they think other scientists will think is important
- Aside: Are finance theories also Keynesian bubbles?
 - Do financial managers, economists & finance professors all write & talk about efficient markets because each thinks all the others will view this is intelligent?

People who live in glass houses
should not throw stones.

Geoffrey Chaucer
in Troilus and Criseyde (1385)



凯恩斯主义科学、医学与金融?

约翰·约阿尼迪斯, 2005。为什么大多数发表的研究结果都是错误的。公共科学图书馆医学2(8)124

Smolin, Lee. 2006。物理学的麻烦。霍顿·米夫林公司

彼得·沃伊特, 2006。连错都没有:弦理论的失败和对物理定律统一性的探索。基本

Young, Neal, John Ioannidis和Omar Al-Ubaydli。2008. 为什么目前的出版实践可能会扭曲科学。公共科学图书馆医学5(10)201。

循证医学被劫持了。Journal Of Clinical Epidemiology, 73,82-6

是否在大学研究中存在凯恩斯主义泡沫?在商学院的研究中?

是否很多教授做的是他们认为别人会认为很美的研究, 而不仅仅是做好的研究?

越来越多的人担心, 很多医学和科学研究经费被浪费了, 因为研究人员所做的研究, 他们认为顶级医学和科学期刊的审稿人会认为是重要的, 而顶级科学期刊的审稿人批准发表他们认为其他科学家会认为重要的研究

旁白:是否金融理论也是凯恩斯主义泡沫?

是否金融经理、经济学家和金融学教授都写和谈论有效市场, 因为每个人都认为其他人会认为这是明智的?

住在玻璃房子里的人不应该
向别人扔石头。
杰弗里·乔叟《特洛伊
罗斯与克里塞德》(1385)



Are Speculative Bubbles Socially Useful?

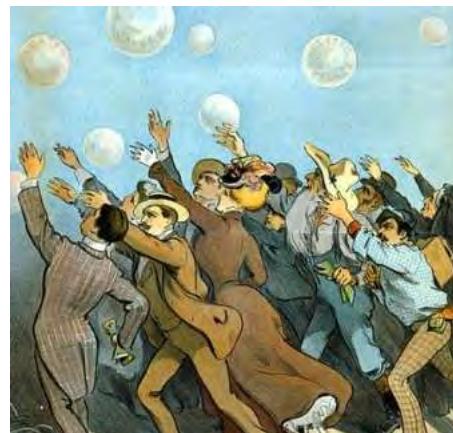
- Controlled speculative bubbles are an important part of modern economies.
- Examples include:



- Gold has few industrial uses. It is valuable because people believe other people will believe it's valuable. Gold is a 5,000 year old Keynesian beauty contest bubble?



- Paper money (also called “fiat money” because is “legal tender” by government “decree” or “fiat”) is valuable because people believe other people will believe it's valuable. Paper money is a government controlled Keynesian beauty contest bubble that makes transactions much simpler than in a barter economy

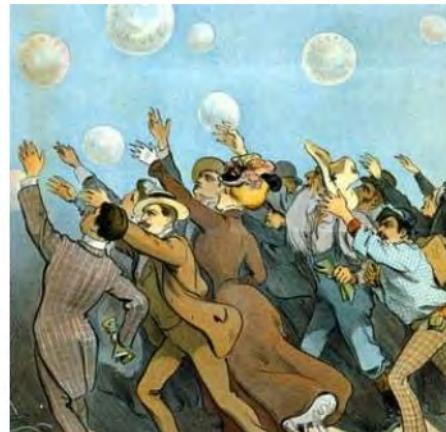


- Stock market manias might even be socially useful if they boost investment in new technologies that would otherwise attract too little investment because of intellectual property right problems and positive externalities associated with innovation

投机泡沫对社会有益吗?

可控的投机泡沫是现代经济的重要组成部分。

☒的例子包括:



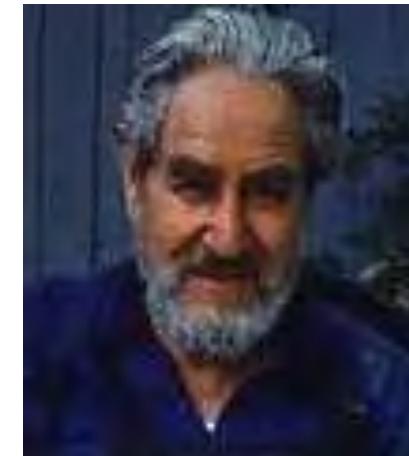
黄金几乎没有工业用途。它之所以有价值，是因为人们相信其他人也会相信它有价值。黄金是5000年前凯恩斯主义选美比赛的泡沫？

纸币(也叫“法币”，因为是政府“法令”或“法令”的“法定货币”)之所以有价值，是因为人们相信其他人会相信它有价值。纸币是政府控制的凯恩斯主义选美泡沫，它使交易比物物交换经济简单得多

如果股市狂热刺激了对新技术的投资，那么它们甚至可能对社会有益，否则，由于知识产权问题和与创新相关的正外部性，新技术将吸引太少的投资

Intellectual Property Rights Problems

Bernstein, Jeffrey & Ishaq Nadiri. 1988. Inter-industry R&D spillovers, rates of return & production in hi-tech industries. *American Economic Review* 78(2)429-37
Griliches, Zvi. 1992. The Search for R&D Spillovers. *Scandinavian Journal of Economics* S29-47
Griliches, Zvi. 1979. Issues in assessing the contribution of R&D to productivity growth. *Bell Journal of Economics*, 92-116
Jones, Charles & John Williams. 1998. Measuring the social return to R&D. *Quarterly Journal of Economics* 113(4)1119-35
Levin, Richard & al. 1987. Appropriating the returns from industrial R&D. *Brookings papers on economic activity* 1987(3)783-831
Mansfield, Edwin, et al. 1977. Social & private rates of return from industrial innovations. *Quarterly Journal of Economics* 91(2)221-40
Pakes, Ariel. 1985. On patents, R & D & the stock market rate of return. *Journal of Political Economy* 93(2)390-409



Zvi Griliches

Intellectual property rights work poorly

- Time inconsistency problems for governments enforcing patents, etc.
- Abuse re patent trolls and patent thickets
- Implication: There is too little investment in innovation

Innovation has positive externality spillovers

- Others benefit because of an innovators' innovations
- Innovations with “private” NPV < 0 for innovator can have “social” NPV > 0
 - $Private\ NPV = -C_{0,innovator} + \sum_{t=0}^{\infty} \frac{cf_{t,innovator}}{(1+r)^t} > 0 \rightarrow$ the innovation would be good for the innovator
 - $Social\ NPV = -C_{0,innovator} + \sum_{t=0}^{\infty} \frac{cf_{t,innovator}}{(1+r)^t} + \sum_{t=0}^{\infty} \frac{cf_{t,everyone\ else}}{(1+r)^t} > 0 \rightarrow$ the innovation would be good for society
 - $Social\ NPV = Private\ NPV + PV(positive\ externalities)$

Is “social” IRR of innovations > “private” IRR the innovator actually receives

- Econometric studies show that if firms did all R&D with “social” NPV > 0, there would be at least 4 times as much R&D as there actually is
- Governments try to encourage more R&D with various subsidy programs, but with few clear successful innovations resulting.
- Possible reason: these programs primarily attract rent-seekers, with expertise at applying for all sorts of different government subsidies

知识产权问题

伯恩斯坦, 杰弗里和伊沙克·纳迪里, 1988。高新技术产业的产业间研发溢出、回报率与产出。《美国经济评论》(第2期)429-37页。寻找研发溢出效应。斯堪的纳维亚经济学杂志(Scandinavian Journal of Economics) S29-47

- Griliches, Zvi. 1979。评估研发对生产率增长贡献的问题。贝尔经济学杂志, 92-116
- Jones, Charles & John Williams. 1998。衡量研发的社会回报。《经济季刊》113(4):1119-35
- Levin, Richard & al. 1987。侵占产业研发收益。布鲁金斯经济活动论文1987(3)783-831
- 曼斯菲尔德, 埃德温, 等人, 1977。产业创新的社会和私人回报率。经济学季刊91(2)221-40
- Pakes, Ariel. 1985。论专利、研发与股票市场收益率。《政治经济研究》 93(2)390-409



Zvi Griliches

I知识产权工作不力

- 政府执行专利的时间不一致问题等。
- 滥用是专利流氓和专利丛林
- 寓意:创新投入太少

创新具有正外部性溢出效应

- 其他人因为创新者的创新而受益
- 对于创新者而言, “私有” $NPV < 0$ 的创新可能具有“社会” $NPV > 0$

$$\begin{aligned} & \text{创新对创新者有好处} \\ & \frac{\infty C_{FT, INNOVATOR}}{T^4 (5+RT)} \\ & \text{这个创新对社会是有益的} \\ & \frac{\infty C_{FT, EVERYONEELSE}}{T^4 (5+RT)} + \frac{\infty C_{FT, INNOVATOR}}{T^4 (5+RT)} \\ & \boxed{\text{SOCIALNPV=PRIVATENPV+PV(POSITIVEEXTERNALITIES)}} \\ & \boxed{NPV=-C<e:2>, I<s:2><s:2><s:2>} \end{aligned}$$

创新的“社会”IRR是否大于创新者实际获得的“私人”IRR

- 计量经济学研究表明, 如果企业在“社会” $NPV > 0$ 的情况下进行所有研发, 则其研发规模将至少增加4倍
实际上是
- 政府试图通过各种补贴计划鼓励更多的研发, 但很少有明显成功的创新成果。
可能的原因是:这些项目主要吸引寻租者, 他们擅长申请各种不同的政府补贴

Back to Needham's Question Yet Again

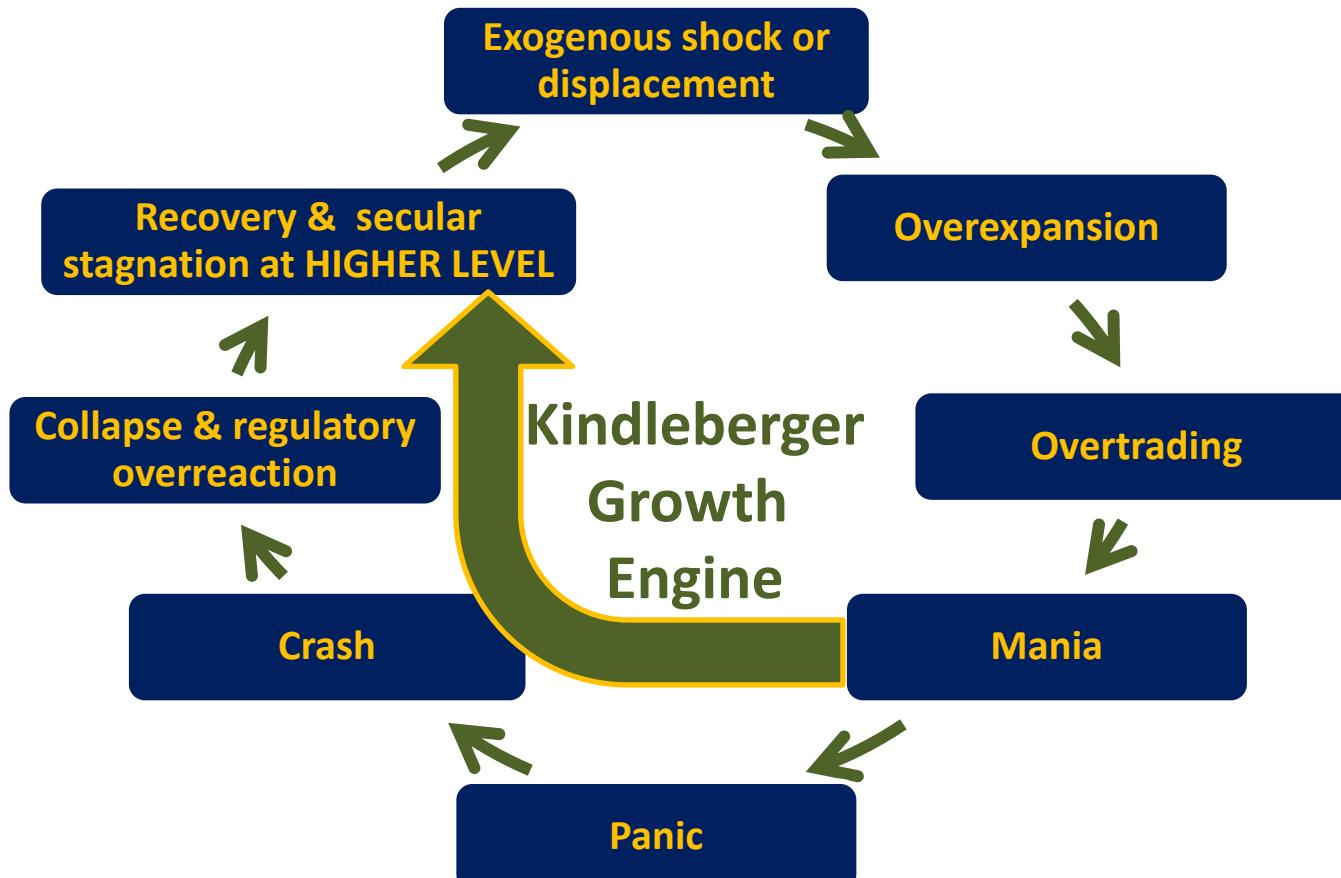
Morck, Randall. 2022. Kindleberger Cycles & Economic Growth: Method in the Madness of Crowds?. NBER working paper 28411



Joseph Needham

High-income economies tend to have

- Financial crises that pour uninformed investors into companies associated with recent big innovations
- Economic growth primarily from innovation
- Are financial manias driven by noise traders useful enough in boosting investment in innovation to be worth the pain of the panics & crashes that follow?



Another response to Needham's Question?

- Countries with bigger better stock market bubbles got richer faster
 - Could Kindleberger cycles be “good for us”?
- Largescale rollout of new technology**
- Uninformed investors lose money
 - Positive externality: Economy gets huge investment in applying the latest technology (canals, railroads, electricity, internet, ...)
 - Bigger Solow residuals
 - Higher productivity growth

再回到李约瑟的问题

兰德尔·莫克, 2022。金德尔伯格周期与经济增长:群体疯狂中的方法?NBER工作论文28411

高收入经济体往往有

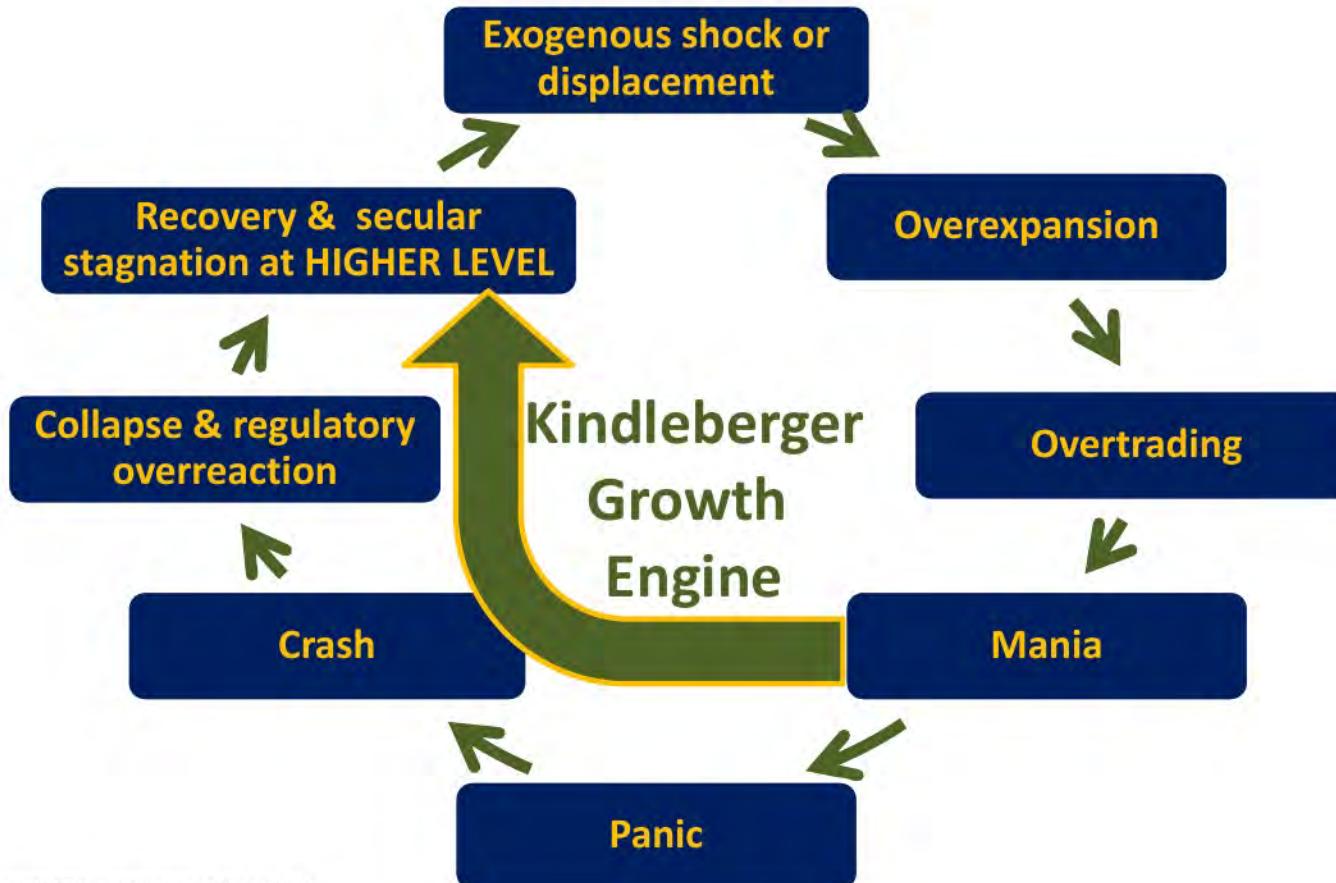
金融危机导致不知情的投资者涌入与近期重大创新相关的公司

由噪音交易者驱动的金融狂热在促进创新投资方面是否足够有用

值得承受随之而来的恐慌和崩溃带来的痛苦吗?



李约瑟



对李约瑟问题的另一个回应?股市泡沫越大
越好的国家富裕得更快

金德尔伯格周期是否“对我们有好处”?新技术的大规模推广

不知情的投资者赔钱

正外部性:经济在应用最新技术(运河、铁路、电力、互联网等)方面获得巨额投资。

更大的索洛残差

更高的生产率增长

Back to Needham's Question Yet Again

Sorescu, Alina, Sorin Sorescu, Will Armstrong & Bart Devoldere. 2018. Two Centuries of Innovations & Stock Market Bubbles. *Marketing Science*
Caballero, Farhi & Hammour. 2006. Speculative Growth: Hints from the U.S. Economy. *American Economic Review* 96(1)159-92
Lansing, Kevin. 2008. Speculative Growth & Overreaction to Technology Shocks. FRBSF Working Paper 2008-08.



Joseph Needham

High-income economies tend to have

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Does Tiebout competition (between countries) favor institutions that

- Encourage manias, panics & crashes as big new technologies appear?
 - Does this solve the problem of too little investment in innovation?
 - But some manias panics & crashes are unrelated to technology
 - The years prior the 1997 East Asian Financial Crisis flooded new market economies (initially, with many $NPV > 0$ opportunities) with capital – arguably a good thing in retrospect?
 - The years prior to the 2008 Financial Crisis regulatory changes (initially, creating many $NPV > 0$ opportunities) flooded debt markets with new kinds of securities – was this a good thing? New lower & middle income housing was build in the US ...
- Make panics & crashes less painful?
 - Panic less costly if there are institutions that prevent runs (deposit insurance, government bank inspectors, ...)
 - Crash is less costly if there are social welfare programs to help people who lose jobs, etc. (unemployment insurance, job placement programs, ...)
- Did the West get rich first because Western countries were the first to start using financial manias to finance waves of innovation?

再回到李约瑟的问题

Sorescu, Alina, Sorin Sorescu, Will Armstrong & Bart Devoldere, 2018。《两个世纪的创新与股市泡沫》。《市场营销科学》，Caballero, Farhi & Hammour, 2006。投机增长:来自美国经济的暗示。《美国经济评论》96(1)159-92
凯文·兰辛, 2008。投机增长与对技术冲击的过度反应。FRBSF工作文件2008-08。



李约瑟

高收入经济体往往有

金融危机使不知情的投资者涌入与近期重大创新相关的公司

经济增长主要来自创新

由噪音交易者驱动的金融狂热对促进创新投资是否足够有用

值得承受随之而来的恐慌和崩溃带来的痛苦吗?

(国家之间的)竞争是否有利于这样的机构

当大型新技术出现时,会鼓励狂热、恐慌和崩溃吗?

这是否解决了创新投资太少的问题?

但有些狂热的恐慌和崩溃与技术无关

1997年东亚金融危机前几年,新兴市场经济(最初有许多 $NPV > 0$ 的机会)充斥着大量的风险

资本——回想起来可以说是一件好事吗?

2008年金融危机前的几年,监管改革(最初创造了许多 $NPV > 0$ 的机会)充斥着债券市场

出现了各种新型证券——这是一件好事吗?美国建造了新的中低收入住房……

让恐慌和崩溃不那么痛苦?

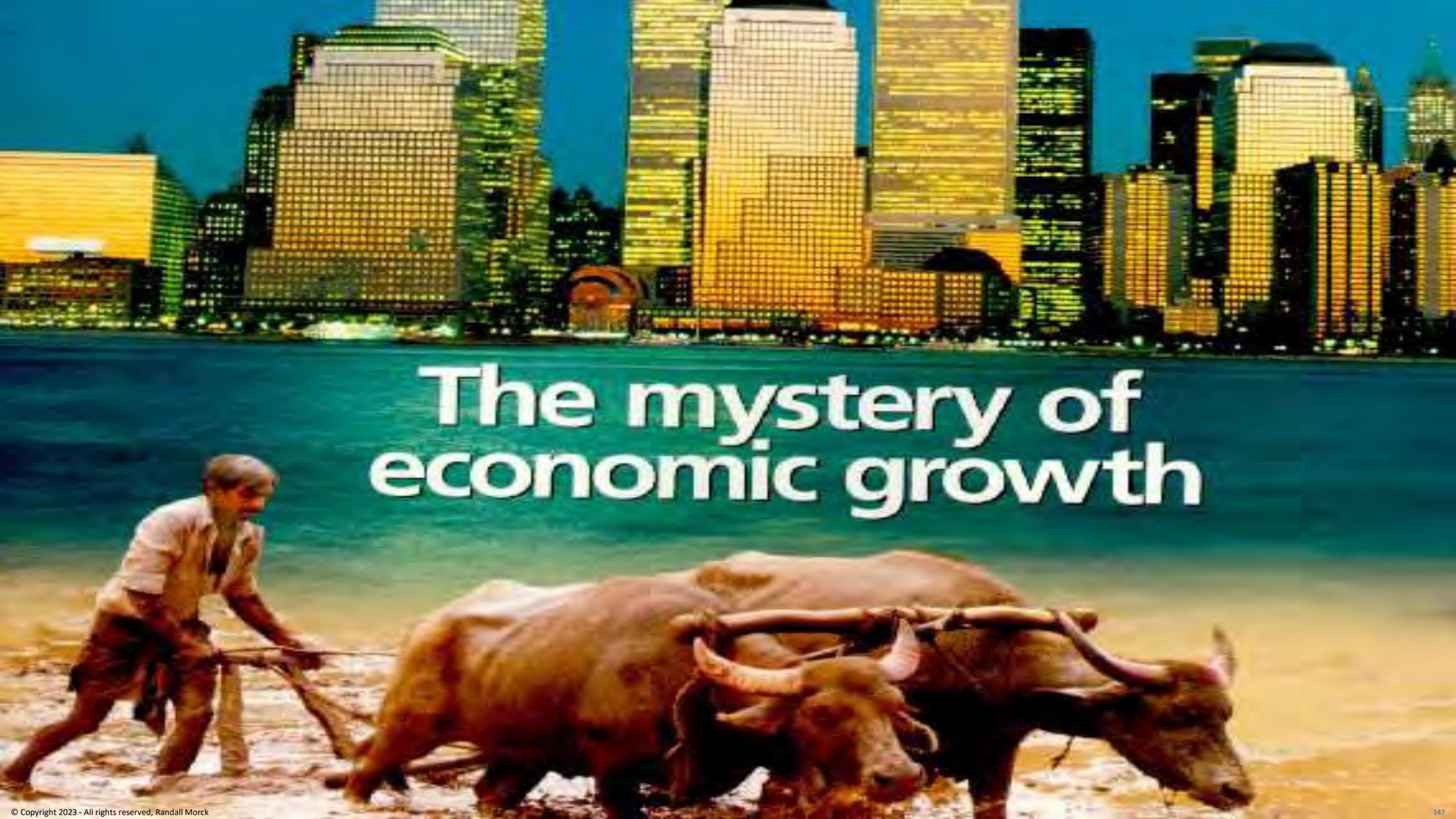
如果有防止挤兑的机构(存款保险、政府银行检查员……),恐慌的成本就会降低。

如果有社会福利项目来帮助失业的人,崩溃的成本就会降低

保险、就业安置项目……)

西方先富起来是不是因为西方国家是第一个开始利用金融狂热来

金融创新浪潮?



The mystery of economic growth

