How it All Started? Back in 1978!

Accuracy of Forecasting: An Empirical Investigation

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the President, Sir Claus Moser in the Chair]

SUMMARY

In this study, the authors used 111 time series to examine the accuracy of various forecasting methods, particularly time-series methods. The study shows, at least for time series, why some methods achieve greater accuracy than others for different types of data. The authors offer some explanation of the seemingly conflicting conclusions of past empirical research on the accuracy of forecasting. One novel contribution of the paper is the development of regression equations expressing accuracy as a function of factors such as randomness, seasonality, trend-cycle and the number of data points describing the series. Surprisingly, the study shows that for these 111 series simpler methods perform well in comparison to the more complex and statistically sophisticated ARMA models.

Keywords: FORECASTING; TIME SERIES; FORECASTING ACCURACY

0. INTRODUCTION

THE ultimate test of any forecast is whether or not it is capable of predicting future even accurately. Planners and decision makers have a wide choice of ways to forecast, ranging fro purely intuitive or judgemental approaches to highly structured and complex quantitati methods. In between, there are innumerable possibilities that differ in their underlying phil sophies, their cost, their complexity and their accuracy. Unfortunately, since informatio about these differences is not usually available, objective selection among forecasting metho is extremely difficult. The major purpose of this paper is to deal with one important aspect choosing a forecasting methodology: accuracy. Section 1 will survey past research accuracy and will look into the reasons why the reported accuracies of different studies var often significantly. Section 2 will report our own empirical findings on the accuracy of 1

3 wishes from a genie!

Write down your wishes:

1. _____

2. _____

3. _____

The Results of 750 MBAs and Executives

1. I wish to be happy.

2. I wish to live a long, healthy life.

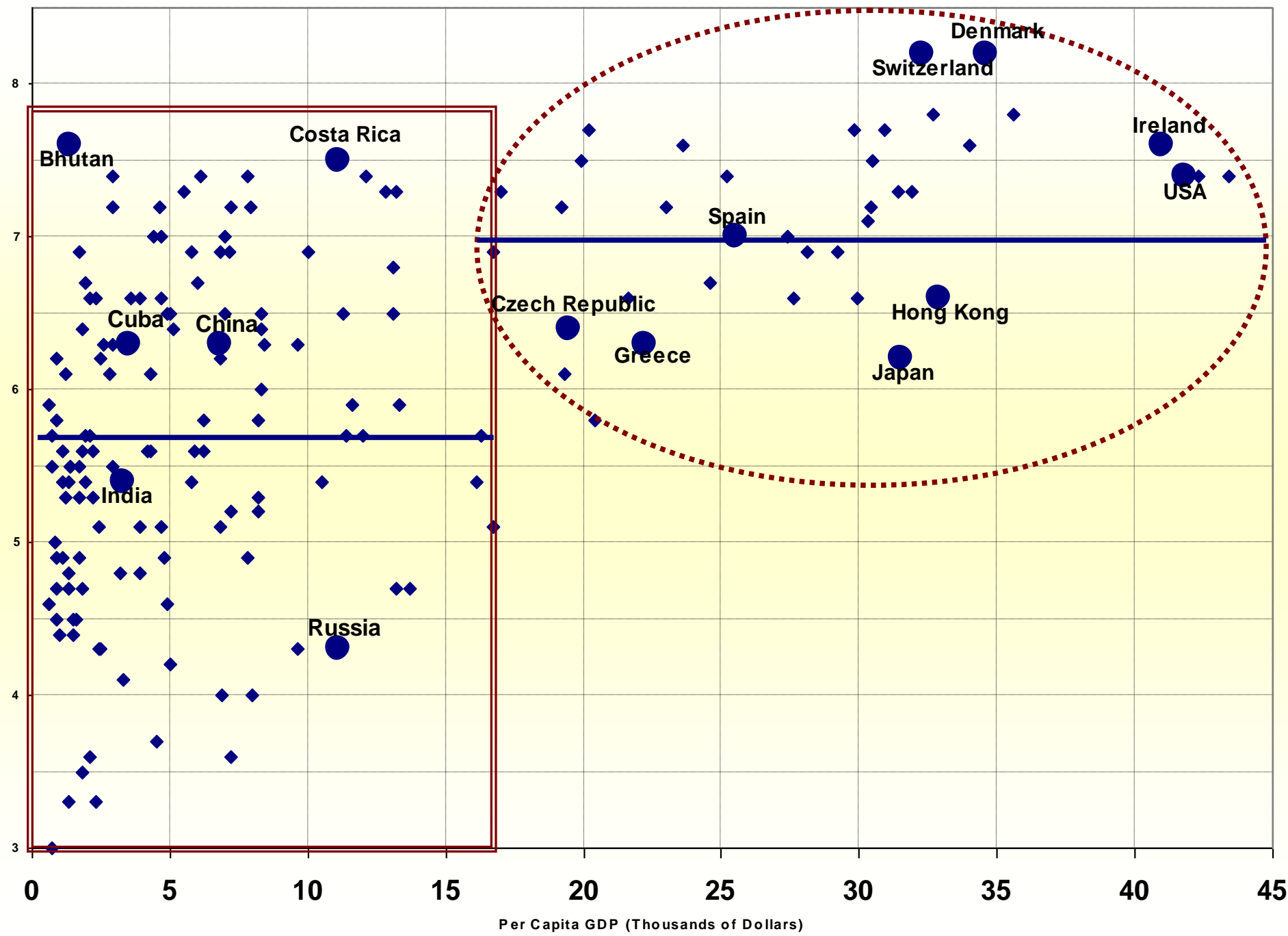3. I wish to be wealthy.

4. I wish to be successful

   (an entrepreneur who gets rich, an artist who becomes famous, an author who is published, a sportsperson who wins medals)

How much control do you say you have?

1. Happiness……………….......64%
2. Health and longevity………52%
3. Wealth……………………….53%
4. Success…………………......63%

Life Satisfaction Versus Per Capita GDP

Life Satisfaction

Denmark
Switzerland
Ireland
USA
Bhutan
Costa Rica
Spain
Czech Republic
Hong Kong
Cuba
China
Greece
Japan
India
Russia

Per Capita GDP (Thousands of Dollars)

How Useful Are Preventive Medical Exams?

Gøtzsche in his book "*Mammography Screening: Truth, Lies and Controversy*" states:

"If we wish to reduce the incidence of breast cancer, there is nothing as effective as avoiding getting mammograms. It reduces the risk of getting breast cancer by one-third."

Ablin in his book "*The Great Prostate Hoax*" states:

"The ability of the PSA test to identify men with prostate cancer is slightly better than that of flipping a coin. And its continued use as a routine screening tool is nothing short of a national health disaster."

Tests for prostate cancer

A study of 77,000 American men found that those who received annual PSA blood tests for prostate cancer did not have a reduced rate of death.

Number of deaths from prostate cancer

Men screened with PSA

Unscreened men
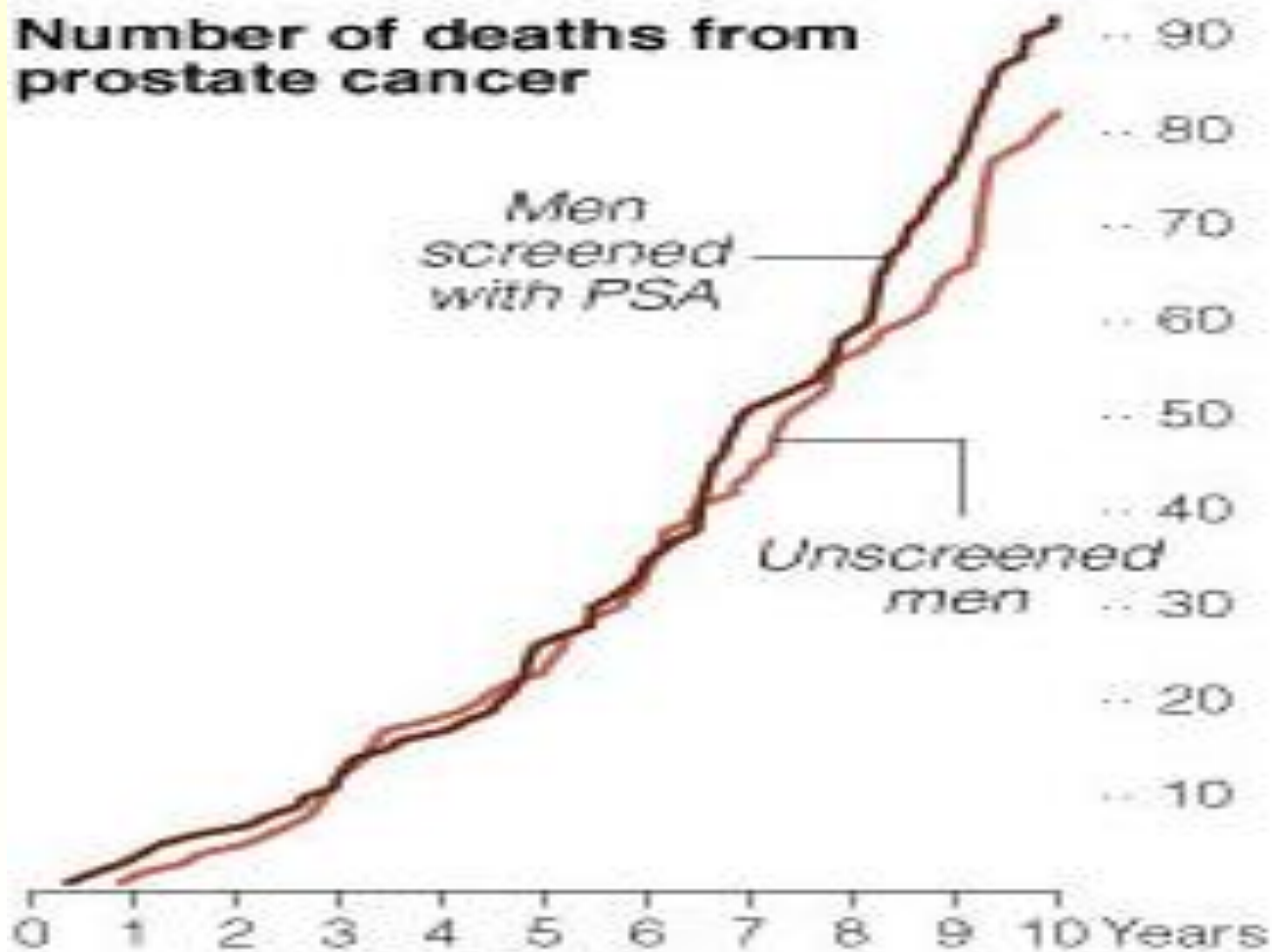
How Accurate and Reliable Are Medical Predictions?

"A total of 118 physicians with broad geographical representation within the United States ==correctly diagnosed 55.3% of easier and 5.8% of more difficult cases== (P < .001) (making an overall average of a 31% success rate). Despite a large difference in diagnostic accuracy between easier and more difficult cases, ==the difference in confidence was relatively small (7.2 vs 6.4 out of 10, for easier and more difficult cases, respectively)== (P < .001) and likely clinically insignificant. Overall, diagnostic calibration was worse for

How Accurate and Reliable Are Medical Predictions?

In a 2010 article in the ***Atlantic*** featuring Ioannidis, Freedman quotes him saying "***that as much as 90 percent of the published medical information that doctors rely on is flawed and that he worries that the field of medical research is so pervasively flawed, and so riddled with conflicts of interest, that it might be chronically resistant to change—or even to publicly admitting that there's a problem***".

How Accurate and Reliable Are Medical Predictions?

A study published in 2013 raises the number of medical mistakes to a low of 210,000, with a more realistic level of more than 400,000 patients who suffer some kind of preventable harm contributing to their death. Moreover, the study reports that serious harm seems to be 10 to 20 times greater than the lethal one.
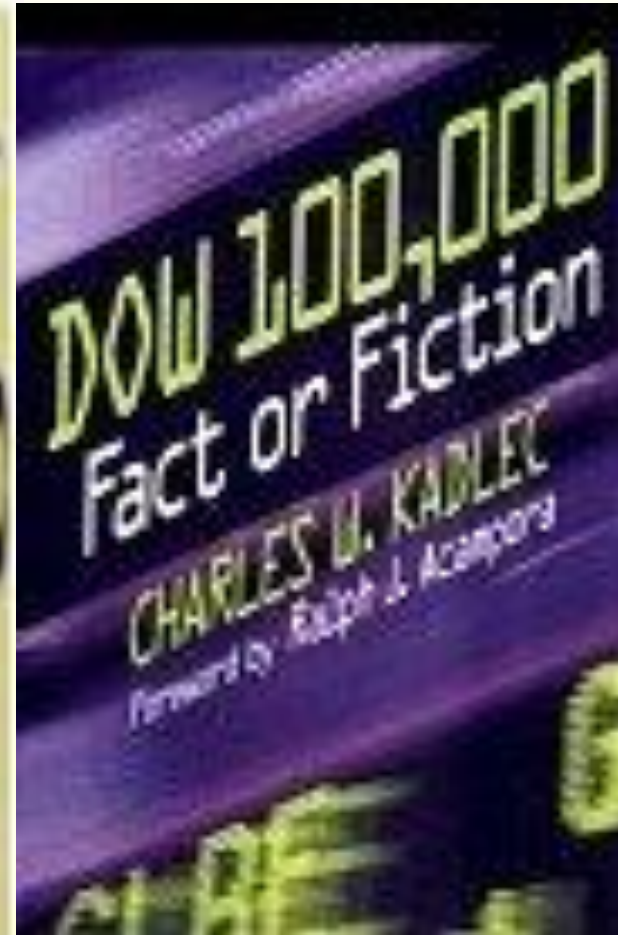
Published 2005

The Accuracy and Reliability of Our Predictions!
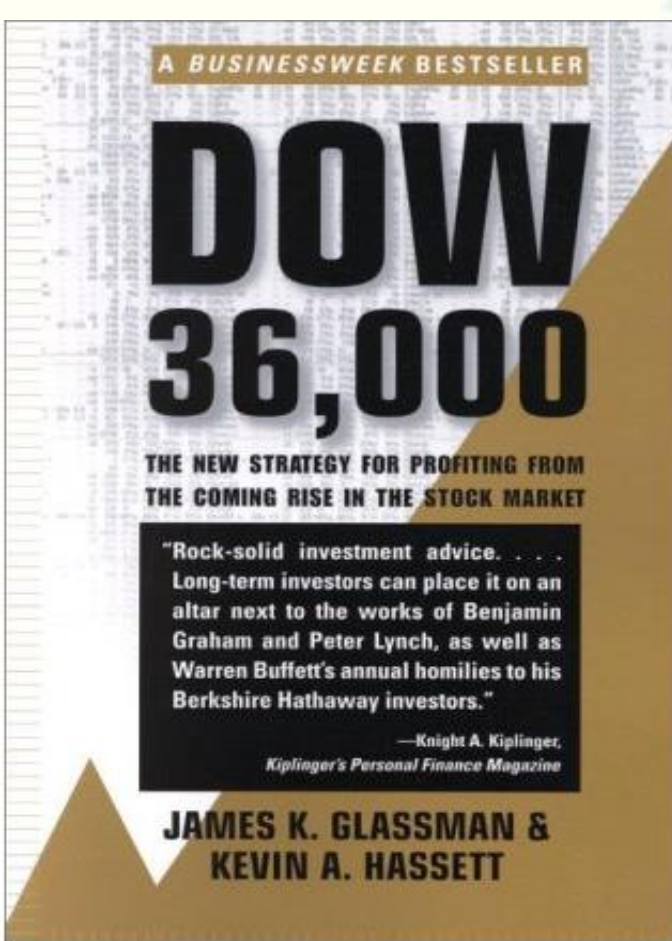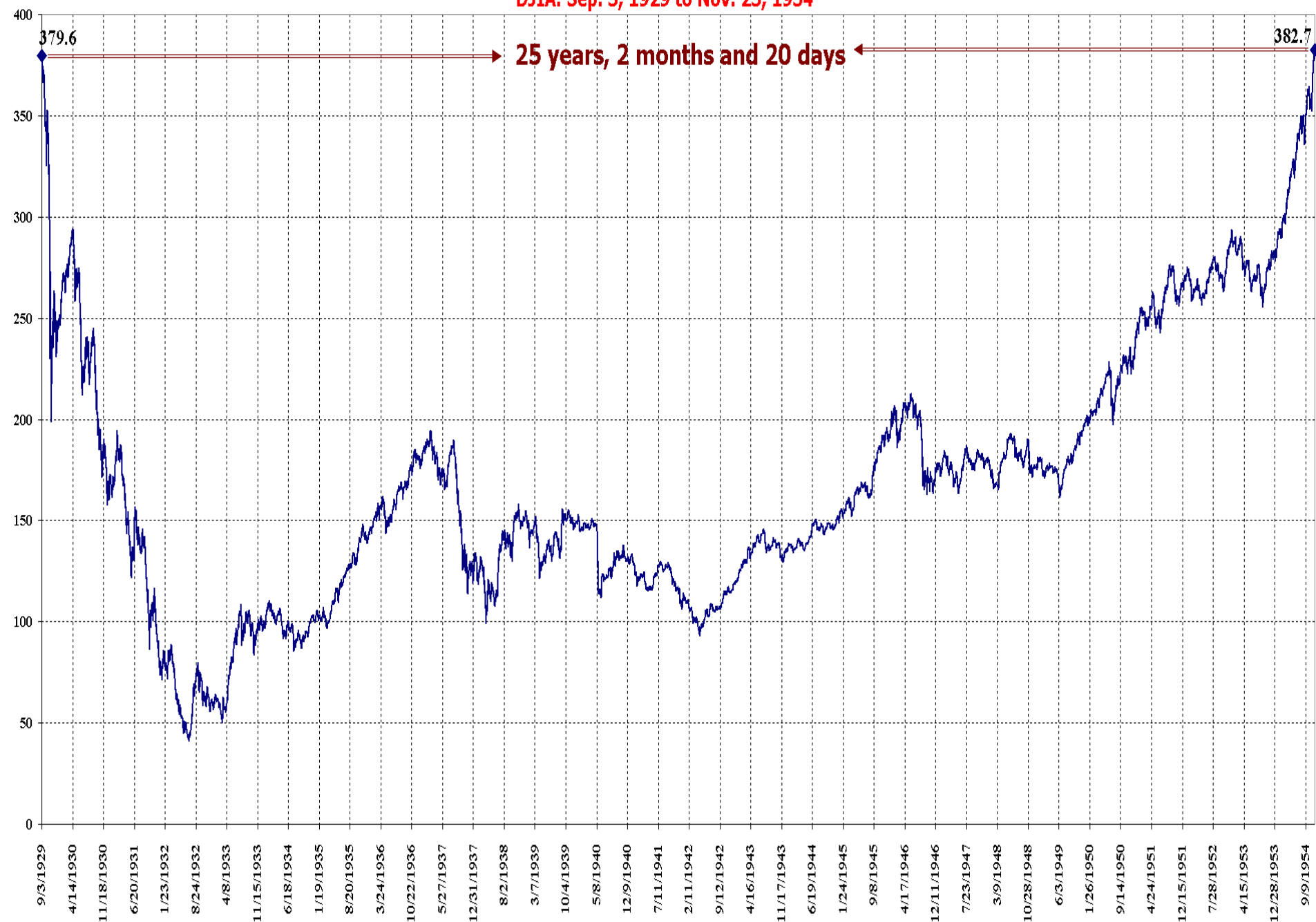

Published 1999
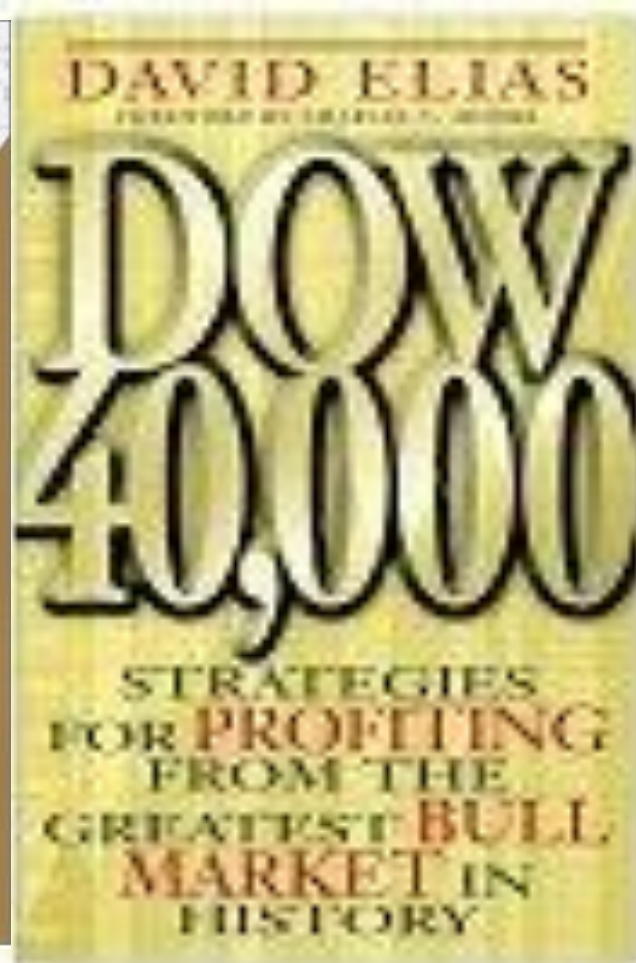
Published 1999

Published 1999

DJIA 30/11/2015: 17,720

September 3, 1929, the DJIA was at **381.2** when it started falling

how long did it take the Dow to reach again **381.2** units?

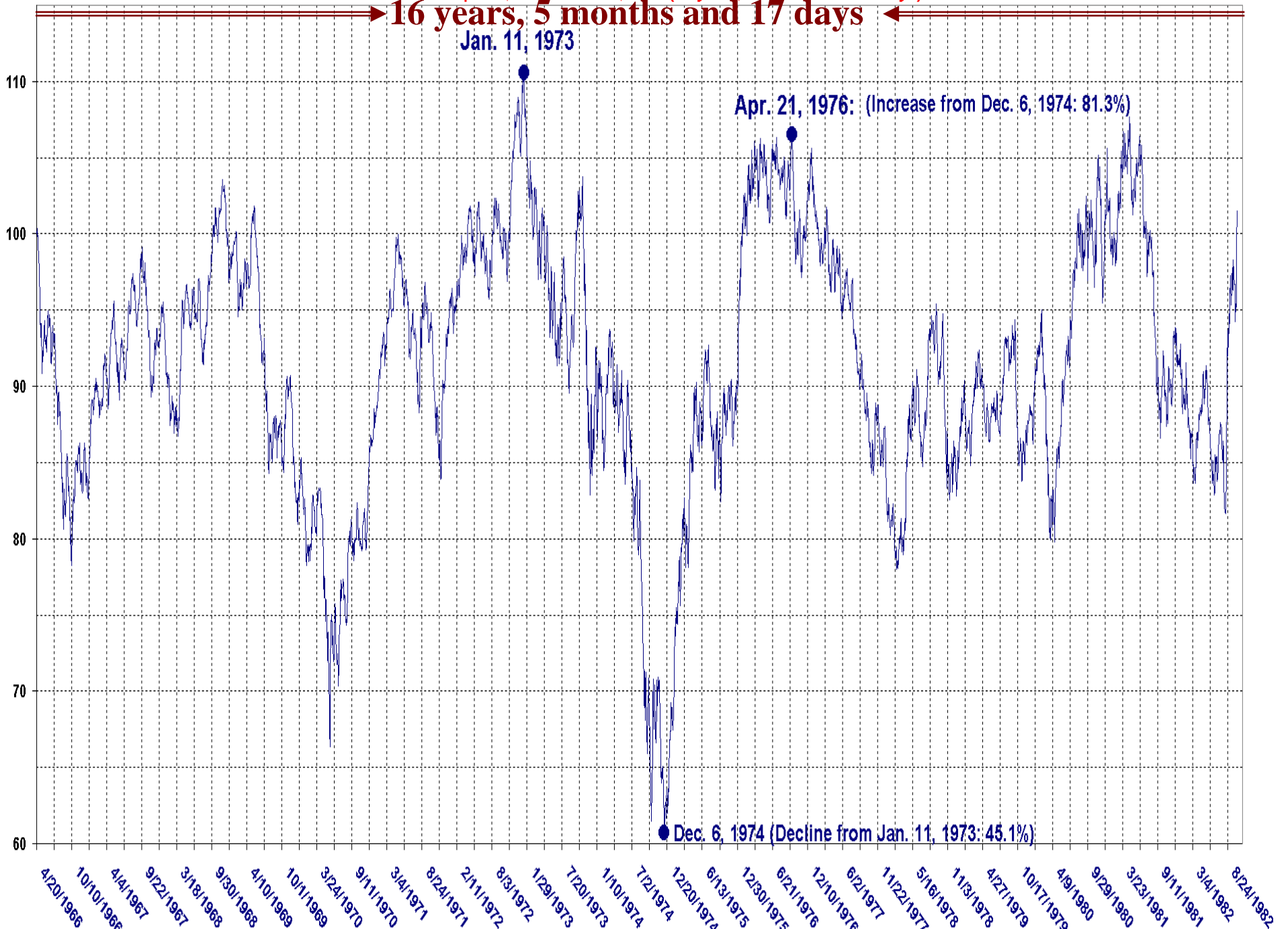DJIA: Sep. 3, 1929 to Nov. 23, 1954

25 years, 2 months and 20 days

On the 20 of April, 1966, the DJIA was at 951.3 when it started falling

How long did it take to reach again 951.3 units?

DJIA from Apr. 20, 1966 to Oct. 7, 1982 (16 years, 5 months and 17 days)

16 years, 5 months and 17 days

Jan. 11, 1973

Apr. 21, 1976: (Increase from Dec. 6, 1974: 81.3%)

Dec. 6, 1974 (Decline from Jan. 11, 1973: 45.1%)

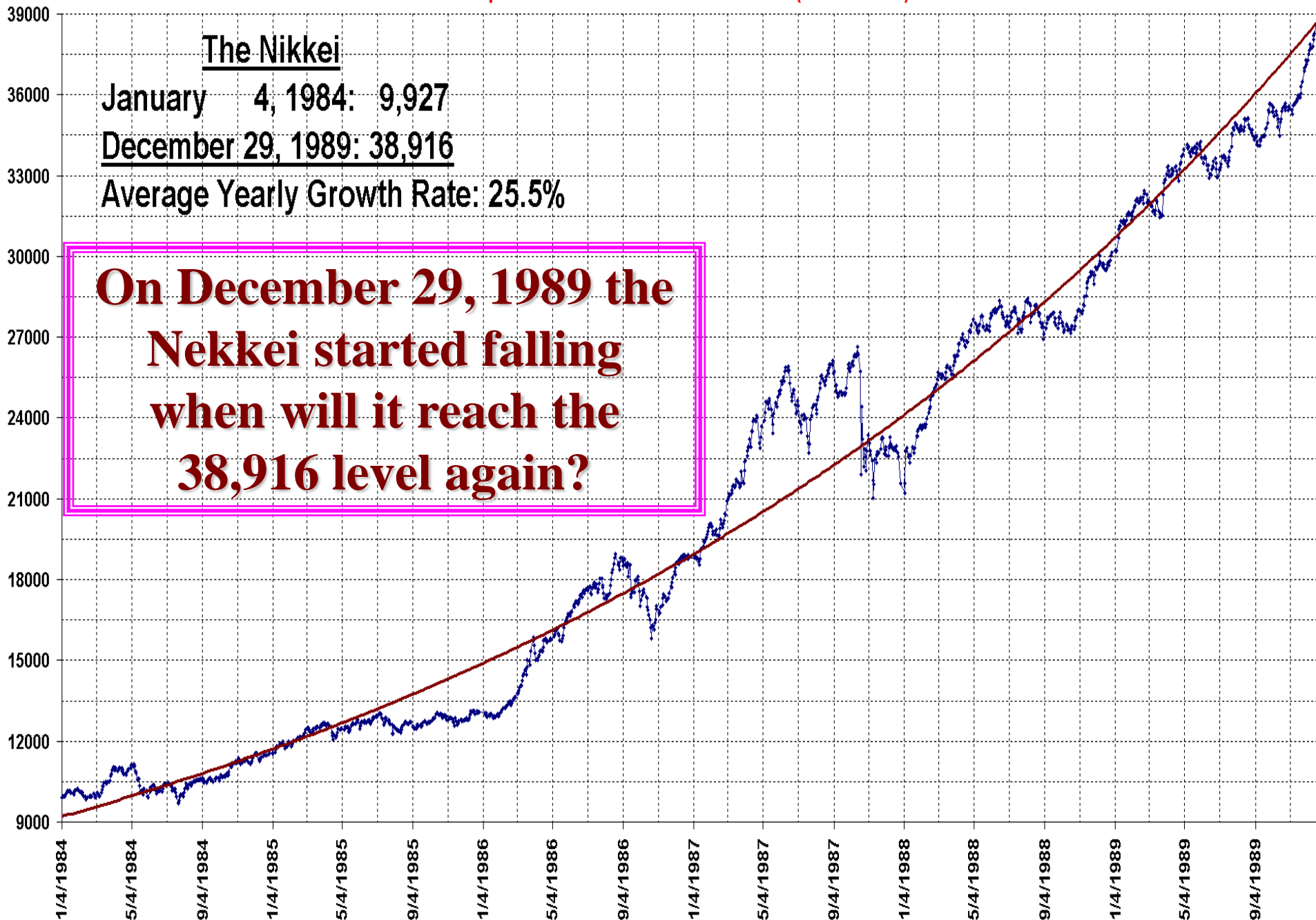# The Japanese Miracle: Nikkei 225 Index (1984 - 1989)

The Nikkei
January   4, 1984:   9,927
December 29, 1989: 38,916
Average Yearly Growth Rate: 25.5%

On December 29, 1989 the Nekkei started falling when will it reach the 38,916 level again?

Finance

▶ **How can uncertainty be assessed realistically?**

▶ **How well can professionals predict the stock market?**

New York Times

How Many Mutual Funds Routinely Rout the Market? Zero

MARCH 14, 2015

2010   2011   2012   2013   2014   2015

DJIA: Forecasting Errors 1900 - 2008
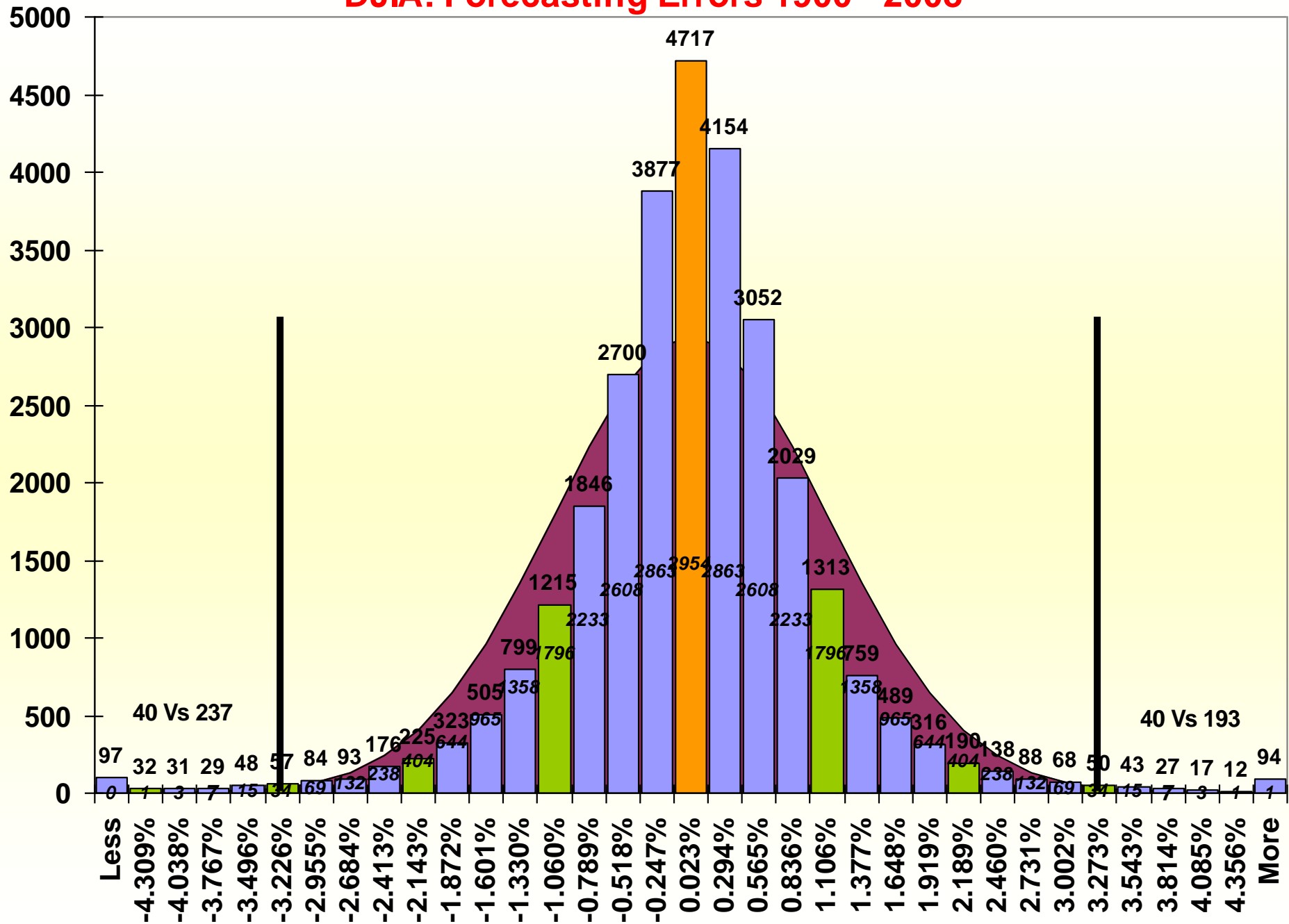
Daily DJIA Returns: Cumulative Gains/Losses (in Successive days)

Period	Gain	Loss
1 Day	15.3%	-22.6%
2 Days	18.7%	-27.2%
3 Days	21.5%	-29.6%
4 Days	23.2%	-33.4%
5 Days	25.0%	-31.9%
10 Days	31.5%	-38.4%
30 Days	52.0%	-47.3%
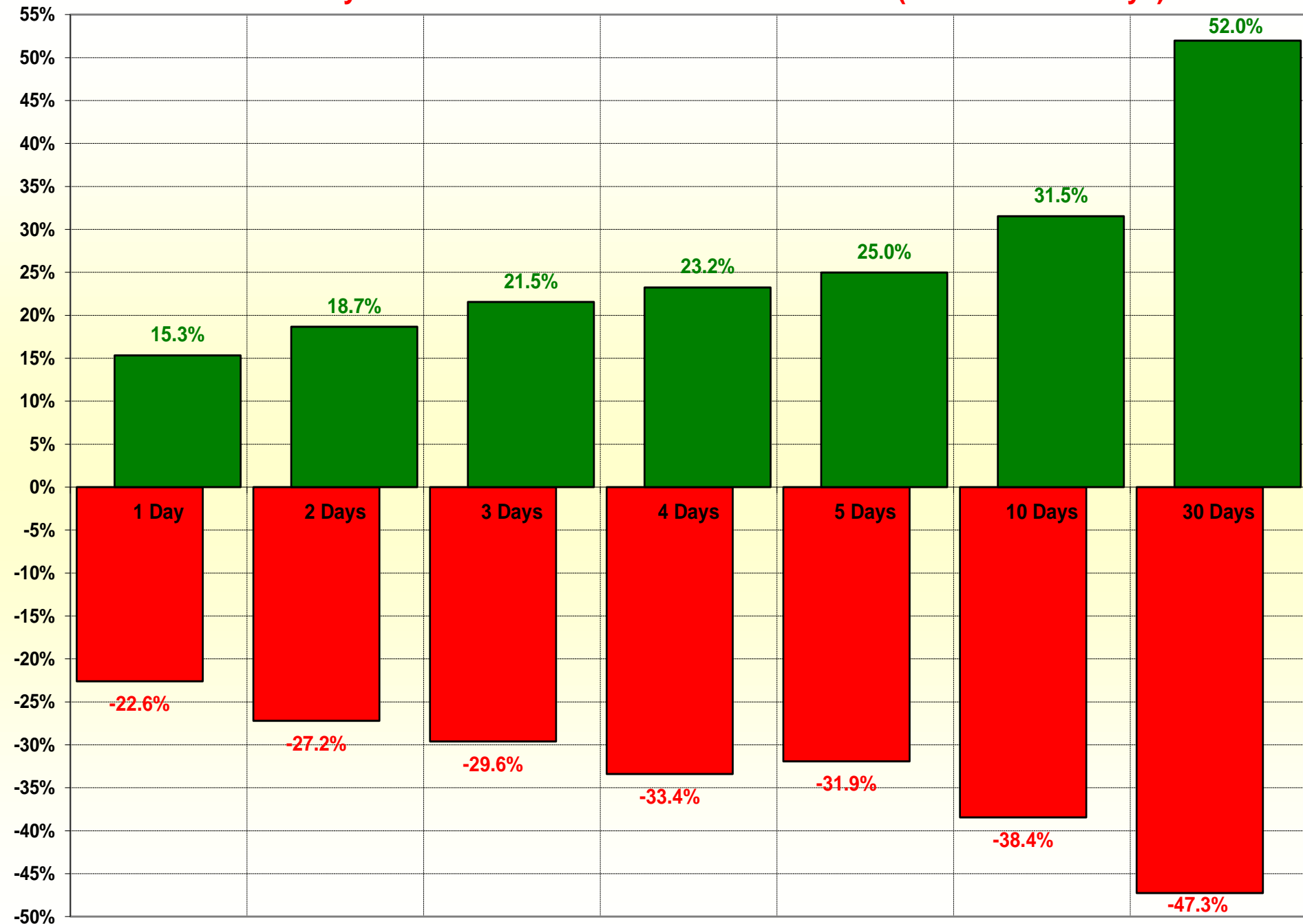
The Illusion of control

- It's not that simple to distinguish skills/abilities from luck:
  - 94% of US professors rated themselves better than their colleagues
  - 80% of drivers regard themselves above average on a number of important characteristics
  - 1% of Australian workers rate their job performance as below average
  - Subjects even rated themselves better than others in predicting the sequence of coin tosses

- Underestimating or ignoring uncertainty results in illusions with serious negative consequences concerning our health, wealth, success and happiness.

Judgmental Biases:
The half empty or half full glass

You are the chief executive officer of a company faced with a difficult choice. Because of worsening economic conditions, **6000** people will need to be fired to reduce the payroll costs and avoid serious financial problems. Two alternative programs to combat the firings have been proposed to you. The estimates of the consequences of the programs are as follows:

If program A is adopted, 4000 people will be fired.

If program A is adopted, 2000 jobs will be saved.

If program B is adopted, there is a one-third probability that nobody will be fired, and a two-thirds probability that 6000 people will be fired.

If program B is adopted, there is a one-third probability that 6000 jobs will be saved, and a two-thirds probability that no jobs will be saved.

Which of the programs would you select A or B?

How Well Do Gurus Predict: The 32 Best-Known Firms in 2007

Published in 1982: *In Search of Excellence: Lessons from America's Best-Known Companies*

At the end of November 2015:

6 Bankrupt or Chapter 11

8 Merged or Bought

Remaining 18

10 Better than the DJIA 500

8 Worse

How Well Do Experts Predict?

Philip Tetlock explored the issue of expertise in a mammoth study analyzing more than 82,000 decisions from experts in politics. His findings:
(a) Simple models turn out to be more accurate than human forecasters
(b) Experts are rarely more accurate in predicting than informed individuals
(c) The political experts were not as good as non-experts at modifying their forecasts in the light of new information, as they felt they knew all the relevant facts and
(d) they were overconfident about the accuracy of their predictions.

Forecasting and Uncertainty: A Survey

	K N O W N	**U N K N O W N**
K N O W N	**I. Known/Knowns** **(Majority of real life situations under normal/usual conditions)** **Accuracy: Reasonable (depending on specific factors)** **Uncertainty: Measurable** **Risk: Can Be Estimated (assuming normality of errors and consistency in the prevailing, normal conditions)**	**II. Unknown/Knows** **(Knowing but not wanting to believe and act)** **Inaccuracy: Can Be Large (influenced by judgmental biases and irrationality)** **Uncertainty: Large and usually under-estimated significantly** **Risk: Underestimated (due to judgmental biases, irrationality and wishful thinking)**
U N K N O W N	**III. Known/Unknows** **(Majority of real life situations under unusual/special situations)** **Inaccuracy: Large to Great** **Uncertainty: Large to Great** **Risk: Hard to Estimate (Usually underestimated given the uniqueness of the unusual/special situations)**	**IV. Unknown/Unknowns** **(Black Swans: Unexpected, surprising events with severe consequences)** **Entirely Unpredictable** **Uncertainty: Infinite** **Risk: Inconceivable** **(Preparation is possible only by having adopted antifragile strategies)**

My Three New Papers I could send you if you give me your email address

▸ **Forecasting and Uncertainty: A Survey**

▸ **The costs and benefits of positive illusions**

▸ **How Accurate and Reliable Are Medical Predictions?**