

January 2019

# This Time is Different

A Collection of Point/Counterpoint Essays  
From the Investment Section



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Disclaimer: In 2017, the Investment Section put out a call for essays in a point/counterpoint format, with actuaries arguing opposite sides of an issue. We are pleased to present the following pairs of essays in this collection: Suhrid Swaminarayan and Joe Koltisko debate the future path of interest rates and inflation; Max Rudolph argues both sides of the efficiency of markets; John Hegstrom and Jim Kosinski square off over when (or if?) fossil fuels will be displaced by renewable energy; and Nate Worrell argues both sides of the type of investors who will succeed in the current market environment.

Please note that this pro/con debate format forces authors to develop arguments in support of the view assigned to them, even if they hold a differing opinion. The positions expressed in this role-playing setting should not be taken for the view of the authors, their companies, the Society of Actuaries or any of its affiliate organizations.

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# Introduction

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An essential investment skill—and one actuaries are well-equipped by training to possess—is the ability to see both sides of a trade. If you are buying an asset, someone is selling it to you, presumably because the two of you have different views about its investment merit. What does the seller know that you don't? What information do you have that the seller isn't taking into account? An understanding of the arguments for or against a given asset is critical to making a sound investment decision.

The insights gained by considering both sides of an issue drove this year's Call for Essays, where we asked contributors to argue opposite sides on topics related to the theme "This Time It's (Not?) Different." As you probably recognize, we borrowed our theme from the great investor Sir John Templeton, who once said, "The four most expensive words in the English language are 'This time it's different.'" We present you with four pairs of essays and invite you to weigh the arguments and make up your own mind as to whether it is different this time.

Our first pair of essays is from Suhrid Swaminarayan and Joe Koltisko, arguing about the long-term path of interest rates. Koltisko argues that we are in danger of seeing inflation (and maybe stagflation) return due to failures of the political system to grapple constructively with fiscal challenges, while Swaminarayan sees the Federal Reserve working cautiously to bring about a more gradual return to normal interest rates, with inflation remaining controlled.

Our second pair of essays is from Max Rudolph, laying out both sides of the "markets are efficient" debate. His first essay argues markets are efficient: While backtesting may find anomalies that would have allowed excess returns in the past, it's different now—those excess returns are no

longer there for the taking. By contrast, his second essay points to a number of anomalies that still seem to be available to the most talented investors and notes that while it may be difficult to beat a mostly efficient market, many investors still try (and some succeed).

In our third pair of essays, John Hegstrom and Jim Kosinski argue whether renewable energy means "this time is different" and the end of the fossil fuel era is at hand. Hegstrom argues the continuing drop in the cost of renewable energy will soon make fossil fuels economically uncompetitive, and, once that happens, adoption will be rapid; Kosinski argues the infrastructure that relies on fossil fuels is not going to be easy, inexpensive or quick to change.

Finally, we have a pair of essays from Nate Worrell with a variation on Batman vs. Superman, imagining which superhero would be a better investor for our current time. Would it be Batman, with his wide array of tools, skepticism of human nature and aversion to risk? Or would it be Superman, with idealism and values embracing technological innovation and progress?

The usual disclaimer that the authors do not speak for their companies, the Society of Actuaries or any of its affiliated organizations is in full force with these essays. In fact, given the nature of the debate format, the arguments stated in these essays might be the authors' attempt to make a case for a position without actually representing that view. The positions expressed in this role-playing setting should not be taken for the view of the authors, their companies, the SOA or any of its affiliate organizations.

We thank the authors for their contributions and hope you find these essays thought-provoking.

—The Investment Section Contests and Membership Committee

# Putting Forward the Case for a “Middle Way” for Long-term Interest Rates

Suhrid Swaminarayan

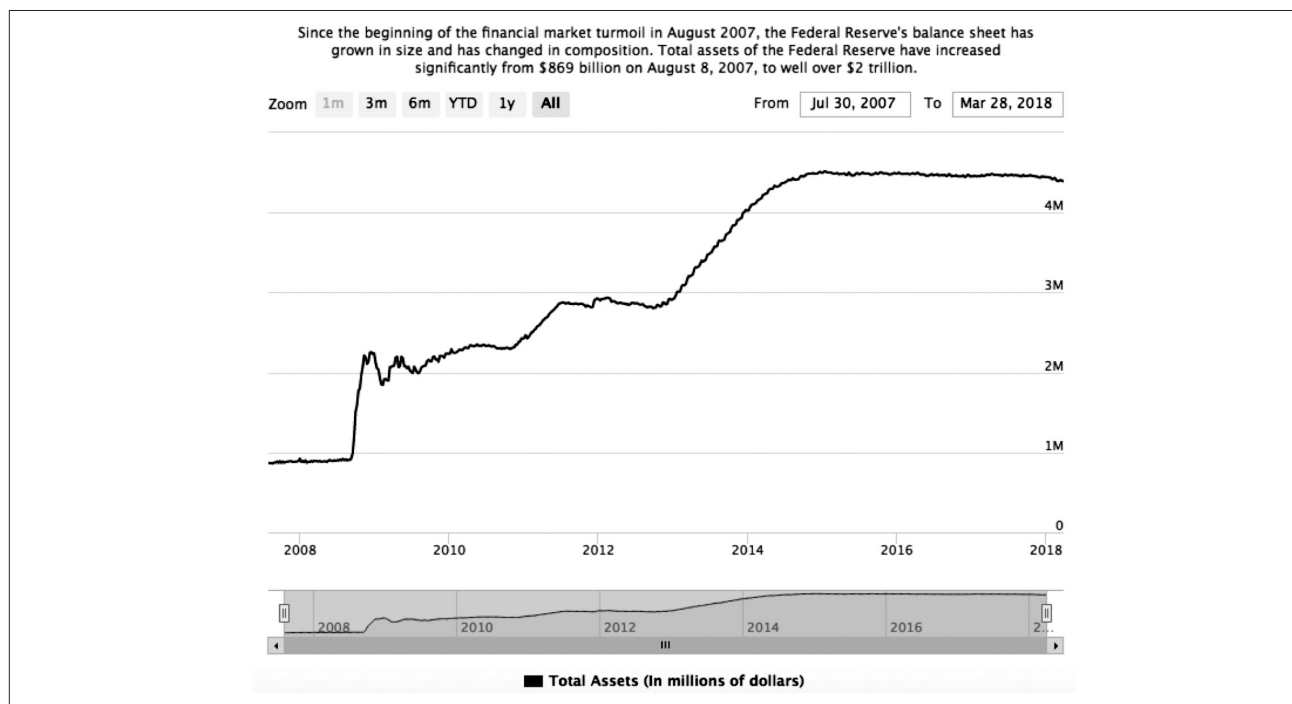
Following three programs of quantitative easing (QE), the Federal Reserve began the next phase of its interest rate policy in October 2017—a process of “normalization” involving a reduction to its balance sheet to move it to more normal levels. Precrisis, the

Fed’s balance sheet stood at 5.5 percent of U.S. gross domestic product (GDP); now it is approximately 25 percent of U.S. GDP, or approximately \$4.5 trillion (Figure 1). The natural question is with this (almost) unprecedented buildup in the Fed’s ownership of Treasury bonds, will a deluge of bond sales not only end the bull market in bonds (dating back to 1981), but also usher in a period of rampant inflation?

## Why Rates Are Unlikely to Spike

Unless there is unrestrained mismanagement of the balance sheet runoff, it is unlikely that long-term rates will spike. We have only one prior example of the Fed balance sheet rising above 20 percent of GDP (approximately 23 percent in the aftermath of the Great Depression and World War II). In that case, through the emergence and firm demonstration of Fed independence, long-term interest rates were successfully guided above 2 percent without the emergence of inflation for the better part of two decades. Yes, in that environment there was greater scope to increase interest rates without worrying about follow-on economic drag from the debt overhang that is pervasive today in most of the

Figure 1 Total Assets of the Federal Reserve



Source: Board of Governors of the Federal Reserve. Recent Balance Sheet Trends: Total Assets of the Federal Reserve. 2018. [https://www.federalreserve.gov/monetarypolicy/bst\\_recenttrends.htm](https://www.federalreserve.gov/monetarypolicy/bst_recenttrends.htm).

developed world. This article will revisit the implications of a debt overhang later when it discusses whether we will see further QE programs from the Fed in the near future. But for now, let’s at least point to the 1950s as a time when interest rates were successfully raised from near today’s levels.

While the Federal Open Market Committee (FOMC) has not defined a specific balance sheet target as the outcome of the normalization process, it is safe to say that the Fed will manage the runoff cautiously so as not to boost bond yields unexpectedly. The Fed has provided guidelines, including a consensus path of deliberately sluggish balance sheet reduction based on a reduction in the reinvestment of proceeds from maturing Treasury and mortgage-backed securities (MBS) bonds rather than active bond liquidation. Estimates project that \$180 billion will run off in the next 12 months, with \$360 billion each year thereafter. And while the Fed has been an important buyer of Treasury debt during its QE programs, foreign and institutional financial sector buyers have actually dominated the market. Low inflation, a forward guidance commitment from the Fed toward stable rate movement and deleveraging in the household and banking sectors all provide anchors to prevent global rates swiftly lifting off from low yields. Let’s also not forget the aged and aging populations in Europe and Japan who would be loath to see any inflationary reduction in their purchasing power and who add to the overall global demand for long-term bonds.

### **The Base Case as a “Muddle-Through” to Normalized Interest Rates and Inflation Moderation**

The Fed is moving slowly for fear that raising interest rates too far too fast may halt the postcrisis economic recovery. Macroeconomic measures, including unemployment (at a 49-year low) and

the modest, positive level of real GDP growth, together with common economic principles such as the Taylor rule suggest that monetary policy should be much tighter and the federal funds rate should be hiked aggressively to prevent potential inflation. Tayyeb Shabbir, an adjunct professor at Wharton Business School, confirmed that he sees a normalization of monetary policy in terms of the current functionality of the economy, although there “may not be an exact reversion to precrisis level(s).”<sup>1</sup> He observes that the deep structural changes to the labor market in the United States from the financial crisis—such as the unprecedented, lengthy average duration of unemployment—have dented the traditional Phillips curve relationship between wage inflation and unemployment. Shabbir argues that “(the) last time the unemployment rate hovered around the current levels, wage growth was 4 percent vs. the present 2.3 percent.”

Longer-term interest rates can also typically be expressive of inflation expectations. With that in mind, the case against out-of-hand wage growth leading to both unchecked inflation and long-term interest rates is strong. In addition to the demographic anchor to inflation highlighted earlier, commodity inflation and wage pressures are weak (these were both unchecked drivers of the uncontrolled inflation of the 1970s).

The danger of debt deflation caused by public and private indebtedness may also be overblown. The case for public indebtedness leading to stunted GDP growth has not been proven, with historical data suggesting that moderate growth is the average case even for indebtedness in excess of 90 percent of GDP.<sup>2</sup> The current U.S. economy also seems to be adhering to that historical average. In terms of fighting off a future stumble back into persistent meager growth territory or recession, the economist

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1 Will the Fed and U.S. Monetary Policy Ever get Back to “Normal”? *Knowledge@Wharton*, May 30, 2017. <http://knowledge.wharton.upenn.edu/article/will-fed-u-s-monetary-policy-ever-get-back-normal/>.

2 Herndon, Thomas, Michael Ash, and Robert Pollin. 2013. *Does High Public Debt Consistently Stifle Economic Growth? A Critique of Reinhart and Rogoff*. Political Economy Research Institute, University of Massachusetts Amherst.

## Putting Forward the Case for a “Middle Way” for Long-term Interest Rates

Christine Romer suggests a more flexible approach than the norm in terms of using fiscal programs or revising inflation tolerance (for example, changing inflation targeting to 3 percent rather than 2 percent).<sup>3</sup>

In summary, both inflationary and deflationary risks are overblown and overly pessimistic, and the most likely base case for future interest rates and inflation is a return to moderation.

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3 David Dayden. 2014. Obama Says Economic Recoveries Have to be Slow. *The New Republic*, Nov. 6, <https://newrepublic.com/article/120183/christina-romers-new-paper-blows-obamas-financial-crisis-defense>.

# Inflation: The Case for a Breakout

Joe Koltisko

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As one Wall Street maven says, “It is NEVER different this time,” and “It is ALWAYS about character.”<sup>1</sup> I apply this filter to the inflation outlook and conclude that we are complacent and not yet willing to do what it will take to contain a debilitating, divisive and stagflationary rise in consumer prices.

We are complacent because the aggregate money supply has not grown faster than gross domestic product. We experience the creative destruction of the shared economy as consumers and find it pretty neat, cheap and disinflationary. We imagine one day there will be an app for everything; we’ll get as much detail as we need just in time from an automated persona like Siri or Alexa. We feel warm and safe in the bubble since we look at aggregates that mask the impact of the huge forces at work.

The economy is really about networks of productive activity, of work teams that turn resources into goods and services through intermediaries like public and private corporations, associations and government. It’s an ecosystem that learns, innovates, grows and distributes rewards. It is quite robust, but it depends on political leadership—mainly through regulatory and tax choices—to define the sandbox within which we all compete. In short, whatever statistics we watch about the average wage earner, the widening gap between people who consider themselves winners and losers fuels political polarization, which in turn invites destructive policy such as tariffs and trade wars.

By this I mean, of course, the pattern of decisions to penalize global business—from pulling out of the Trans-Pacific Partnership, to undermining the North American supply chains that have flourished

under the North American Free Trade Agreement, to aluminum and steel tariffs, to who knows what’s next? These invite reprisals and at best create opportunities to substitute products. What has been missing is the commitment to share the benefits of free trade more broadly within our sandbox over many administrations and many years. Measures that might help in this area include corporate and public investment in apprenticeship programs and useful infrastructure. In the short run, higher trade barriers will mean higher prices at the retailers for consumer products, which will translate into wage growth, which is approaching 3 percent. This is the bad kind of inflation since it comes with no pickup in productivity.

The unemployment rate continues to break through whatever red lines for nonaccelerating inflation rate of unemployment (NAIRU) that may have been set back in the crisis; labor force participation has certainly improved. It seems that we are accomplishing as much as one can expect from monetary policy with a cautious data-driven Federal Reserve. However, fiscal policy has tilted toward tax cuts and spending increases, which are stimulative in the short run. The test will be how much of it translates into real growth and how broadly that growth either spreads or goes to fuel an asset price bubble.

A relatively high old-age population is not necessarily disinflationary. Entitlements for health care and pensions can grow larger than the savings this group has generated. Theoretically, governments can fund them with unlimited tax increases, but in real life, the tax base can move to a warmer climate and let inflation make up the difference.

The Fed has started on a “stealth tightening” program of allowing a portion of its Treasury and agency holdings to mature at a pace of up to \$30 billion/month in April 2018, rising to a cap of \$50 billion/month from October 2018. While it could take seven years at this pace to reduce the Fed’s \$4.5 trillion balance sheet to precrisis levels, the reduction in demand should boost Treasury yields. By itself, it is clearly a manageable and needed adjustment. But the Fed is not the whole picture. Counting intragovernmental holdings (like the Social Security trust funds), Treasury debt totals about \$20 trillion. About

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1 Harley Bassmen. n.d. *The Complexity Maven*. <http://www.convexitymaven.com/themavenmantra.html>.

## Inflation: The Case for a Breakout

40 percent of outstanding Treasury debt matures within five years, while the average interest rate of outstanding federal debt is 2 percent.<sup>2</sup> Two percent of \$20 trillion is \$400 billion of interest expense. Replacing \$10 trillion of it at 5 percent raises the annual cost to \$700 billion. That's expensive.

At the same time, foreign central banks held \$6.3 trillion of Treasuries as of December 2017, and of that, more than a third was held by the central banks of Japan and China. If central banks and sovereign wealth funds were to shift a meaningful portion of their holdings to Euros or yen, that could add to upward pressure on market rates and a weaker dollar. The “perfect storm” aspect of this scenario is that trade barriers and global trade friction reduce the export benefit opportunity from a weaker dollar and leave us with just the high import costs. A weaker dollar increases commodity and food prices, which impacts anyone who eats, drives or turns on the lights.

All of this assumes that the world muddles through all the geopolitical risks without an escalation in the

cost of a prolonged, large-scale military deployment. Given the other economic forces at work, higher military spending could be inflationary.

So, are we “on the cusp of an inflationary cycle as in 1979–1981”? Not yet, but the factors that lead to such a bad outcome are on the march. High inflation is a failure of the fiscal and political system first of all, and on that front, “it is ALWAYS about character.” What would help is a functioning political center. Imagine a world where the leaders of opposing political factions are able to set consensus, compromise goals and govern together.<sup>3</sup> Then some real progress on our fiscal challenges would be likely. Let's work on that.

Bottom line, the risk is that we will keep interest rates low despite inflation. As half the current debt matures and rolls out of 2 percent securities, the non-negotiable cash needs due to rising entitlements, lower tax revenues and global uncertainty could mount. Despite our best intentions to keep inflation contained, higher inflation could be seen as the lesser evil.

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2 U.S. Government Accountability Office. 2017. *Financial Audit, Bureau of the Fiscal Service's Fiscal Years 2017 and 2016 Schedules of Federal Debt*. Publication GAO-18-134, November, p 26.

3 As we recently saw in the renewed coalition between Angela Merkel's Christian Democratic Union (CDU) and Martin Schulz's Social Democratic Party (SDP) in Germany.



# This Time is Different: Markets are Now Efficient

Max J. Rudolph

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No one is forced to buy or sell a security. Trades are made under no duress; they are fair. This is the definition of an efficient market. The three forms of the efficient market hypothesis (EMH) show the challenges that must be overcome to beat the market.

In the weak form of the EMH, all past information is included in the current price. The semi-strong form requires that all publicly available information is included. And in the strong form, even nonpublic information is included in the price. Information is the key. If there is no new information, there is no reason for the price to change. There is no such thing as an undervalued stock, nor an overvalued one (or bubble). Higher returns can only be earned by accepting additional systemic risk.

A look at the academic literature, rational markets, the capital asset pricing model, arbitrage and behavioral finance reinforces the theory—and the reality—that markets are now efficient.

## Academic Literature

There is a plethora of literature to back up EMH. Burton Malkiel, in his classic book *A Random Walk Down Wall Street*,<sup>1</sup> provides a practitioner reasons

to focus on asset allocation rather than try to earn additional returns through stock selection.

The father of the efficient market hypothesis, Eugene Fama, looks for ways to integrate risk and return relationships for investors. As he argued for passive investing, he also developed factor models that define where higher risks are tied to higher expected returns.<sup>2</sup>

Friedrich Hayek believed that markets can best regulate themselves and that government should generally stay out of financial markets. He wrote *The Road to Serfdom*,<sup>3</sup> a classic (originally published in 1944) that goes beyond economic theory to argue that better decisions are generally made by markets than by government manipulation of them.

Historically, when new information is released, the variability of stock prices surges and then settles down as new expectations form. This is what you would expect from an efficient market.

## Rational Markets

A belief in rational markets does not mean there are not good and bad times to buy specific assets; there is uncertainty in the future, and not everyone interprets the available information in the same way. This does not mean expectations are not rational. Mosaic theory says that a smart investor can interpret information from multiple sources in unique ways. It could be possible to outperform through this type of analysis, by gaining access to information not publicly available, or seeing shifting trends earlier than others. Even in these situations, transaction costs will offset any excess returns (especially when including taxes and spreads relative to a benchmark portfolio).

Periodically, often through data mining, new sources of alpha returns are discovered. The extra returns generated in back testing quickly dissipate after public release of the method, just as the EMH would predict.<sup>4</sup>

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1 Malkiel, Burton. 2016. *A Random Walk Down Wall Street: The Time-Tested Strategy for Successful Investing*. 11th ed. New York: W.W. Norton & Company.

2 Sommer, Jeff. Eugene Fama, King of Predictable Markets. *The New York Times*. Oct. 26, 2013. <https://www.nytimes.com/2013/10/27/business/eugene-fama-king-of-predictable-markets.html>.

3 Hayek, Friedrich. 2007. *The Road to Serfdom*. Chicago: University of Chicago Press.

4 Bodie, Zvi, Alex Kane, and Alan Marcus. 2017. *Essentials of Investments*. 10th ed. New York: McGraw-Hill.

### TRADERS

You can't trade with yourself. It takes two to tango. Assuming neither has insider information, this means the same set of information has led one investor/trader to anticipate the price to rise and another to expect the price to fall. This is no different than betting on a sporting event. Assuming the bookie is looking at the data objectively, the point spread is defined to generate approximately equal betting on both sides. Stock market investing is no different. For example, one investor's methodology may be driven by valuation metrics, and another by the company's story of competitive advantage.

There are so many extremely smart people researching and trading stocks that it would be impossible to develop a better formed analysis than they do. Arbitrage opportunities take care of small discrepancies.

### BUBBLES/CRASHES

Bubbles are only identified in hindsight; those who claim to have done so in advance generally have predicted 20 bubbles and been right once or twice. Since prices are always accurate, there is no such thing as a bubble.

### Capital Asset Pricing Model (CAPM)

Louis Bachelier, in 1900, used stochastic processes to introduce Brownian motion as a modeling technique. Publicized in the 1960s by Benoit Mandelbrot and Paul Samuelson, work by them and Fama further developed the hypothesis as efficiency applies to markets. The mathematics requires that price changes are normally distributed for the calculations to be clean. Modern portfolio theory builds off these methods, arguing that higher returns are available only to those who take additional systemic risk, and that higher risk is defined by volatility of prior price changes relative to a benchmark (defined as beta).

### Arbitrage and Connectedness

In an era of highly networked financial markets, professional investors track arbitrage opportunities where the same security is available at different prices simultaneously in separate markets. They buy

the security in the cheaper market and sell it in the more expensive market, pocketing the difference.

Connectedness is also a way to quickly absorb new information about a security. Investors probe news services electronically using artificial intelligence for keywords that trigger buy or sell commands, and process them in tiny fractions of a second. No human could read the news, let alone process an order, that quickly. New public information is truly incorporated in prices simultaneously with the announcement.

### Behavioral Finance

The proponents of cognitive biases driving serial underperformance of money managers are right that individuals, and even groups, are biased. Note that no arguments are made that the market itself is biased. It is another argument why the market can't be beaten.

Where there are higher returns, there are other risks that have not previously been considered. These often include liquidity restrictions or other risks recognized by the market (herd) but not by individuals.

Also, when a variable moves forward without direction, it is said to follow a random walk, much like a drunk walking down a street who lurches randomly from side to side. Another way of thinking about this is the electrical engineering concept of signal and noise, made popular among financial types by Nate Silver with his book *The Signal and the Noise*.<sup>5</sup> The signal is the trend of the data; the noise, random fluctuations which deviate from that trend. Humans are subject to cognitive biases and so see patterns in what is really noise. This is called the clustering illusion, but calling it false pattern recognition may be more useful. In these cases, some individuals see trends they believe are actionable, providing buyers/sellers for those with differing interpretations.

Stock pickers are generally unable to beat their benchmark due to transaction costs, spreads, taxes and a general inability to select stocks that do better than the benchmark.

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<sup>5</sup> Silver, Nate. 2013. *The Signal and the Noise: The Art and Science of Prediction*. London: Penguin Books.

## Conclusions

Yes. Markets are efficient. Even if a few individuals have beaten them in the past, current methods have become more efficient and the vast majority of investors have failed to repeatedly outperform. More than a few anomalies are needed to prove that markets are not efficient.

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# This Time is Not Different: Markets are Not Efficient

Max J. Rudolph

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If markets were efficient, there would be no bubbles, no master investors and no reason to still be having this discussion decades after efficient market hypothesis (EMH) was proposed. Academics have taught EMH as if it has been an accepted theory since the 1960s. Fundamental investors use intrinsic value, discounting contingent cash flows, utilizing methods very familiar to actuaries.

In the weak form of the EMH, all past information is included in the current price. The semi-strong form requires that all publicly available information is included. And in the strong form, even nonpublic information is included in the price. Information is the key. If there is no new information, there is no reason for the price to change. Nevertheless, many traders successfully use technical analysis, the mosaic theory combines with fundamental analysis to create market-beating wizards, and insider trading still occurs.

## Examples of Inefficient Markets

Textbooks include many examples of anomalies showing prices that moved prior to takeovers and earnings announcements.<sup>1</sup> One famous example showed that companies mentioned in Barron's magazine tended to move late the day before publication on Saturday morning due to a scheme where the information was selectively shared in advance.

Some analysts discover techniques to add alpha and do not publicize them. One example is Ray Dalio and the Bridgewater Associates hedge fund, whose proprietary algorithms regularly beat the market.

If enough monkeys sat down at typewriters, eventually one would write a best-seller. This is the same argument made to claim that beating the market is not possible except by luck. As Warren Buffett asserted in counterpoint,<sup>2</sup> if all the best-selling monkeys are in the same zoo, then it makes sense to see what is special about that zoo. He argues that investors who seek out values with a significant margin of safety will outperform the market. This investment style can be identified in advance, and historically has done well. Indeed, choosing Buffett's Berkshire Hathaway investment vehicle when he took control of the firm would have led to outperformance by 10 percent annually over a 50-year period.

Growth stocks are regularly valued at too high, and value stocks too low, a price.<sup>3</sup> This leads to value stocks producing higher long-term returns than growth stocks. A tech/FAANG (Facebook, Apple, Amazon, Netflix, Google) stock selling at astronomical price/earnings (P/E) levels has a much more challenging future than the steady stock selling at a low P/E. This seems obvious, but each time a bubble forms, there are claims that "it's different this time." It's not. Those who optimize returns using longer time horizons can utilize mean reversion tendencies and competitive forces to outperform. If a stock is priced assuming perfection, it's unrealistic to assume it will outperform in addition to that. While momentum strategies outperform in the short term, reversals dominate over longer time frames.

Insider trading occurs regularly, although not as often as in the past. While the Securities and Exchange Commission (SEC) attempts to regulate it for company officers, politicians regularly attend hearings pertaining to companies and trade immediately following.<sup>4</sup> Pharmaceutical companies are favorites, but defense and other sectors where Congress is involved in

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1 Bodie, Zvi, Alex Kane, and Alan Marcus. 2017. *Essentials of Investments*. 10th ed. New York: McGraw-Hill.

2 Buffett, Warren E. 1984. The Superinvestors of Graham-and-Doddsville. *Hermes, the Columbia Business School Magazine*.

3 Haugen, Robert A. 2004. *The New Finance: Overreaction, Complexity, and Uniqueness*. 3rd ed. Upper Saddle River, N.J.: Pearson/Pren-tice Hall.

4 Severns, Maggie. 2017. Reckless Stock Trading Leaves Congress Rife With Conflicts. *Politico*. May 14. <https://www.politico.com/story/2017/05/14/congress-stock-trading-conflict-of-interest-rules-238033>.

## This Time is Not Different: Markets are Not Efficient

oversight and budgeting are also susceptible to the abuse.

### Random Walk

Even Burton Malkiel, author of *A Random Walk Down Wall Street*<sup>5</sup> and leading proponent of EMH, has put money into algorithmic trading to beat passive investments.<sup>6</sup>

### Irrational Markets

#### TRADERS

The big research houses make money when their clients trade. Their incentives are to churn the accounts. *Where are the Customers' Yachts?*,<sup>7</sup> written in 1940, shows how brokers get rich and buy yachts while their customers can't. While broker fees have been reduced to \$5 trades today, incentives remain distinct. Future advisers will likely choose from a menu of index funds and perform asset allocation while practicing psychology with their clients. The best ones will help clients remain invested while markets cycle and emotions discourage continuity.

#### BUBBLES/CRASHES

An investor can accumulate wealth even if they don't ever participate in a 10-bagger investment, but when emotions get in the way, you can lose everything very quickly. Two authors have done a good job describing this type of result, and they describe a mental state more than anything that can be quantified. This is why it is so hard to manage risk—there are times when nearly everyone is saying “This time is different” and the quants and pundits are backing them up. You need someone like Hyman Minsky<sup>8</sup> to talk about how periods of stability breed instability, or David Ingram<sup>9</sup> describing how risks

grow in the dark when times are good and are exposed to light when a risk event occurs. Bernie Madoff is a great example; he was able to perpetrate his Ponzi scheme as long as the economic environment was stable. Once the financial crisis began, he received redemption requests. The gig was up.

### Capital Asset Pricing Model (CAPM)

The CAPM assumes that volatility of a stock's price determines its risk and expected return relative to a benchmark index. Studies have shown that this result does not hold. Beta is not predictive of higher returns. Subsequent studies have shown that various factors are predictive for returns. Outperformance has been shown for small firms (especially in January), neglected firms (not covered by analysts) and firms with high book-to-market ratios.

### Behavioral Finance

Temperament and emotions can differentiate between a successful investor and one whose actions do not add value. Someone like Charlie Munger is able to stay calm during extreme volatility. He sticks to his methods even when others outperform over the short-term, consistently staying inside a circle of competence. Fundamental analysis to beat the market is hard enough, but if you can't also control your emotions, you should let someone else trade for your account.

### Climate Change and Cycles

There are other reasons why markets are not as they appear. When double-entry accounting was developed<sup>10</sup> nearly 600 years ago, it included only financial metrics. There was no concern for depleting natural resources or polluting the environment, and there is no

- 
- 5 Malkiel, Burton. 2016. *A Random Walk Down Wall Street: The Time-Tested Strategy for Successful Investing*. 11th ed. New York: W.W. Norton & Company.
  - 6 Stewart, James B. An Index-fund Evangelist is Straying From his Gospel. *The New York Times*. June 22, 2017. <https://www.nytimes.com/2017/06/22/business/burton-malkiel-investment-stock-index-funds.html>.
  - 7 Schwed, Fred. 1940. *Where are the Customers' Yachts? Or a Good Hard Look at Wall Street*. New York: Simon and Schuster.
  - 8 *The Economist*. 2016. Minsky's Moment. July 30. <https://www.economist.com/news/economics-brief/21702740-second-article-our-series-seminal-economic-ideas-looks-hyman-minskys>.
  - 9 Ingram, David. Risk and Light. Paper presented at the Enterprise Risk Management Symposium, April 29–May 1, 2009, Chicago, IL. <http://www.ermssymposium.org/2009/pdf/2009-ingram-risk-light.pdf>.
  - 10 Soll, Jacob. 2012. Accounted for: The Origins of Modern Finance. *The New Republic*. Oct. 16. <https://newrepublic.com/article/108345/double-entry-venice-modern-finance-accounting-jane-gleeson-white>.

## This Time is Not Different: Markets are Not Efficient

recognition today for these types of issues. A carbon tax, administered consistently across economies, would partially address these issues.

A warming planet, with increasing acidity in the air and water caused by carbon release through fossil fuel use, provides challenges to analysts trying to forecast future returns. Add in an aging developed world, large populations in coastal areas at risk for sea level rise, and overly indebted governments, corporations and individuals, and it becomes near impossible to anticipate the future.

History does not repeat, but it often rhymes. There is a natural cycle to our lives on earth tied to generations. Four 25-year generations build to a century, with actions recurring in similar ways once the last old-timers have died off. *The Fourth Turning*<sup>11</sup> defines these groups over many centuries and predicts a cycle that is currently in its most volatile stage. The rise of populism and great upheaval has previously occurred at these pivotal moments. A conflict that grew into a war would be fought using large amounts of fossil fuels, potentially setting in motion irreversible harm to the planet. An increasingly networked environment, cyber warfare and political polarity all combine to form a combustible environment.

### Conclusions

Markets are generally efficient, especially when taking into account the emotional side of investing. It is very hard to outperform an index fund—but not impossible.

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Buffett is a great example of someone who does fundamental investing really well, is unemotional about investing and changes tactics as the markets evolve. It is interesting that, after the fact, academics write articles about how he “did” it.<sup>12</sup> Buffett’s ability to recognize the right time to invest in stocks, bonds or entire companies has allowed him to outperform. Most investors find adapting and evolving is very hard when they are having current success. It becomes harder to beat as you become bigger, mainly because it takes time to manage the larger portfolio. Buffett focuses on allocating capital and hires others to manage subsidiaries.

Munger said:

I think it’s roughly right that the market is efficient, which makes it very hard to beat merely by being an intelligent investor. But I don’t think it’s totally efficient at all. And the difference between being totally efficient and somewhat efficient leaves an enormous opportunity for people like us to get these unusual records. It’s efficient enough, so it’s hard to have a great investment record. But it’s by no means impossible. Nor is it something that only a very few people can do. The top 3 or 4 percent of the investment management world will do fine.<sup>13</sup>

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11 Strauss, William, and Neil Howe. 1997. *The Fourth Turning: An American Prophecy*. New York: Broadway Books.

12 Frazzini, Andrea, David Kabiller, and Lasse H. Pedersen. 2013. Buffett’s Alpha. National Bureau of Economic Research working paper no. 19681. <http://www.nber.org/papers/w19681>.

13 Carlson, Ben. 2015. 10 Underrated Quotes From Charlie Munger. *Business Insider*. Aug. 24. <http://www.businessinsider.com/10-underrated-quotes-from-charlie-munger-2015-8?r=UK&IR=T>.

# The Future of Renewable Energy

John Hegstrom

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The arguments surrounding the near-term viability of renewable energy take many shapes. There are discussions about environmental impact, transmission and delivery infrastructure, storage capacity and the current political outlook. However, the focus always turns to cost in the end. While, by most measures, the unsubsidized cost of renewable energy is still higher than that of traditional forms of power generation, the gap is closing rapidly. According to a recent report from the International Renewable Energy Agency (IRENA), current trends indicate that renewable energy will be cost-competitive by 2020.<sup>1</sup>

According to the report, onshore wind power now costs an average of \$0.06 per kilowatt-hour (kWh) globally, while solar (photovoltaic) power comes in at \$0.10 per kWh. Wind and solar rates have decreased by 23 percent and 73 percent, respectively, since 2010. In contrast, fossil-fuel power costs in the range of \$0.05 to \$0.17 per kWh. Even with a conservative trend assumption, we will soon see cost-efficient renewable energy.

Another concern is the ramp-up of infrastructure to meet the demands of renewable energy users. The prime example of this is the need for widespread charging stations for electric cars. In much of the intermountain western United States, the distances between charging stations are currently very large, causing anxiety for drivers of electric vehicles on interstate highways. In response to this, the governors of several western states

joined together in 2017 to develop a regional electric vehicle plan called the REV West Plan.<sup>2</sup> This plan will generate new economic development along interstate corridors, and states have already begun to implement it. Some states, such as Nevada, have state-level plans. Nevada has almost completed an electric highway from Reno to Las Vegas. Also, Nevada is committed to completing an electric highway system serving the entire state by 2020.<sup>3</sup> Recently both ExxonMobil and BP significantly revised their estimates of electric car usage upward. ExxonMobil expects 100 million electric cars on the road by 2040, and BP expects that many by 2035.<sup>4</sup>

A primary component of renewable power infrastructure is the distribution and storage of wind, tidal and solar power. Water releases can control renewable power generated by hydroelectric facilities. However, wind, tidal and solar power do not have the same controllability. Peak demand that does not match up with renewable generation must be met by grid storage, demand-side management or traditional power generation. Grid storage technology consists of batteries in electric vehicles, storage heaters, district heating systems or ice storage. Demand-side management mainly consists of instantaneously adjusting the cost of electricity based on the cost of supply to encourage efficient usage. Finally, peak needs that are not met by solar or wind power can be met by hydroelectric plants, which can adjust quickly. Coal and nuclear power plants take longer to adjust. The conclusion is that large-scale use of renewable energy is possible using current technology, and future technology will only speed up the adoption of renewable energy.

At first there will be some resistance to replacing heavily embedded nonrenewable technology such as natural gas home heating. However, as the costs of solar technology continue to plunge, legacy sources such as natural gas will become more expensive due to their reduced scale. At some point in the near future, it will become economically infeasible to continue to use

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1 International Renewable Energy Agency (IRENA). 2017. Renewable Power: Sharply Falling Generation Costs. [http://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Nov/IRENA\\_Sharply\\_falling\\_costs\\_2017.pdf?la=en&hash=124D0C6FF4AE247D8CFB4FF7F064F5F25432AC5B](http://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Nov/IRENA_Sharply_falling_costs_2017.pdf?la=en&hash=124D0C6FF4AE247D8CFB4FF7F064F5F25432AC5B) (accessed November 15, 2018).

2 U.S. Department of Energy. 2017. Regional Electric Vehicle (REV) West Plan. *Alternative Fuels Data Center*. <https://www.afdc.energy.gov/laws/11875> (accessed November 15, 2018).

3 Nevada Governor's Office of Energy. 2018. Nevada Electric Highway. [http://energy.nv.gov/Programs/Nevada\\_Electric\\_Highway/](http://energy.nv.gov/Programs/Nevada_Electric_Highway/) (accessed November 15, 2018).

4 Exxon Mobil. 2017. 2017 Outlook for Energy: A View to 2040. <https://cdn.exxonmobil.com/-/media/global/files/outlook-for-energy/2017/2017-outlook-for-energy.pdf> (accessed November 15, 2018).

## The Future of Renewable Energy

natural gas, and gas heating will be as rare as horses on the freeway.

There is much debate as to whether or not human-made global warming is a real phenomenon. In any case, renewable energy is without a doubt more environmentally friendly than fossil-fuel usage. There is no question that air pollution is responsible for many health problems around the world. The bottom-line costs of environmental damage and cleanup to humanity are enormous. The United Nations estimates the annual cost of environmental damage to be \$6.6 trillion globally, which works out to about 11 percent of the world's gross domestic product (GDP). This amount is expected to grow to \$28 trillion by 2050 (18 percent of GDP). The main culprits are oil and gas production and mining.<sup>5</sup>

One factor that could slow down the adoption of renewable energy is the entrenched interests of oil, gas and coal producers and the politicians who support them. The political situation is always in flux. In other words, just wait a few years, and the political climate always changes. You can bet that when the cost of renewables reaches a critically low point, the opposition will crumble.

We are part of a global community now. Countries around the world have invested heavily in renewable energy. According to IRENA, China has more than 2.5 million people working in the solar energy sector, compared to 260,000 in the United States. “Even in China where coal is—or was—king, the government still recognizes that the economic opportunities of the future are going to be in clean energy,” according

to Alvin Lin, head of the Natural Resources Defense Council. China's National Energy Administration recently created a mandatory target for reducing coal usage. The country also set a goal for renewable energy to provide 20 percent of China's energy needs by the year 2030. According to a United Nations report, China invested a whopping \$102.9 billion into wind, solar and other renewable projects in 2015. Prime Minister Modi of India has targeted bringing 100 gigawatts of solar power online by 2020, as part of a goal to bring reliable power to all Indians.<sup>6</sup>

Several leading-edge companies based in the United States have made renewable energy a priority. Apple has made several moves into renewable energy operations in China, where it manufactures many of its products. These include a solar project in the Sichuan mountains, where the panels are designed to allow the local yak population to graze around them. Facebook and Google are pushing to reach 100 percent renewable energy, and Microsoft has been at 100 percent renewable since 2017. Even the traditional energy companies are getting in on the action. In 2017, Shell Oil purchased the electric car charging company NewMotion.<sup>7</sup>

Historically new, cost-effective technologies have replaced obsolete practices in varying amounts of time. It took about 40 years for the automobile and tractor to replace the horse and mule entirely. In today's fast-paced world, change happens much more quickly. It is not overly optimistic to expect renewable energy to predominate in our lifetime.

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5 Ghosh, Subir. 2010. Annual Cost of Environmental Damage is \$6.6 Trillion, Says UN. *Digital Journal*, October 6. <http://www.digitaljournal.com/article/298574> (accessed November 15, 2018).

6 Pham, Sherisse, and Matt Rivers. China is Crushing the U.S. in Renewable Energy. *CNN*, July 18, 2017, <https://money.cnn.com/2017/07/18/technology/china-us-clean-energy-solar-farm/index.html> (accessed November 15, 2018).

7 Pham, Sherisse. Why Apple is Investing in Wind Turbines in China. *CNN*, December 9, 2016, <https://money.cnn.com/2016/12/09/technology/apple-wind-turbine-china-investment/index.html?iid=EL> (accessed November 15, 2018).



# Fossil Fuel Replacement Will Take Longer Than We Think

Jim Kosinski

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Renewable energy has seen huge growth in recent years, with some sources estimating that wind farms are now the cheapest source of energy<sup>1</sup> and solar becoming more competitive every year. While some people proclaim that the end of fossil fuels is near, this article will argue that fossil fuels will continue to be a substantial part of the energy mix for the foreseeable future.

First, let's look at power generation, which is potentially the easiest place to make a case for renewable energy. Data on electricity generation from the U.S. Energy Information Administration<sup>2</sup> shows that in 2017, about 63 percent of electricity was generated by fossil fuels, split roughly 50/50 between coal and natural gas. The 17 percent of electricity generation due to renewables includes 7.5 percent hydropower, 6.3 percent wind and about 3 percent other (including solar). Despite the rapid growth in solar (and positive publicity), solar still produces only about as much electricity as biomass (mostly wood). Hydropower is not likely to grow substantially, as many of the most suitable sites are already in use. So to displace fossil fuels, wind and solar will have to expand their share of electricity generation massively, from a combined 7 percent to 8 percent today to 70 percent to 80 percent, assuming nuclear power continues to produce its current 20 percent.

But producing 70 percent to 80 percent of electricity from wind and solar power brings up the need for baseload capacity. What powers the grid at nighttime or when the wind is not blowing? The potential technologies suggested as future solutions to this issue (grid-scale battery storage, fuel cells, hydrogen, pumped storage hydropower, thermal storage using molten salt) are all still experimental, and it is unclear whether any of them will be practically and economically feasible over the intermediate term. Producing electricity from wind/solar may be inexpensive, but it is unclear whether running a reliable electric grid on wind/solar will be.

Second, let's talk about home heating. Roughly 50 percent of homes in the United States are heated with natural gas, with another 10 percent or so heated by fuel oil or propane/liquified petroleum gas (LPG).<sup>3</sup> Presumably a "renewable energy" world would involve heating homes with electricity generated from wind/solar, greater energy efficiency, better insulation and more use of "passive solar." While it seems likely that we will see newer construction adopt renewable energy approaches more often as costs fall, there is a huge existing housing stock that would require renovation, substantial overhaul and replacement of home mechanicals at great expense to the homeowners. That may happen over time, but it will not be a fast process absent regulation or other substantial government intervention.

Regarding government intervention, there is vocal opposition in the United States to "letting government pick winners and losers." Any substantial push toward mandating renewable energy is likely to be met with well-organized and well-funded lobbying campaigns. It is difficult to see how a mandate requiring homeowners to retrofit their houses to use electric heat at huge expense would ever get any traction. (And if it did, it would likely result in a lot of politicians being voted out and replaced by people who would overturn the mandate.)

Government intervention can impede the adoption of alternative energy to the benefit of well-connected incumbents. Despite the opposition to letting government pick "winners and losers," incumbent operators

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1 Lazard. *Lazard's Levelized Cost of Energy Analysis—Version 11.0*. 2017. <https://www.lazard.com/>.

2 U.S. Energy Information Administration. *Frequently Asked Questions—What is U.S. Electricity Generation by Energy Source?* 2018. <http://www.eia.gov>.

3 U.S. Department of Energy, Energy Saver. *Home Heating Systems*. <https://www.energy.gov/>.

## Fossil Fuel Replacement Will Take Longer Than We Think

are happy to hire lobbyists to gain advantages so they can continue to “win.” Electric utility companies have lobbied in recent years to restrict the ability of rooftop solar to hurt their bottom lines, coal operators have lobbied for relaxed treatment of emissions rules from power plants to try to maintain profitability, and oil/gas companies have argued for expanded drilling access. Renewable energy is capable of being hugely disruptive to very well-entrenched, profitable companies’ business models, so there will be intense lobbying and efforts to change the rules to maintain fossil fuels companies’ advantages and limit the growth of renewables. Renewables’ growth may be inevitable over the long run, but it can be delayed and hampered by government actions.

Finally, transportation is an even more difficult issue for renewable energy advocates to address. Roughly 50 percent of a barrel of crude oil eventually turns into gasoline and goes to power automobiles. (An additional 25 percent is refined into diesel fuel.<sup>4</sup>) While numerous articles have chronicled the drop in price of electric vehicles and expressed the view that they will be cost-competitive with gasoline vehicles in a few years, as of 2017, plug-in electric vehicles made up just over 1 percent of the U.S. market.<sup>5</sup> Even if electric vehicles become cost-neutral with gasoline vehicles, it is likely that gasoline vehicle sales will predominate as long as charging is slow, range is limited and gasoline is cheap. With gasoline, you can get 500 miles of range in less than 5 minutes, and all the necessary infrastructure is already available. Until the electric charging infrastructure is as well-developed as the gasoline infrastructure, electric vehicles will be more the exception than the rule. And that means gasoline will still be around.

Additionally, how far can electric vehicle sales scale up before running into shortages of key battery materials or other technological limitations? There are well over 1 billion vehicles on the road worldwide, roughly 250 million of which are in the United States.<sup>6</sup> Are they all going to be electric? If so, how much additional electrical generation capacity will be required? Add that to the “power generation” demanded of wind/solar.

And then there is air travel. Jet fuel comprises about 12 percent of the refined yield of a barrel of oil.<sup>7</sup> Even if there were an alternative propulsion source, a huge amount of work, time and expense would still be needed to retrofit engines and planes to use that source. Even if power generation demand and motor vehicle demand for fossil fuels were to go away completely, which seems unlikely, expanded air travel demand is likely to result in substantial fossil fuel usage for the foreseeable future.

In short, renewable energy is very promising, growing fast and becoming more cost-competitive. That said, the economy runs on fossil fuels, is built to run on fossil fuels and is likely to continue to run on fossil fuels for the foreseeable future. Too much infrastructure is built around fossil fuels for them to be discarded lightly, and the cost of migrating existing uses from fossil fuels to renewable energy is likely to delay adoption. On the transportation side, it is hard to see electric cars fully replacing gasoline-powered cars without government intervention (or electric cars becoming not only as inexpensive, but as convenient as gasoline-powered cars), and it is unclear what technology will replace jet fuel. Fossil fuels will be here for a while yet.

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4 U.S. Energy Information Administration. *Oil: Crude and Petroleum Products Explained*. 2017. <http://www.eia.gov>.

5 Environmental and Energy Study Institute. *Fact Sheet—Plug-in Electric Vehicles (2017)*. 2017. <http://www.eesi.org>.

6 International Organization of Motor Vehicle Manufacturers (OICA). *World Vehicles In Use—All Vehicles*, <http://www.oica.net>.

7 *Supra* note 4.

# Bat-vestment Strategies

Nate Worrell

Who would you rather get investment advice from: A successful billionaire with an eye for hot new technology or a rank-and-file news reporter who occasionally wears underwear on the outside of his clothes?

I choose the former. I choose Batman.





Why? Because this time, it is not different. Not really. Things do change—in the sense that babies

grow into adults and maple trees will go from bare branches to green to scarlet and back to bare. But that aging person is still very human, and the natural cycle of seasons occurs every year.

The common adages *the only constant is change* and *history repeats itself* may seem paradoxical. Yet, as Batman knows, they are both true. The masked vigilante understands too well that his enemies have a way of reappearing and causing havoc, no matter how often he locks them away in Gotham City’s asylum.

The schemes and tactics of his enemies evolve over time, but Joker will always be Joker.

If the Dark Knight were to look at the U.S. today, he would see evidence of nefarious plans from his worst enemies:

	<p>The city of Gotham, like the rest of the U.S., shows signs of a rising prevalence of obesity.<sup>1</sup> Is <b>Poison Ivy</b> lacing the food supply with sugary toxins? We’ve seen tricks like this before (lead in paint and water supplies, asbestos in insulation, carcinogens in hair spray).</p>
	<p>A proliferation of opioids<sup>2</sup> has <b>Scarecrow’s</b> fingerprints all over it. Will this specter prove more deadly than the cocaine and meth crises of years past?</p>
	<p>The <b>Riddler</b> could be the instigator of social media-driven manias. Is this sinister schemer also to blame for unsettling suicide trends?<sup>3</sup></p>
	<p>And as the markets surge to unprecedented highs, cryptocurrencies take off like rockets and housing prices tick ever upward, somewhere in the noise is the spine-chilling cackle of the <b>Joker</b>, who’s quite good at inflating—and then popping—economic bubbles.</p>

1 Hales, Craig M., Margaret D. Carroll, Cheryl D. Fryar, and Cynthia L. Ogden. Prevalence of Obesity Among Adults and Youth: United States, 2015–2016. *NCHS Data Brief No. 288*, October 2017. <https://www.cdc.gov/nchs/products/databriefs/db288.htm>.

2 Owen, Rebecca. The Increasing Number of Opioid Deaths in the United States: A Brief Overview. Society of Actuaries, February 2017. <https://www.soa.org/Files/Research/mortality-opioid-deaths.pdf>.

3 Holman, R. Jerome, Cynthia S. MacDonald, and Peter J. Miller. U.S. Population Mortality Observations: Updated With 2016 Experience. Society of Actuaries, April 2018. <https://www.soa.org/Files/resources/research-report/2018/us-population-mortality.pdf>.

## Bat-vestment Strategies

These headwinds impede progress and put a damper on prosperity. We are not entering some “Golden Age.” We likely never will. Or perhaps less pessimistically, we will never be totally immune from calamity.

Another way to think of this is that as our technologies become more sophisticated, so does the complexity of our problems. Think of high-frequency trading, and the related flash crashes, for example. As Robin might say, “Holy quantitative algorithms, Batman, what do we do now?”

We need to reach out to the hero that knows the night. How does this nocturnal vigilante prevail against his foes?

Primarily, he invests in the tools that will combat the villains. His inventory is diverse and constantly changing. The Batmobile and his armored suit are constants, but the contraptions he carries on his utility belt can handle a variety of adverse situations.

His investment philosophy is similar. Flexibility, protection and low volatility take priority over returns and accumulation targets. Liquidity is crucial and will come at the expense of longevity risk.

You might imagine a portfolio that has the following elements:

- Heavy cash and cash equivalents
- Treasury securities (inflation protection included)
- Equities that are a mix of negative and positive beta
- Funds that manage volatility
- Short duration bonds, highly rated
- Other assets, such as gold
- Annuities with withdrawal guarantees
- Insurance with options for benefit acceleration

In some ways this portfolio mirrors an income-oriented allocation. A Vanguard summary shows

this approach only has losses in 12 to 14 years out of 91, whereas a more growth-oriented approach sees close to twice as many years with losses.<sup>4</sup>

I’d imagine the Black Knight is also a fan of *The Black Swan*<sup>5</sup> and other works by Nassim Nicholas Taleb. As such, protection would be tantamount in the portfolio. The utility belt would contain stop-loss mechanisms and he’d focus on lots of small bets with marginal opportunities, and also seek out those areas where a small position could really payoff in a big way.

In addition to tactical strategies, what really makes the Caped Crusader the hero for the job is his humanity. Unlike other superheroes who are either mutants, divinely blessed or from another world, Batman is completely carnal.

Batman knows the price of making mistakes. He feels the pain. This makes his risk-taking that much more admirable.

Through this grueling learning process, he makes progress against his human tendencies. These include overconfidence and emotion-driven irrationality. He doesn’t do this alone.

Bruce Wayne, the man behind the mask, has Alfred. Alfred is the gentle counterpoint to Bruce’s ego. He is the outside observer who challenges Bruce’s motivations and looks after his well-being. Arguably, the butler may be the savior of Wayne Manor, and ultimately Gotham itself. His calm voice repeats the central premise: This time it is not different.

It’s somewhat ironic that the best counter to human bias is another human. Perhaps artificial intelligence could be our Alfred one day. Until then, having an accountability partner, one whom you trust and who is willing to challenge you, becomes as important as the constitution of the investments themselves.

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4 Vanguard portfolio allocation models. <https://personal.vanguard.com/us/insights/saving-investing/model-portfolio-allocations>. (accessed Oct. 25, 2018.)

5 Taleb, Nassim Nicholas. 2012. *The Black Swan: The Impact of the Highly Improbable*. 2nd ed. New York: Random House.

## Bat-vestment Strategies

The world is a scary place. The markets are inherently unpredictable. These themes are not new. By following Batman's approach and utilizing a gamut

of tools that orient around preservation of capital, the world becomes a little less harsh.

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# Super-vestment Strategies

Nate Worrell

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It's a bird! it's a plane! It's a super-inflated asset bubble! Who can we turn to in this tumultuous world? Faster than a flash crash, more powerful than any derivative, able to fund tall buildings with a single bond—we need the Man of Steel; we need Superman.

We are entering a new age. This time is different. Technology is pushing us into the Fourth Industrial Revolution. Homo sapiens is crossing over to Homo deus.<sup>1</sup> From an investment standpoint, the best way to navigate the “world of tomorrow” is with an approach inspired by the Man of Tomorrow.

Superman's “superness” is his capacity to exceed human limitations, but the gap between humans and The Big Blue Boy Scout is closing. Enhancements in biotechnology are allowing people to do remarkable things like see infrared light, feel energy fields and control objects with their minds. Treatment for paralysis, deafness, blindness and many other disabilities are having technological breakthroughs. Our relationship with technology is becoming increasingly interconnected as we ask our phones for directions and wear devices on our wrists that record our activity levels and vital signs. Peter Diamandis, founder of the X Prize Foundation, sees the positive inertia of innovation in technology, increases in global life expectancy and better predictive capabilities of natural disasters as a few reasons to be optimistic.<sup>2</sup>

As humanity transcends its biological boundaries, human institutions are also seeing rapid change in this age of disruption. Amazon is slowly taking over the world. Digitization and automation are bringing major

changes to many businesses, from manufacturers “employing” more robots to McDonald's taking orders via electronic kiosk. The tech startup space is churning with a fury it hasn't seen since the dot-com era as techies try to find a way to revolutionize an industry the way Uber and Airbnb have done theirs. Cryptocurrency craziness is sending tremors through the banking industry. While there is certainly a large degree of hype around these disruptors, the potential explosive power is worth paying attention to. Companies that adapt will survive; those that don't will die. It's dangerous to think any industry is immune from innovation. Even Superman has his kryptonite.

As humanity rockets into a new era, it is important to stay grounded. A key element of Superman's story is that he could have chosen to be the overlord of the Earth and no one could have stopped him. However, he came out of Kansas, the heartland of America, and was raised with Midwestern morals. He uses his abilities to protect mankind and improve the good of humanity. His alter ego, Clark Kent, is a journalist. Kent is not some trust-fund baby with a penchant for expensive gadgetry. He's the 99 percent. He also has an awkward relationship with Lois Lane, loving her while she loves Superman. It is this blend of family and feelings that allow Superman to keep his powers in check.

How does this all fall into an investment framework? Superman's approach would be aggressive but grounded in values. The stage is set for new levels of prosperity through technological innovation. He would orient around growth companies and limit his exposure to industry giants. Volatility would certainly be an element in this framework, but that would not be a deterrent to the Man of Steel. Perhaps he could temper the fluctuations with some volatility management strategies like trying to hold a portfolio with minimally correlated assets so that an adverse market event wouldn't take down the whole thing. Superman anticipates that as growth occurs, central banks can start to raise rates again and interest rates will begin to inch forward. Finally, the strategy would not be completely bullish. Somewhere in the portfolio would be a recognition that progress may come at a price. Perhaps a protective put or two would be in place in the event that

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1 Harari, Yuval Noah. 2017. *Homo Deus: A Brief History of Tomorrow*. New York: Harper.

2 Diamandis, Peter. 2017. The World is Still Better Than You Think. *Medium*, Oct. 10. <https://medium.com/@PeterDiamandis/the-world-is-still-better-than-you-think-eb0b742cbb66>.

## Super-vestment Strategies

the world falls apart. While we are as exposed as ever to calamitous events, this time is different.

Humanity sits on the precipice of a new era. There is a massive amount of growth potential out there, and rewards will come to the bold and the brave. Ultimately,

though, it is also important to remember that for progress to lead to prosperity, we don't lose sight of our morals.

As the Last Son of Krypton said, "Do good to others and every man can be a Superman."

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