FINM3407 – Behavioural Finance

Topic 9:

Chapters 14: Behavioral Factors and Stock Market Puzzles

Reference: Ackert and Deaves, Chapter 14

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What we do this week

[Behavioral Factors and Stock Market Puzzles]

- **Brief Introduction: Behavioural Explanations for Stock Market Puzzles**
- **Equity Premium Puzzle**

  The Equity Premium

  Why is the Equity Premium a Puzzle?

  What Can Explain This Puzzle?

- **Real-World Bubbles**
- **Experiment Bubble Market**

  Design of Bubbles Markets

  What can we learn from these experiments?

- **Excessive Volatility / Markets in 2008**

Recap: Traditional Finance vs. Behavioral Finance

Assumptions	Traditional Finance	Behavioural Finance
Fully Rational • Belief • Preference	Implications: • Apply Bayes law correctly • Compatible with expected utility (value maximization)	Bounded rational • Heuristic biases and frame dependence • Prospect theory (loss aversion)
Unsystematic irrational	• No effect on prices (cancel out each other)	• Evidence shows systematic irrationality
Systematic irrational	• Rational arbitrageurs correct the errors	• Limits to arbitrage
Outcomes	• Efficient market • Prices are right	• Puzzles • Anomalies

Introduction: Do Behavioral Factors Explain Stock Market Puzzles

- We argued that behavioral considerations can contribute to an understanding of certain anomalies in the pricing of individual stocks.
- There we took a cross-sectional (or individual stock) approach. If we aggregate the market values of all stocks in the market, we have the aggregate value of the stock market.
- It turns out that, just as there are cross-sectional anomalies, there are also aggregate stock market puzzles.

Section 14.2:
[Equity Premium Puzzle]

While equities are riskier than fixed-income securities and as a result should earn higher average returns in compensation for the additional risk borne, it is apparent that the historical gap between stock and bond returns is implausibly high from the standpoint of expected utility theory.

Section 14.3/14.4:
[Over-Valuation and Bubbles]

- Two famous overvaluation episodes, the tulip mania, which occurred in Europe close to 400 years ago, and the tech/Internet bubble that occurred in world stock markets in the late 1990s.
- Providing insight into the conditions under which asset price bubbles are generated

Section 14.5/14/6/14.7:
[Behavioral Finance and Asset Price Bubbles]

- We consider whether behavioral finance can contribute to an understanding of overvaluation episodes, including asset price bubbles.
- We turn to the puzzle that stock market prices seem to exhibit too much volatility.
- With a tentative interpretation of events that roiled markets in 2008

The focus will be on three puzzles

Big Market Puzzles

Several big puzzles relate to aggregate stock market – behavioral finance has partial explanations for some of these puzzles:

- **Equity premium puzzle:**

Stock returns are **higher** than they should be *given risk borne by investors in stock markets*

- **Bubbles:**

Why do markets get **so far out of line** with fundamentals?

- **Excess volatility:**

Stock returns are **more volatile** than they should be given that *stock prices are present values of future expected cashflows*

Historical (Realised) Equity Premium in U.S.

- Historically, a **well-diversified portfolio** of stocks has **substantially outperformed fixed-income securities**.
  - Important to look at real returns which control for **inflation effects**.

- The difference between **expected equity return and fixed-income return** is known as **equity premium**.
- The equity premium is defined to be the *gap between the expected return on the aggregate stock market and a portfolio of fixed-income securities*.

- On this basis, the **equity premium can be calculated in a number of ways**:
  - it depends on whether you use arithmetic versus geometric average returns, the sample you employ, and what your market and fixed-income proxies are.

The Equity Premium

$$E[R_m - R_f] = \beta \times E[m_{t+1}(R_m - R_f)]$$

where:

$E[R_m - R_f]$ = Expected equity premium.

R_m = Return on the market portfolio.

R_f = Risk-free rate.

β = Coefficient of relative risk aversion.

m_{t+1} = Stochastic discount factor.

- **Observed vs. Predicted Equity Premium:**

Historical U.S. Equity Premium (20th Century): **Roughly 6% (HIGH).**
Predicted by classic models: **Less than 1% (LOW).**

= > Extremely High-Risk Aversion needed (β Values) / unrealistically high levels of consumption volatility.
Theorists have shown that realised equity premium implies an improbably **large degree of risk aversion**.
In an economy with reasonable parameters, the average return on the stock market would be just 0.1% higher than the risk-free rate, not 3.9% (or higher) observed in most studies.

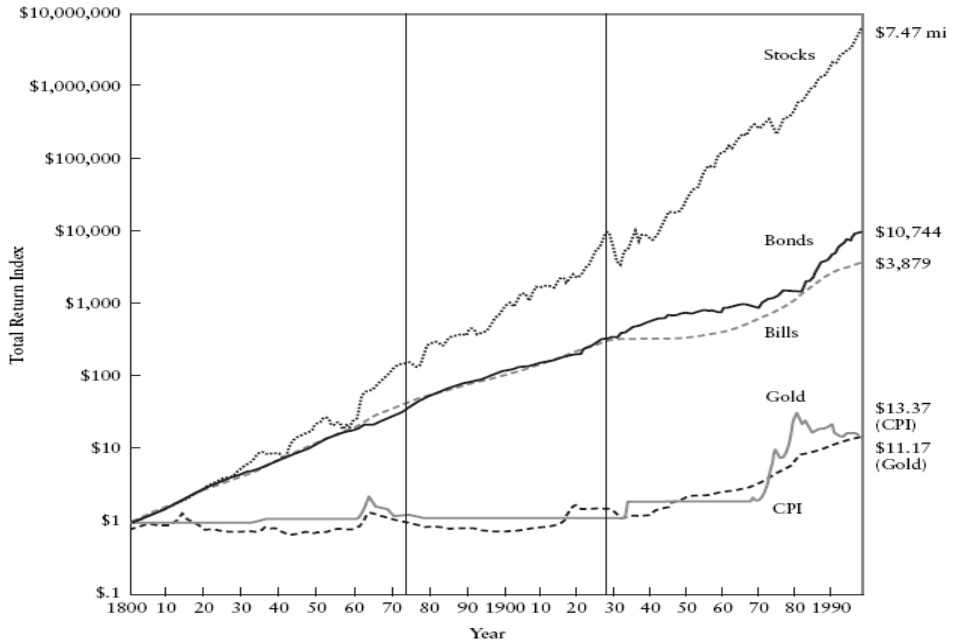
The Equity Premium: Total Nominal Return Indexes: 1802-1997

Investment Growth from 1802 to 1997 (Jeremy Siegel's Data)

- **Data Period:** 1802 - 1997
- **Initial Investment:** $1 "let it ride" in various asset classes.

Asset Classes Performance
U.S. Stocks: Over $7,000,000.
Bonds: Over $10,500.
Treasury Bills (T-bills): Over $3,500.

Stocks have historically provided much higher returns over the long run compared to other asset classes.

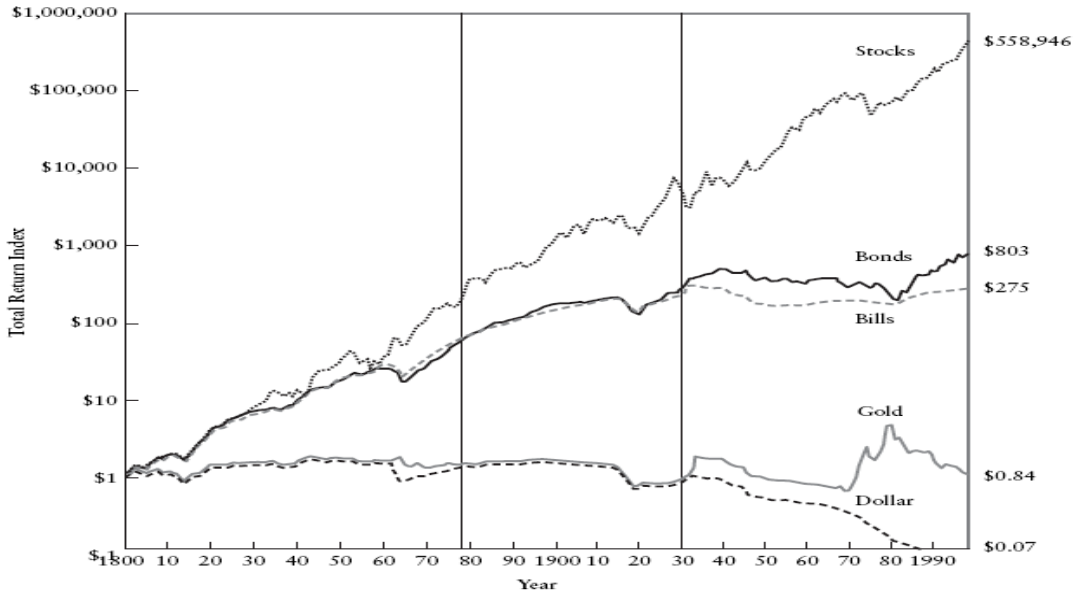


Siegel, J.J.. From "The Future Value of an 1802 Dollar Invested in Different Asset Classes (in nominal terms)," in Stocks for the Long Run 2nd Edition (McGraw Hill, New York, New York), 1998. ©1998 by McGraw-Hill, Inc. All rights reserved. Reproduced by permission.

Total Real Return Indexes: 1802-1997

- **Inflation Reference:** Prices have **risen over the period** (based on the Consumer Price Index - CPI).
- **Insight:** $1 in 1802 had significantly more purchasing power than in 1997, emphasizing **the importance of accounting for inflation in long-term investment analysis.**
- **Now all returns are on a real (or constant-dollar) basis.**

- Stocks are tamed to some extent, **but a $1 investment still grows to over $550,000**, versus **less** than **$1,000 for bonds and bills**, and (perhaps surprisingly to some) **less** than **$1 for gold.**



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Average Historical Real Returns for Stocks, Bonds, and Bills

Real Returns Overview:

Data covers the full sample and three roughly equal subperiods. Real returns are used to adjust for the effects of inflation.

	1802-1997	1802-70	1871-1925	1926-1997
Stocks (Geometric)	7.0	7.0	6.6	7.2
Stocks (Arithmetic)	8.5	8.3	7.9	9.2
Bonds (Geometric)	3.5	4.8	3.7	2.0
Bonds (Arithmetic)	3.8	5.1	3.9	2.6
Bills (Geometric)	2.9	5.1	3.2	0.6
Bills (Arithmetic)	3.1	5.4	3.3	0.7

= > Stocks:

- Stability in average returns over time.
- Using the conservative geometric average:
  Long-term averages: 6.6% to 7.2%.

= > Bonds:

Average returns for various subperiods: **2% to 4.8%.**

= > Treasury Bills:

Average returns across periods: **0.6% to 5.1%.**

= > Equity Premium:

- **Lowest full-sample equity premium** (stocks vs. bonds using geometric average): 3.5%.
- For the most recent subperiod *(starting in 1926)*:
  The gap is 5.2%.

Is Equity Premium Too High? Why is the Equity Premium a Puzzle?

Many theorists believe equity premium is too large for actual risk.

Especially clear when we look at longer horizons:

- At longer horizons stocks almost **always outperform**, plus risk of stocks declines **more quickly than would be expected**.

Risk vs. Returns:

- Stocks are inherently riskier → higher expected returns.
- However, the observed equity premium contradicts conventional wisdom on risk preferences.

•**Expected Utility Theory**:

- Implies an unreasonably high-risk aversion to justify observed returns.

•**Mehra & Prescott Argument**:

Equity Premium with reasonable risk aversion = 0.1%

•**Coefficient of Relative Risk Aversion (CRRA)**:

- Typical value from logarithmic utility function: **CRRA=1.0**
- Observed equity premium suggests: **CRRA=30**
- **The higher the CRRA, the more risk averse an individual is.**

•**Certainty Equivalent Analysis**:

- Prospect: *P*1(0.50,$50,000,$100,000)
- **With CRRA=30, the certainty equivalent *x*=$51,209.5**

•**Conclusion: Such high levels of risk aversion (CRRA=30) appear implausible.**

ERP Behavioural Explanation

On the behavioural side, there are **two main explanations:**

- One is based on ambiguity aversion.
- A second one, as proposed by Shlomo Benartzi and Richard Thaler, is based on loss aversion and mental accounting.

ERP Behavioural Explanation – Ambiguity Aversion

Ambiguity Aversion:

Puzzle implies an implausibly high risk aversion.

- *Consideration: Investors may be both risk averse and ambiguity averse.*
- *Ambiguity: Uncertainty not just in outcomes (returns), but also in the distributional parameters themselves.*

❑ ***Survey Evidence:***

Reveals disagreement on the ex-ante equity premium level.
Implication: Uncertainty about the mean of the return distribution.

❑ **Effective Risk Aversion:**

In situations of uncertainty, the perceived risk aversion effectively increases.

❑ **Plausible Values:** By factoring in both risk aversion and ambiguity (or uncertainty) aversion, a 5% equity premium becomes reasonable.

Historical Returns (Table 14.1): Stocks (Geometric): 7.0% (1802-1997), with variations across subperiods. / Bonds & Bills: Generally lower than stocks; details provided in table.

= > Conclusion: Behavioural factors, like ambiguity aversion, might offer a solution to the equity premium puzzle, making higher observed premiums understandable.

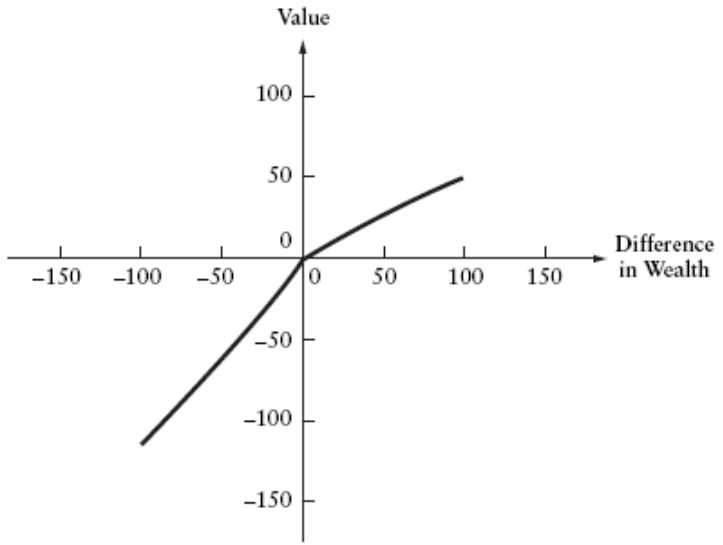
ERP Behavioural Explanation – Loss Aversion and Mental Accounting

Researchers have linked **prospect theory** to the equity premium puzzle.

- **Recall:**
  Common value functional form of Prospect Theory

$v(z) = z^{\alpha}$ for $z \geq 0$, $0 < \alpha < 1$

$v(z) = -\lambda(-z)^{\beta}$ for $z < 0$, $\lambda > 1$, $0 < \beta < 1$



- **Assume α & β = 1, we have the following "kinked" linear function:**

$v(w) = z$ if $z \geq 0$

$v(w) = \lambda z$ $\lambda > 1$ if $z < 0$

This function says that people are risk neutral once they are away from the reference point.

In the equation below we will assume λ = 2.5. Another complication of prospect theory is the weighting function, but once again we can keep matters simple and assume that, as in the case of expected utility, weights and probabilities are equivalent.

ERP Behavioural Explanation – Loss Aversion and Mental Accounting

- **Mental accounting** involves categorising financial information into distinct and manageable blocks.

= > This method impacts how individuals evaluate and perceive their financial data. Often, people don't scrutinise their portfolios continuously, **leading to passive oversight of short-term gains or losses.**

- However, periodic **reviews make them more aware of their financial performance**. At these moments, they might **"book their losses,"** essentially ***separating past financial decisions from future ones***.

= > Due to an aversion to losses, individuals are likely to avoid investments with high chances of negative returns when they eventually assess their portfolios.

ERP Behavioural Explanation – Myopic Loss Aversion

- **Myopic Loss Aversion:** investors focus too much on short-term losses while ignoring potential long-term gains

- Key is to remember **loss aversion (investors hate losing money)** and to consider how often investors evaluate their portfolios
- Intuitively, if you evaluate your position every day, there is a **very good chance** that by day's end you will have **lost money, so you find stocks very risky**.
- But if you evaluate stocks once per decade there is a much smaller chance that you will lose money, so you will find stocks not so risky

QUESTION:

Given the prospect theory approach, what evaluation period is consistent with historically observed market risk premium?

ANSWER:

About a year – which is logically how often **a typical investor gives his portfolio a careful look.**

Reasons:

- **Tax is paid annually**
- **Portfolio assessment and adjustments are often annual**

Myopic Loss Aversion Illustration

Consider the following prospect: P2(0.50, $200, -$100).

❑ **Individual has 2 choices:**

- Invest $100 in a *savings account* (assume zero return)
- *Or buy stock with 50/50 distribution for net earnings of $200 or -$100*

= > If we assume **loss aversion and linearity**, value function is:

$$v(z)=z \text{ for } z\geq 0 \;\&\; v(z)=\lambda z \text{ for } z<0 \; (\lambda>1)$$

❑ **If λ = 2.5, will investor invest in stock? (assuming she looks at her portfolio once per year).**

Myopic Loss Aversion Illustration

- **What if the investor looks at the portfolio every 2 years?**

Myopic Loss Aversion Illustration

- **Less frequent evaluation leads to:**

  ✓*higher demand for stock*

  ✓*higher price of stock*

  ✓*lower equity premium*

What is a Bubble?

A bubble occurs when prices are driven **more by enthusiasm than fundamentals.**

- Bubbles are identified in hindsight, leading to **hindsight bias**.

- E.g., Investors claiming, they saw it coming.

Real-World Bubbles

Stock Market Valuations & Oversights

- Stock valuations can diverge from actual corporate performance.
- *Example: **Enron's bankruptcy** and high investor valuation.*

- **Nasdaq Composite Index**:
  - March 10, 1999: Closed at 2,406.00
  - March 10, 2000: Peaked at 5,048.62
  - October 9, 2002: Dropped to 1,114.11
  - Hasn't surpassed the 3,000 mark since.
- **Many tech/Internet stocks believed to be overvalued in early 2000.**

*Key Question: **How could the market make such significant oversights?***

Real-World Bubbles – The Tech/Internet Bubble

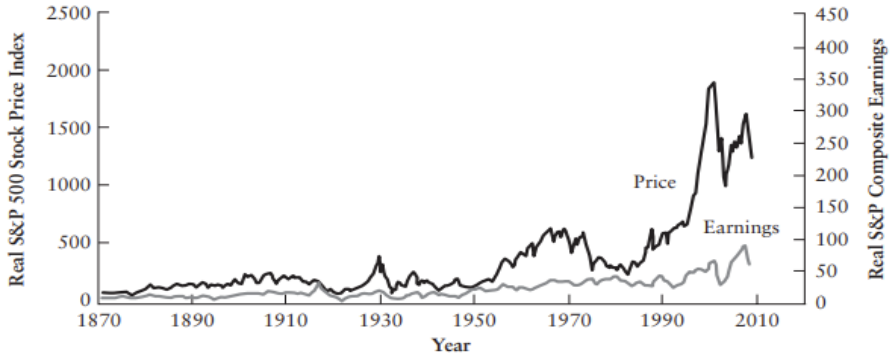
- Tech and Internet stocks had notably **high valuations** in the late 1990s.
- By early 2000, U.S. stock market's level was believed to reflect **investor irrationality.**

- **Robert Shiller** provided evidence, *describing the market's psychology as "**irrational exuberance".***

- The term "irrational exuberance" was first coined by **Federal Reserve Chairman Alan Greenspan** in a 1996 speech. Although markets momentarily **dropped** post-Greenspan's speech, *they continued to **rise** and peaked in early 2000*.

Real-World Bubbles – The Tech/Internet Bubble

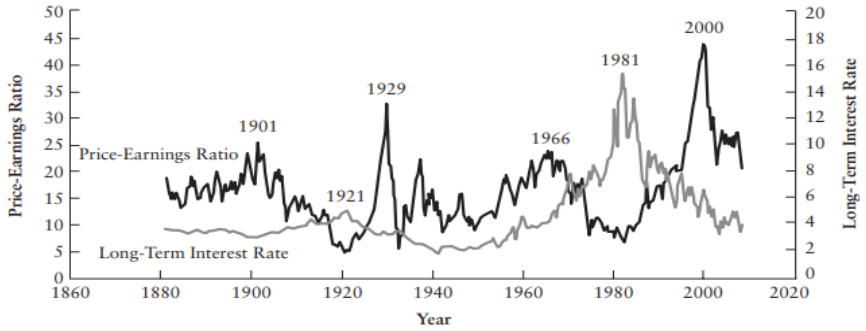
FIGURE 14.3 Real S&P 500 Stock Prices and Earnings



Source: Shiller, Robert. From "Figure 1: Real S&P 500 Stock Prices and Earnings," in http://www.econ.yale.edu/~shiller/data.htm © 2008 International Center for Finance at Yale School of Management. Reproduced by permission.

- Presents the **monthly real stock price and earnings** of the S&P 500 from January 1871 to August 2008.
- Adjusted for inflation using the Consumer Price Index (CPI).
- A **steep market decline** occurred in 2008, primarily after August.
- The figure reflects the **long-term movement** of stock prices.
- While stock prices in the late 1990s were at unprecedented levels, a rise in earnings also occurred.

FIGURE 14.4 Real S&P 500 Price-to-Earnings Ratio

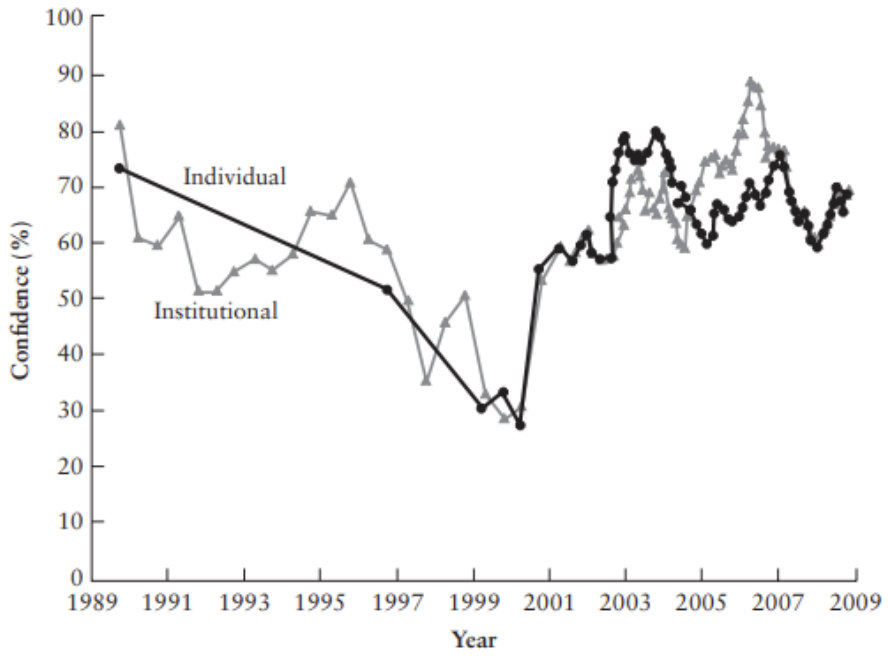


Source: Shiller, Robert. From "Figure 3: Real S&P 500 Stock Prices and Earnings," in http://www.econ.yale.edu/~shiller/data.htm © 2008 International Center for Finance at Yale School of Management. Reproduced by permission.

- Displays the **price-to-earnings (P/E) ratio of the S&P 500, indicating the amount investors pay for each dollar of earnings.**
- Several **peak P/E values were** noted: 32.6 in 1929 (followed by a market crash), 1901, 1966, and an unmatched peak of 44.2 in December 1999.
- The 1999 peak was attributed to a **"new era" mindset**, where the advent of computers and the internet was seen as a driver for future earnings growth. **High P/E values often suggest that stocks might be overvalued relative to their earnings, hinting at possible market corrections**

Real-World Bubbles – The Tech/Internet Bubble

FIGURE 14.5 Shiller's Valuation Confidence Index



Source: Shiller, Robert. From "Valuation Confidence Index," in http://icf.som.yale.edu/Confidence.Index/ValueIndex.shtml. © 2008 International Center for Finance at Yale School of Management. Reproduced by permission.

- Confidence among both individual and institutional investors **declined** leading up to 1999.
- **At its lowest in 1999,** only 31% of individual investors and 29% of institutional investors believed the market was fairly valued.
- This indicates that a vast majority (69% of individual and 71% of institutional investors) believed stock prices were **overvalued** in 1999.
- After the peak of stock prices in early 2000, confidence began to **increase**, returning to levels seen in the early 1990s.
- **From 2003 to mid-2008**, confidence levels remained **relatively stable** for both individual and institutional investors.
- The data suggests that during the late 1990s, many investors were wary of stock valuations, possibly with some purchasing in the hopes of offloading to someone else at a higher price, in line with the **greater fool theory**.

Real-World Bubbles – Tulip Mania

Two lasts of wheat[17]	448
Four lasts of rye	558
Four fat oxen	480
Eight fat swine	240
Twelve fat sheep	120
Two hogsheads of wine	70
Four tuns of beer[18]	32
Two tuns of butter	192
One thousand lbs. of cheese	120
A complete bed	100
A suit of clothes	80
A silver drinking cup	60
Total	2,500 florins

❑ Tulip Mania of the 1630s:

- **Originated in Western Europe in the 16th century.**
- Huge demand, especially in **Holland and Germany.**
- By the 1630s, **specialised tulip markets emerged.**
- **Fortunes were made and lost quickly.**

*Example: Trade of goods worth **2,500 florins** for one tulip bulb.*

❑ Interpretations:

- **Greater Fool Theory**: Buying **overvalued** assets *hoping someone else will pay even more.*

- **Alternative View: Tulip bulbs**, like art, might have had genuine value based on the preferences of the time. The bubble might reflect a sudden shift in preferences.

Experimental Bubbles

Experimental asset markets have provided new insights into how markets work.

- One of most perplexing findings from this research is tendency of prices to rise far above fundamental value and then later crash.
- First study to **report bubbles in experimental asset markets was published in 1988.**

Since then many studies have investigated factors that both ***mitigate and promote bubble formation.***

In a typical bubbles design, subjects trade an *asset over a fixed number of periods*.

- Asset has a common dividend that is earned on all units and determined at the end of a trading period using a known probability distribution.

If **risk neutrality** is assumed, we can easily compute fundamental value of asset by *multiplying number of trading periods by expected dividend each period.*

- *Given risk aversion,* ***correct value would be lower***

Dividend Distributions

Asset Dividend Distributions				Expected Value of Dividends	Fundamental Value in Period 1
Probability	0.48	0.48	0.04	0.72	8.64
Standard asset's dividends	0.50	0.90	1.20		
Lottery asset's dividends	0.00	0.00	18.00		

Note: The fundamental value in period 1 is the expected dividend per period multiplied by the number of trading periods (12).

This is Panel B of Table 1 from Ackert, Lucy F., Narat Charupat, Bryan K. Church, and Richard Deaves, 2006, "Margin, short selling, and lotteries in experimental asset markets," *Southern Economic Journal* 73(2), page 424.

• Dividends and Value

Focus on standard asset, leaving lottery asset for later.

- Asset trades for twelve five-minute periods so **if you buy one unit in period 1 and hold it until the end of the experiment (i.e., 12 periods)**, you would earn twelve dividends.

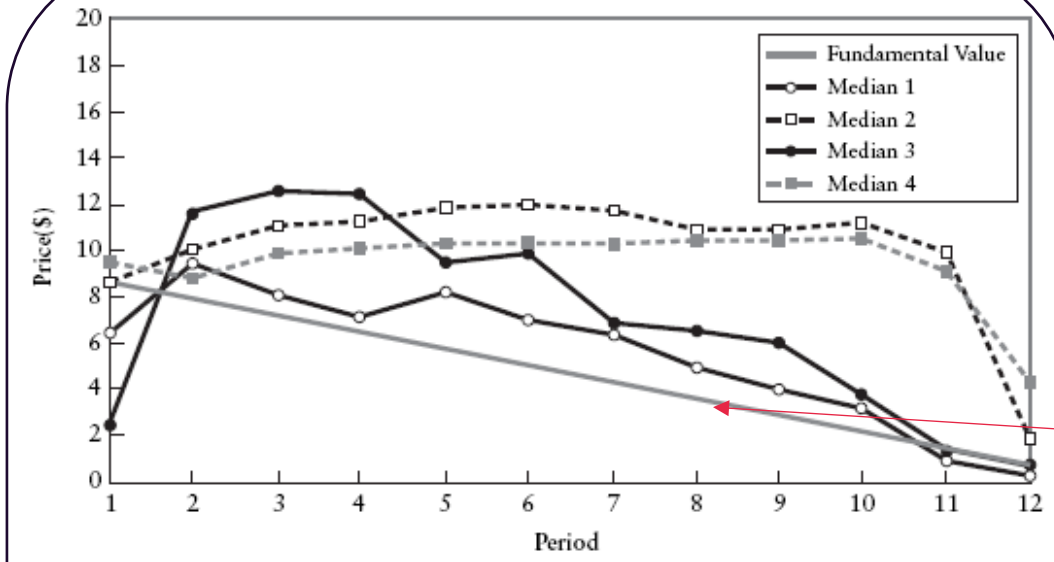
Expected value of dividend each period is **sum of probability-weighted possible dividends:**

0.48*0.50 + .048*0.90 + 0.04*1.20 = $0.72

- What is asset worth?
- **If you are risk neutral:** **0.72 * 12 = $8.64**

- Fundamental values in **all subsequent periods** can be computed just as easily ***by multiplying the number of periods remaining times the expected value of $0.72***

Typical Price Paths

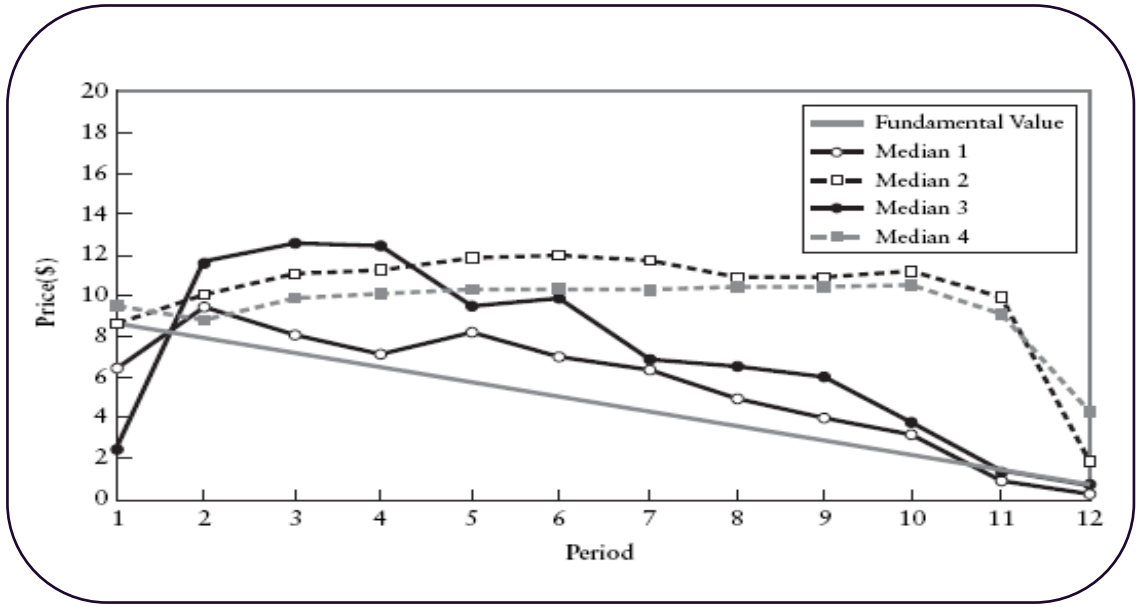


Source: This is Figure 1 from Ackert, L. F., N. Charupat, B. K. Church, and R. Deaves, 2006, "Margin, short selling, and lotteries in experimental asset markets," *Southern Economic Journal* 73(2), page 427.

Interpretation

- ***Typical price pattern in bubbles markets is different from what one would expect.***
- Solid line indicates fundamental value each period, **beginning at $8.64 in period 1 and falling by $0.72 each period.**
- Dashed lines show **median transactions prices per period for four different bubbles markets**.

Interpretation cont.



What happened?

- Usually, price in **period 1 is below fundamental value but *quickly rises high* above this point**
  - Price in first period **may be low** due to subjects' initial risk aversion because they are trading in an environment in which they are inexperienced
  - Some of bubbles in this figure are quite persistent -- **but all eventually crash back to fundamental value as remaining trading periods become small**

Lessons from Experimental Bubble Markets

Though experimental bubbles markets ***are simple and do not include all important features of a complex market (like NYSE), they teach us how real bubbles might be generated.***

- Price bubbles are more moderate and disappear faster when traders are experienced.
- Potential for short-selling leads to bubble dissipation.

In some experiments, **two assets are traded in order to investigate whether pricing differs across the assets.**

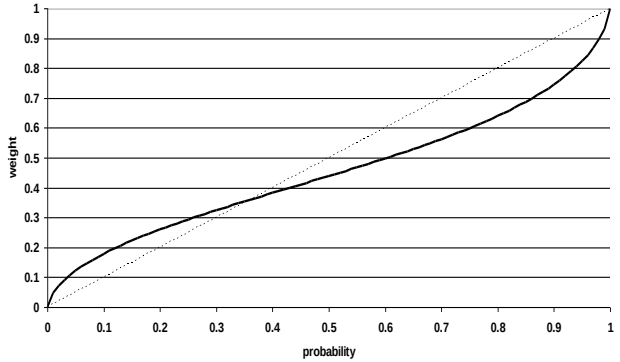
One study allowed trading of two assets: **a standard asset and a "lottery" asset.**

Second asset is referred to as lottery asset because its payoffs are similar to a lottery.

- Payoff usually zero, but **4% of the time asset earns *large dividend payment*** of **$18.00**

Lessons from Experimental Bubble Markets

Although standard and lottery assets have identical expected values, traders were willing to **pay *more* for lottery asset.**



- Suggests that traders may be subject to probability judgment error **(overweighting small probabilities).**
- Another possible explanation is that ***speculation or gambling plays into how people determine what they will pay to acquire an asset.***
- Willing to **pay more for lottery asset** because they become *more risk taking as trading heats up*

Excess Volatility Puzzle

*It seems that often market movements are **not obviously explained** by new information.*

- One study examined largest stock price movements and important news events to try to ascertain connections.
- First looked at **major events** and whether they **induced major market movements**.

Example 1: Japanese bomb Pearl Harbor (Dec. 8, 1941).

- Market **dropped dramatically** (by **4.37%**)

Example 2: Johnson defeats Goldwater in presidential election (Nov. 4, 1964).

- Market **hardly moves** (down by **0.05%**)

Market Moves vs. News?

- **50 biggest market moves of last 50 years matched against explanation in *New York Times.***

•On several days *Times* actually reported there was no apparent cause (e.g., Sept. 3, 1946).

•Many other times "cause" doesn't seem important enough – doesn't seem that there is really any new meaningful information.

•Suggests excess volatility…

– Driven by changes in market sentiment

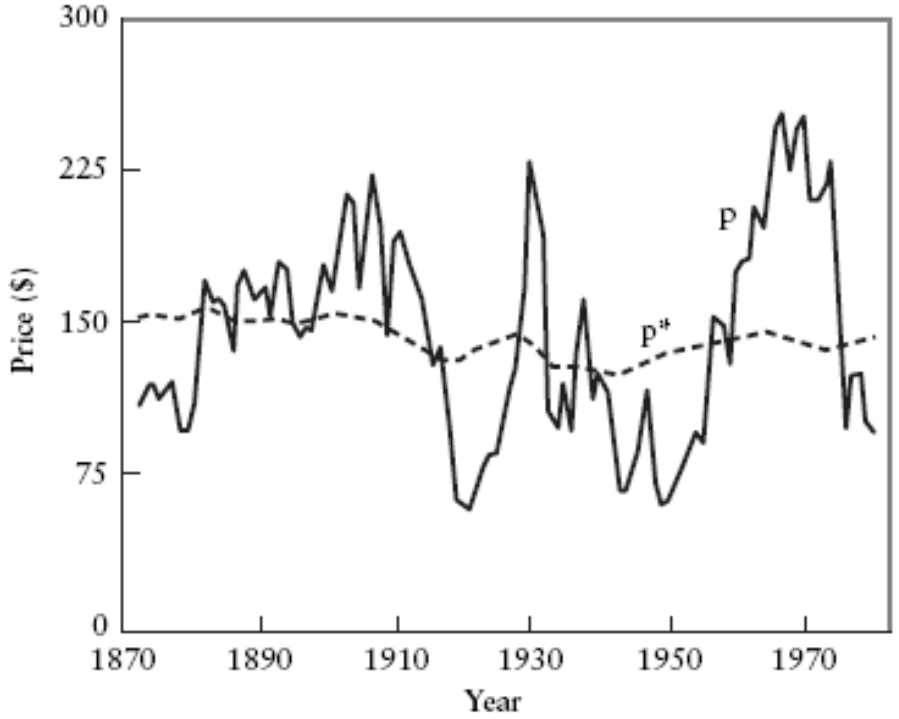
Shiller and Theory

- **Shiller tackles excess volatility taking a theoretical approach.**
- He showed that it is difficult to ***explain the historical volatility of stock returns…***

- Assuming investors are **rational and discount rates are constant:**

- Existing volatility implies a **great deal of variation in dividend growth rates** – which is fine if these expectations are **realised**.
- Using **constant growth model**, *he considered growth rate forecast changes needed to justify realized changes in stock prices.*
- Given **a constant discount rate these would be unreasonably high.**

Prices vs. Rational Prices



Shiller, Robert J.. From "Do stock prices move too much to be justified by subsequent changes in dividends?," American Economic Review, 71(3), p. 422. © American Economic Review.

Figure 14.7 contrasts the observed **S&P 500 index (p) with the calculated rational stock price (p*),** based on future dividends.

- Notably, actual stock prices **display significant volatility**, diverging often from the **more stable p*.**
- Despite dividends being predictable, **stock prices show 5 to 13 times more volatility than rational expectations.**
- This disparity poses the question: *Why are stock prices so volatile when dividends are stable?*

Behavioural Explanation

Consider a stock. Investors *think* (wrongly) that dividend growth changes are permanent rather than transitory.

- For this reason, **they overreact**
- When they figure things out mean reversion sets in
- **High returns are followed by low returns** -- and vice versa
- Recency plays a role: ***recent high earnings growth makes people think that future growth is going to be higher than it actually turns out to be***

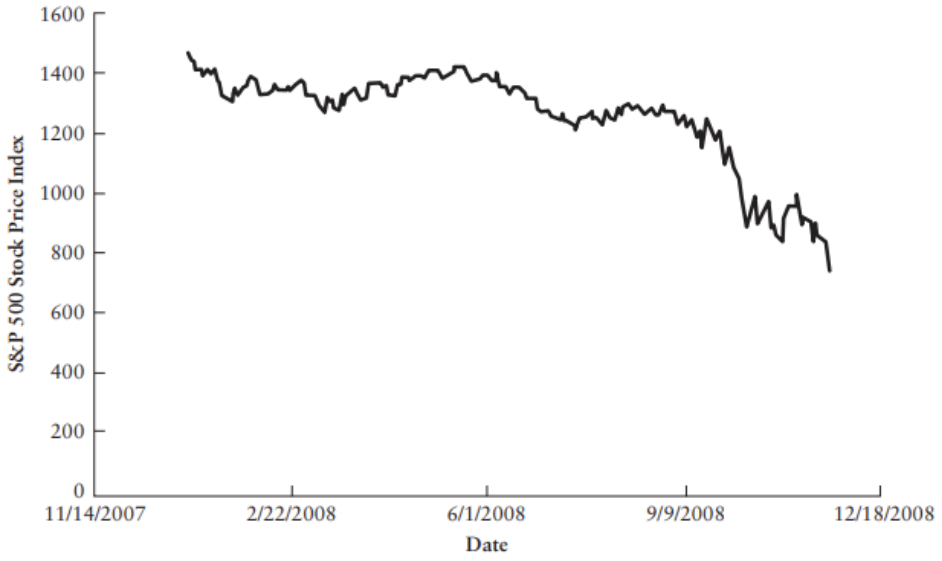
A similar story can be told for overall market.

Market in 2008 - Key Events & Impacts

- **2007:**
  - Liquidity crisis strikes; U.S. Federal Reserve & European Central Bank inject capital.
  - Rise in zero-down mortgage loans; inadequate borrower due diligence.
  - Securitized mortgages jeopardize institutions; U.S. housing downturn causes security value drops.
- **Sept 15-19, 2008:**
  - Lehman Brothers bankrupt; Merrill Lynch acquired by Bank of America.
  - World's largest insurer AIG nears collapse, rescued by U.S. government.
  - Morgan Stanley & Goldman Sachs face short seller attacks.
  - U.S. announced $700 billion TARP bailout.
- **Public Perception:**
  - Once revered Wall Street nears ruin.
  - U.S. financial system's stability questioned.

Market in 2008 - Key Events & Impacts

FIGURE 14.9 The S&P 500: December 31, 2007 to November 20, 2008



•**Implication:** Trillions of dollars in stock market value evaporated during this short time frame, *signifying one of the most intense periods of market volatility and downturns.*

•**Market Reaction:** Despite **significant negative** events in September 2008, the market remained stable during that week, potentially due to the anticipation of government intervention (like the bailout). However, the optimism was short-lived, and the market soon witnessed one of its most profound downturns.

This interpretation summarizes the ***movement of the S&P 500 during a critical period of the 2007-2008 financial crisis, highlighting the market's extreme vulnerability and the rapid erosion of investor wealth.***

Conclusion

1. **The equity premium** is the difference between the expected returns on equity and debt. The high level of the premium is puzzling because it seems to require very high-risk aversion.
2. Survivorship bias refers to the tendency to get biased results because failed observations are excluded from the sample over time. This may explain the equity premium.
3. **Loss aversion, combined with mental accounting** and so-called myopic loss aversion, can explain why investors require a large premium on equity.
4. **A speculative bubble** is present in a market when high prices seem to be generated more by traders' enthusiasm than by economic fundamentals.
5. **Price bubbles** are observed in diverse markets. For example, during the tulip mania, people traded large sums of money and goods for tulip bulbs.
6. According to the **greater fool theory**, a person buys an asset because he believes another will pay even more to acquire it.
7. In the 1990s, **the entire U.S. market seems to have deviated far from valuations based on economic fundamentals.** The technology sector was affected most dramatically.
8. **"Irrational exuberance"** is a term used to describe the U.S. stock market by Federal Reserve Chairman Greenspan in the 1990s.
9. **Extremely high price-to-earnings ratios were explained by "new era" arguments**

Conclusion

10. Survey data indicate that **a majority of individual and institutional investors thought the market was overvalued in 1999.**

11. In experimental bubbles markets, **assets are traded over a fixed number of periods** and traders can easily compute expected fundamental values.

12. Prices in experiments typically bubble **high above the fundamental value**, **crashing down as the end of trading approaches**.

13. Bubbles moderate when a subset of traders is knowledgeable and experienced, there is **not too much cash** in the market, and ***short sales are permitted.***

14. The **generation of price bubbles is encouraged by probability judgment error and speculation**.

15. Stock prices are **too volatile to be explained by future dividends**.

16. Volatility is **higher** for technology firms and the **level of volatility is increasing**, as is the difference in volatility across the S&P 500 and Nasdaq.

17. The VIX, or fear index, gauges investors' expectations of future stock market volatility using current option prices. In recent months, the **VIX rose to unprecedented levels**.

18. Beginning in 2007, markets were **gripped by a liquidity crisis**. Potential contributing factors included the **large risky positions taken by financial institutions, easy lending practices, and the perception that credit default risk was high**.

FINM3407 – Behavioral Finance

Topic 9:

Thank you very much