



Presentation by  
Barry Ritholtz  
AAII  
October 8, 2014

# This is Your Brain on Stocks:

Behavioral Economics,  
Neurofinance and Risk Aversion

*The ongoing battle between you and that large, mostly under-utilized slab of grey matter resting atop your spinal cord, doing very little of anything (except keeping you alive...)*

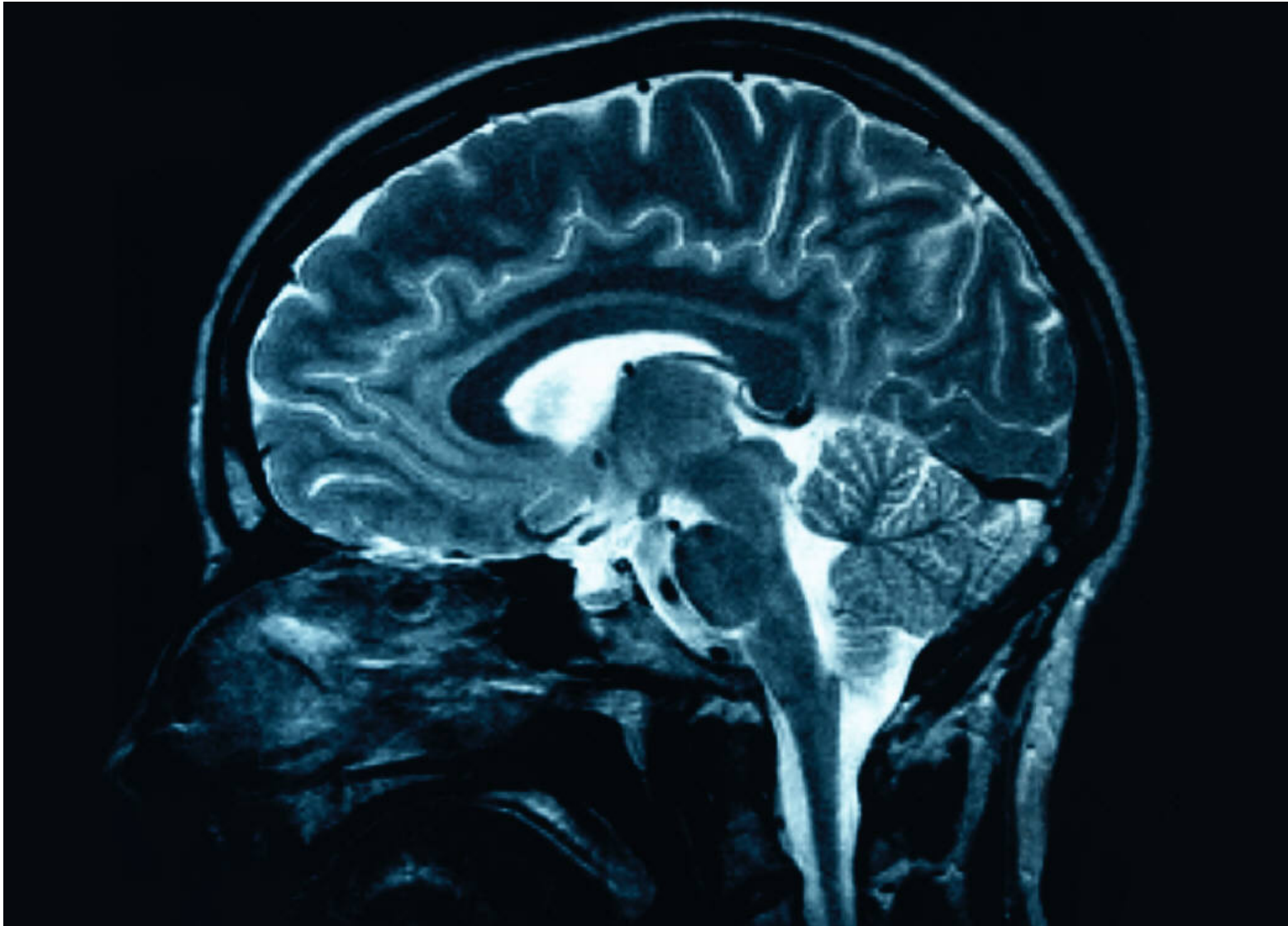


## Today's Discussion:

1. Review aspects of Investor Psychology & Behavioral errors
2. Cognitive Reasons why mistakes occur
3. What is it that we fear?
4. What if you were the world's greatest \_\_\_\_\_ ?

This is Your Brain.  
*This is Your Brain on Drugs*  
1987 PSA



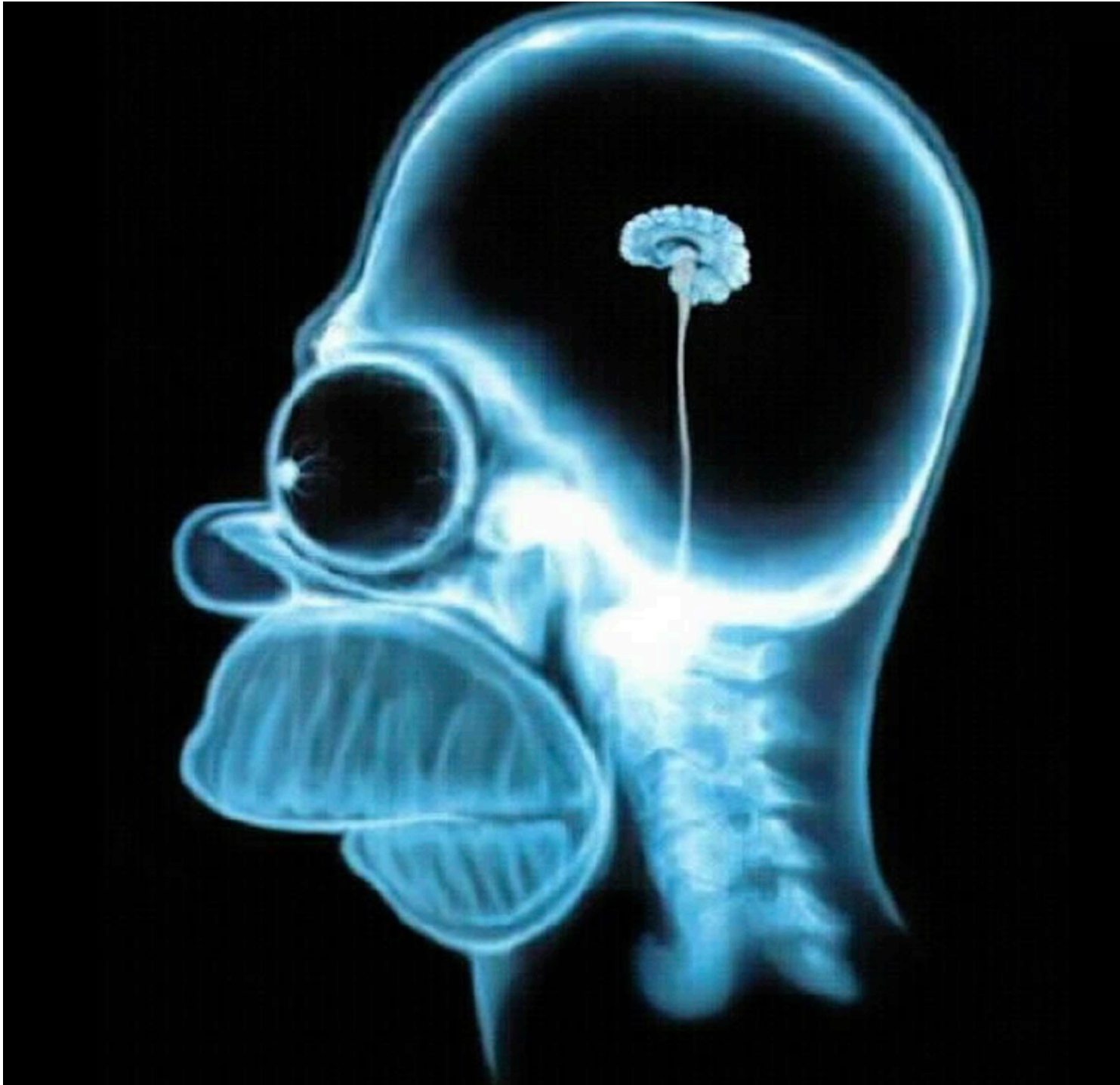


# **This is your brain**

Your brain weighs 3 pounds, and is 100,000 years old. It is a “*dynamic, opportunistic, self-organizing system of systems.*” MRIs have revealed to Neurologists what our brains looks like when making decisions. We can observe it 1) in real time; 2) under actual conditions, and 3) in reaction to financial risk/reward stimuli.

Once we begin trading stocks, however, our brains begin to undergo subtle physical change that we can actually see in the MRIs of Traders . . .





**This  
is  
your  
brain  
on  
stocks**

# How Your Brain Interferes with Your Investing

## **Behavioral Economics**

1. Herding, Groupthink
2. Optimism Bias
3. Confirmation Bias
4. Expert Opinions
5. Recency Effect
6. Endowment Effect
7. Hindsight Bias

## **Risk Aversion**

1. Misunderstanding risk & fear
2. Black Swans
3. Biggest financial fears
4. What actually hurts portfolios

## **Neuro-Finance**

1. Anticipation vs. Rewards
2. Selective Perception/Retention
3. Words vs Images
4. Pattern Recognition
5. Data vs Narrative
6. Cognitive Dissonance
7. Species of Dopamine Addicts

## **World' Greatest ®**

1. Active Trader
2. Market Timer
3. Stock Picker

## Section I

# *A brief intro to* Behavioral Economics



JUST A NORMAL DAY AT THE NATION'S MOST IMPORTANT FINANCIAL INSTITUTION...

# Herding



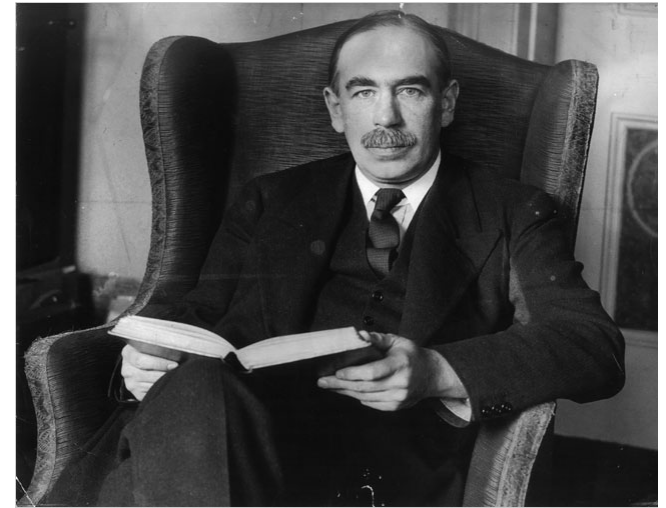
Mutual of Omaha

"Lone Gazelle"



# Groupthink

1. Only 5% of Wall Street Recommendations Are “SELLS”  
-NYT, May 15, 2008
2. Why Analysts Keep Telling Investors to Buy  
-NYT, February 8, 2009
3. Equity Analysts Too Bullish and Bearish at the Exact Wrong Times  
-McKinsey, June 2nd, 2010
4. None of the S&P 1500 have a Wall St. Consensus “Sell” on them  
-Robert Powell, Editor, Retirement Weekly, August 2011



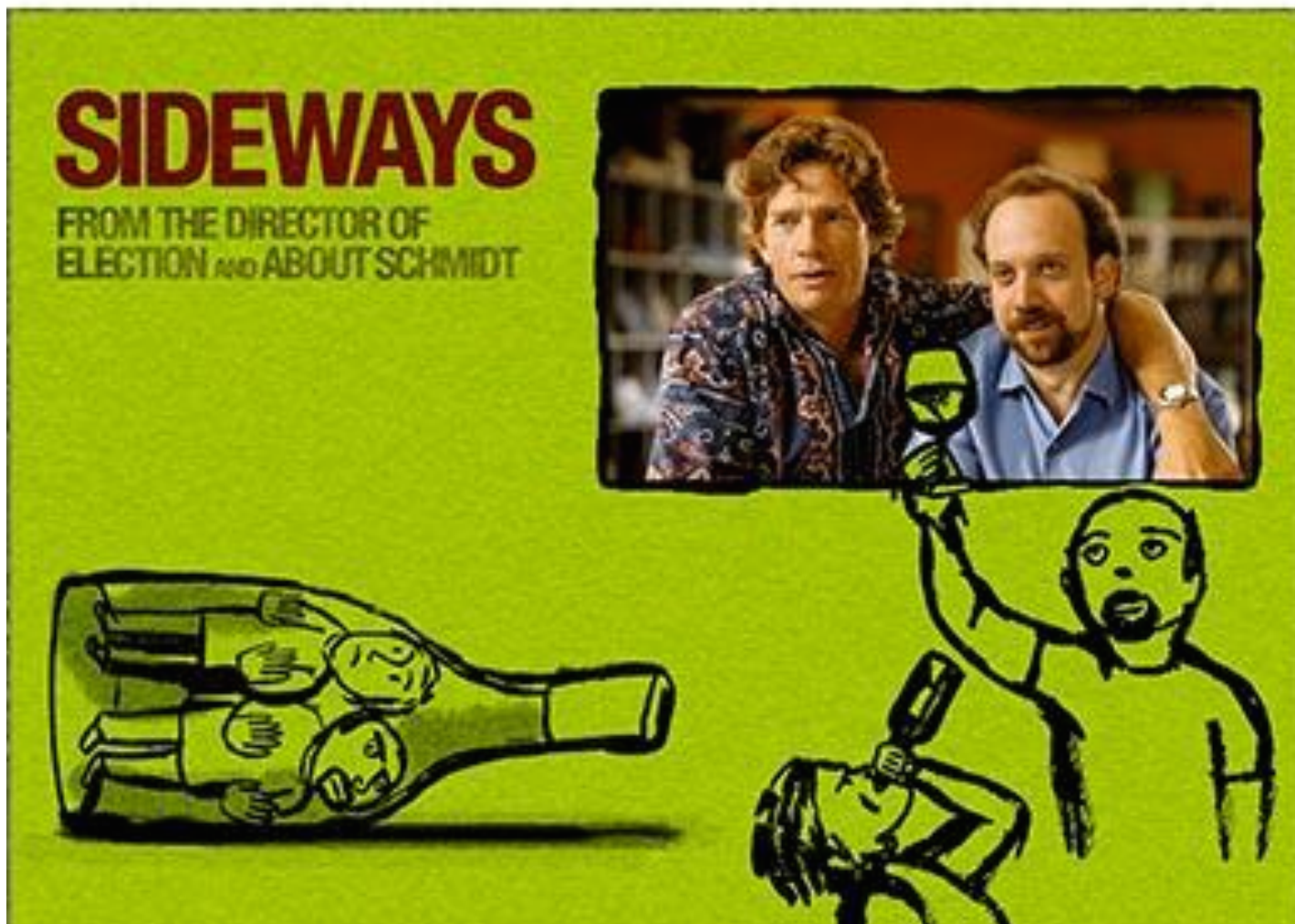
*It is better for one's reputation to fail conventionally than to succeed unconventionally.*

-John Maynard Keynes

Sources: Ritholtz.com, NYT, McKinsey, Marketwatch

# Herding: The “Sideways” Effect

Paul Giamatti: “I am NOT drinking any f&%king Merlot!”



Sources: IMDB

# Lake Wobegone Effect



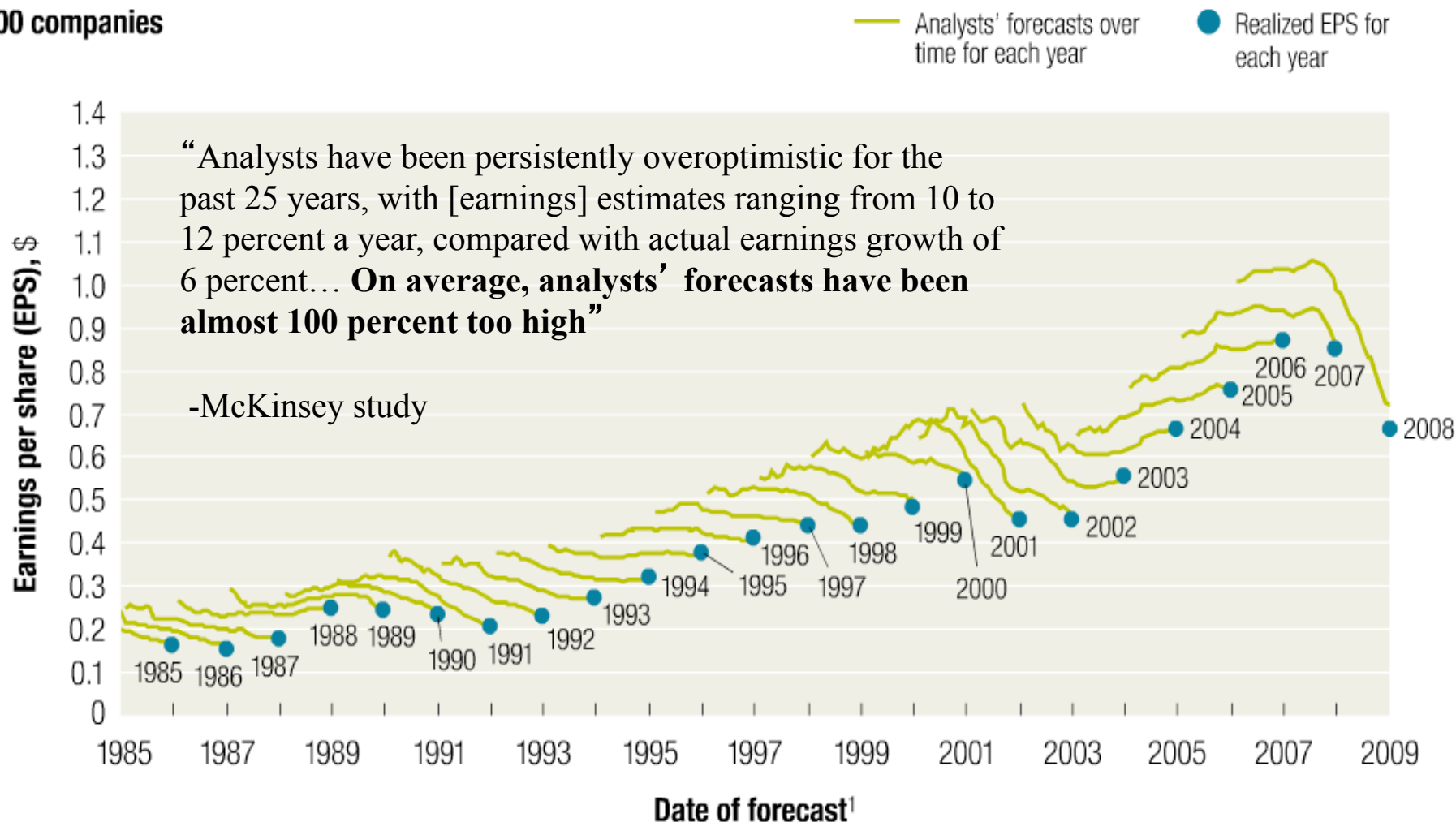
The Lake Wobegone Effect:

A natural and pervasive human tendency to overestimate one's achievements and capabilities in relation to others



# Analysts: Over-Optimistic Group Think

S&P 500 companies



Source: McKinsey & Co.



# Optimism Bias



# Active Management Is Hard

## The Math of Active Management is Daunting:

1. Only 20% of active managers (1 in 5) can outperform their benchmarks in any given year;
2. Within that quintile, < half (1 in 10) outperform in 2 out of the next 3 years;
3. Only 3% stayed in the top 20% over 5 years (1 in 33)
4. Add in costs and fees, less than 1% (1 in 100) manage to outperform (net).
5. What are the odds of picking that that 1-in-100 manager?



Source: Morningstar, Vanguard

# Dunning Kruger Effect

**Dunning Kruger Effect**: cognitive bias in which unskilled people make poor decisions and reach erroneous conclusions, but their incompetence denies them the *metacognitive* ability to recognize these mistakes.





# “Expert” Forecasting

## Expert Forecasters predictions:

- Are statistically indistinguishable from random guesses.
- More self-confident = *worse their track record*
- Most famous = least accurate.
- Most self-confident = most likely to be believed
- Outliers = underperform



*with apologies to Robt. Day  
& the New Yorker* Hoot

*“The bottom’s in. . . The bottom’s in  
. . . The bottom’s in. . .”*

Source: Zweig, Your Money & Your Brain; Grants Interest Rate Observer,



# Confirmation Bias

1. We read what we agree with
2. Our biases change the way we perceive objects
3. We remember *less* of what we disagree with . . .
4. Our expectations affect our perceptions



# Recency Effect

## WSJ: 2007

U.S. STOCKS | OCTOBER 15, 2007

### Exorcising Ghosts of Octobers Past

*Despite Housing Slump, Crashes Such as in 1987 Likely to Stay Memories*

Article

Comments

Email Print Save This Like + More

By E.S. BROWNING

*See Corrections & Amplifications item below.*

With the stock market booming lately, many investors are putting aside worries about the housing slump and the summer's credit crunch.

At the same time, some are thinking about a looming anniversary.



Source: WSJ

## WSJ: 2010

MARKETS | MAY 17, 2010

### How the 'Flash Crash' Echoed Black Monday

*May 6 Selloff Had Parallels to 1987; Electronic Trading Magnified Selling Pressure*

Article

Interactive Graphics

Comments (26)

Email Print Save This Like 16 + More Text

By SCOTT PATTERSON



Agence France-Presse/Getty Images

The Black Monday crash on Oct. 19, 1987, above, sent the Dow industrials down 508 points—or a startling 22.6% in a day.

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Management



# What Just Happened vs. What is Going to Happen

Time, June 2005



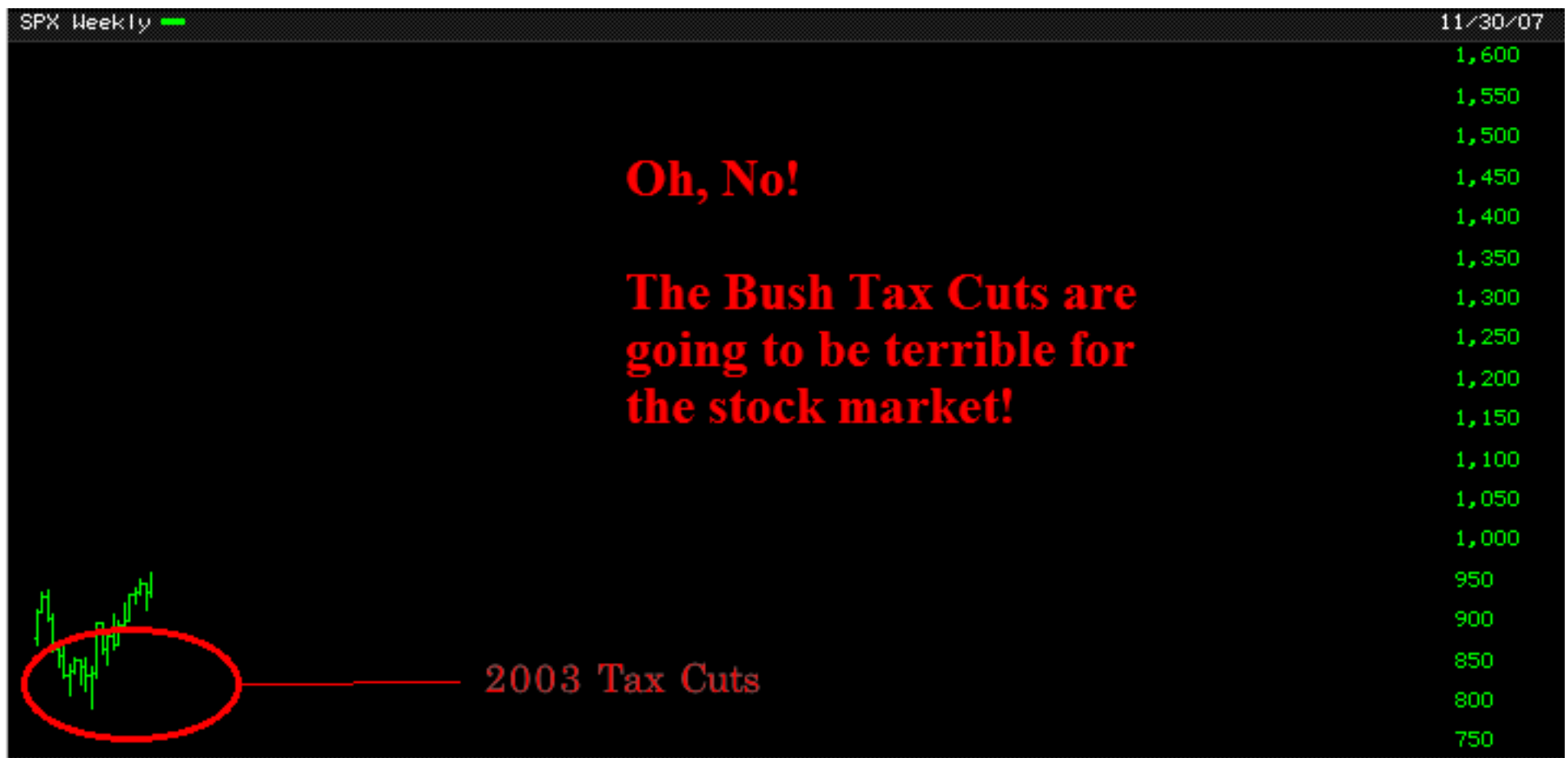
Fortune, June 2005



Source: Fortune, Time

# 2003: Politics and Asset Management Don't Mix

*These are poorly designed tax cuts - Stay Out of Markets!*





# 2003: Politics and Asset Management Don't Mix

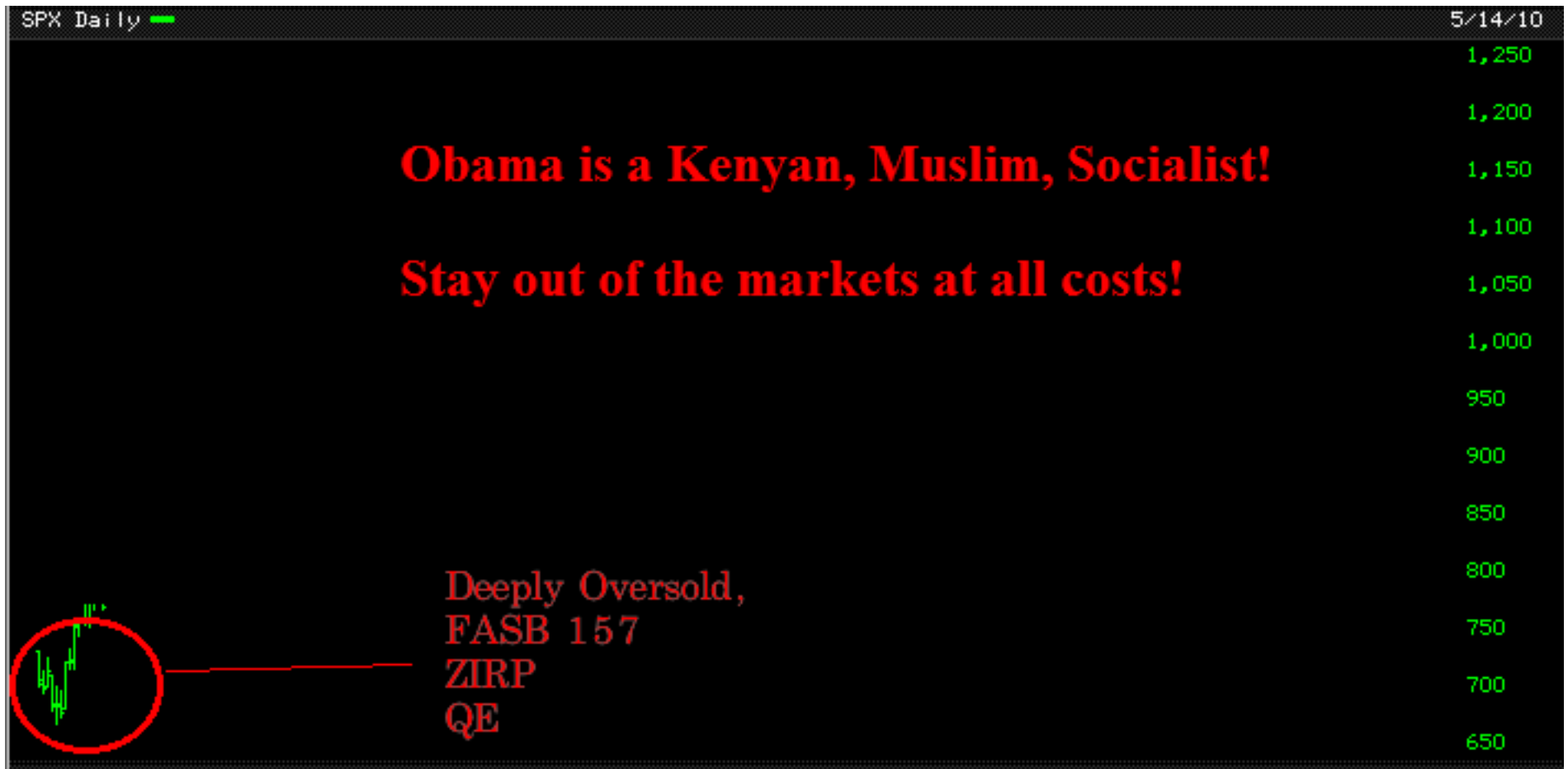
*2003 Tax Cuts > \$1 Trillion*

*How did that political trade – up over 90% over 4 years –  
work out for you . . . ?*



# 2009: Political Investing

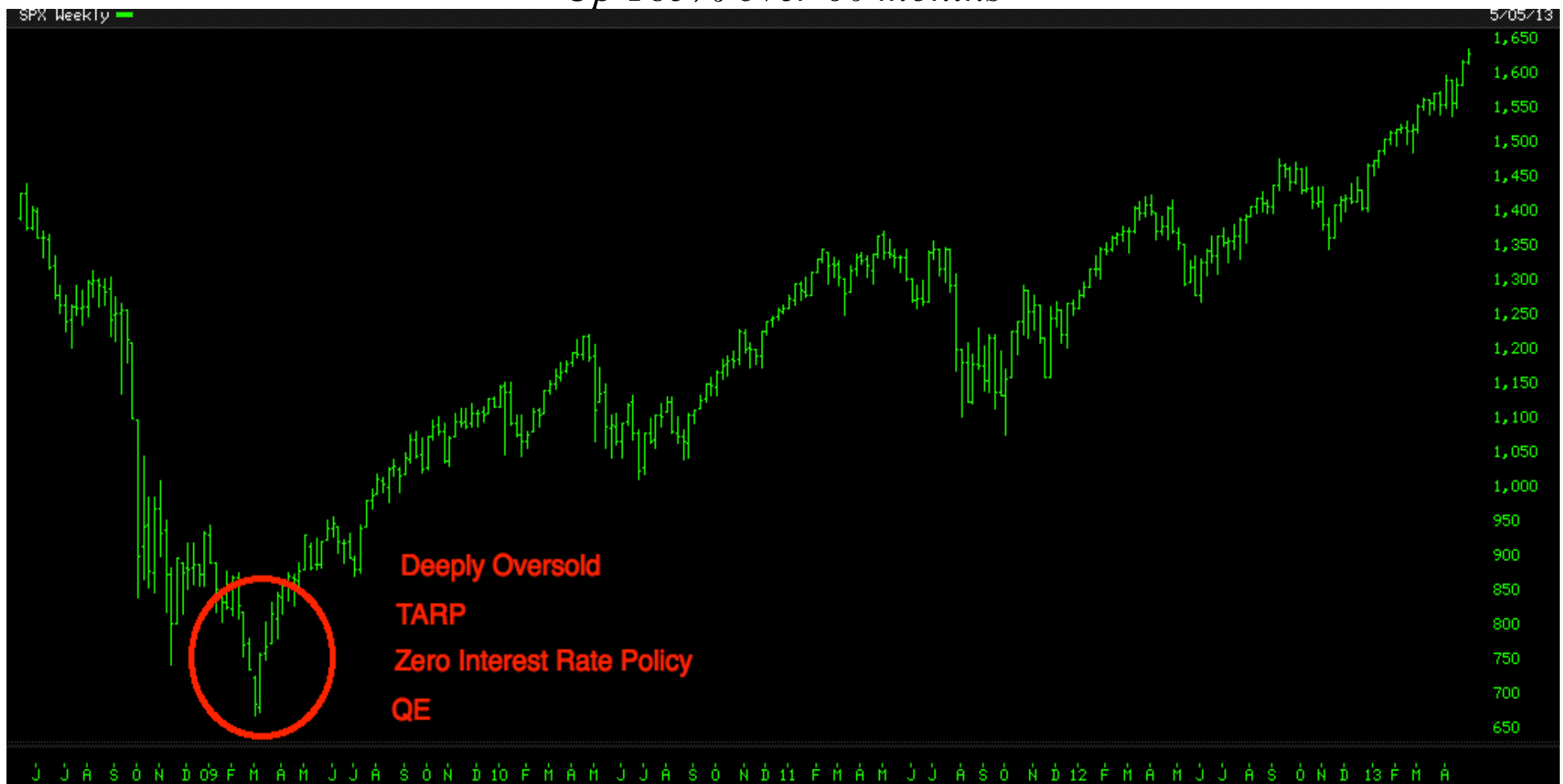
*Obama is a Socialist! Stay Out of Markets!*



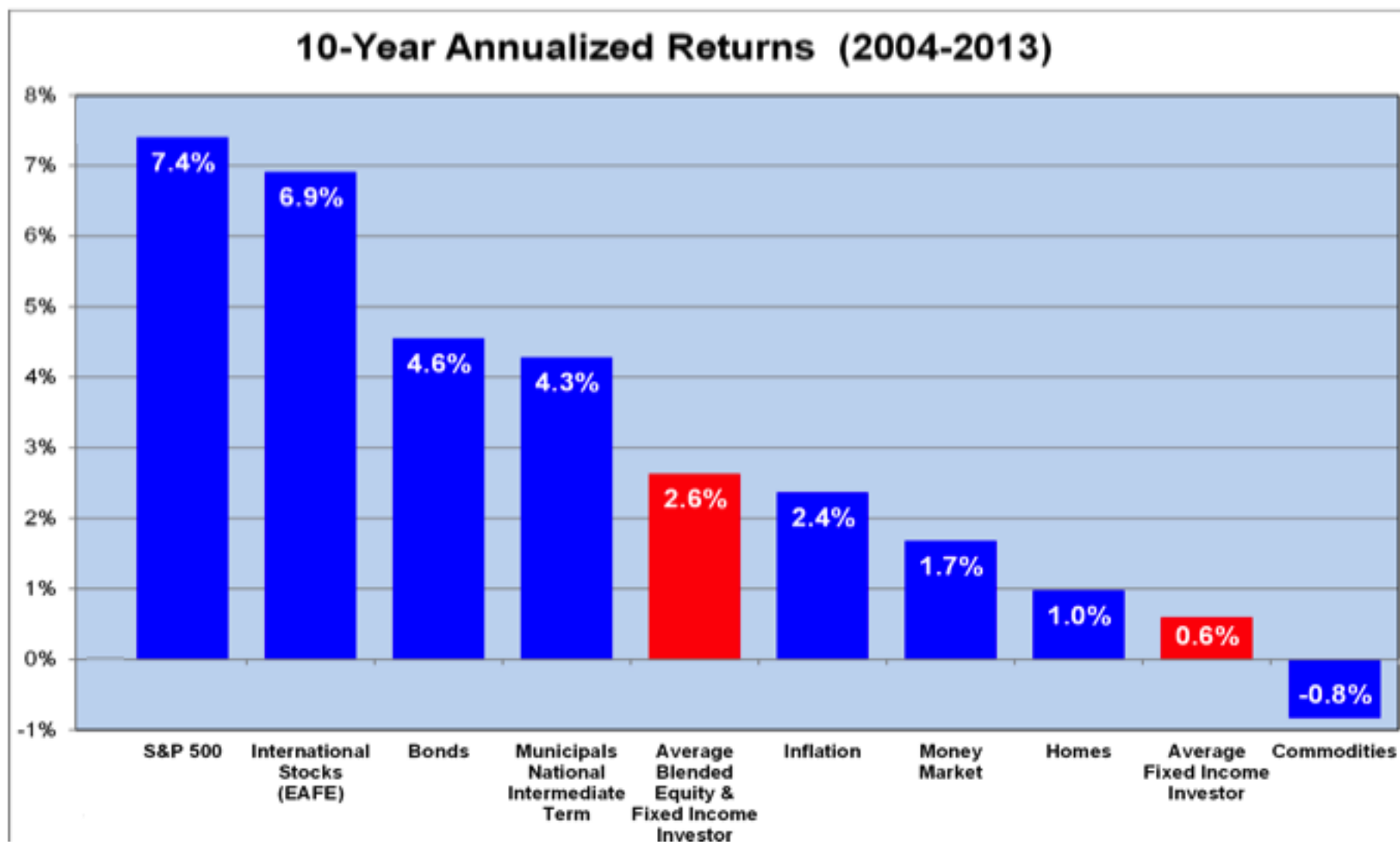
# 2009: Politics and Asset Management Don't Mix

*FASB 157, ZIRP, QE + VERY Oversold Markets*

*The political trader missed the best rally in a generation –  
Up 185% over 60 months*



# Investor Performance (10 Years)

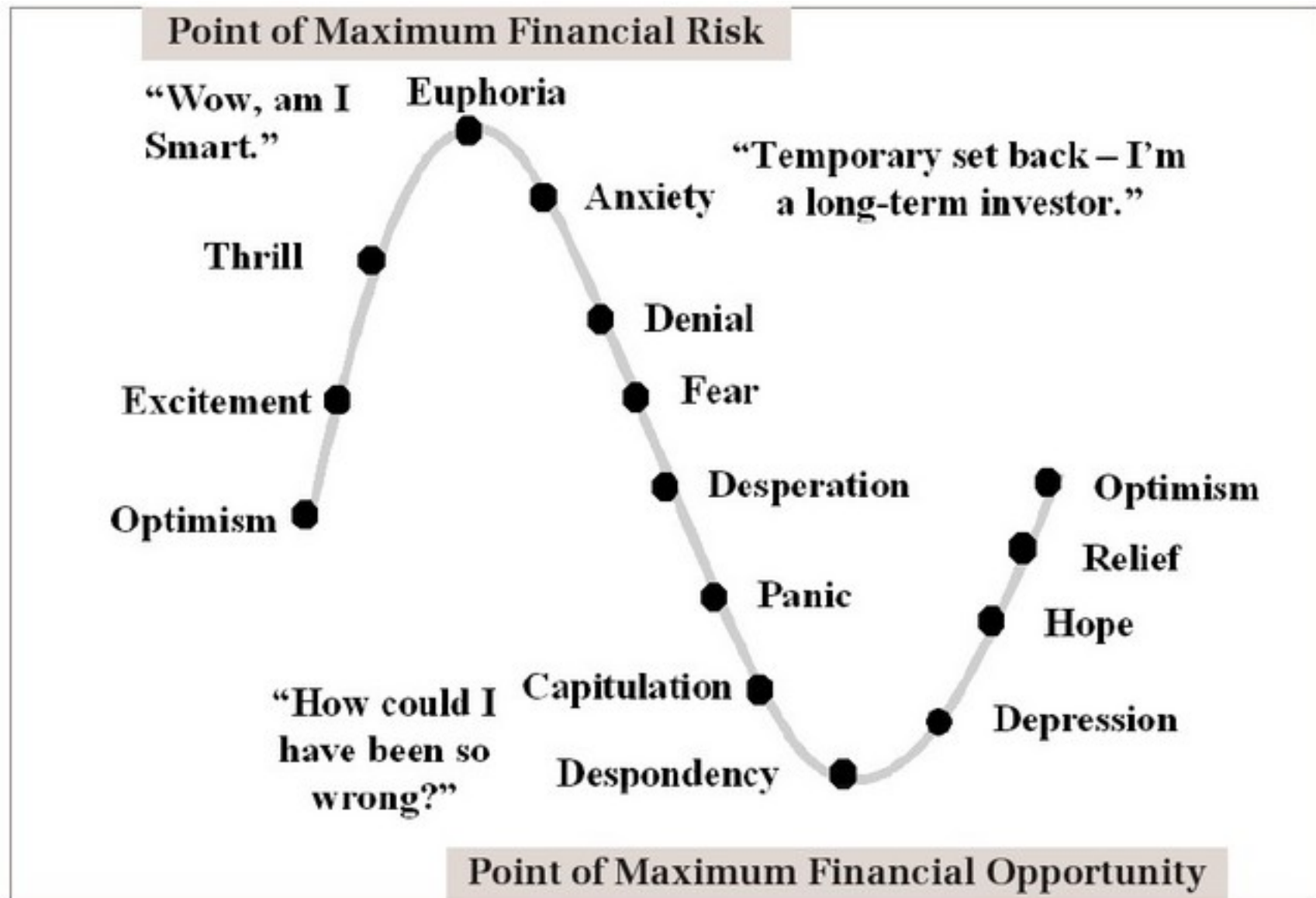


Source: DALBAR

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Management

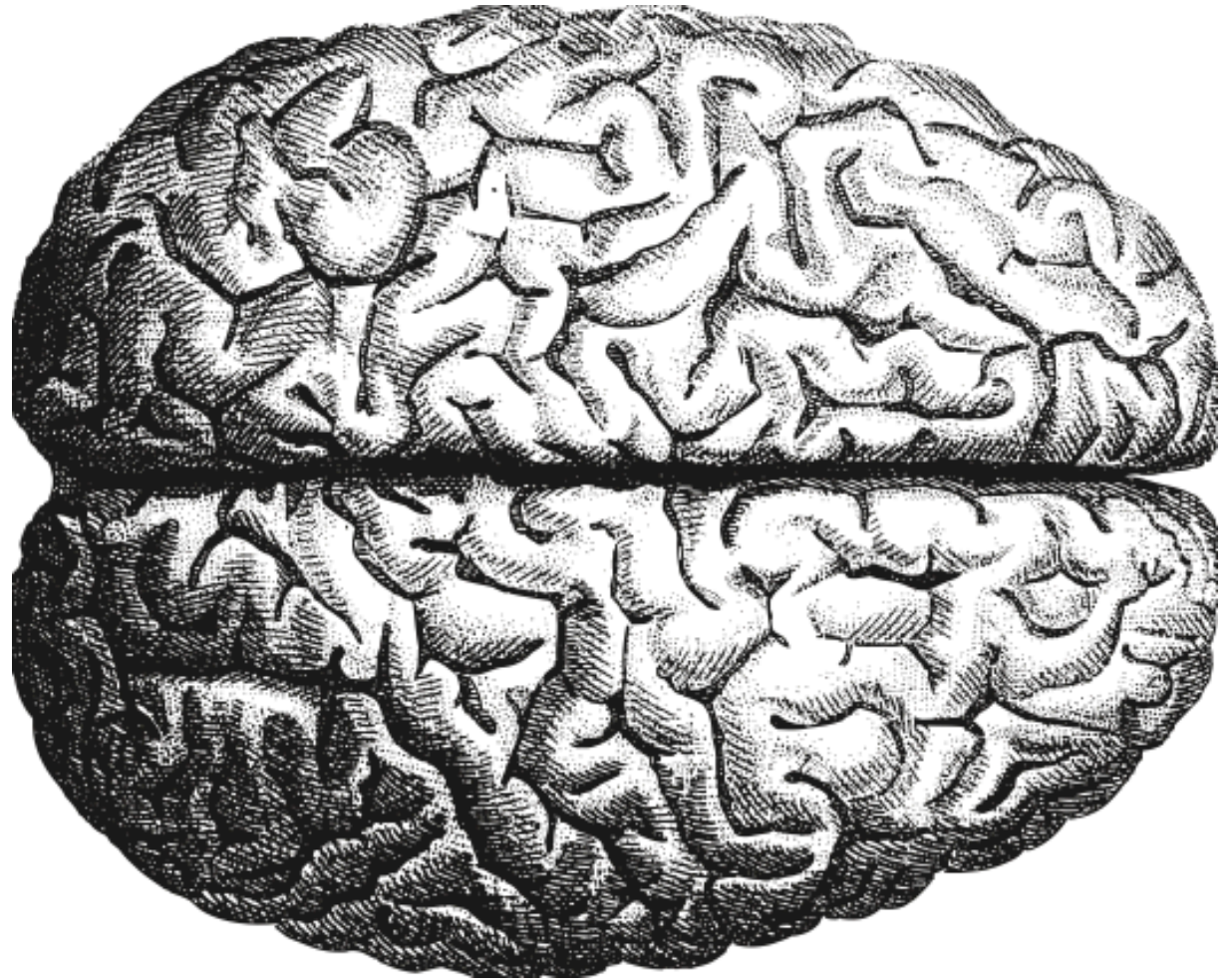


# Sentiment Cycle



## Section 2

# *A brief intro to* Neuro Finance



# If u cn rd ths

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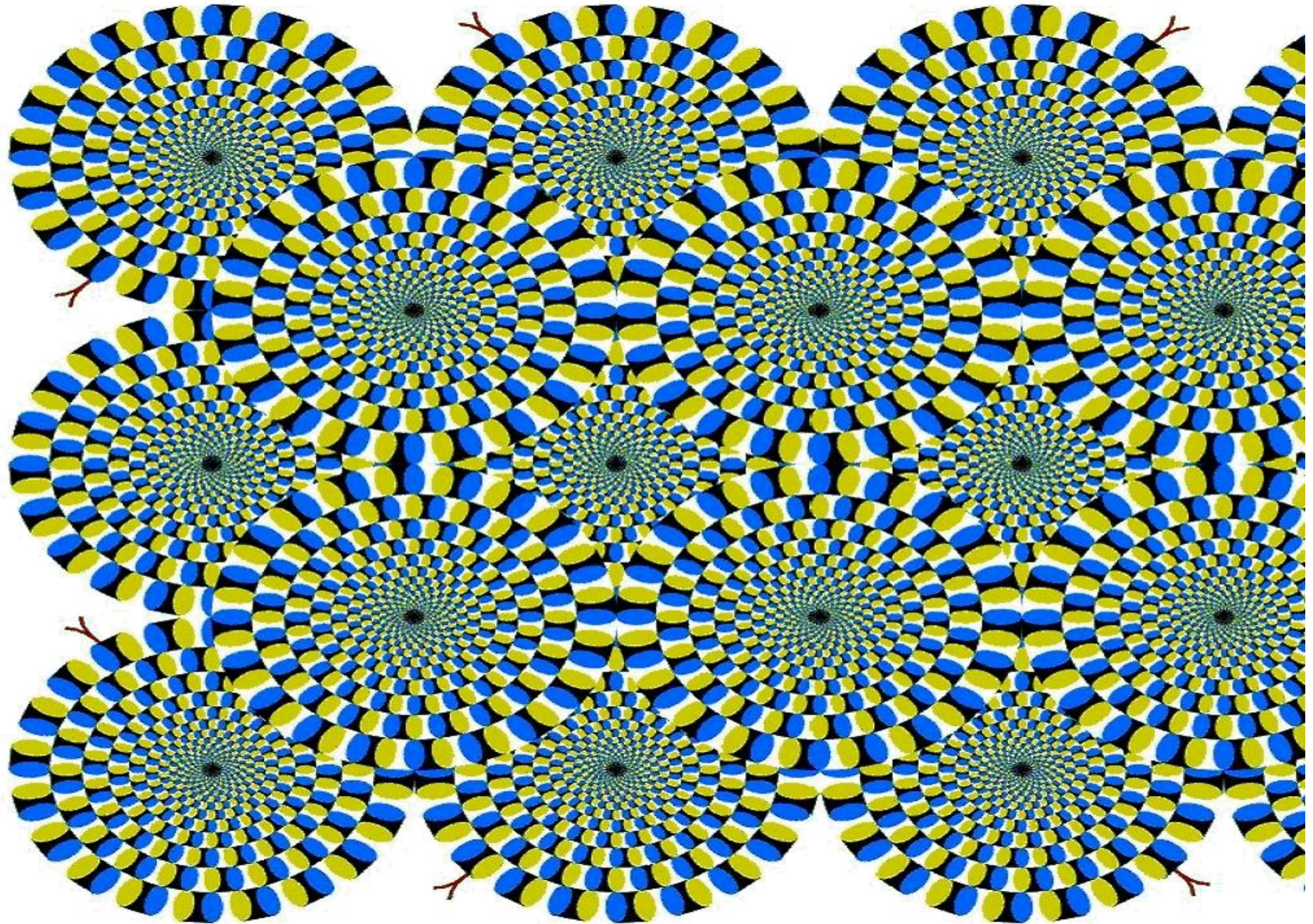
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rdanieg. The phaonmneal pweor of  
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in a wrod are, the olny iprmoatnt  
tihng is taht the frist and lsat  
ltteer be in the rghit pclae. The  
rset can be a taotl mses and you  
can still raed it wouthit a  
porbelm.

Tihs is bcuseae the huamn mnid  
deos not raed ervey lteter by  
istlef, but the wrod as a wlohe.  
Amzanig huh? yaeh and I awlyas  
tghuhot slpeling was ipmorantt! if  
you can raed tihs psas it  
on !!

IF YOU CAN READ THIS  
WITH EASE THEN YOU ARE  
INCREDIBLY TALENTED AT  
READING BACKWARDS,  
WHICH IS AN INCREDIBLY  
POINTLESS TALENT  
TO HAVE.



This animation . . .



. . . is not an animation



# Cognitive Habits: What Parking Spot # is Car In?

Hong Kong Elementary School First Grade Student Admissions Test Question



香港小学入学考试题: 21题 Hong Kong Elementary School Admissions Test Question: #21

What parking spot # is the car parked in?

请问汽车停的是几号车位?

请在20秒内完成回答 Please answer within 20 seconds

When it absolutely positively  
has to deceive your eyes overnight



Source: Federal Express

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No, this was not photoshopped...



1974

1994 - TODAY

[www.boredpanda.com](http://www.boredpanda.com)

Source: 11even.net

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Management



# The Narrative Fallacy



You prefer a story to data:

- Story-telling is how Humans evolved to share information

- You are vulnerable to anecdotes that mislead or present false conclusions unsupported by data

Tipping Point, Freakonomics

## Section 3

*A brief introduction to*  
Understanding Risk



We Are All Going to Die. *Here's How.*



**Shark**: A perfectly evolved killing machine, immortalized in Spielberg's 1975 film, "Jaws."

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10 People a year are killed by sharks worldwide

Other large predators:

Lions? (100)

Elephants (100)

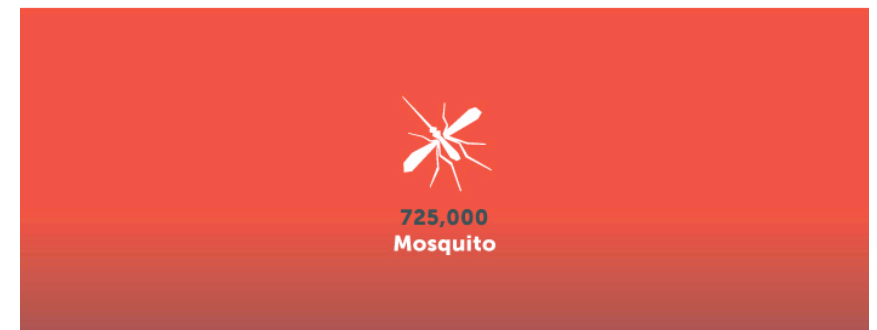
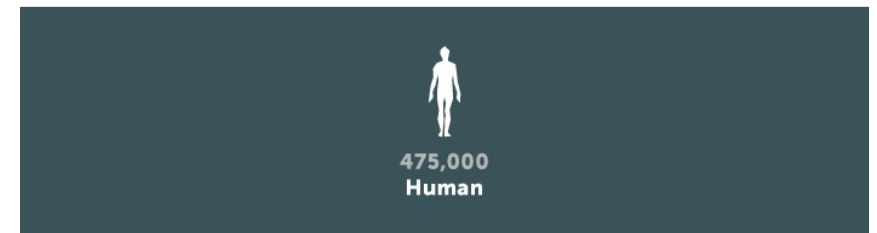
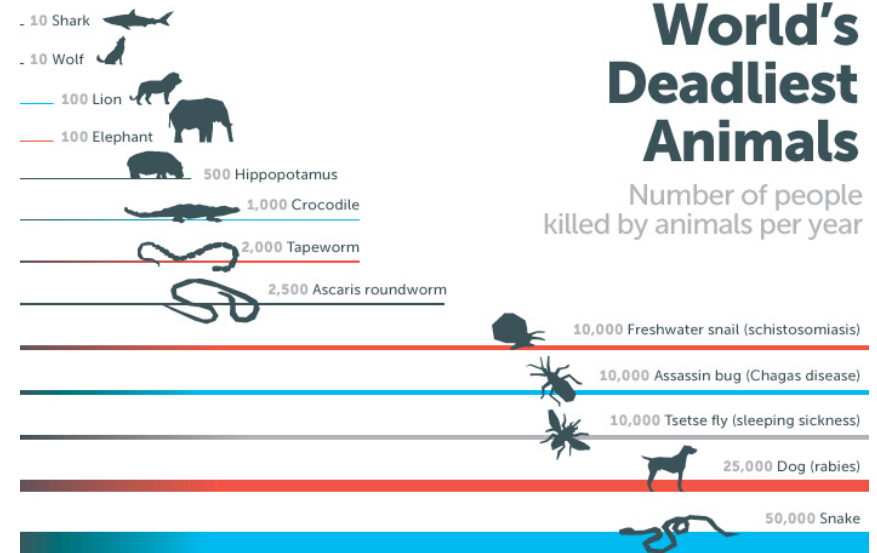
Hippos (500)

Crocodiles (1,000)

Snakes (50,000).

Dogs (25,000) almost all due to rabies.

# The Deadliest Animal in the World



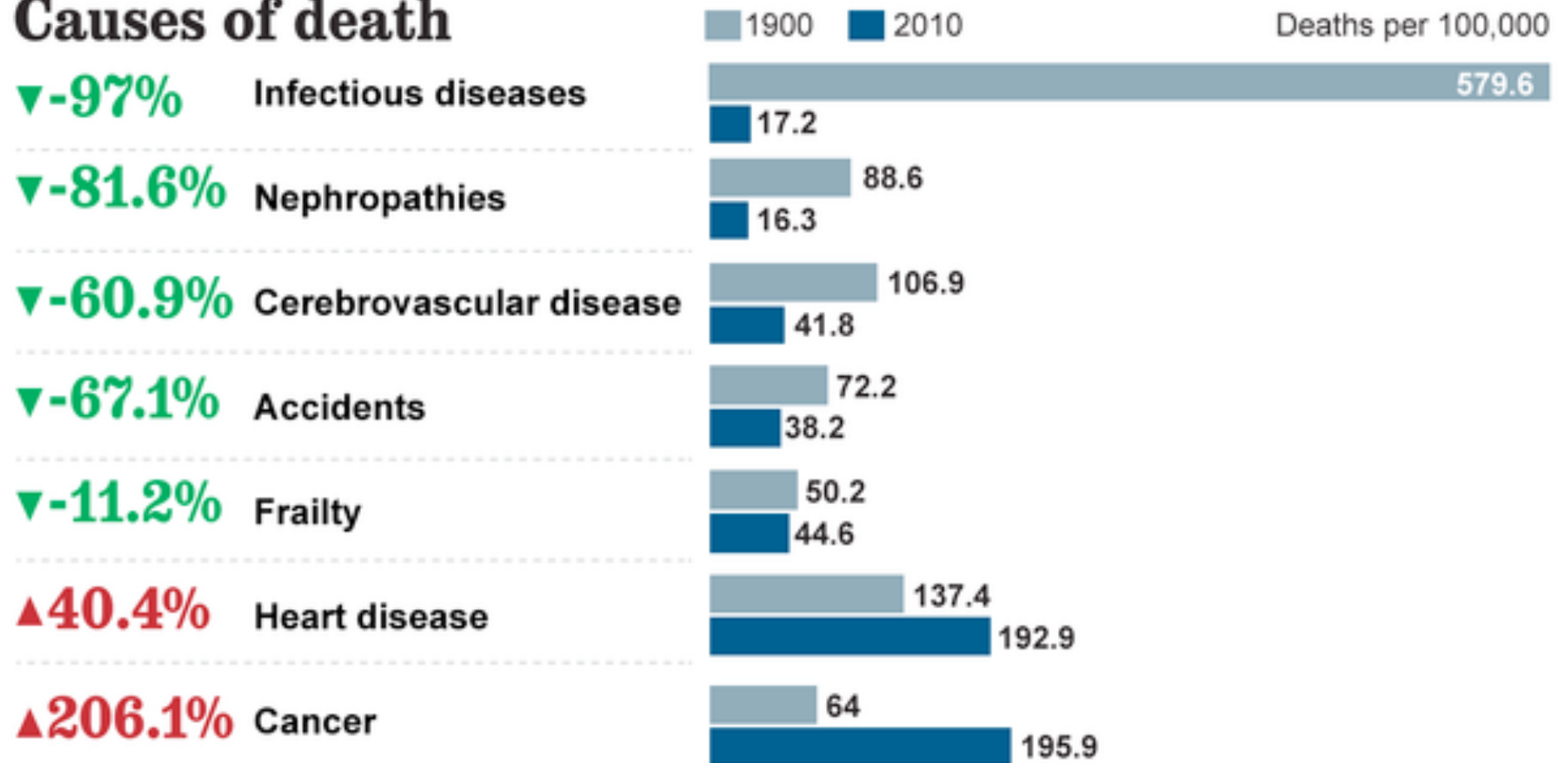
Mosquitoes are the deadliest creature on earth; Man only comes in second

Source: Gates Foundation, CDC

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# What killed Americans in 1900 vs. 2010

## Causes of death



Source: New England Journal of Medicine, Randy Olson, L.A. Times reporting

Kyle Kim / @latimesgraphics

Source: LA Times

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# Risk of Terrorism

2010: U.S.  
noncombatant  
fatalities from  
terrorism  
worldwide = 25

2011: Terror  
deaths = 8

People who die  
after being  
struck by  
lightning = 29.



Source: CDC, Mueller & Stewart, Terror, Security, and Money.



# Your Actual Risk

**Table B. Deaths and death rates for 2011 and age-adjusted death rates and percentage changes in age-adjusted rates from 2010 to 2011 for the 15 leading causes of death in 2011: United States, final 2010 and preliminary 2011**

[Data are based on a continuous file of records received from the states. Rates are per 100,000 population; age-adjusted rates per 100,000 U.S. standard population based on the year 2000 standard; see Technical Notes. For explanation of asterisks (\*) preceding cause-of-death codes, see Technical Notes. Figures for 2011 are based on weighted data rounded to the nearest individual, so categories may not add to totals]

Rank <sup>1</sup>	Cause of death (based on the <i>International Classification of Diseases, Tenth Revision, 2008 Edition, 2009</i> )	Number	Death rate	Age-adjusted death rate		
				2011	2010	Percent change
...	All causes	2,512,873	806.5	740.6	747.0	-0.9
1	Diseases of heart . . . . . (I00-I09,I11,I13,I20-I51)	596,339	191.4	173.7	179.1	-3.0
2	Malignant neoplasms . . . . . (C00-C97)	575,313	184.6	168.6	172.8	-2.4
3	Chronic lower respiratory diseases . . . . . (J40-J47)	143,382	46.0	42.7	42.2	1.2
4	Cerebrovascular diseases . . . . . (I60-I69)	128,931	41.4	37.9	39.1	-3.1
5	Accidents (unintentional injuries) . . . . . (V01-X59,Y85-Y86) <sup>2,3</sup>	122,777	39.4	38.0	38.0	0.0
6	Alzheimer's disease . . . . . (G30)	84,691	27.2	24.6	25.1	-2.0
7	Diabetes mellitus . . . . . (E10-E14)	73,282	23.5	21.5	20.8	3.4
8	Influenza and pneumonia . . . . . (J09-J18) <sup>4</sup>	53,667	17.2	15.7	15.1	4.0
9	Nephritis, nephrotic syndrome and nephrosis . . . . . (N00-N07,N17-N19,N25-N27) <sup>5</sup>	45,731	14.7	13.4	15.3	-12.4
10	Intentional self-harm (suicide) . . . . . (*U03,X60-X84,Y87.0) <sup>2</sup>	38,285	12.3	12.0	12.1	-0.8
11	Septicemia . . . . . (A40-A41)	35,539	11.4	10.5	10.6	-0.9
12	Chronic liver disease and cirrhosis . . . . . (K70,K73-K74)	33,539	10.8	9.7	9.4	3.2
13	Essential hypertension and hypertensive renal disease . . . . . (I10,I12,I15)	27,477	8.8	8.0	8.0	0.0
14	Parkinson's disease . . . . . (G20-G21) <sup>6</sup>	23,107	7.4	7.0	6.8	2.9
15	Pneumonitis due to solids and liquids . . . . . (J69)	18,090	5.8	5.3	5.1	3.9
...	All other causes . . . . . (residual)	512,723	164.6	...	...	...

You are ...

35,079 times more likely to die of heart disease

33,842 times more likely to die of cancer

... than a terror attack.

Source: CDC

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Management

# What are YOU afraid of?

**① 45 percent of world's wealth destroyed: Blackstone CEO**

*Reuters – 3/10/09*

**④ U.S. Home Prices Take Record Plunge**

*CBS News – 3/31/09*

**⑦ Global recession worst since Depression, IMF says**

*Associated Press – 4/22/09*

**② The Dow's Jump: Just Another Bear-Market Rally?**

*U.S. News & World Report – 3/24/09*

**⑤ FOX News Poll: Worst Is Yet to Come on Economy**

*FOX News – 4/2/09*

**⑧ Swine Flu, the Last Thing Economy Needs Right Now**

*Wall Street Journal – 4/27/09*

**③ Now the Long Run Looks Riskier, Too**

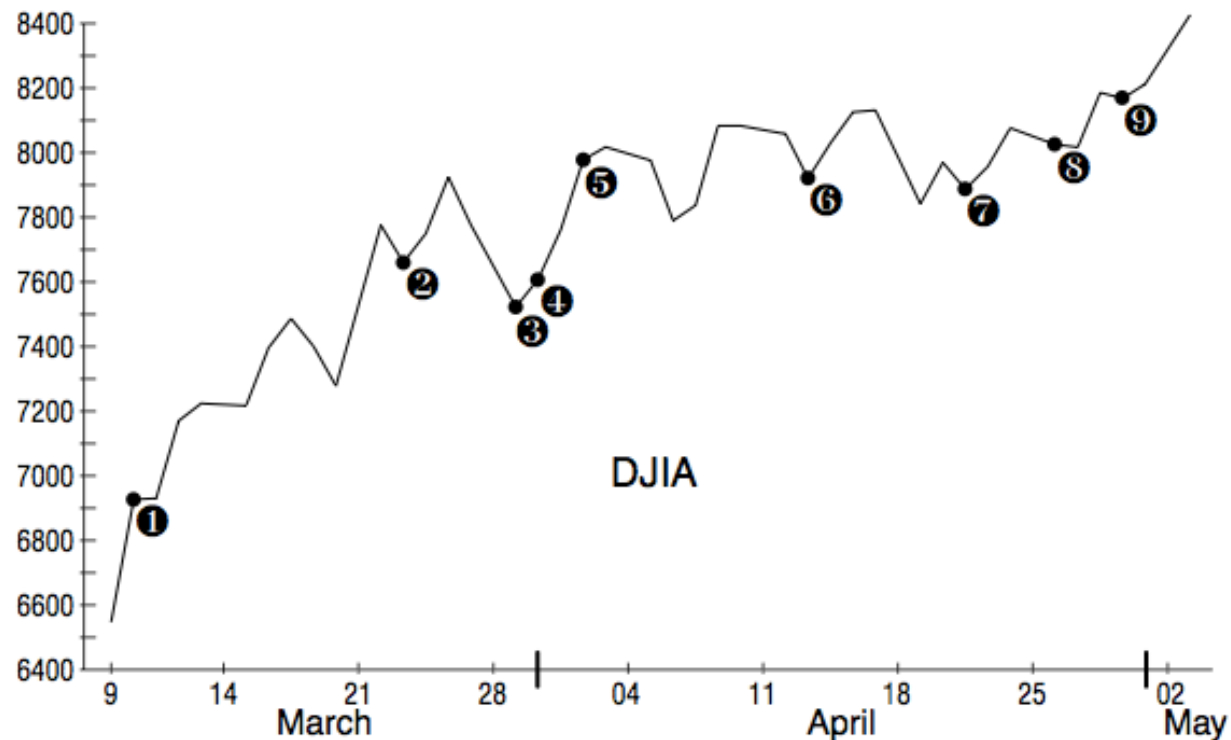
*The New York Times – 3/29/09*

**⑥ Bankruptcies soaring with 'no end in sight'**

*Associated Press – 4/14/09*

**⑨ Chrysler files for bankruptcy**

*Reuters – 4/30/09*



Market Crashes

HyperInflation

Collapse of the Dollar

*Looking foolish...*

## Marc Faber: 2014 crash will be worse than 1987's –CNBC, April 10, 2014

### **STOCKS PLUNGE 508 POINTS, A DROP OF 22.6%; 604 MILLION VOLUME NEARLY DOUBLES RECORD**

#### **U.S. Ships Shell Iran Installation In Gulf Reprisal**

#### **Offshore Target Tamed a Base for Gunboats**

By STEVEN V. ROBERTS  
Special to The New York Times

WASHINGTON, Oct. 19 — United States naval forces struck back at Iran today for attacks on American-registered vessels and other Persian Gulf shippers by shelling two concrete oil-shelf platforms that American officials said were a base for Iranian gunboats.

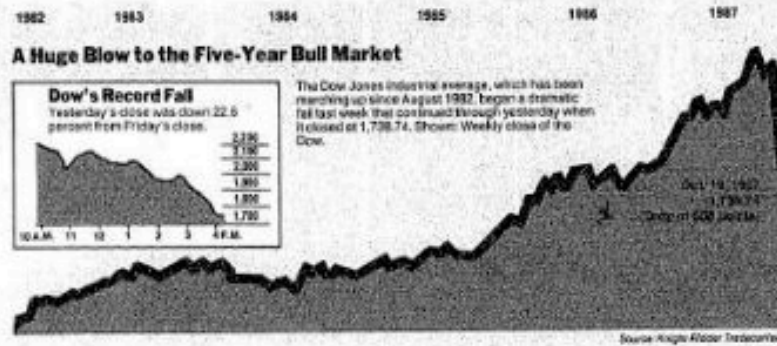
A few hours later, a naval commando detachment boarded a third platform five miles away and destroyed radar and communications equipment, Pentagon officials said.

No American casualties were reported in the actions, which occurred 128 miles east of Bahrain at about 2 P.M. (7 A.M. Eastern daylight time).

#### **A 30-Minute Warning**

American officials said the attacking force took pains to avoid killing Iranians, giving the crew on the first two platforms a 30-minute warning before four destroyers, stationed about 30 miles away, began the shelling.

At the United Nations, an Iranian delegate said "several innocent people" had been killed in the attack, but the accusation could not be confirmed.



#### **WORLDWIDE IMPACT**

#### **Frenzied Trading Raises Fears of Recession — Tape 2 Hours Late**

By LAWRENCE J. DE MARIA

Stock market prices plunged in a tumultuous wave of selling yesterday, giving Wall Street its worst day in history and raising fears of a recession.

The Dow Jones industrial average, considered a benchmark of the market's health, plummeted a record 508 points, to 1,730.74, based on preliminary calculations. That 22.6 percent decline was the worst since World War I and far greater than the 13.82 percent drop on Oct. 28, 1929, that along with the next day's 11.7 percent decline preceded the Great Depression.

Since hitting a record 2,732.42 on Aug. 26, the Dow has fallen almost 1,000 points, or 36 percent, putting the blue-chip indicator 157.5 points below the level at which it started the year. With Friday's plunge of 508.25 points, the Dow has fallen more than 25 percent in the last two sessions.

#### **Unprecedented Trading**

Yesterday's frenzied trading on the nation's stock exchanges lifted volume to unheard-of levels. On the New York Stock Exchange, an estimated 604.3 million shares changed hands, almost double the previous record of 318.5 mil-

#### **Does 1987 Equal 1929?**

By ERIC GELMAN

As stock prices soared this year, a chorus of pessimists warned that 1987 was looking more like 1929, when a stock market crash helped to usher in the Great Depression. Yesterday, after a plunge reminiscent of the worst days of 1929, one pressing question was whether the aftermath would be as devastating to individuals and the nation.

The quick answer, many economists say, is no. The huge losses on Wall Street, director of the Center for International Business Cycle Research at Columbia University.

To be sure, there are some unsettling similarities between the current era and the pre-Depression years. Like the Roaring Twenties, the 1980's have seen an extraordinary boom on Wall Street. Now, as then, individual and corporate debt are high, and some sectors of the economy are extremely weak. Trade relations are strained, with protectionist sentiment growing.



# Catastrophizing Markets

Faber on Hyperinflation: “Not A Matter Of If But When” –Business Insider, 9/23/2010

'The Bear Market Is Starting' Marc Faber –CNBC, August 3, 2011

Faber: The Dollar's Value In The Future Will Be Zero –Business Insider, 4/18/ 2011

Marc Faber: We Could Experience A 1987-Style Crash This Year –Business Insider, 5/10/2012

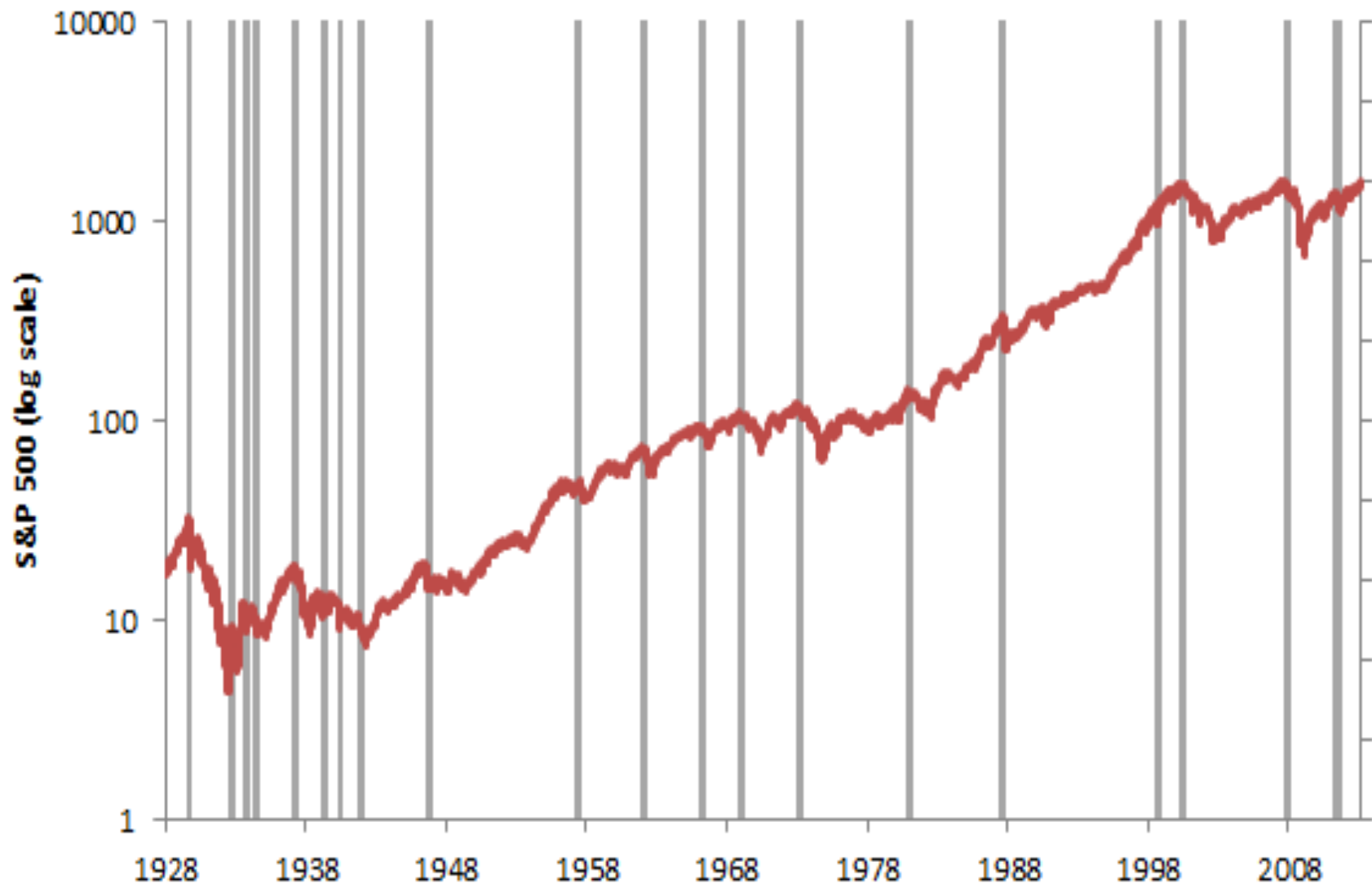
Marc Faber: Look out! A 1987-style crash is coming. –CNBC, August 8, 2013

2014 crash will be worse than 1987's: Marc Faber –CNBC, April 10, 2014

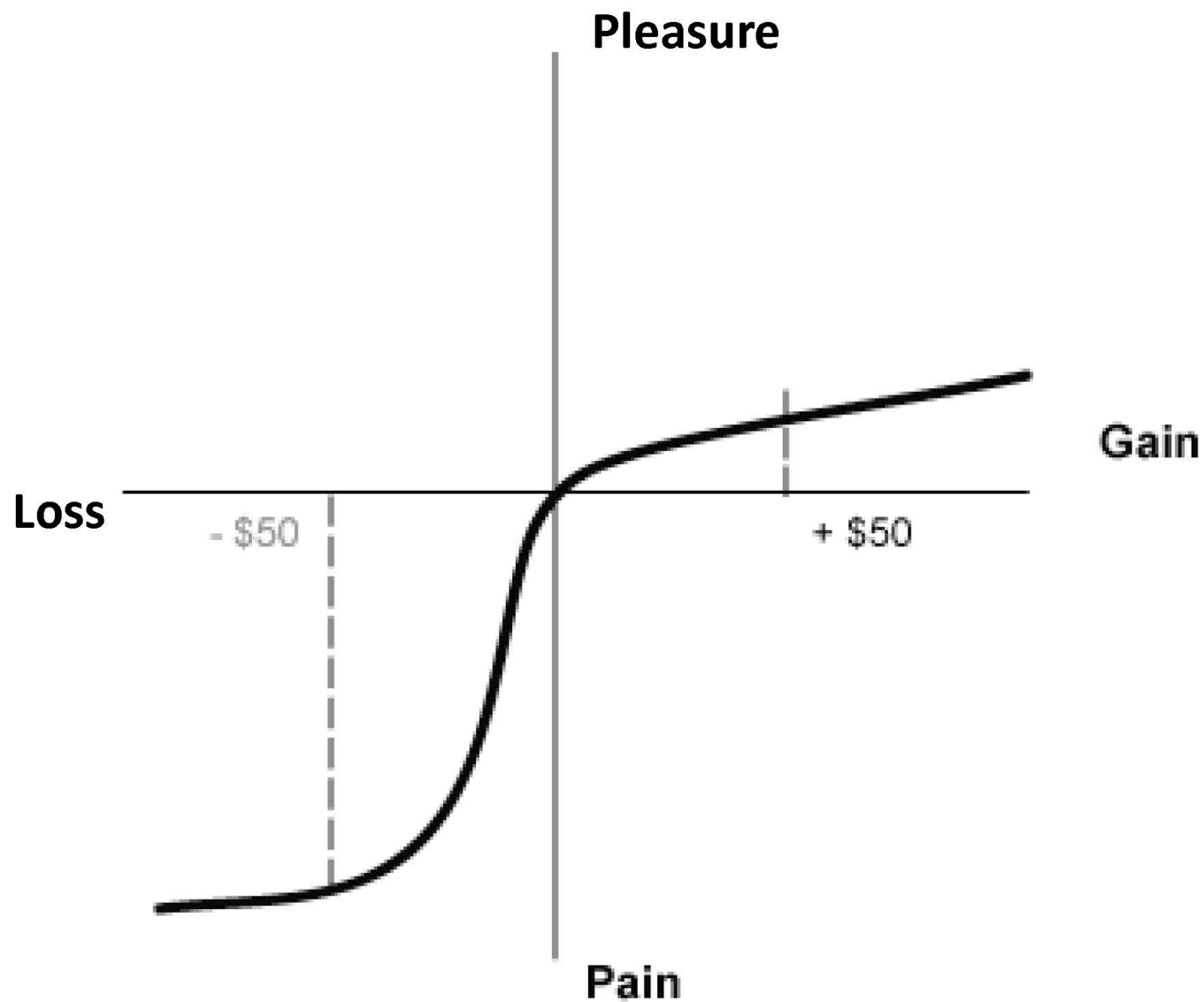
*My prediction? In 2015, Faber will predict crash . . .*



# S&P500 Declines of 20% (or more)



# Pleasure versus Pain



# Section 4 *The World's Greatest®:* *Trader, Market Timer & Stock Picker*





# The World's Greatest® Stock Picker

- Netflix: -25% 4 separate time  
Over 4 months in 2011, it lost 80%  
On its worst day, it fell 41%.
- Chipotle 15% on four separate days.  
During 2007-09 crash, -76%
- Tesla +400% in 6 months, then -40% for 10 weeks;  
Down 25% in a month
- Google -70% in 2007-09; In its worst quarter,  
down -36%

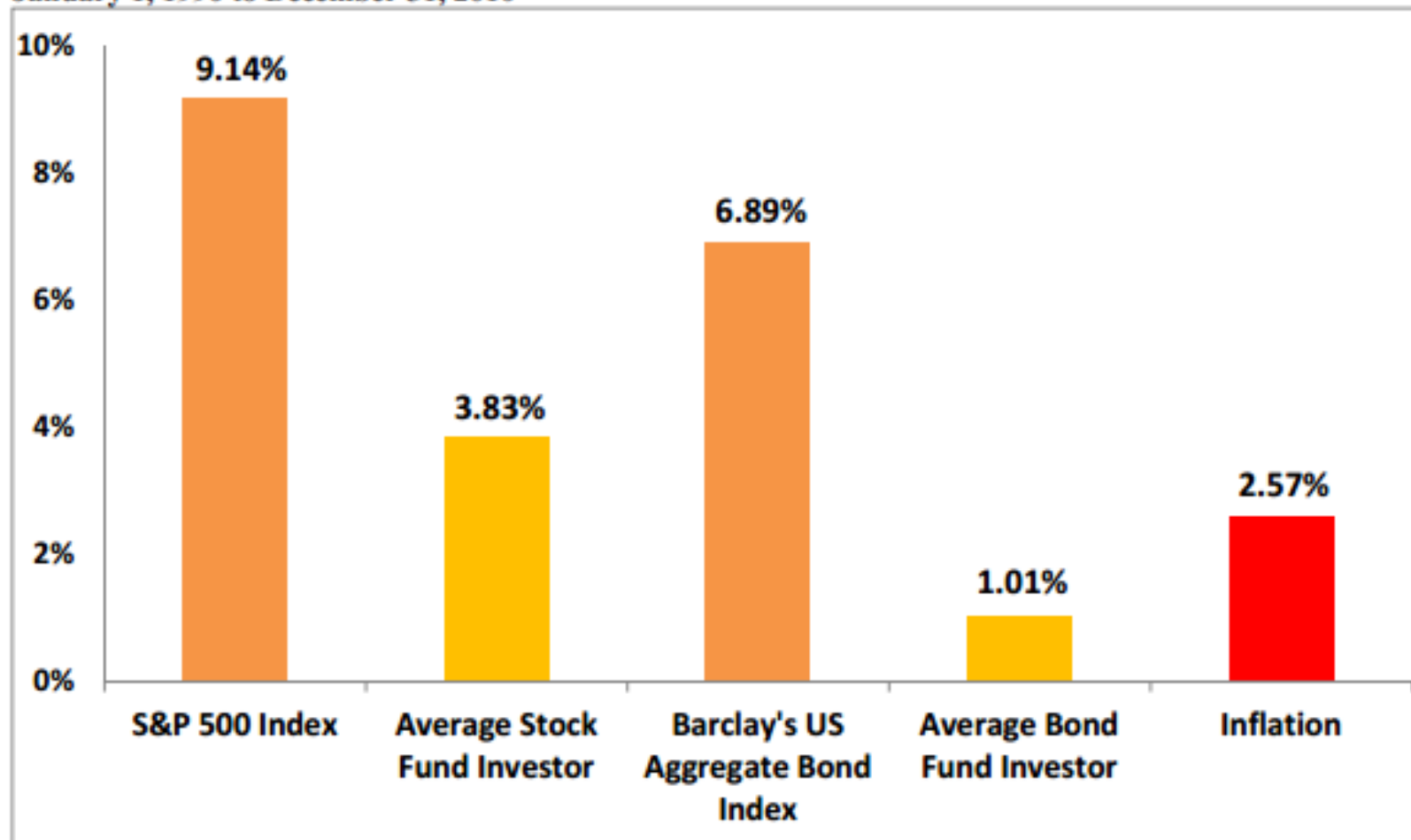
# The World's Greatest® Stock Picker

- Apple has lost 25% or more six times in the past 10 years alone (after its meteoric rise).
- During its worst week, it was cut in half, falling 51%. It was also cut in half (or worse) during its worst month and quarter as well.
- Apple is now = value of September 2012 – just before it fell 44%.
- What if you bought 1,000 of AAPL on that newfangled iPod. Now 14,000 = \$1.4 million dollars.

# Investor Performance (20 Years)

## Average Investors vs. Markets

January 1, 1990 to December 31, 2010

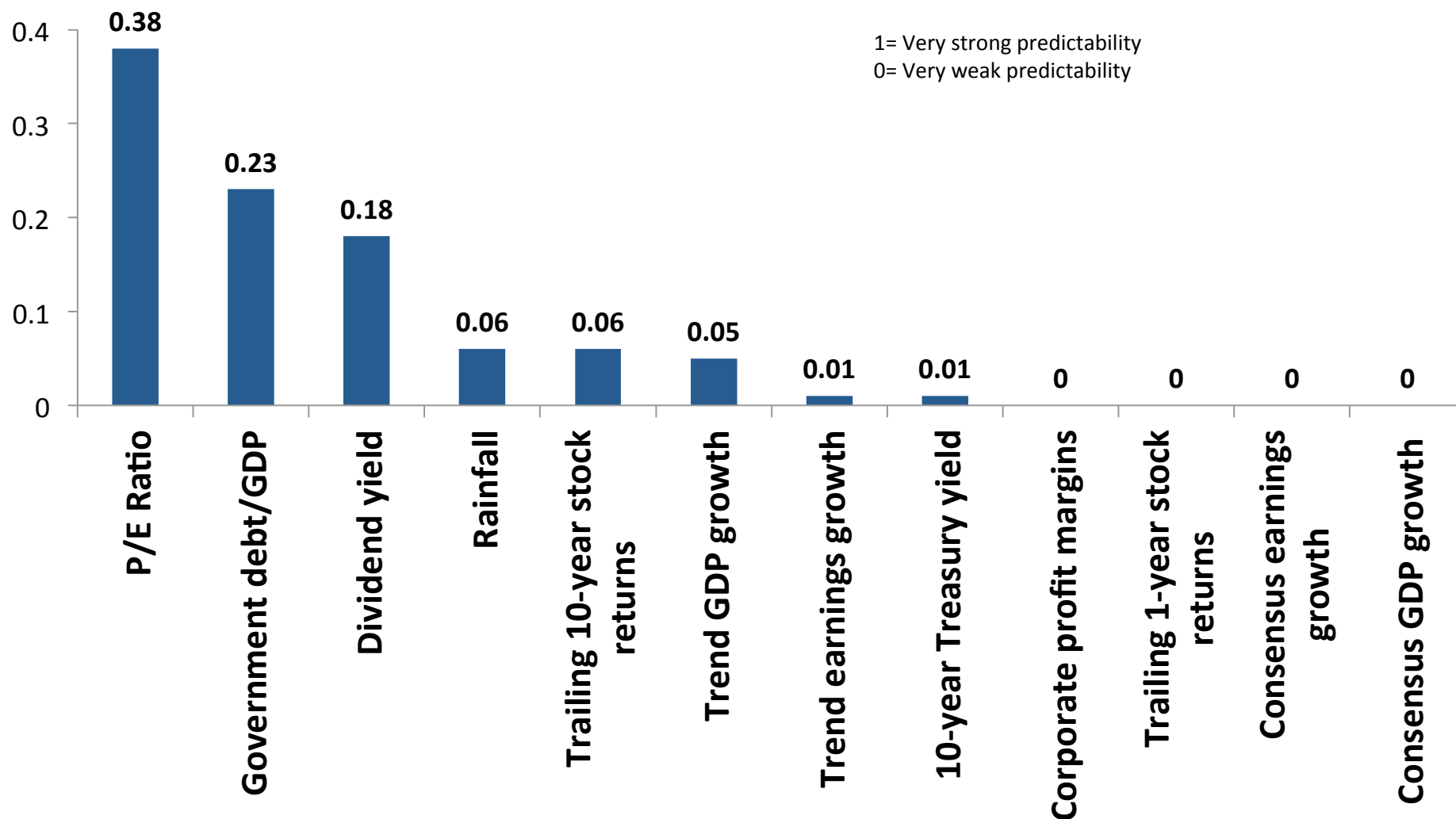


Source: "Quantitative Analysis of Investor Behaviour, 2011" DALBAR, Inc.



# What Makes the Market Tick?

Variance of 10-year real stock returns explained by various metrics, since 1928



# Why Do Investors Fail ?

1. Managing Losses
2. Excess Trading
3. Lack of Discipline
4. Costs, fees
5. Position Sizing
6. High Turnover = High Taxes
7. Taking profits too soon
8. Leverage
9. Deviating from Strategy (“style drift”)
10. Emotional Decision making
11. Over Confidence
12. Poor Risk to Reward Ratio

“We have met the  
enemy, and he is us.”

-Walt Kelly, Pogo, 1971





# The War Between You & Your Brain

*Now I understand  
these  
cognitive issues*

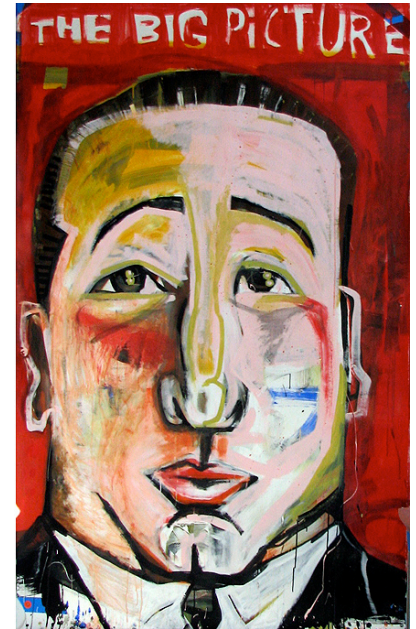
*Stop making them  
over and over!*



*for more information, please contact*

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*My favorite books on these subjects can be found at*  
<http://www.ritholtz.com/blog/behavioral-books>