

## LEARNING TO LOVE INVESTMENT BUBBLES: WHAT IF SIR ISAAC NEWTON HAD BEEN A TRENDFOLLOWER?

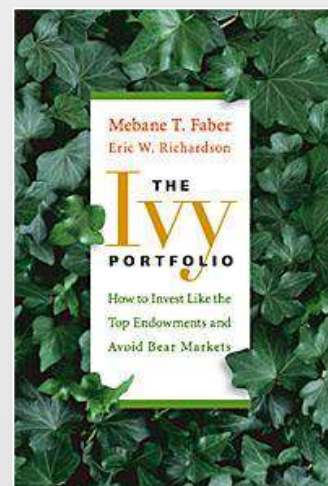
Investment manias and financial bubbles have likely existed for as long as humans have been involved in financial markets. In this research piece we take a look at some of the more famous market bubbles in history and the extreme volatility and drawdowns they experienced. We then examine a simple trendfollowing approach investors could use to manage their risk. Across twelve market bubbles we find that a trendfollowing system would have improved return while reducing volatility. Most importantly, it would have reduced drawdowns significantly leading to the most important rule in all of investing – surviving to invest another day.

### *Acknowledgements*

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What exactly is a bubble? The Merriam-Webster definition of a bubble is “a state of booming economic activity that often ends in a sudden collapse”, but perhaps the most common sense definition of a bubble is a scenario where the general public is sucked into an investment in which they have no business being involved. It is a good sign a bubble exists when everyone is talking internet stocks in 1999, buying tulips and tulip futures worth as much as a house in the 1600s, or flipping real estate in 2007.

Some people define a bubble as a deviation from the long term price trend, while others declare a bubble when price decouples from an asset's fundamental value. In many cases fundamental value is relative of course—how much that Van Gough or '67 Corvette is worth to you may be very different than how much it is worth to someone else. Steve Cohen certainly finds \$10,000,000 worth of value in *The Physical Impossibility of Death in the Mind of Someone Living*, while I most simply see a dead and rotting shark.

Financial assets are a little different from muscle cars and shark sculptures in that they generate a stream of cash flows that act as an anchor to an estimate of fundamental value. But at the very end of the rope lies the emotions of greed and fear which determine the vast majority of asset price movements in the short term.

There is a lot of talk these days about bubbles, and while the US Treasury bubble talk has subsided a bit and been replaced with the “Social Media Bubble”, investment bubbles have likely been around as long as trading has occurred in markets. (This paper, written in July, is already dated. There is no more talk of the Social Media Bubble as equity markets decline and bonds explode in value.)

A fellow student of bubbles, Jeremy Grantham at Grantham, Mayo, Van Otterloo and Co. (GMO) has collected data on over 330 bubbles in his historical studies. He points out in a recent research piece “[Time to Wake Up: Days of Abundant Resources and Falling Prices are Over Forever](#)”, that one of the key difficulties is distinguishing when a bubble is indeed occurring, and when there actually is a paradigm shift. When is this time *really* different?

Three of the most famous bubbles in history are [the South Sea Company](#) bubble of 1711–1720, the [Mississippi Company](#) bubble of 1719–1720, and the Dutch [tulipmania](#) of the early seventeenth century all of which saw drawdowns from peak to trough of 88-99% (Dreman, [Contrarian Investment Strategies](#)). We are not going to review at length these bubbles as many have done a wonderful job already, and we have included a reading list at the end of this piece for further enjoyment.

While tulipmania and the Mississippi Company are both fascinating bubbles, this essay focuses on the South Sea Bubble of 1711-1720, since the term "bubble" was actually coined during this period.

## THE SOUTH SEA BUBBLE

The South Sea Company was a British company founded by a high ranking government official by the name of Lord Treasurer Robert Harley. England had amassed a large national debt during the War of Spanish Succession, and the company was founded to help fund the government debt in a roundabout way since the Bank of England had the only joint stock banking charter at the time. The South Sea Company issued new shares of stock to existing bond holders of the government debt. In exchange for assuming the debt, the government granted the company a monopoly on trade with South America while continuing interest payments on the debt in the amount of 6%.

In theory, this was a win-win scenario for all parties. The company received cash flows to fund operations (government bond payments), the government reduced their interest payments, and the holders of the government debt received shares in a company founded with a built in monopoly and staffed by high ranking government officials. The South Sea Company continued to acquire more debt over the next few years with lower and lower interest payments.

### WHAT COULD POSSIBLY GO WRONG?

The investors in South Sea Company stock were convinced that the troves of wealth coming out of the South American gold mines would be traded for Europe's fine textiles and other refined goods, all at an obscene profit. Unfortunately, profits from the shipping monopoly, which also included rights to deliver slaves to South America, never materialized as only one ship was allowed transport per year. This reality did not stop a speculative frenzy from ensuing as many secondary offerings of South Sea stock were initiated with politicians receiving shares and options, thus incentivizing them to inflate the stock price further.

As speculative trading in South Sea Company stock increased, other joint stock companies were launched on the London exchange. Charles MacKay reviews some of the speculative companies being founded and presented to investors in his book [\*Extraordinary Popular Delusions and the Madness of Crowds\*](#), including one company that was founded with a purpose of "carrying on an undertaking of great advantage, but nobody to know what it is." In effect, none of the investors knew what the company's business model was. The founder collected £2,000 for the share offering the next day and promptly skipped town never to be heard from again. (If this scenario seems implausible, recall the rabid popularity of so-called special purpose acquisition corporations (SPACs) from 2005-2007-essentially blank check companies that raised a hoard of capital based on a vague and imprecise business plan.)

Another company planned to build floating offshore mansions for London's elite and yet another had a formula to harness energy by reclaiming sunshine from vegetables. These newly-floated stock issuances were called "bubbles" at the time. Eventually, the South Sea Company convinced members of parliament (many of whom had already lined their pockets with South Sea Company shares) to pass the Bubble Act on June 9, 1720, which prohibited the existence of any joint-stock company not authorized by a royal charter. South Sea Company had been granted a royal charter, and the Bubble Act, passed before the peak of the run up of South Sea Company stock, helped foment the bubble by making South Sea Company shares all the more valuable.

Trading in South Sea Company shares was one of the earliest "pump and dump" schemes in history. South Sea Company's management lacked any relevant shipping and trading experience but were shrewd stock promoters that took office space in the finest area of London's financial district and appointed their offices with opulent furniture and art. The public could not get enough of the shares given the ostensible wealth that had already been created for South Sea's management group. In the end, when the insiders knew that the company's earnings would be abysmal, management began quietly selling at the height of the market. South Sea Company shares began to plummet, and to make matters worse, company officials allowed shareholders to borrow money to buy shares (effectively granting them margin). As share prices fell, investors were forced to sell even more shares. As seen in Figure 1, the stock price began the year at around £100, then raced to a peak of nearly £1,000 before crashing all the way back down to £100. A number of high ranking officials were impeached or imprisoned and estates confiscated for their corruption including the Chancellor of the Exchequer, the Postmaster General, and the heads of Ministry. The trading in South Sea Company shares translated from all walks of life from high ranking officials, to everyday craftsmen, to one very prominent scientist.

**FIGURE 1**  
**SOUTH SEA STOCK**  
**DECEMBER 1718 – DECEMBER 1721**



Source: Marc Faber, *Gloom Boom and Doom*, and [Riding the South Sea Bubble](#), Temin and Voth

### "I can calculate the movement of the stars, but not the madness of men"

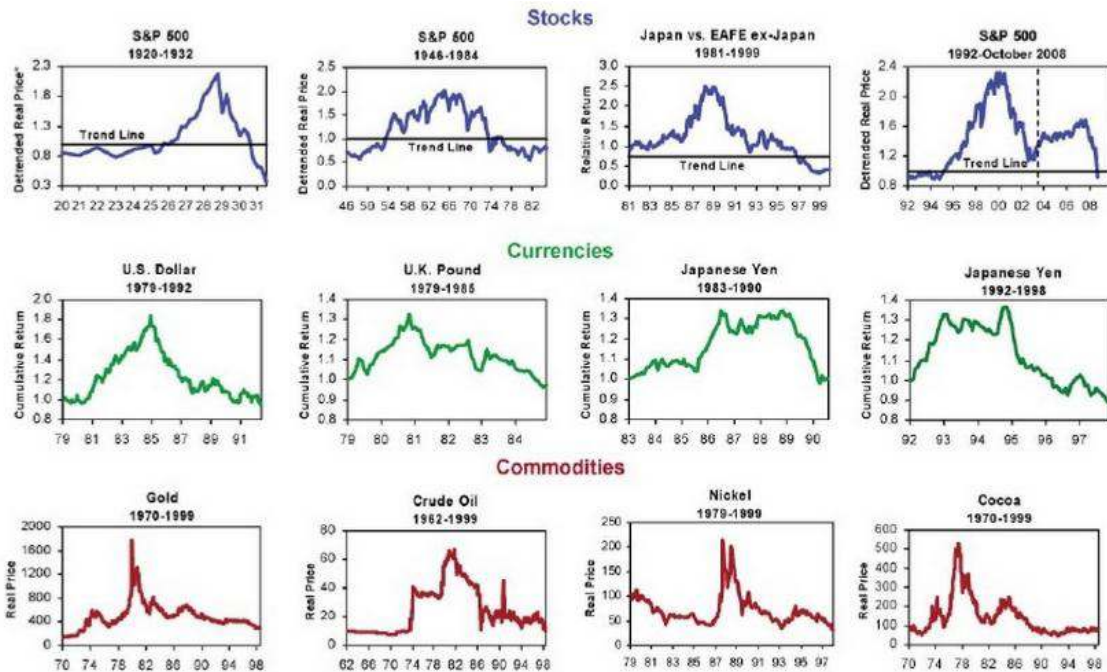
The aforementioned quotation is attributed to Sir Isaac Newton, an unfortunate speculator in South Sea Company during the period. Marc Faber has compiled a chart of Newton's trading ability in the prior figure, and it illustrates a few key points that have withstood the test of time: a) investment bubbles have been around for centuries, and b) it is nearly impossible to stand aside while everyone else (your neighbor included) is getting rich. Ironically enough, the company continued to operate until the 19<sup>th</sup> century far outlasting all of the original shareholders.



RIDING BUBBLES

Since we don't have a list of all of Grantham's bubbles we will take a look at the 12 bubbles in Figure 2 from James Montier's piece "[I Want to Break Free, or, Strategic Asset Allocation Does Not Equal Static Asset Allocation](#)".

**FIGURE 2**  
**TWELVE MARKET BUBBLES IN HISTORY**



Source: GMO Data through 10/10/08

Note: For S&P charts, trend is 2% real price appreciation per year.

\* Detrended Real Price is the price index divided by CPI+2%, since the long-term trend increase in the price of the S&P 500 has been on the order of 2% real.

Source: Montier, GMO

Figure 3 shows that when you examine all 12 bubbles, on average, returns over the bubble periods were meager while volatility was high (22%) and drawdowns severe (66%).

**FIGURE 3**  
**AVERAGE RETURN AND RISK STATISTICS ACROSS 12 BUBBLES, VARIOUS TIMEFRAMES**

	Nominal	Real
CAGR	3.49%	0.07%
Volatility	22.64%	21.71%
Max DD	-61.64%	-66.34%

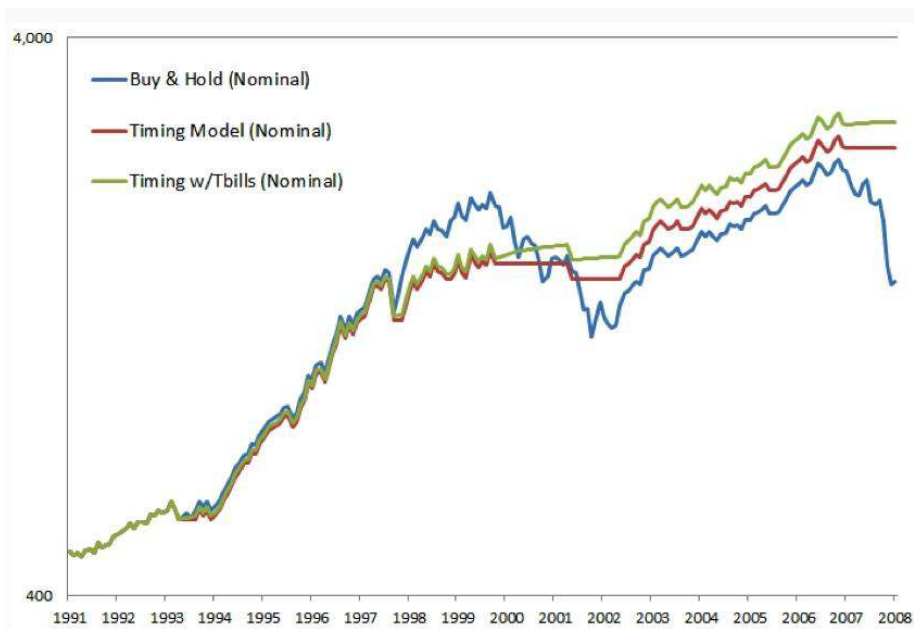
Source: Global Financial Data, Author

Our recent research piece entitled "[Where the Black Swans Hide](#)" demonstrated the impact of market outliers as well as the tendency of big price moves to come in batches. This “volatility clustering” occurs after markets have already been declining and is due largely to the behavioral properties of the human condition. Namely, we hate to lose money but love making it and we use different parts of our brains when doing both.

To examine a simple way in which an investor could have attempted to profit (while protecting themselves) from these wealth destroying bubbles, we examine how a simple trendfollowing measure would have performed in these 12 bubbles. We use the 10-month simple moving average, and examine returns both including T-Bills as well as stuffing cash under the mattress. The portfolio is invested in the specific market when the price is above the 10 month moving average, and out of the specific market then the price is below the trend. We also look at nominal and real returns. While GMO made some adjustments to their bubbles (such as detrending the stock ones), we look at all returns in the manner an investor would have experienced them at the time with real money.

Figure 4 below is an example of how the timing model would have worked with the S&P 500 during two recent bubbles: The 1990s internet bubble and ensuing crash, and the 2000s real estate bubble and ensuing crash.

**FIGURE 4**  
**S&P 500 VS. TIMING WITH AND WITHOUT T-BILLS**



Source: Global Financial Data, Author

The timing system did a good job of reducing the drawdown from the large bear market declines in 2000-2001 and in 2008 as well as reducing volatility. Notice the underperformance at certain periods as well. Figure 5 on the following page shows the returns and statistics over the period.

**FIGURE 5**  
**S&P 500 TOTAL RETURNS VS. TIMING, 1992 - 2008**

	S&P 500 Buy & Hold	Timing	Timing w/Tbills
Total Return	204.04%	428.81%	490.04%
CAGR	6.76%	10.29%	11.01%
Vol	14.23%	10.10%	10.05%
Max DD	-44.73%	-15.37%	-15.37%

Source: Global Financial Data

How would overlaying a trendfollowing model have worked across GMO’s twelve historical bubbles in stocks, currencies, and commodities? Our research demonstrates that a trendfollowing approach improved returns in every bubble (except one) and reduced volatility and drawdown in all twelve of them. Figure 6 below shows the improvement that the trendfollower would have enjoyed over the buy and hold investor in each of the twelve bubble scenarios.

**FIGURE 6**  
**RETURNS TO BUY AND HOLD AND TIMING MODELS IN MARKET BUBBLES**

**STOCKS**

	S&P 500 Buy & Hold	1920-1932 Timing	Timing w/Tbills	S&P 500 Buy & Hold	1946-1984 Timing	Timing w/Tbills	S&P 500 Buy & Hold	1992-2008 Timing	Timing w/Tbills	Japan Buy & Hold	1981-1999 Timing	Timing w/Tbills
Total Return Real	117.48%	460.56%	558.32%	782.80%	347.49%	706.47%	99.49%	246.35%	286.54%	210.98%	230.77%	314.26%
CAGR	6.16%	14.18%	15.60%	5.74%	3.92%	5.50%	4.15%	7.58%	8.28%	6.15%	6.50%	7.77%
STDEV	27.53%	13.68%	13.63%	14.24%	11.27%	11.18%	14.23%	10.26%	10.21%	19.79%	13.61%	13.55%
Max DD	-79.18%	-23.45%	-23.45%	-52.21%	-36.48%	-32.58%	-47.34%	-16.62%	-15.59%	-66.03%	-47.38%	-37.78%

**CURRENCIES**

	US Dollar Buy & Hold	1979-1992 Timing	Timing w/Tbills	UK Pound Buy & Hold	1979-1985 Timing	Timing w/Tbills	Japanese Yen Buy & Hold	1983-1990 Timing	Timing w/Tbills	Japanese Yen Buy & Hold	1992-1998 Timing	Timing w/Tbills
Total Return	-49.21%	-35.97%	7.79%	-51.70%	-27.85%	12.02%	4.74%	14.01%	47.92%	-9.61%	-3.40%	13.32%
CAGR	-4.72%	-3.13%	0.54%	-9.87%	-4.56%	1.63%	0.58%	1.65%	5.01%	-1.43%	-0.49%	1.80%
STDEV	10.26%	6.93%	6.89%	12.45%	7.36%	7.44%	12.40%	10.23%	10.12%	10.79%	8.94%	8.90%
Max DD	-63.15%	-39.21%	-15.55%	-65.00%	-40.15%	-22.64%	-35.99%	-27.87%	-20.67%	-35.57%	-18.46%	-15.40%

**COMMODITIES**

	Gold Buy & Hold	1970-1999 Timing	Timing w/Tbills	Crude Oil Buy & Hold	1962-1999 Timing	Timing w/Tbills	Nickel Buy & Hold	1979-1999 Timing	Timing w/Tbills	Cocoa Buy & Hold	1970-1999 Timing	Timing w/Tbills
Total Return	82.69%	250.70%	893.36%	103.19%	107.25%	653.02%	-65.47%	9.95%	165.83%	-77.88%	-72.89%	-16.52%
CAGR	2.03%	4.27%	7.95%	1.88%	1.94%	5.46%	-4.94%	0.45%	4.77%	-4.90%	-4.26%	-0.60%
STDEV	21.61%	17.85%	17.72%	46.59%	43.15%	43.09%	40.80%	35.90%	35.82%	29.82%	21.41%	21.38%
Max DD	-83.90%	-60.03%	-33.02%	-89.12%	-78.97%	-73.31%	-84.99%	-72.40%	-64.96%	-93.57%	-93.29%	-82.87%

On average, timing (both nominal and real) improves CAGR about two percentage points, reduces volatility about 25%, and reduces maximum drawdown about 30 to 40%. Note: “pp” refers to “percentage point” in the below tables (i.e. a 2pp improvement is the same as an improvement from 10% to 12% per annum).

**FIGURE 7**  
**AVERAGE RETURN IMPROVEMENT AND RISK ACROSS 12 BUBBLES, EXCLUDING T-BILL RETURNS**  
**VARIOUS TIMEFRAMES**

	Nominal	Real
Return Improvement	2.45pp	2.27pp
Vol Reduction	-27.61%	-25.28%
Max DD Reduction	-41.65%	-32.95%

Source: Global Financial Data, Author

As demonstrated by Figure 8, if you include T-bill returns when sitting in cash it increases the outperformance a few percentage points as well.

**FIGURE 8**  
**AVERAGE RETURN IMPROVEMENT AND RISK ACROSS 12 BUBBLES INCLUDING T-BILL RETURNS**  
**VARIOUS TIMEFRAMES**

	Nominal	Real
Return Improvement	6.10pp	5.24pp
Vol Reduction	-27.87%	-25.56%
Max DD Reduction	-52.27%	-47.59%

Source: Global Financial Data, Author



## Summary

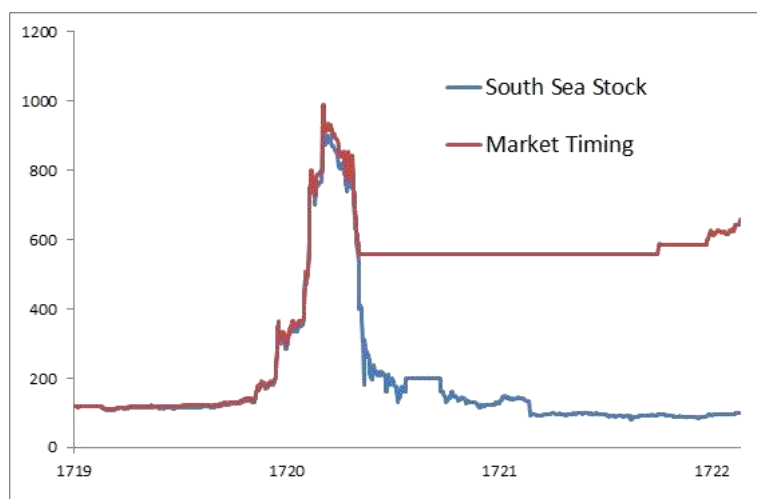
Market timing with quantitative measures isn't sexy. From a behavioral and psychological standpoint it is often the most difficult to deploy when it is most useful. Strong discipline would have been required to sell technology stocks in 2000, REITs in 2007, or South Sea stock in 1720, especially when one's colleagues, friends and neighbors were making money hand over fist. In the end, for those who imposed such discipline, it was the prudent choice.

Let us revisit the granddaddy of bubbles, and see what Newton's South Sea portfolio would have looked like if he was a trendfollower.<sup>1</sup> If you really want to examine the portfolio take it out to 1736 (we only examine the boom/bust period that Marc Faber identifies in his chart).

The buy-and-hold investor who bought early on, say at the beginning of 1719, would have endured a rollercoaster of an up and down ride, and would have had mildly negative compound returns of -3% or a total loss of only 15% over the period. The Newtons of the world, sucked into the frenzy at ever increasing levels, would have had a maximum loss of 90% (basically an entire destruction of capital).<sup>2</sup> Newton's niece Catherine Conduitt reportedly told friends that Newton lost £20,000, equivalent to about £3,000,000 in today's terms.

The savvy trendfollower in South Sea Stock would have performed much better. Although the trendfollowing approach would have resulted in a nasty 44% drawdown, the strategy would have produced a large overall profit and the investor would have quadrupled his money to speculate another day. All that really matters is surviving to invest another day. You may not acutely notice the difference between an 8% and 10% return, but you will certainly notice the difference between a 40% and 90% loss.

**FIGURE 9**  
**SOUTH SEA STOCK VS. TIMING MODEL, 1719 - 1722**



Source: [Riding the South Sea Bubble](#), Temin and Voth

<sup>2</sup> For those that think this is an outdated example, research out of [DALBAR](#) and [Morningstar](#) shows that investors consistently chase performance much to the destruction of their net worth. The best performing mutual funds over the past 10 years often have vastly different time-weighted returns vs. dollar weighted returns.

## READING LIST

### Stock Distributions

- [Why Stock Markets Crash: Critical Events in Complex Financial Systems](#) - Didier Sornette
- [The Misbehavior of Markets](#) by Benoit Mandelbrot
- [Fooled by Randomness](#) and [The Black Swan: The Impact of the Highly Improbable](#) by Taleb
  
- [Finding Alpha](#) – by Eric Falkenstein
- [Market Volatility](#) – Robert Shiller
- [Optimal Portfolio Modeling](#) – Philip McDonnell
- [Fractal Market Analysis](#) - Edgar Peters
- [More Than You Know: Finding Financial Wisdom in Unconventional Places](#) - Michael Mauboussin
- [The Failure of Risk Management: Why It's Broken and How to Fix It](#) – Douglas Hubbard



### Market Bubbles

- [Famous First Bubbles](#) – Garber
- [Manias, Panics, and Crashes](#) by Charles Kindleberger
- [Extraordinary Popular Delusions and the Madness of Crowds](#) by Charles MacKay
- [Irrational Exuberance](#) – by Robert Shiller
- [A Short History of Financial Euphoria](#) and [The Great Crash 1929](#)- John Kenneth Galbraith
- [The Panic of 1907: Lessons Learned from the Market's Perfect Storm](#) - Mark Bruner
- [The Little Book of Behavioral Investing](#) – James Montier



### History of Markets

- [Triumph of the Optimists: 101 Years of Global Investment Returns](#) by Elroy Dimson, Paul Marsh, and Mike Staunton
- [Stocks for the Long Run](#) by Jeremy Siegel
- [Reminiscences of a Stock Operator](#) by Edwin LeFèvre
- [When Genius Failed](#) by Roger Lowenstein
- [Capital Ideas, Capital Ideas Evolving,](#) and [Against the Gods](#) by Peter Bernstein
- [Ibbotson Yearbook](#) by Ibbotson Associates
- [The CRB Commodity Yearbook](#) by Commodity Research Bureau
- [The Essays of Warren Buffett](#) by Warren E. Buffett and Lawrence A. Cunningham
- [Fortune's Formula](#) by William Poundstone

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