

Slaughterhouse-Five (Hundred)

Passive Investing and its Effects on the U.S. Stock Market

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“Blind certainty: a close-mindedness that amounts to an imprisonment so total that the prisoner doesn’t even know he’s locked up.”

– David Foster Wallace

Executive Summary

Low interest rates, the “Fed Put,” and technological advancement are major pillars of the narrative attempting to justify extreme valuations in US stocks. However, a profound shift in market share from active to passive management is the underlying cause. Passive investing, with its simple, zero-analysis formula of inflows requiring stock purchases and outflows requiring stock sales, continues to drive the US equity market to record valuations while weakening the underlying market structure. Higher passive market share means fewer available buyers and sellers at any market price. Equity prices will continue to rise as passive vehicles experience inflows, but severe instability in prices and liquidity will eventually result as shareholders become concentrated in a few massive players. This instability will cause material declines in US stock valuations. Outflows from passive strategies have the potential to crash the equity market as the pool of active buyers is both shrinking and unlikely to provide liquidity at current valuations.

- As passive strategies have crowded out all others, they dominate the flow of buyers in US stocks.
- When passive flows slow, stop, or reverse, illiquidity and volatility will result.
- Passive flows are predestined to slow, stop, or reverse from law of large numbers, US demographic shifts, or recession.
- US equity valuations are unjustifiably elevated and will return to long-term averages after passive flows abate.

Passive Investing Has Won, Even Warren Buffett Thinks We Should All Buy Index Funds

In the aftermath of the 2008 crisis, passive investing has become the dominant investment strategy. From institutions, to investment advisors, and individual investors, there is broad consensus that buying index funds is the most intelligent way to invest money. The logic is simple. Most active funds, which are professional investment vehicles that employ analysts to research individual companies and portfolio managers to make buy and sell decisions on individual stocks, have broadly underperformed a stock index like the S&P 500, so why not cut out securities analysts and portfolio managers altogether, and save on costs while getting a higher return?

Even Warren Buffett, who made his fortune not by indexing but by buying undervalued stocks and acquiring whole businesses at attractive prices, believes most investors should simply purchase index funds as their only investment strategy. In 2018, Buffett told CNBC his recommendation,

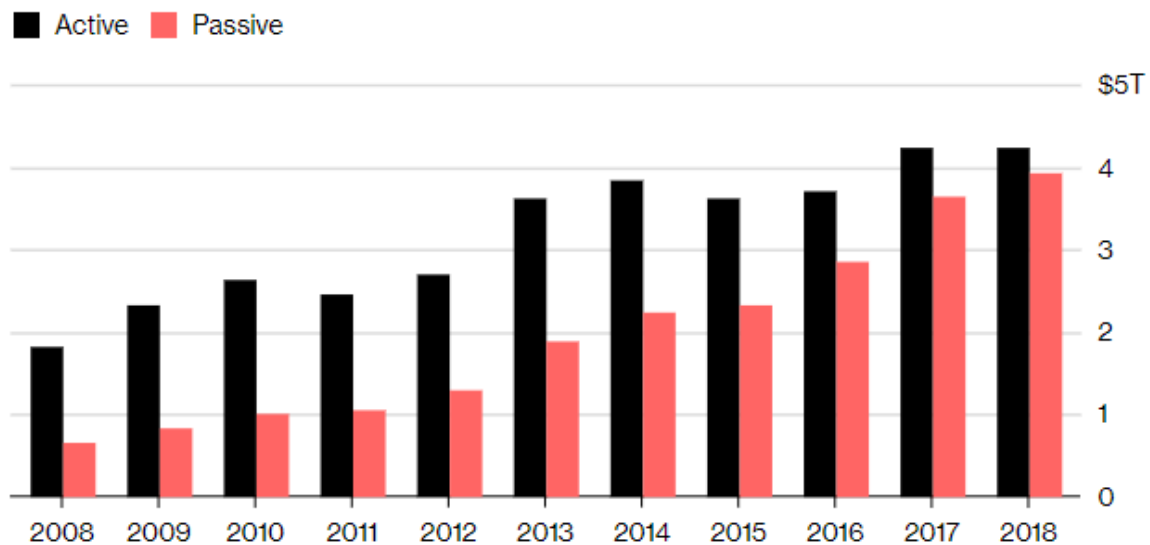
“Consistently buy an S&P 500 low-cost index fund. I think it’s the thing that makes the most sense practically all the time.” He has heaped praise on Jack Bogle, founder of indexing giant Vanguard. “Jack did more for American investors as a whole than any individual I’ve known. A lot of Wall Street is devoted to charging

a lot for nothing. He charged nothing to accomplish a huge amount.” Later he added, “He converted, in a 30-year period, a lot of people to the right religion of investing. And it’s a good religion. It pays off.”

Who can argue with Warren Buffett? He has one of the greatest investment track records ever. Not only do the performance figures of active funds versus passive vehicles support his arguments, investors have wholeheartedly embraced indexing as their primary investment strategy.

Indexing on the Rise

Passive U.S. equity funds could soon overtake their active peers



Source: Morningstar Inc.

Note: 2018 data as of Nov. 30

Thanks to past performance, Buffett’s endorsement, and glowing press, passive investing as a business has also been enormously successful. As the chart above from Morningstar shows, passive funds have seen tremendous growth at the expense of their active peers. In 2008, investment assets in active funds were more than double passive funds. Through November 2018, passive assets have more than quadrupled, while active has stagnated. In fact, if not for the strong stock market returns during this cycle, active assets would have declined, as active funds have experienced consistent redemptions from their investors since 2008.

Chart 3: Active vs. Passive equity flows since 2009



Source: BofA Merrill Lynch Global Investment Strategy, EPFR Global

The chart from Bank of America, Merrill Lynch shows the extent of this historic shift in the U.S. stock market. Since 2009, \$2 trillion of investor assets have been withdrawn from active funds, while \$2.5 trillion have been added to passive funds.

As this report will show, the dominance of passive investing at the expense of active management raises serious questions about whether the stock market is functioning properly. Active management has seen persistent outflows for over 12 years. As clients redeem money from these managers, it means that active funds in aggregate are net sellers of stocks to meet their clients cash withdrawal demands. According to the efficient market theory, which is the theoretical basis for passive investing, it is these active managers who are the agents keeping stock prices in line with their true value, by their informed buying and selling in accordance with the profits and growth prospects of the companies behind the stock prices. However, if all active managers are forced by redemptions to sell the very assets they believe are attractive investments and therefore deem undervalued, where then is the mechanism to bring these investments in line with fair value? The authors believe this is a logical inconsistency that will be shown by the data that follows here.

To further support this point, in an article at cnbc.com, JP Morgan global head of quantitative and derivative research, Marko Kolanovic, has shown that 90% of the daily stock trading in the US is comprised of non-fundamental investors, meaning that the investors who actually analyze businesses and buy and sell stocks based on companies' future growth prospects are outnumbered

in daily stock trading by strategies that ignore these fundamentals by a factor of 9 to 1. According to Kolanovic,

“While fundamental narratives explaining the price action abound, the majority of equity investors today don’t buy or sell stocks based on stock specific fundamentals,” Marko Kolanovic, global head of quantitative and derivatives research at JP Morgan said, in a Tuesday note to clients.

Kolanovic estimates “fundamental discretionary traders” account for only 10 percent of trading volume in stocks. Passive and quantitative investing accounts for about 60 percent, more than double the share a decade ago, he said.

As a result, stock prices are being pushed higher by passive investment flows and by other market participants that buy stock without regard to the fundamental value of the businesses behind the stock prices. We will explore and support this view further in the subsequent sections.

Key Points In This Section:

- Passive investment is now the preferred way to invest. As a result, trillions of dollars have been added to index funds and exchange-traded funds (ETFs), at the expense of other strategies.
- How can active management keep stock prices in line with fair value if all active managers collectively are experiencing cash outflows from clients and thus are forced to sell the very investments they believe are attractive? Logically, it cannot.
- JP Morgan research shows that 90% of all the daily trading in the US stock market is based on strategies *other than* traditional portfolio managers who base their buy and sell decisions on fundamental business values. Therefore, active managers’ influence on stock prices is miniscule. Their market-stabilizing effect is drowned out and thus ineffective in keeping prices in-line.

Academic Paper: Is There a Dark Side to Exchange Traded Funds?

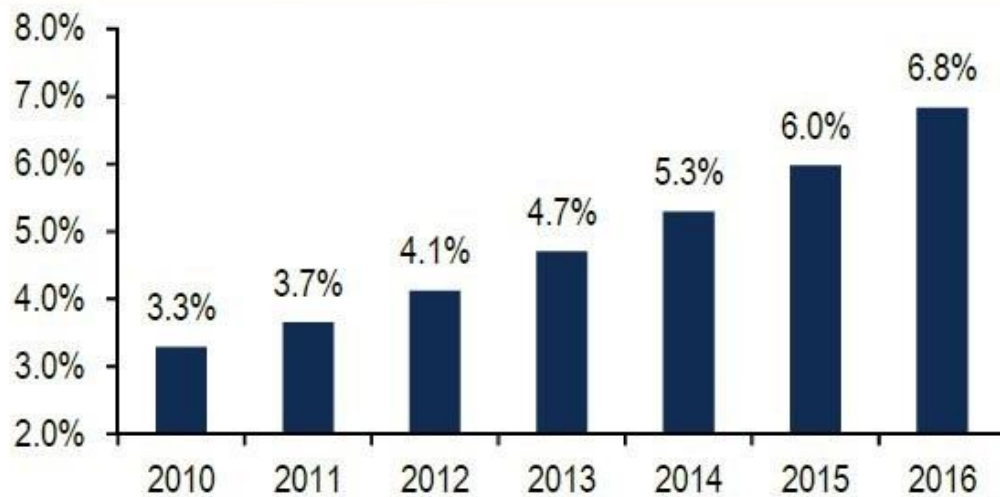
Is there a Dark Side to Exchange Traded Funds? An Information Perspective by Israeli, Lee, and Sridharan, January 13, 2017.

In this study, researchers from Stanford University, Emory University, and the Interdisciplinary Center of Herzliya in Israel found that when exchange-traded funds (ETFs) increase their ownership of a given company’s stock by just 1%, it makes the stock’s price **14% less correlated to its future earnings**. Basically, the more these passive funds own of a given company, the less that company’s stock price will react to changes in that company’s profits. The entire point of the stock market is that stock prices are supposed to react to favorable and unfavorable developments

in the underlying businesses, but the authors of this study show this functionality is being destroyed by exchange-traded funds.

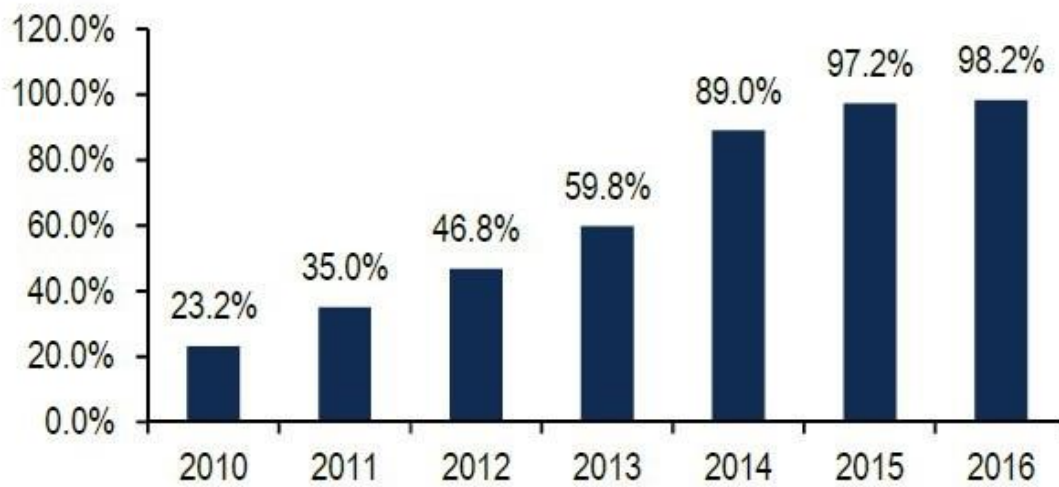
The fact that an exchange-traded fund could distort a stock's future movement by owning just 1% of a company's stock is stunning because ETFs and index funds are now very large owners of almost every major publicly-traded company. Consider these statistics about Vanguard, the largest seller of index funds:

Chart 1: % S&P 500 market cap owned by Vanguard



Source: BofA Merrill Lynch US Equity & US Quant Strategy, FactSet Ownership.

Chart 2: % Stocks where Vanguard owns > 5% of float



Source: BofA Merrill Lynch US Equity & US Quant Strategy, FactSet Ownership.

The implications of this chart are very important when combined with the insights from the ETF study (for reference, float means the shares of a company that are available for trading in the public market, i.e. shares not held by company insiders). The data show that Vanguard owns more than 5% of the shares of almost every company in the S&P 500 (to make matters worse, Vanguard is just one of many index fund and ETF providers). Note the huge jump from 2013 to 2014 where Vanguard went from having greater than 5% ownership of 59.8% of the companies in the S&P 500 in 2013 to having more than 5% ownership of 89.0% of the companies in the S&P 500 in 2014. It logically follows that the stock prices of virtually all the 500 companies in the S&P 500 are not reflecting business fundamentals, such as changes in profitability, based on the findings of the Israeli, Lee, and Sridharan academic study. That means nothing fundamental is holding up stock prices except the current optimism in the stock market, making holders of these risky investments extremely vulnerable to losses when investors' psychology changes.

If stocks aren't following changes in company profits, what are they following? The answer is: stock prices are being pushed up by the tidal wave of cash flowing into index funds and ETFs. This works fine while the money continues to come in, but what happens when investors stop adding money or even just slow their cash deposits from the current breakneck pace?

Key Points In This Section:

- The Israeli, Lee, and Sridharan academic paper shows that a small increase in ownership by passive investing vehicles in a given company's stock significantly impairs the ability for the stock's price to reflect real-world business values.

- Given the enormous percentage increase in passive ownership of every S&P 500 stock, it logically follows that the US stock market is dangerously disconnected from the true values of the companies it represents. The following sections will demonstrate this further.

Mike Green – Thiel Macro

Thank you to Realvision and the Hidden Forces podcast for the information on Mike Green

Mike Green is a portfolio manager at Thiel Macro, an investment firm that invests the wealth of technologist and businessman Peter Thiel. Thiel co-founded PayPal was the first outside investor in Facebook, and founded Palantir Technologies. He is known for his contrarian way of thinking, so it is not surprising that Green appears to have these tendencies as well.

Green has a Wall Street background, working in capital markets for about 30 years. He founded Ice Farm Advisors in 2014. He was managing director and portfolio manager at Canyon Capital Advisors, where he founded their New York office and grew their assets under management to \$2 billion. Green is a CFA charter holder and received his bachelor's degree from Wharton. He is well-regarded in finance circles and has presented his research on the effects of passive investing to the Federal Reserve, Bureau of International Settlements, (BIS) and the International Monetary Fund (IMF).

Green has said his expertise is figuring out when people are forced to do irrational things in markets. Regarding the dominance of passive investing in the investment industry, Green says that many market participants who are old enough to remember previous market cycles realize there is something dramatically wrong with the current environment, but they have difficulty explaining what it is. Active management, the process of investing in stocks based on individual company research, has underperformed index funds so dramatically during the post-2008 cycle, there is a great deal of angst and fear for the future of the careers of analysts and portfolio managers. As a result, active investors are hesitant to speak out because they do not want to call further attention to their subpar performance, and they believe any comments about the markets being dysfunctional will be perceived as sour grapes and excuse-making. However, Green believes those who see problems are correct, and the issue is enormous for the future of the financial markets.

Bill Sharpe is a Nobel Prize winner in economics from Stanford University. His work underlies some of the basic academic finance theory that is taught in colleges around the world. Sharpe's 1991 paper, *The Arithmetic of Active Management* was one of the great boosters in forming the theory of the passive investment movement. In summary, it stated that investors in aggregate cannot outperform the market after fees and taxes, so passive investment is the optimal strategy for most investors. However, the paper makes assumptions that do not hold in the real world. Specifically, it assumes passive investors do not transact in the market, when clearly, they are buying securities when they place their money in a passive index fund or exchange-traded fund. Stock markets are reflexive systems, meaning the act of participating on the buy or sell side affects the market. Envision an auction where additional buyers enter the room. The sellers, seeing this, will think about demanding higher prices. Then, when the sellers learn the buyers do not care about price and need to buy before the auction is over, the system adjusts, and prices steadily rise with

the influx of value-agnostic buyers. As we will see shortly, this assumption is critical in markets today, as large money flows into passive funds have become a dominant feature of markets in the modern era.

Some observers have said the outperformance of passive strategies relative to active is due to the removal of unskilled investors from competing in the market, as they have left voluntarily by purchasing index funds. This theory supposes that markets are now more efficient, since only the highly skilled professionals remain and the easy marks have retreated to the safety of passive investment. This view, however, is incorrect. As Green details using the facts below, the massive, unidirectional money flows into passive funds has caused stocks to act increasingly like a single herd of sheep, walking in unison.

According to Green, at the end of 2018, passive investment has risen to 47% of the assets under management of equity funds up from 5% in 1995. This is a tremendous shift. As a result of passive investing becoming the default strategy for most individuals, financial planners, and retirement assets, Green argues this has drastically changed the functioning of the stock market. Since passive investing only decides to buy when clients add money and sell when clients redeem, this has made markets entirely dependent on money flows and inherently unstable. Prices are now determined largely by the billions of dollars flowing into passive investment strategies, and these flows have been a one-way-street positive as passive consistently gains market share. This has resulted in prices way out of line with true business values.

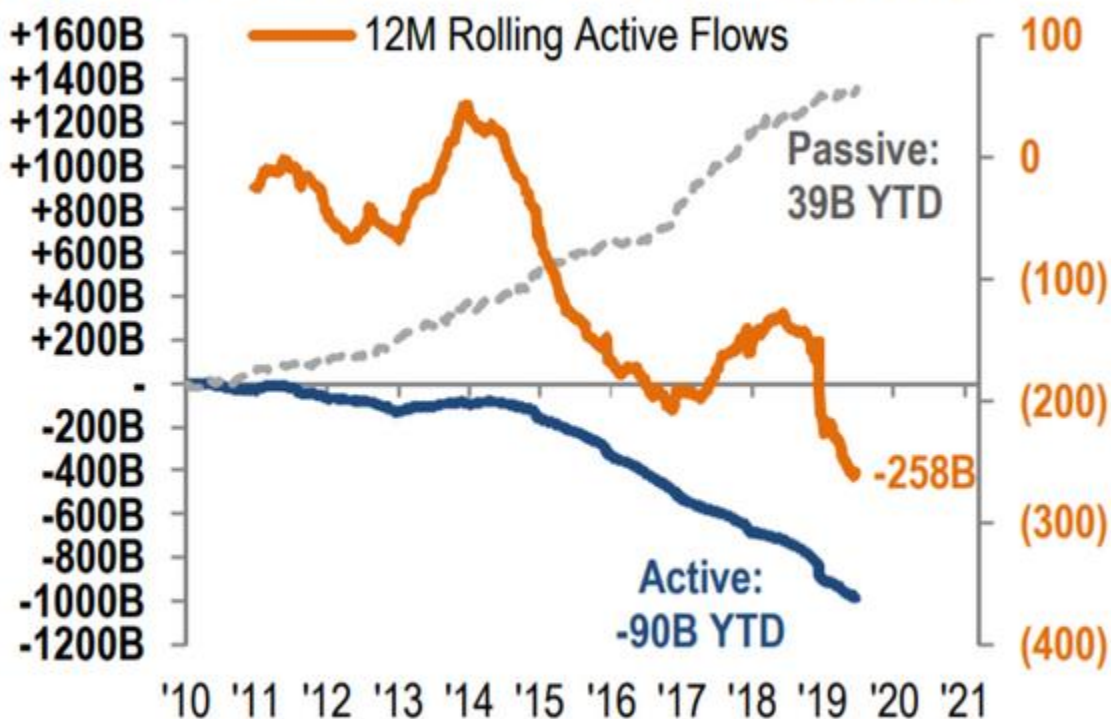
To see this, it is instructive to revisit why stock markets were originally created. Green notes the presence of liquid capital markets is a relatively recent phenomenon in history. Some participants view the market as robust but in practice, they are fragile. By changing the underlying inputs and assumptions of how markets work, they cease to function the way they have historically.

The historical role of a stock market is to give liquidity to buyers and sellers. For example, an executive who owned a lot of stock in his company may wish to diversify his holdings or use his wealth purchase another asset, so he needs to find a buyer for some or all his stake. Before stock markets were created, he would have to find a person or several people who would be willing to buy what he was selling, a slow and cumbersome process. Stock markets established a central location and designated times when shares of company ownership could be exchanged. In this way, owners of corporations could much more easily sell their shares for cash, while individuals with money to invest could easily buy a stake in many different businesses.

Implicit in the interaction between buyers and sellers was the fact that each party was doing an independent calculation of the intrinsic value on the shares being exchanged and acted in his own best interest. Sellers would not transact unless they believe they are obtaining a fair price for their shares. Buyers would not risk their capital unless they believe the share price represents a good value in relation to the company's profits and that the price is likely to appreciate in the future. Passive investing, however, destroys this relationship. Green describes passive investing as a very dumb algorithm. It operates as follows: 1: Did the client give me cash? Then buy every stock in the designated index. Or 2: Did the client ask for his cash back? Then sell every stock in the underlying index to satisfy the demand for cash. There is no thought of the underlying value of the companies in the index.

The academic premise for passive investing is that investors could be free riders on the efforts of skilled investors and securities analysts who set market prices by their informed buying and selling. If passive investing remains a small fraction of the money flowing into the market, this was a valid assumption. However, when passive investing became the dominant flow of money into the market, passive investors ceased to be “free riders” on the valuation principles of active investors and instead set prices themselves. Simultaneously, active management is withdrawing money from stocks in aggregate because investors have been net sellers of these strategies for the past several years. This exacerbates the market’s inability to trade on fundamentals. See chart below.

Figure 2: 12M Active Outflows at Record



Source: J.P. Morgan US Equity Strategy, J. P. Morgan Prime Brokerage, EPFR

This means passive buyers, who do not value the companies, are setting the prices. The assumptions underlying the case for passive investment have broken down completely and resulted in absurd stock prices significantly divorced from company fundamentals. This void between price and value can only exist if passive strategies continue to take in money and remain the dominant source of flows. Should money exit passive strategies in the aggregate, the underlying unstable and dangerous system will be revealed as prices collapse to fundamental value.

Passive Investing Flow Analogy: The Carnival Balloon Game



There is a popular game at boardwalks and amusement parks where players each have a water gun and a designated clown head, which inflates a balloon as water is sprayed into the clown's mouth. Green has said this is a good analogy for what is occurring in the stock market due to passive money flows. The objective of the carnival game is to spray the water stream into the mouth of your designated clown and be the first to pop the balloon. If you are competing against a group of people in this game, the best strategy is to team up with a friend and have him concentrate his water stream on your clown instead of his own. That way, you have double the stream of the other players and will win the game easily. Passive investment is like having 9 out of 10 players all spraying their water into one clown's mouth. This is continually causing the passive players to win the game, but it is all due to the concentrated flow of water (i.e. money), not due to the superiority of the underlying stocks. The investments that are riding the passive investing phenomenon are seeing their prices surge, but this performance is wholly disconnected to the intrinsic merit or value of the investments.

Why can't this go on forever? If investors keep shoveling money into passive strategies, shouldn't valuations stay at elevated levels indefinitely? Thinking about passive market share as stock vs. flow is helpful here.

If you elect to invest \$200 of your paycheck every pay period into a passive strategy, this \$200 will “flow” into passive. That means the asset manager running the strategy will take your \$200 in cash and buy all the stocks in the index. Afterwards, you own shares of the index fund or ETF, and your money is now part of the “stock” or money that has already been invested. When we say “stock” we do not mean shares of stock, we mean existing supply like the inventory of a grocery store can be called the store’s stock. Until you redeem your \$200 from the passive asset manager, your money remains in the passive manager’s stock and never re-enters flow as a sell order. The passage of time brings us closer to the endpoint where passive stock becomes more than half of professionally managed US equities as passive gains hundreds of billions in new assets each year.

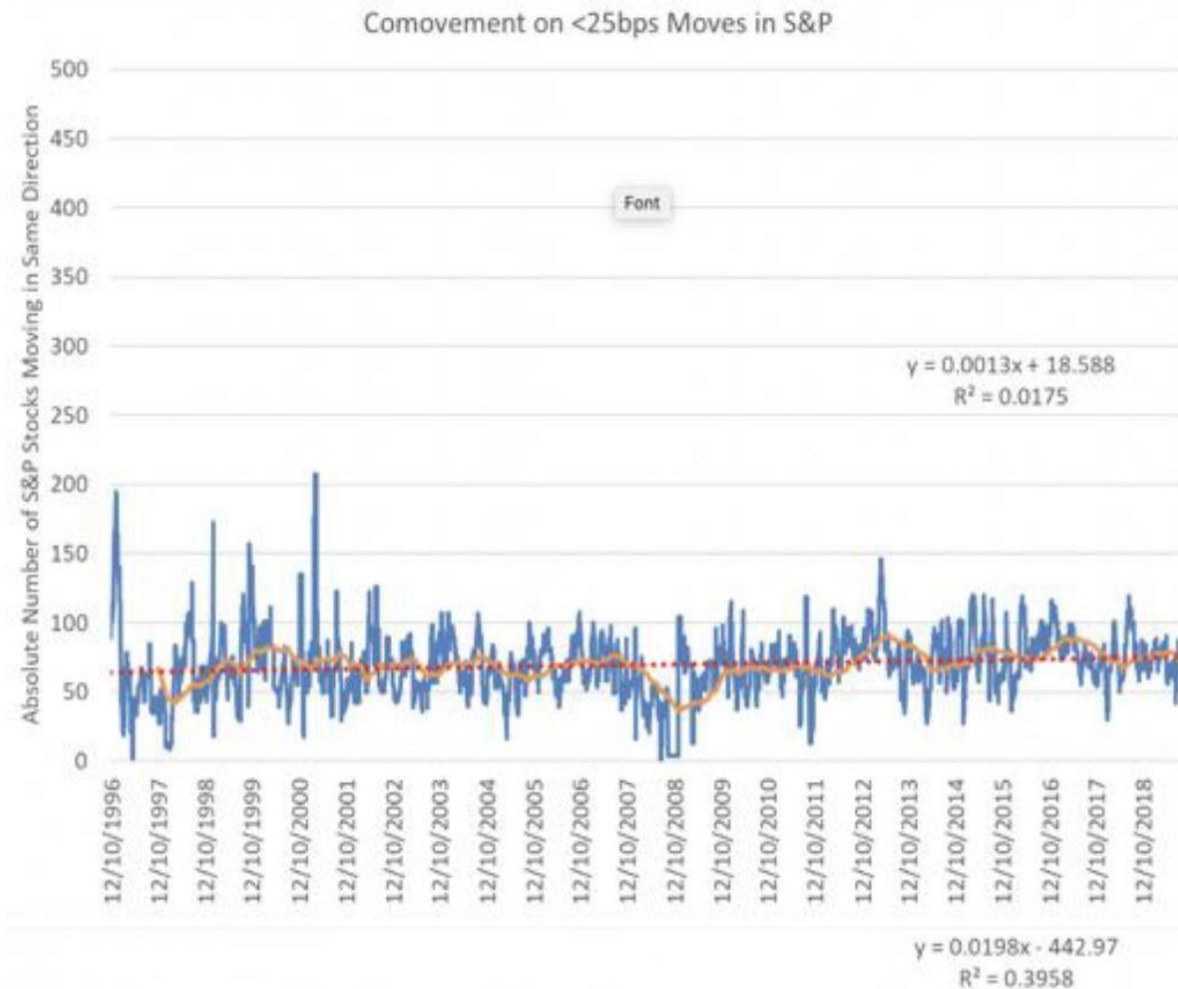
Passive “stock” is now approaching 50% of all professionally managed money. This is up from 5% in 1995. Again, once passive flows enter the stock of passive holdings, they stay there until the passive investor redeems. At 50% market share, the chance that a portion of these investors will want to convert their index holdings into cash via redemption is higher by the day. When you consider demographics, where retiring and aging baby-boomers become net sellers of stocks, and business cycles, where a reversal in the unemployment rate will cause those losing their jobs to sell stocks, it is easy to imagine how the stock of passive will enter flows as sales. When this happens, our balloon game will instantly go from 9 streams of water inflating one balloon to a complete silencing of the guns. Flows will turn from buying to selling and the game will be drastically different.

Evidence For Herding Behavior Caused By The Dominance Of Passive Investment Strategies

Index fund supporters believe that if the large money flows into the market from passive investment were causing stock prices to rise from all the buying (not on fundamentals), that stocks should be increasingly moving together as a group, meaning that the movement between each stock’s price would be more and more correlated. So, why haven’t we seen correlation increase between individual stocks?

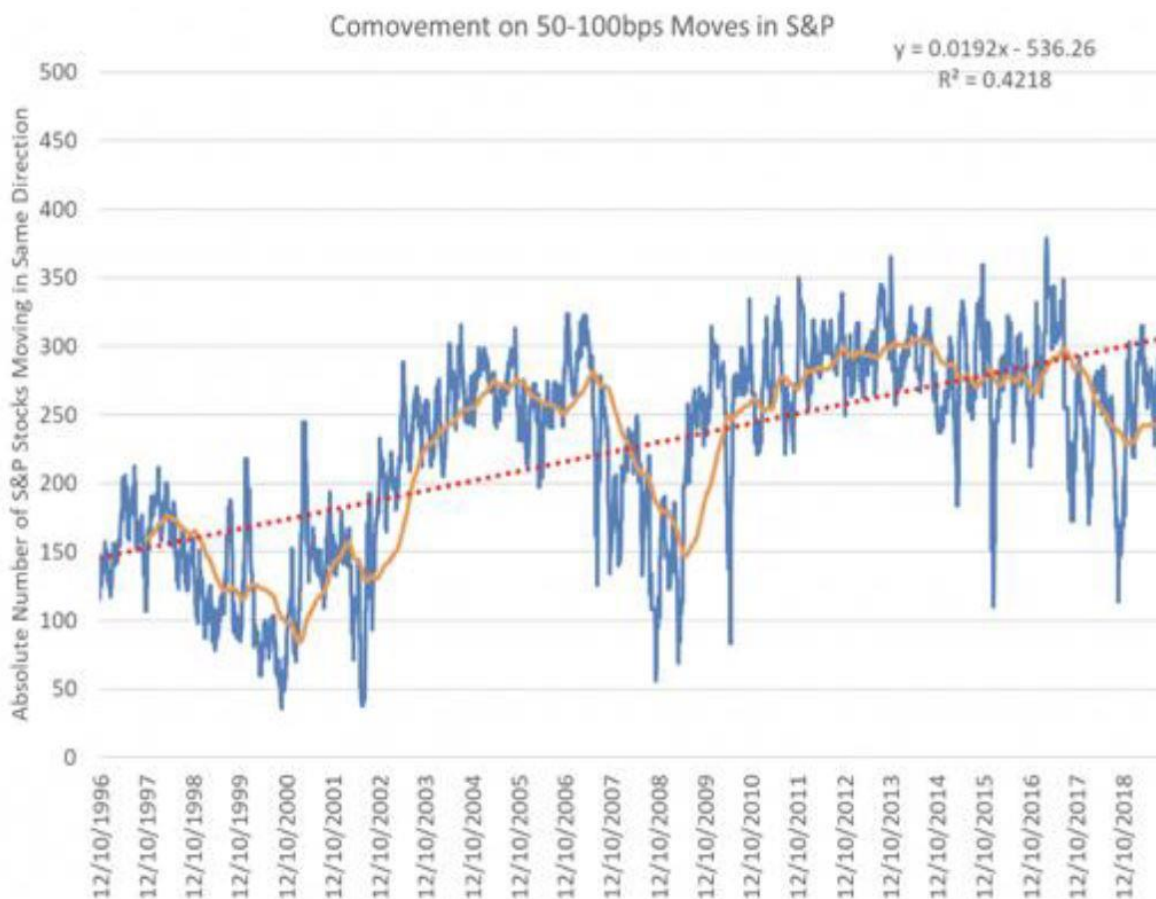
The reason is that stock market volatility has been extremely low during recent years. It is difficult to measure the movement of different stocks relative to each other if stocks as a group do not move much at all. In 2017, the market had the highest number days where it moved 25 basis points (0.25%) or less in the entire history of the U.S. stock market. This means stocks are fluctuating very little compared with their historical volatility. Some investment analysts have also wondered, in a supposedly efficient market, why the daily moves could be so small during a period of rapid technological and societal change.

The chart below (from Mike Green and the Hidden Forces Podcast) shows that the co-movement of stocks in the S&P 500 is very low on days where the market moves 25 basis points or less, due to the lack of overall market volatility:



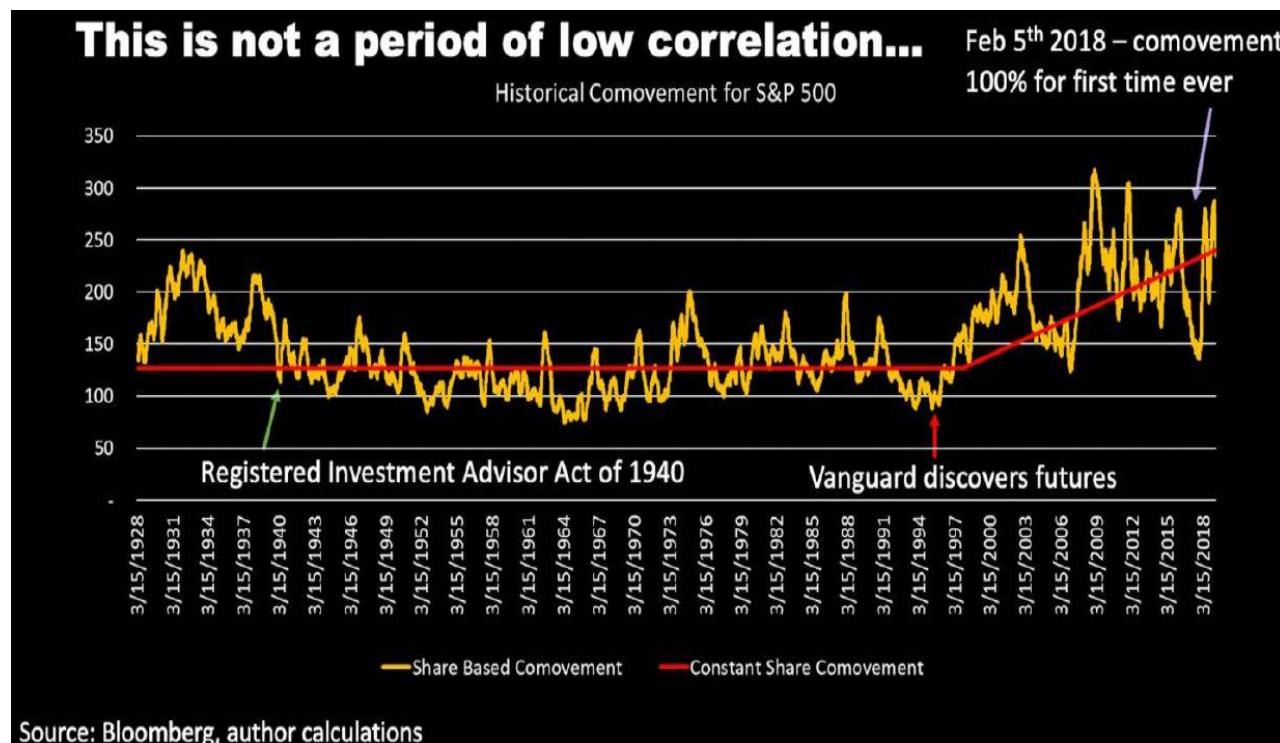
There is no pattern in this chart. Co-movement, or the number of stocks moving in the same direction up or down, has not changed much over time on days when the overall market has moved less than 25 basis points.

However, Green shows that if we analyze the movement between stocks on more volatile trading days, such as during market moves of 50 to 100 basis points (0.5% to 1% daily market moves up or down) a clear and persistent trend in rising co-movement emerges. Observe how the dotted red line slopes upward and to the right in a pronounced trend. This is clear evidence of how passive investment is causing all stocks to move together as passive takes a larger share of the market each year.



As the tendency of stocks to move as a group becomes more extreme, the U.S. stock market is starting to do things it has never done before. In January 2018, there was a dramatic surge in the S&P 500 that culminated at the end of that month. February 2018 brought a reversal in trend, with stocks selling off sharply. Then, on February 5, 2018, for the first time ever, every stock in the S&P 500 moved in the same direction -- down. According to Green, this did not even occur during the historic stock market crash of 1929, the black Monday crash of 1987, or the global financial crisis in 2008. In December 2018, every stock in the index fell together on two additional days as the S&P 500 had its worst December performance since 1931. As of this writing, we have not had a market correction of the magnitude seen in 2018. Given the rising co-movement and increased index penetration in the American stock market, the authors of this report believe that the events of 2018 were merely previews of an ultimate crash. Green's work suggests this as well, saying that as passive investing becomes a larger and larger share of the markets, stocks will begin to react in a discontinuous fashion.

See the following chart below from Mike Green and the Hidden Forces Podcast. Co-movement of U.S. stocks was constant from 1928 until 1996, which was when indexing strategies began taking off significantly:



Other Facts From Mike Green’s Analysis Of The U.S. Stock Market

Parallels to the Destruction of XIV: During the sell-off of February 2018 discussed above, an obscure exchange-traded fund called the XIV blew up and went to zero in a matter of days. Professional and retail investors used this fund to speculate on lower volatility in the markets. Volatility exploded when the stock market sold off and the fund essentially went bankrupt. The reason for this is the XIV fund used futures contracts to achieve its objective and its position became so large to where it became basically the entire market for VIX (volatility futures). Once the price of the futures began dropping, there was almost no one to sell to and the fund collapsed. This setup has obvious parallels to the passive investing environment. As passive becomes a larger and larger share of the market, it eventually *becomes* the market (if it has not already). This dynamic produces the gradual melt-up phenomenon as money is added to passive each year. However, when the passive investment industry experiences a cash outflow (something that is inevitable given its size and the aging of overall U.S. population), there will be no one to sell to on the other side of the trade. The only logical outcome in such a supply/demand mismatch is a violent stock market crash.

Models Show Alpha Trending to Zero: Green conducted computer simulations to model stock market behavior in a trading environment increasingly dominated by passive investing. In this model, alpha (the ability for active portfolio managers to outperform a benchmark) declines in almost a linear fashion with increased passive share of the market. This occurs right up until the moment the stock market breaks. The authors of this report believe the investing environment of the past several years validates this phenomenon, as many great investors, particularly value investors with stellar multi-decade track records, seem to have “lost their touch,” coincidentally all during the previous few years. As a result, another tenet of the academic case for indexing is violated, because there is little to no incentive to be an active investor if active management is experiencing dramatically worse returns than passive. How can active managers entice clients to invest assets with them and incur the expense of research and analysis when there is no performance incentive to do so?

Market Activity on Earnings Releases: Since index funds only follow their simple algorithm described above, they do not incorporate any data from firms’ quarterly earnings releases. For the active management community and anyone doing fundamental analysis on a company, however, earnings releases are critically important, because revenue, profit, and cashflow are the core building blocks in of any calculation of what a given firm is worth. Green’s research has shown that on earnings release days, stocks trade as if their float is significantly reduced. Float is simply the number of shares available to be publicly traded (the remaining balance of a company’s shares outstanding may be held by parties such as a founder like Microsoft’s Bill Gates who holds a significant block of shares for the very long-term, so these shares are never available in the market). Since passive funds are not trading in a stock during earnings days, the available shares for trading are much less than usual. This leads to wild swings in the stock price. Green has seen this trend increasing each year.

Target Date Funds: Target date funds were introduced as a “set it and forget it” option for retail investors, particularly in their retirement accounts like 401(k) plans. Conventional portfolio management stipulates that younger workers have a large stock allocation and a smaller bond allocation in their portfolios. As workers approach retirement, the equity allocation should decrease while the bond allocation increases. Since it is difficult for individuals to constantly rebalance their accounts, the investment industry created target date funds to do these adjustments automatically. An investor simply buys a fund that is associated with his desired retirement date (i.e. the year 2040 target date fund) and he needs to do nothing else until retirement. The fund itself adjusts the stock and bond mix for the investor.

The growth of target funds has been explosive. From zero assets in 2003 they were worth \$2.7 trillion in 2019. Vanguard has reported that 80% of their clients will be in a target date fund by the year 2023. Many clients’ 401(k) accounts contain only one target date fund and no other assets. So, it is imperative that these funds be executing a sound investment strategy because investors have bet all their retirement assets on them.

Mike Green reports that these target date funds are the largest purchasers of negative-yielding sovereign debt. During the summer of 2019, the yields on bonds of countries like Germany slipped even further into negative territory than they were previously. Target date funds and other bond

funds are buying increasing amounts of negative-yielding debt just because the bonds' prices are increasing. Bond index funds, like stock index funds, buy each asset in the index in proportion to size. For a bond, the weighting is calculated on the market value of the bond. Therefore, as yields of sovereign debt go negative, target date funds and index funds *buy more* of these bond issues because their price has gone up and their weighting in the index has increased. This makes no sense in the real world of investment analysis because a negative-yielding bond has a **guaranteed loss** to the investor if held to maturity. The more negative the yield, the less you should buy, especially if there are more attractive alternatives, like positive-yielding U.S. Treasury bonds. However, the passive algorithm does not incorporate common sense and just does what it is programmed to do, creating huge distortions in the markets.

Key Points In This Section:

- Mike Green explains how passive investing is like a very dumb computer program. It buys when clients deposit cash. It sells when clients withdraw cash.
- The spectacular performance of the US stock market over the past decade is largely due to cash deposited into passive strategies, which is the buying phase of the passive computer program. When the computer program goes into the selling phase, we will see catastrophic price declines.
- Mike Green has shown how the increase in passive assets is causing stocks to move together as a group, without reflecting the changes in profitability of the individual companies.
- As passive investing approaches the critical threshold of 50% of managed assets under management, Mike Green's simulations show the functionality of the stock market will completely break down. This is the endpoint of passive investing and the authors of this report expect a stock market crash will be the result, although the timing is uncertain.

Horizon Kinetics

Horizon Kinetics is a value-oriented firm in New York City that has documented many of the absurdities and market distortions caused by the rise of passive investing. Co-founders Steve Bregman and Murray Stahl have written extensively on this topic and their writing is freely available on their website for further reading.

We highlight just a few of their observations in this section.

Concept of Float

In Horizon Kinetics' April 2018 market commentary, they pose the question whether index funds are part of the market's "float." In investing, float is the portion of a company's shares available to be publicly traded. The remaining portion of shares that are not part of the float is not available

for stock market transactions because it is held by company insiders, founders, the company's pension plan or stock ownership plan, or a major shareholder that is a long-term investor.

Companies that have a small float relative to their total shares outstanding may experience volatile price swings, due to demand for shares fluctuating over a relatively small number of shares available for the market to trade.

In a free market, an investor, either an individual or an institution, purchases shares he believes will rise at some point in the future. When the investor's price target is met, he will consider selling those shares to someone else in the market (or perhaps events do not go as planned and he sells at a loss). Thus, given a high enough price, some percentage of investors will always be willing to transact in the market to a willing buyer.

Passive investing destroys this relationship. Unless the end investor in a passive vehicle asks for his money back, passive funds never sell a single share. Since the passive management industry has gained money year after year, even in the 2008 crisis, the indexing titans have never had to test demand from the market by selling their holdings. They have only bought shares. As a result, their sustained purchases have steadily removed very large portions of stock from the market (please see the section on Vanguard and State Street ownership of S&P 500 components). This has a significant effect on price as the supply of shares is going down while demand is constant or increasing. Therefore, stocks that are in popular indexes rise continually and drops are quite rare and short-lived over the past decade. Passive's great performance record is created by this mechanism but one can see it is clearly unsustainable.

Launching an ETF or an Index: Favorable Back-tests and Liquidity Are Prerequisites

A recurring theme in Horizon Kinetics letters is how liquidity and favorable back tests are required to launch a new exchange-traded fund (ETF) or index. Without these two factors, there is no client demand because performance is what sells on Wall Street during the passive era. Having liquidity means that the stocks that are selected as holdings of an ETF must trade significant volumes of shares per day, so they can accommodate the concentrated flows of money without moving the share price very much at once. In investing, a back-test is a process where a model using historical stock prices is used to show how the investment strategy would have performed had it been implemented in the past. However, as the ever-present investment disclaimer states: past performance is no guarantee of future results.

By building the liquidity and past performance biases into the strategies which are dominating the positive flows of money into the stock market, passive strategies are continuously distorting stock prices. By prioritizing liquidity, only the largest and most favored companies are receiving the bulk of the new money invested. By prioritizing historical performance, these strategies are causing what has performed well in the past to continue to perform well in the future, which is often not justified by the fundamentals of the stock prices behind the companies.

Key Points In This Section:

- Horizon Kinetics poses the question whether the assets held by index funds and ETFs are part of the stock market's float: the shares that are available to be bought and sold in the stock market.
- Since passive funds never sell unless they have a redemption and there have been no net redemptions from these funds, even in 2008, it logically follows that shares held by passive funds are not part of the float.
- As a result, the supply of shares in the stock market is continuously restricted while demand is strong, making stock prices surge and awarding passive funds with exceptional performance, despite lackluster earnings growth in the US overall.
- New passive investment vehicles are only created when tests using historical stock prices show they would have done well if started at a favorable point in history. This is classic rear-view mirror investing and has obvious pitfalls. Passive vehicles tend to favor the most liquid stocks, which favors the stocks that have already performed well. This tendency causes passive investors to buy more of the assets that are already expensive and less of the assets that are cheap.

Seth Klarman, Investing Legend, Predicted Passive Investing Problems in 1991

Seth Klarman, CEO of the Baupost Group, is a highly regarded practitioner of value investing. He has an excellent performance record from the inception of Baupost in 1982 and manages about \$29 billion.

Klarman's book on value investing, *Margin of Safety*, was written in 1991. It has been out of print and routinely sells for over \$1,000 given its author's time-tested value investing principles and stature in the industry.

Notably, Klarman predicted the rise of passive investing and its concomitant damage to the market when he wrote this 29 years ago on pages 64-66 of *Margin of Safety*:

Indexing is a dangerously flawed strategy for several reasons. First, it becomes self-defeating when more and more investors adopt it. Although indexing is predicated on efficient markets, the higher the percent of investors who index, the more inefficient the markets become as fewer and fewer investors would be performing research and fundamental analysis. Indeed, at the extreme, if everyone practiced indexing, stock prices would never change relative to each other because no one would be left to move them.

....

There are implicit assumptions in indexing that securities markets are liquid, and that the actions of indexers do not influence the prices of the securities in which they transact. Yet even very large capitalization stocks have limited liquidity at a given time. Owing to limited liquidity, on the day that a new stock is added to an index, it often jumps appreciably in price as indexers rush to buy. Nothing fundamental has changed; nothing makes that stock worth more today than yesterday. In effect, people are willing to pay more for that stock just because it has become part of an index.

....

More significantly, as *Barron's* has pointed out, "A self-reinforcing feedback loop has been created, where the success of indexing has bolstered the performance of the index itself, which, in turn promotes more indexing." When the market trend reverses, matching the market will not seem so attractive, the selling will then adversely affect the performance of the indexers and further exacerbate the rush for the exits.

The indexing phenomenon has gone much farther than Klarman could have imagined in 1991. However, his arguments are sound. We are presently very close to a hard endpoint, where passive strategies become so large relative to the active management funds they are poaching that the system can no longer sustain itself. This constraint, combined with valuations higher than the 1929 and 2000 bubble peaks, will be the catalyst that unwinds the indexing bubble.

Key Points In This Section:

- Seth Klarman predicted the distortions created by passive investing in 1991, although index funds and ETFs were very small at the time.
- Indexing makes the markets less efficient, meaning that prices do not react to changes in company earnings and future prospects.
- The performance record of passive investing draws more investors to adopt it, creating a self-reinforcing feedback loop. However, this cycle has hard limits and we are rapidly approaching them.

Individual Stock Absurdities:

The authors' primary expertise is in individual analysis of publicly traded companies. We have been analyzing and investing in US stocks since the late 1990s using a full-cycle value investing approach. Investment criteria are strict, but not prohibitively so. Since the late 1990s, daily computer screens have been able to identify hundreds of companies meeting the valuation metrics making them eligible for our qualitative research process. Names we followed began drifting above and away from our reasonable valuation targets in 2014 like a child losing their grip on a helium balloon. This piqued suspicion, and then gradually turned to shock, as the screens went

from hundreds of stocks to one hundred, to fifty, to ten some days and zero on others. Something wrested companies from their underlying fundamentals and this chapter will dive into the plumbing of individual names to show the mammoth stock holdings now in passive firms.

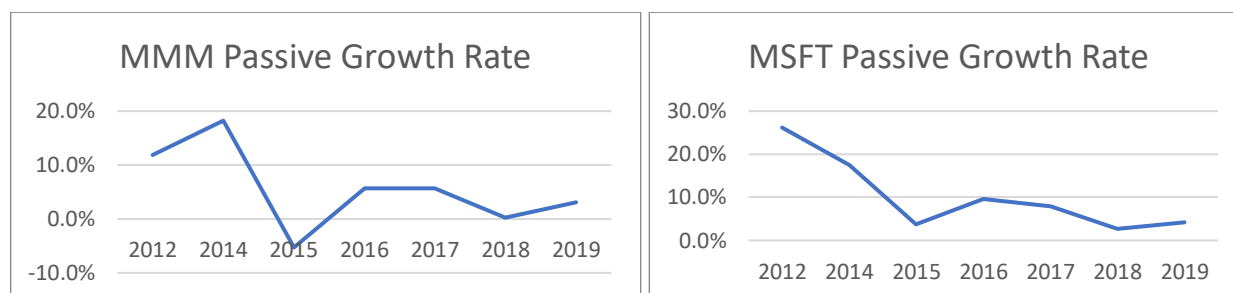
The below chart shows ownership data taken from Securities and Exchange Commission 13F filings for six “blue chip” S&P 500 companies. The below excludes data from Blackrock, the second largest passive firm, because the company did not consolidate its holdings in one filing until 2017. You can observe in many instances the percentage of Vanguard and State Street holdings to have doubled as percentage of shares outstanding from 2009! Once shares enter the vault of these passive companies, it is important to remember that they remain unavailable for outside buyers to purchase at any price. This crowding out exacerbates the effect of further passive flows.

Year	Company	Vanguard Shares (Millions)	State Street Shares (Millions)	Total Shares out (Millions)	% Passive
2009	Exxon Mobil	165	180	4832	7.1
2012	Exxon Mobil	214	191	4628	8.8
2015	Exxon Mobil	262	184	4196	10.6
2018	Exxon Mobil	340	203	4270	12.7
2019	Exxon Mobil	354	202		
2009	Microsoft	276	285	8996	6.2
2012	Microsoft	343	326	8506	7.9
2015	Microsoft	485	306	8254	9.6
2018	Microsoft	603	304	7794	11.6
2019	Microsoft	624	316	7753	12.1
2009	Bank of America	312	430	9938	7.5
2012	Bank of America	464	450	10778	8.5
2015	Bank of America	585	426	11214	9.0
2018	Bank of America	660	392	10237	10.3
2019	Bank of America	620	359		
2009	3M	24	53	707	11.0
2012	3M	34	52	703	12.3
2015	3M	41	45	626	13.7
2018	3M	50	43	602	15.4
2019	3M	51	42	585	15.9
2009	Abbott Laboratories	55	55	1555	7.1
2012	Abbott Laboratories	71	66	1592	8.6
2015	Abbott Laboratories	94	62	1506	10.3
2018	Abbott Laboratories	144	70	1749	12.1
2019	Abbott Laboratories	152	74	1770	

2009	McDonald's	39	45	1107	7.6
2012	McDonald's	51	51	1020	10.0
2015	McDonald's	55	44	963	10.3
2018	McDonald's	66	39	794	13.2
2019	McDonald's	68	39		

To reiterate, as passive strategies own larger percentages of US stocks, the expanding-valuation-party will continue only if passive consistently enjoys net inflows. When investors are net-buyers of passive strategies, there are two major effects on the underlying equities. First, all the shares that passive currently owns are unavailable for other investors to purchase at any price. This is a stealth decrease in the float, also known as the shares available for trading. Second, the passive strategies must allocate their daily net inflows as soon as possible at any price. Why? Passive is price and valuation agnostic. The sole aim of the strategy is to replicate the index. More money entering the strategy means cash as a percentage of the fund or ETF is too high, and the asset manager must buy the equities in the index regardless of price or valuation in order to match the percentage weightings.

The chart on **page 10** shows consistent outflows in aggregate across all active managers. In order to meet redemptions, active managers must sell equity holdings to raise cash for the redeeming investor. This has been happening the entire bull market cycle since 2009. Active has lost its voice in pricing US stocks. So what? Maybe passive is a superior strategy and the active managers have been too conservative in valuing companies. Not so fast. As we saw in December 2018, when passive must sell, finding buyers willing to transact at these elevated valuations is an ugly and volatile process resulting in material drops in stock prices. Looking at the above data, you might be able to detect a deceleration in the growth rate of passive ownership of the blue-chip companies. You would be correct. The growth rate of passive ownership percentage of stocks is slowing over time.



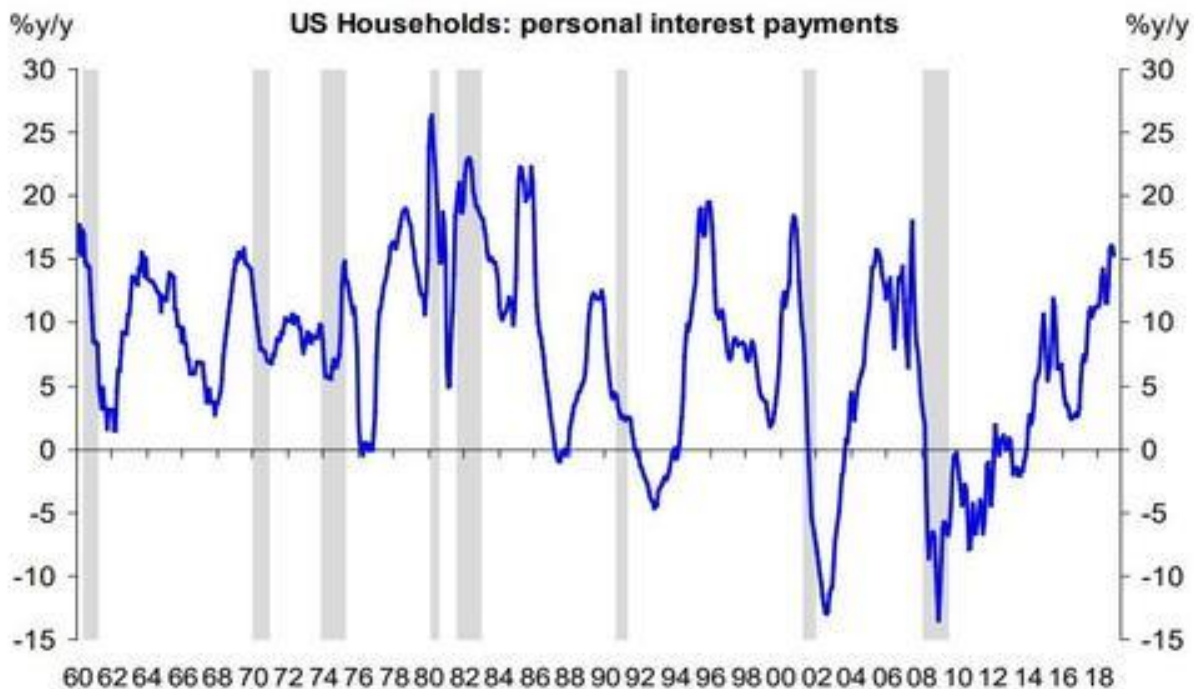
As you can see in these charts, passive, like any company winning market share, is a victim of its own success. The growth rate of passive stock ownership is trending down over time. Company researchers like ourselves talk about the “law of large numbers” as it pertains to companies, meaning wildly successful businesses like Apple can only win so much before they run out of potential customers and merely grow with global population. Finance guys call this the “terminal growth rate.” Worse, when you understand the stock and flow dynamics on stocks, (**page 11**) a terminal growth rate for passive is highly unlikely.

Apple's ecosystem of iOS applications, iCloud backup, and other seamless sharing and communication tools between Apple users keep customers on the upgrade cycle. In order to grow, Apple must not only win new customers but also retain the million and millions of existing customers who have purchased Apple products in the past. Apple's high switching costs and enviable network effects enable the company to keep its massive customer base and attract new buyers as they enter the mobile phone market for the first time. Unlike Apple, which has several defensible competitive advantages that keep customers coming back, passive investing is guaranteed to face net outflows at some point for several reasons.

Demographics mandate that Baby Boomers are retiring *en masse* and engaging in the largest wealth transfer in US history. Baby Boomers must sell stocks to fund lifestyles in retirement. Later, rather than retain the investment assets Baby Boomers have accumulated, it is understandable that younger generations, with millennials, the most indebted generation in US history among them, will elect to sell stocks in order to pay down debt. This uptick in selling will easily overwhelm the already decelerating growth rate of passive ownership, leading to net outflows. The two trillion-plus dollars in target date funds has saturated the market, making it difficult to acquire new customers to grow, and a natural part of the target date funds is to lower the equity allocation as investors age. In order to do this, these funds must also sell equities. Demographics put the existing customer base for passive investing at risk. These investors are not locked in by competitive advantages and must sell some or all their existing holdings over time. Thanks to the severely weakened market structure and shrinking pool of active managers, buyers for these stock sales will be difficult to find.

The business cycle also forces investors to sell stocks, especially the younger, indebted generations. Any person entering the workforce after 2009 has never experienced a recession, and this may be providing a false sense of security. The US unemployment rate has declined for over ten years, but history tells us recessions are a part of capitalism and unemployment will rise in the future. The below chart shows US household interest payments are rising at a rate normally seen before recessions, indicating households are already stretched thin, unable to make ends meet even with the US unemployment rate at extreme lows. Recessions are rife with job losses, and when employment income is lost, people must sell assets to make ends meet. Given that passive firms now control roughly 1 out of every 5 shares of the S&P 500, it is highly likely passive will suffer net outflows in the next recession, which will shock the markets as passive firms desperately look for buyers at any price.

Household interest payments rising 15% yoy



Source: BEA, Haver Analytics, DB Global Research

Even if the above negative events never transpire, current valuations require constant passive inflows to stay or increase from current levels. Unfortunately for those relying on past performance to guarantee future results, the slowing growth rate indicates that passive is in the process of saturating the market and additional buyers are increasingly difficult to locate. If passive firms merely hold all the shares they own with no new inflows or outflows, even this seemingly benign scenario will cause a material drop in valuations of US stocks. The answer again is in the flow of buyers and sellers. If passive flows are net zero, meaning those firms do not need to buy or sell any shares of US stocks, the largest, valuation-agnostic buyer of US stocks in the past decade no longer has a voice determining the day-to-day price changes. Instead, as observed in December 2018, stock prices will lurch and descend until buyers willing to transact are found. At the time of writing, valuations in general were 30% higher than December 2018, meaning passive flows have elevated US stocks far beyond where extreme volatility took hold the last time passive lost its control on pricing.

To better understand where investors concerned with valuation would be more likely to buy stocks, it is worth looking at individual names. We have attempted to choose relatively simple companies that have stayed true to their core businesses over the years. Though the businesses have remained consistent over the years, their valuations have expanded by a stunning amount to levels usually reserved for cutting-edge growth companies breaking into and taking over new markets. The below is by no means a condemnation of the business models of these companies. In fact, there are still

hundreds of high-quality US businesses trading on the exchanges today including the firms in this chapter. However, extreme valuations preclude disciplined, value conscious investors from purchasing them. As *MoneyLife's* Chuck Jaffee would say, “good company, bad price.”

VF Corp (NYSE:VFC)

On the micro level, here are some stats on VF Corp (NYSE: VFC) which is exactly in the middle of the S&P 500 in terms of price/revenue valuation. This company is average – it is not part of the high growth top decile nor is its business under threat, making it part of the “cheap” 10% of the S&P 500. VF Corp is a great example of valuation excess because it is not a sexy corporation. The company makes apparel like Dickies workwear and footwear like Timberland boots and has no budding technology or subscription service investors can use to justify its dangerously high



valuation. In fact, growth has slowed in recent years. Compared to the last twelve years, VFC now trades at a free cash flow yield about 50% more expensive than its previous record high. On operating income, the company is about 25% higher than its previous richest valuation. Given that operating margin and revenue decline in a recession and the US manufacturing index contracted five months in a row in 2019, a prudent investor might discount the valuation for a drop in

earnings rather than send it to its highest premium ever. VF Corp is excessively valued on any metric, and investors are likely to suffer losses in the long-term from these levels.

Fundamental investors often imagine purchasing the entire company in order to envision what an owner of the stock will receive in return on their investment. Instead of getting wrapped up in typical Wall Street jargon like Price to Earnings ratios, which are only loosely correlated to long-term returns, value investors will look at the entire enterprise, meaning both the equity and the debt, as well as the cash flow required for payback on an investment. For example, if you purchase a company for \$100,000 and the business produces \$10,000 of cash every year after expenses and taxes are paid, the payback period, if cash flows remain consistent, is ten years. There are lots of other factors to consider like growth and competitive advantages, but in general, a fifteen-year payback or less is in the ballpark of providing a risk-mitigating margin of safety to an investor.

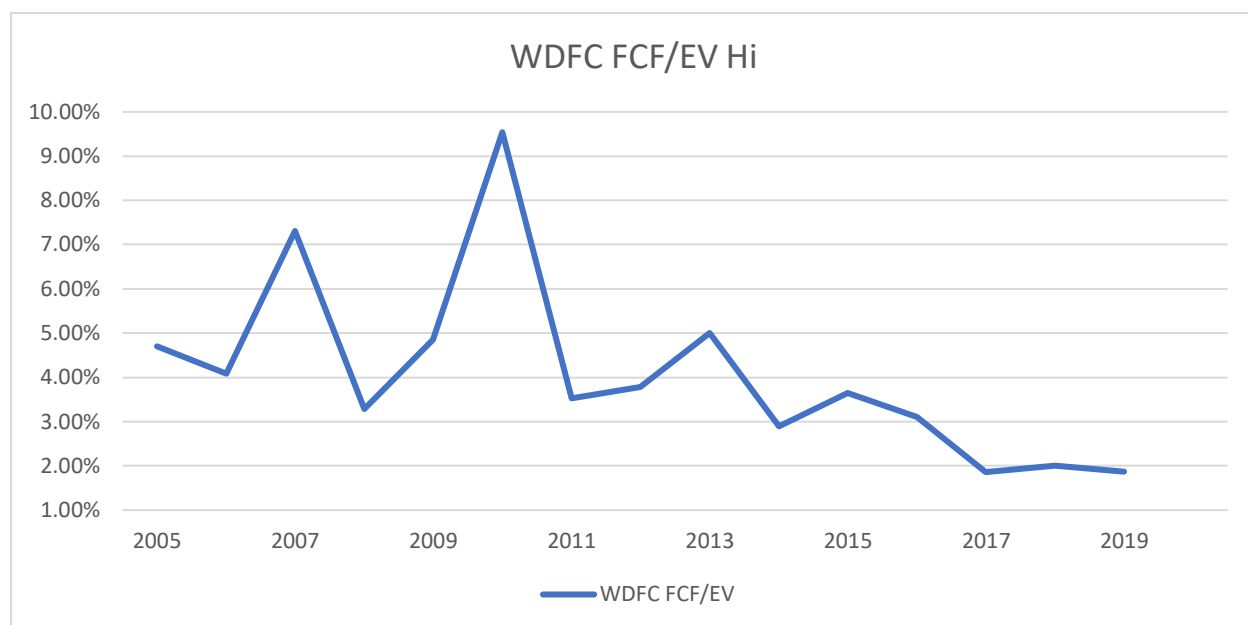
From 2008 to 2019, VF Corp has been offered at a cash flow payback of less than fifteen years in five of those years – the last time occurring in 2013. For those seeing low interest rates as the cause of valuation expansion it is important to note that the US Fed Funds rate was 0.14% on average in 2012, compared to 1.56% in 2019. The US 10-year bond average yield in 2012 was 1.80% compared to 1.71% in 2019. Interest rates in the United States have gone up at the short-end since 2012 and stayed relatively flat at the long-end. Revenue growth decelerated since 2013, with the VF Corp’s average growth rate falling to 3.6% compared to 8.8% for the period 2008 – 2013. Instead, passive inflows have moved the valuation of VFC since 2012, and the payback period on free cash flow on December 31, 2019 was approaching fifty years!

WD-40 (NASDAQ: WDFC) Almost everyone has the blue and yellow can of WD-40 lubricant in their garage. This universally recognizable brand is a consumer goods story so successful that fundamental investors have written entire case studies on the product. Somewhat unknown to the average investor, WD-40 is a stand-alone company. Most other consumer brands are part of larger conglomerates like Colgate-Palmolive Company (NYSE:CL) or The Procter & Gamble Company (NYSE:PG). This keeps the following case simple.

From 2005 to 2013, WD-40 at the expensive end of its range traded with an average free cash flow yield of around 5.1%. The authors calculate free cash flow yield as $(\text{Operating Cash Flow} - \text{Capital Expenditures}) / (\text{Market Capitalization} - \text{Cash} + \text{Debt})$. This means if an investor were to purchase the entire company, after all expenses and taxes are paid, the investor would receive 5.1% of their purchase price annually in cash. With the US 10-Year bond yielding an average of about 3% during this time period, investors opting to hold WD-40 received a risk premium of about 2% over US treasuries. Then, as passive flows began to dominate buy-side trading, something changed drastically.

From 2014 to the end of 2019, WDFC at the expensive end of its range had an average high free cash flow yield at the of around 2.6%. This may not seem like a large change from 5.1% but the way the math works, WD-40's valuation multiple expanded a startling 93%. The stock appreciated even more in this time period due to rising free cash flow. Compare that 2.6% free cash flow yield with the US 10-Year bond averaging a nearly identical 2.6% in the same time period. Keep in mind during the entire time period, 2005-2019, the company's product portfolio and revenue growth rate remained largely the same. It is also doubtful the average customer will double their WD-40 usage in the future, justifying a 93% expansion in valuation multiple. See the below chart.





Why take the risk of holding a company, even one as great as WD-40, if you can get the same cash coupon from a “risk free” US treasury? It may have something to do with the ownership table of WD-40.

According to SEC filings, Blackrock and Vanguard, the two largest indexing firms, held about 3.4 million shares of WDFC. Out of the total shares outstanding of 13.7 million, this represents a hulking 25%, so the two behemoths own roughly 1 out of every 4 shares outstanding. This does not include State Street, the third largest passive firm or any other potential passive holders. There are two conclusions to draw from the above.

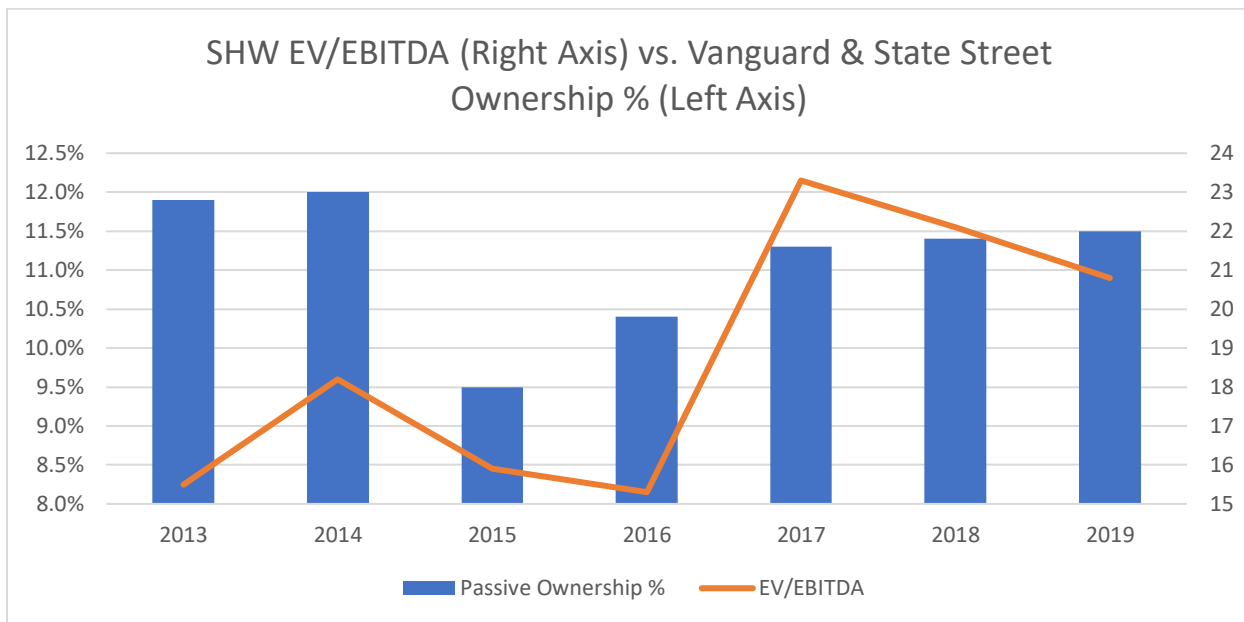
First, as Vanguard and Blackrock enjoyed large inflows over the past years, they purchased 25% of the company without regards to valuation. Second, should clients of these two firms ever need to sell, it would be extremely difficult to find a buyer both large enough and willing to transact at a record high valuation. If the indexing firms needed to sell just 10% of their holdings, natural buyers would most likely come from other existing holders of the stock. The problem is 10% of 3.4 million passive shares is 340,000 shares, and out of the 302 institutional holders of WD-40, only 7 hold more than 340,000 shares*! Some of these 7 firms also offer passive strategies and may also be looking to sell at the same time. Imagine trying to convince one of the other institutional holders to double or triple their position in a company with a valuation making it expensive to risk-free treasuries without the promise that no additional shares will be sold. After all, the algorithm dictates that if customers sell tomorrow, the passive firms must sell more shares. Worse, since indexing requires all the firm’s inflows and outflows to be allocated as quickly as possible, both buyer and seller know that the deal must be done before market close.

* <https://www.nasdaq.com/market-activity/stocks/wdfc/institutional-holdings>

This scary scenario becomes more likely by the day as passive firms gain additional dollars. The more shares passive firms own, the higher the probability of a complete shutdown or total loss of liquidity in individual stocks. This is because passive strategies are beholden to the actions of their shareholders. Active strategies, on the other hand, can elect to buy or sell without inflows or outflows. Of course, this weak market structure will only be illuminated when passive firms suffer net outflows. Until then, the inflow party continues with steady gains for all.

Sherwin Williams (NYSE: SHW)

SEC 13f filings from Vanguard and State Street show how much of each stock these firms own. As two of the three largest firms selling passive ETFs and mutual funds, Vanguard (largest) and State Street (third largest) are a good proxy for the passive market. The below excludes data from Blackrock, the second largest firm, because the company did not consolidate its holdings in one filing until 2017. Like WD-40, Sherwin Williams is a good example because it is a household name with a relatively easy to understand business – selling paint. Sherwin Williams is part of the S&P 500 making it a target of every passive product targeting the popular index.



As you can see in the above chart, from 2015 to 2017 the passive ownership of Sherwin Williams jumped from 9.5% to 11.3% of all the shares outstanding. This is a buying frenzy of 2 million shares without regards to valuation! Is it a surprise that in this same time period the valuation expanded 22% from 18x EBITDA to over 22x? Did prospects for selling more paint suddenly increase in 2017? Far from it. Fundamentally, business uncertainty was quite high in 2017, with the company ballooning its debt from \$2 billion to \$10 billion for an acquisition and suffering a gross margin collapse from 50.0% to 45.3%. Instead, passive investing drove the valuation to record highs without regards to the fundamentals.

In reverse, you can see by the blue bars that passive ownership as a percentage of the shares outstanding declined from 2014 to 2015. Following the orange line down, the valuation also decreased. What is strange about this? In 2015 gross margin increased from 46.4% to 49.0% and operating income grew 23.8% - by far the best operational performance in a decade at Sherwin

Williams. Yet, with passive firms selling without regards to the fundamentals, their influence punishes SHW's 2015 valuation with a contraction.

This example shows in both directions, passive buying and selling, the valuation of Sherwin Williams is moving on these flows instead of fundamentals. At the time of this writing, the passive ownership of Sherwin Williams was over 18.2% from just the big three firms – Vanguard, Blackrock, and State Street. This excludes other firms with indexing strategies and active firms like FMR LLC that run large passive index funds.

As you have seen in the previous pages, the passive firms have enjoyed a one-way street of inflows to their strategies – even through the financial crisis and bear market of 2008. Chillingly, with their market share reaching such material levels, the authors believe a complete breakdown of single-stock liquidity will eventually result. Sherwin Williams is just a microcosm for the entire US stock market, and this name proves flows are driving valuations, not fundamentals. Passive flows cannot remain positive indefinitely, especially as they have become, in many cases by 10 times, the largest holders in most US stocks. As of the time of this writing, the big three passives owned over 17 million shares of SHW. The next largest active holder is Capital World Investors with 4 million shares.

Key Points In This Section:

- Passive firms own roughly 20% or more of every US stock. As they accumulate shares the prices rise, but underlying liquidity is weakened.
- Should passive firms need to sell, their size makes it extremely difficult for non-passive holders to absorb passive supply.
- Passive flows have removed the causal relationship between company fundamentals and valuation.

Vanguard Founder Jack Bogle Privately Feared Indexing Would End In Tragedy

Even Jack Bogle, founder of Vanguard and the godfather of indexing, realized that he may have inadvertently created a monster. Here is a Tweet from Diana Henriques, author and *New York Times* contributor who interviewed Jack Bogle many times:



Diana B. Henriques

@dianabhenriques

Follow



I talked with him many times, and he was wonderful. But he realized, in recent years, that universal indexing could be the new tragedy of the commons: individually good, communally very dangerous. RIP, Jack. I will miss you.

Financial Times @FinancialTimes

John 'Jack' Bogle, founder of Vanguard Group and creator of the world's first index mutual fund, has died at age 89 — leaving an unassailable legacy as the pioneer and leading advocate of the \$10tn index investment universe on.ft.com/2FJzE1Z

7:28 AM - 17 Jan 2019

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Furthermore, in an interview with Yahoo! Finance in May 2017, Jack Bogle admitted that mass adoption of Vanguard's indexing strategy would lead to extreme stock market dysfunction. "If everybody indexed, the only word you could use is chaos, catastrophe, Bogle said. "There would be no trading, there would be no way to convert a stream of income into a pile of capital or a pile of capital into a stream of income. **The markets would fail.**" Although he later said he did not think this would happen because there would always be active investors to set the correct prices. However, given the extreme market distortions we have catalogued here, his confidence looks misplaced. Active asset managers, in aggregate, have been net sellers of stocks and therefore lack the ability to set the correct prices.

Thus, we are left with a conundrum. Indexing has performed vastly better than the great majority of mutual funds and hedge funds. The consensus of investment advisors, academics, journalists and even regulators is in favor of passive investing. Each year, passive funds acquire a bigger slice of the available stock in U.S. markets. Yet, even the founder of indexing giant Vanguard admits that if everyone followed this strategy, it would destroy the stock market. Given how badly active funds have lagged relative to passive, who will volunteer to invest their money at subpar returns so that index funds can function without killing the market? It appears logical and very likely that money will continually flow out of active management into passive until the stock market completely breaks down.

Key Points In This Section:

- Jack Bogle, founder of indexing giant Vanguard, conceded that everyone could not index because passive investors are free riders on the buying and selling of active investors. If everyone becomes a free rider, there is no one left to set prices accurately.
- Given the current trends, it appears highly likely that indexing will continue to become larger and larger until the market fails.

Passive Investing Is Simply The 1960s Nifty Fifty Writ Large

Financial history tends to repeat itself in similar ways, although investors' memories and historical awareness are usually quite limited. In the late 1960s and early 1970s, a group of fifty popular large companies were viewed as being the quintessential investments. All one had to do is buy and hold them forever and one would make money. These businesses and their shares were so good, the sentiment was, that one could pay any price for them and they would still turn out to be great investments. Since price was no object and investors were clamoring to buy, the prices rose to absurd levels versus the profits of the Nifty Fifty.

Since investors were concentrating their buying power on the Nifty Fifty stocks, the companies' share prices rose far beyond any rational levels in relation to the real-world performance of the underlying businesses. As is the case with indexing, the performance of the Nifty Fifty was spectacular and it persisted for a long time. This led investors to divert cash from other strategies and concentrate only on this select group of blue-chip stocks

In the book *Concentrated Investing* by Allen Benello, Michael van Biema, and Tobias Carlisle, the authors recount Charlie Munger's (Warren Buffett's right-hand man) experience with the Nifty Fifty:

Very concentrated investors' portfolios will suffer from tracking error, which, in simple terms, is the difference between the performance of the portfolio, and the performance of the market or benchmark. Seeking to avoid redemptions from clients for brief periods of underperformance, some managers become "closet indexers"—a manager who holds a portfolio in similar proportions to the benchmark against which she or he is measured. Munger recounts a story about J.P. Morgan Bank, which he says charged a quarter point—0.25 percent—per year to manage a portfolio to invest in the Nifty Fifty “and nothing else, and they bought it regardless of its price to earnings ratio.”⁶⁴

They were so successful at that that more and more money came in and it was going to be the same 50 stocks. The record was partly creating itself. And of course it eventually puffed up so high that it blew up in a big way. But that kind of success where you have a self-fulfilling prophecy for awhile, I don't count that as successful investment. It is successful for a long time. These people were regarded at J.P. Morgan as fabulous investors for a very, very long time—at a quarter of a point. And of course that problem is just endemic. That's why we have so many closet indexers. It can't work out very well because you got a zillion guys being paid to manage money who are a very substantial element of the market. There was a little of that at Berkshire nor GEICO.

All it took to burst the Nifty Fifty bubble was the 1973-1974 recession. The losses were devastating. Dr. John Hussman recently showed the performance of some of the top Nifty Fifty stocks over the 1973-1974 period:

Du Pont: -58.4% decline

Eastman Kodak: -62.1% decline

Exxon: -46.9% decline

Ford Motor: -64.8% decline

General Electric: -60.5% decline

General Motors: -71.2% decline

Goodyear: -63.0% decline

IBM: -58.8% decline

McDonalds: -72.4% decline

Mobil: -59.8% decline

Motorola: -54.3% decline

PepsiCo: -67.0% decline

Philip Morris: -50.3% decline

Polaroid: -90.2% decline

Sears: -66.2% decline

Sony: -80.9% decline

Westinghouse: -83.1% decline

The parallels to passive indexing are clear. Investors concentrated their buying power on the same stocks, consistently, without regard to price. The superior performance of these stocks led to more money chasing them, creating a positive feedback loop that eventually ended in collapse. Except today, during the passive investing mania, the phenomenon is *much* more widespread among investors, as 401(k) accounts, pensions, and target date funds all employ a passive investing strategy. The dollar amounts are orders of magnitude greater, but the underlying flaws and inevitable fall are the same.

Key Points In This Section:

- The Nifty Fifty in the late 1960s and early 1970s was essentially a microcosm of today's passive investing mania.
- The Nifty Fifty stocks declined catastrophically when the 1973-1974 recession hit.

Dr. Michael Burry – Hero of *The Big Short* - Believes Passive Investing is Distorting the Market

Michael Lewis's 2010 Book, *The Big Short*, told the stories of a group of brilliant investors who predicted the 2008 housing crisis and were able to shield their investors and profit from its aftermath.

One of the contrarian individuals in Lewis's book is Dr. Michael Burry, who was played by Christian Bale in the movie adaptation. Dr. Burry is a physician turned value investor who was among the first to buy credit default swaps from Wall Street banks, reaping billions of dollars for his investors after the collapse of mortgage bonds in 2007-2008.

Now, Dr. Burry sees a new bubble in the form of passive investing.

According to *Bloomberg News*, Dr. Burry said in September 2019, "The bubble in passive investing through ETFs and index funds as well as the trend to very large size among asset managers has orphaned smaller-value type securities globally."

Dr. Burry's expertise is finding undervalued stocks of smaller companies in the market. The passive indexation boom has had an outsized effect on the larger companies in the market (like Amazon, Microsoft, and JP Morgan) since they have greater weighting (or share) in the indexes.

What this means is, the larger the size of the company in the market, the greater the percentage of all the money from the index that flows to that company. So, for instance, since Apple is roughly 5% of the S&P 500, five cents of every dollar that flows into an S&P 500 index fund would be used to buy Apple stock, regardless of price. Since the stocks Michael Burry has been successfully buying for over 20 years have very little if any index weighting, there is no mechanism to bring them to fair value, especially as value investors and other active funds have seen clients redeem money.

Therefore, Dr. Burry is trying to find a way to realize value from these investments. Besides, the difficulty to his business, there is serious concern that the system is not functioning properly, which creates significant distortions in the U.S. economy. Indexing is essentially a momentum strategy. Its design gives more capital to the companies that are already large and successful, and less or none to small companies that lack capital, effectively freezing in place a free market system that is supposed to be dynamic and instead making it sclerotic. This has significant implications for future growth, inequality, and the stability of our markets and capitalist system.

Key Points In This Section:

- Dr. Michael Burry is a keen observer of financial markets. His contrarian style enabled him to predict and profit from the mortgage crisis when most of Wall Street was enamored with mortgage-backed securities.
- Dr. Burry sees a bubble in passive investing, which is distorting the market in unprecedented ways.

The Potential Endgame – What is Fair Value?

Myriad favorable factors support passive flows continuing into the US stock market. Positive press reports, a narrative of low fees producing superior returns, and law changes like the Department of Labor Rule, all contribute to the positive feedback loop for passive strategies. This makes it extremely difficult to predict the timing of an endpoint, but the underlying lack of fundamental support at these valuations also makes said endpoint inevitable.

When passive flows eventually stop or reverse, US stocks will once again have to stand on their own fundamentals. Valuations will return to historical averages. This section details the frightening gap between current valuations compared to historical levels. While the authors see this as an inevitable ending, we also believe current valuations can and will expand while passive flows remain positive.

The S&P 500 has reached its highest price-to-sales ratio in history at 2.36 times (price to sales compares the revenue of all the companies in the S&P 500 with the current stock market value of the S&P 500). This surpasses the peak of the dot-com bubble in 2000, which was the previous record. In a top-down analysis of the market, price-to-sales is actually much more strongly

correlated with future long-term returns than the current earnings of all the companies in the index, due to the significant variability of company profit margins over a complete economic cycle. This demonstrates why a full cycle analysis is very important when valuing a company. Many analysts simply extrapolate the current year's earnings forward which is a grave error in most cases. Price to sales eliminates these distorting variabilities and proves to be the superior long-term indicator. See the Bloomberg 1990-2020 price to sales chart below.

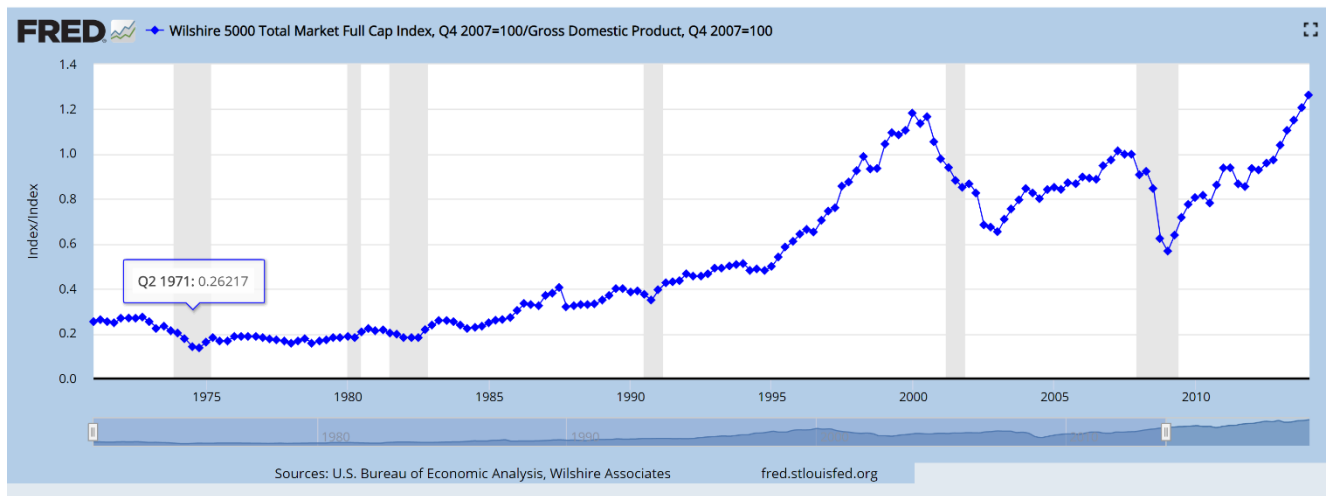


Worth noting is the Tech Bubble of 1998-2000 set the previous record in price to sales. During this period the economy was growing over 5% per year, the commercialized Internet was in its infancy, and the US federal government boasted a budget surplus. None of these positive forces were able to prevent the NASDAQ from falling over 80% from its peak in March of 2000. After the mania, markets returned to fundamentals. This is something that has reoccurred not only in United States' history but human history as well. An elevated Price to Sales ratio guarantees extremely low future returns and has a high probability for steep losses.

Could there be something wrong with the price to sales ratio? Maybe it has lost its predictive power of high price to sales means low future returns and vice versa. If this were the case, then we would be able to find other indicators showing stocks are cheap and passive flows have had little effect

on valuations. Yet, other highly accurate long-term indicators are telling the same story – stocks are lightyears beyond their fundamentals.

Warren Buffett and others have suggested a useful valuation indicator for the market is comparing the total value all the stocks in the market versus gross domestic product (GDP.) One way to calculate this is to use the Wilshire 5000 index, which comprises most of the publicly traded companies in the United States. Below is the chart showing this indicator using all the available data back to the 1970s. The information can be found on the Federal Reserve Bank of St. Louis's FRED website. The indicator also shows that the market valuation is even higher than the 2000 dot-com bubble peak!



What is different about conditions in the year 2020 that makes these valuations sustainable when the last time valuations were at these levels stocks crashed in the year 2000? It is difficult to make the case that economic growth and potential are higher today than they were in 2000. As for interest rates, it is important to note that the US Fed Funds rate was 0.14% on average in 2012, compared to 1.56% in 2019. The US 10-year bond average yield in 2012 was 1.80% compared to 1.71% in 2019. However, the price to sales ratio and market cap / GDP were both over 50% lower in 2012. This would directly translate into a greater than 50% decline in US stocks to merely return to levels in 2012 when interest rates were nearly identical to 2020.

Both price to sales and market capitalization to GDP are top down indicators that ignore the earnings of companies. Could there be something in company earnings justifying these valuations? Again, the answer is no. To look at earnings we prefer to use an average over a full economic cycle.

Yale professor Dr. Robert Shiller is a Nobel Prize winner, author of the seminal book on asset bubbles *Irrational Exuberance*, and creator of one of the more accurate long-term stock market indicators, the Cyclically Adjusted Price to Earnings Ratio, or CAPE. Shiller is more qualified to talk about asset prices and excess than most others in the world. On January 2, 2020, Shiller published an [opinion piece in the New York Times](#) with the following statement on the degree of market excess:

CAPE reached 33 in January 2018 and is almost as high now, at 31. That number might seem meaningless in itself, but it is significant when you consider that it has been as high or higher on only two occasions: 1929, just before the 85 percent stock market crash ending in 1932, and in 1999, just before the 50 percent drop at the beginning of the new millennium.

Shiller goes on to state that one of the hallmarks of bubbles are individuals shunning warnings from experts and refusing to see signs of excess. Whatever the reasons for the high valuation, the outcome is clear – a steep decline in stock market returns from these levels. You can ignore the beleaguered fundamental value investor and sour-grapes active managers, but should you ignore the Nobel laureate for asset prices who wrote the book on bubbles?

Price-to-sales compares company revenue with the firm's stock market value. Market capitalization-to-GDP compares U.S. economic production with the total value of the U.S. stock market. The CAPE ratio compares a long-term average of company earnings with the total value of the market. All three have proven to be accurate long-term indicators of future US stock returns. All three are showing extreme or record levels, indicating zero or below long-term returns for US stocks. Similar levels in the past like 1929 and 1999 have caused investors to lose money on equities in the following ten years. We don't know when it will end but we know fair value is much lower than here. Given that the underlying fundamentals are similar to other time periods, the only variable influencing valuations is the dominance of flows into passive strategies.

Key Points In This Section:

- Reliable metrics like Price to Sales, Market Capitalization to GDP, and CAPE are showing extreme valuations for US stocks.
- Extreme valuations always revert to the mean over time. Fair value for US stocks is at least 50% lower from early 2020 valuations.
- Passive flows have more of an influence on extreme valuations than interest rates, economic activity, or company fundamentals. This is an unsustainable phenomenon.

Potential endgame – Effect of a 50% Drop in Stocks

The previous section shows US stocks are trading at roughly twice their fair value, meaning a 50% decline in stock prices is required for companies to return to their historical average valuations. This sounds like an impossible drop but be aware US stocks have lost 50% or more on two occasions since the year 2000. Despite considerable irrational exuberance, hype, and growth, bubbles like the tech bubble of 2000 always pop and stock valuations revert to their mean.

Significant drawdowns in stocks have a twofold detrimental effect on investors' accounts. The obvious is the halving of value. The second and more dangerous is a psychological aversion to stocks causing investors to lower their allocation to equities at a time when they should be buying

more stocks through a rebalancing of their accounts. Imagine this scenario: you are 55 years old, your account is worth \$250,000, and you and your advisor decided on a 70% allocation to stocks and 30% allocation to bonds. This means you currently have \$175,000 in equities. After a 50% collapse in stock prices, your equity portion is worth \$87,500. You are sitting on a paper loss of \$87,500. CNBC and the rest of financial media are running stock market crisis specials trying to figure out what went wrong. You think of all the way more fun things you could have done spending that \$87,500 you lost. Mainstream media is questioning the validity of buying stocks as a long-term strategy while scary economic events like rising unemployment and recession perpetuate the airwaves. Does this sound like a time where you will bravely move the necessary \$45 – 50,000 from your bond allocation into stocks to return your allocation to 70-30? This is what a good advisor will recommend, and this is also what is required in order to have a shot at meeting long-term goals.

Even if you do have ice-water in your veins and maintain your investing discipline, at age 55 and up it will be extremely difficult to maintain lifestyle plans with a 50% drop in stocks. Here are some charts with different scenarios:

First, the (relatively) good news:

Date	Portfolio Type	\$ Bonds	% Bonds	\$ Stocks	% Stocks	Annual Contribution \$	Stock Return	Bond Return	Total Value \$	Client Age
12/31/2020	70-30	75,000	30%	175,000	70%				250,000	55
1/1/2021	70-30	75,000	30%	175,000	70%				250,000	
12/31/2021	70-30	67,500	39%	97,500	56%	10,000	-50%	-10%	175,000	56
1/1/2022	70-30	52,500	30%	122,500	70%				175,000	
12/31/2022	70-30	62,700	30%	136,300	65%	10,000	8%	8%	209,000	57
1/1/2023	70-30	62,700	30%	146,300	70%				209,000	
12/31/2023	70-30	64,581	27%	168,004	69%	10,000	8%	3%	242,585	58
1/1/2024	70-30	72,776	30%	169,810	70%				242,585	
12/31/2024	70-30	74,959	27%	193,394	69%	10,000	8%	3%	278,353	59
1/1/2025	70-30	83,506	30%	194,847	70%				278,353	
12/31/2025	70-30	86,011	27%	220,435	70%	10,000	8%	3%	316,446	60
1/1/2026	70-30	94,934	30%	221,512	70%				316,446	
12/31/2026	70-30	97,782	27%	249,233	70%	10,000	8%	3%	357,015	61
1/1/2027	70-30	107,104	30%	249,910	70%				357,015	
12/31/2027	70-30	110,318	28%	279,903	70%	10,000	8%	3%	400,221	62
1/1/2028	70-30	120,066	30%	280,155	70%				400,221	
12/31/2028	70-30	123,668	28%	312,567	70%	10,000	8%	3%	446,235	63
1/1/2029	70-30	133,871	30%	312,365	70%				446,235	
12/31/2029	70-30	137,887	28%	347,354	70%	10,000	8%	3%	495,241	64
1/1/2030	70-30	148,572	30%	346,668	70%				495,241	

12/31/2030	60-40	153,029	32%	349,640	73%	(24,762)	8%	3%	477,907	65
1/1/2031	60-40	191,163	40%	286,744	60%				477,907	
12/31/2031	60-40	196,898	43%	285,788	62%	(23,895)	8%	3%	458,791	66
1/1/2032	60-40	183,516	40%	275,275	60%				458,791	
12/31/2032	60-40	189,022	43%	274,357	62%	(22,940)	8%	3%	440,439	67
1/1/2033	60-40	176,176	40%	264,264	60%				440,439	
12/31/2033	60-40	181,461	43%	263,383	62%	(22,022)	8%	3%	422,822	68
1/1/2034	60-40	169,129	40%	253,693	60%				422,822	
12/31/2034	60-40	174,203	43%	252,847	62%	(21,141)	8%	3%	405,909	69
1/1/2035	60-40	162,364	40%	243,545	60%				405,909	
12/31/2035	60-40	167,234	43%	242,733	62%	(20,295)	8%	3%	389,672	70
1/1/2036	60-40	155,869	40%	233,803	60%				389,672	
12/31/2036	60-40	160,545	43%	233,024	62%	(19,484)	8%	3%	374,086	71
1/1/2037	60-40	149,634	40%	224,451	60%				374,086	
12/31/2037	60-40	154,123	43%	223,703	62%	(18,704)	8%	3%	359,122	72
1/1/2038	60-40	143,649	40%	215,473	60%				359,122	
12/31/2038	60-40	147,958	43%	214,755	62%	(17,956)	8%	3%	344,757	73
1/1/2039	60-40	137,903	40%	206,854	60%				344,757	
12/31/2039	60-40	142,040	43%	206,165	62%	(17,238)	8%	3%	330,967	74

This first chart shows a 55-year old starting with \$250,000 in 2020 contributing \$10,000 per year until retirement at age 65 into a 70-30 portfolio (70% stocks, 30% bonds) rebalanced annually. This scenario can weather a 50% drop in stocks and a 10% decline in bonds in 2021, if the investor both rebalances after the 50% drop by taking money from the bond portfolio and buying stocks and investing all the \$10,000 annual contribution to equities. Again, the mental wherewithal required to buy while there is blood in the streets is formidable. If these actions are taken, and the account enjoys “normal” annual returns of 8% from stocks and 3% from bonds, the account will support a 5% withdrawal rate starting at age 65 lasting easily past age 85. It is important to note that the 5% withdrawal amounts to \$24,762 at age 65 and reduces to \$17,238 by age 74. For most investors, lifestyle expenses stay flat at best, so a constant dollar withdrawal is necessary.

Date	Portfolio Type	\$ Bonds	% Bonds	\$ Stocks	% Stocks	Annual Contribution \$	Stock Return	Bond Return	Total Value \$	Client Age
12/31/2020	70-30	75,000	30%	175,000	70%				250,000	55
12/31/2030	60-40	153,029	33%	344,402	74%	(30,000)	8%	3%	467,431	65
1/1/2031	60-40	186,972	40%	280,459	60%				467,431	
12/31/2031	60-40	192,582	44%	272,895	63%	(30,000)	8%	3%	435,477	66
1/1/2032	60-40	174,191	40%	261,286	60%				435,477	
12/31/2032	60-40	179,417	45%	252,189	63%	(30,000)	8%	3%	401,606	67
1/1/2033	60-40	160,642	40%	240,963	60%				401,606	

12/31/2033	60-40	165,462	45%	230,241	63%	(30,000)	8%	3%	365,702	68
1/1/2034	60-40	146,281	40%	219,421	60%				365,702	
12/31/2034	60-40	150,669	46%	206,975	63%	(30,000)	8%	3%	327,644	69
1/1/2035	60-40	131,058	40%	196,587	60%				327,644	
12/31/2035	60-40	134,989	47%	182,313	63%	(30,000)	8%	3%	287,303	70
1/1/2036	60-40	114,921	40%	172,382	60%				287,303	
12/31/2036	60-40	118,369	48%	156,172	64%	(30,000)	8%	3%	244,541	71
1/1/2037	60-40	97,816	40%	146,725	60%				244,541	
12/31/2037	60-40	100,751	51%	128,463	64%	(30,000)	8%	3%	199,213	72
1/1/2038	60-40	79,685	40%	119,528	60%				199,213	
12/31/2038	60-40	82,076	54%	99,090	66%	(30,000)	8%	3%	151,166	73
1/1/2039	60-40	60,467	40%	90,700	60%				151,166	
12/31/2039	60-40	62,281	62%	67,956	68%	(30,000)	8%	3%	100,236	74
1/1/2040	60-40	40,095	40%	60,142	60%				100,236	
12/31/2040	50-50	41,297	89%	34,953	76%	(30,000)	8%	3%	46,250	75
1/1/2041	50-50	23,125	50%	23,125	50%				46,250	
12/31/2041	50-50	23,819	-213%	(5,025)	45%	(30,000)	8%	3%	(11,206)	76

The above table starts in the same scenario (\$250,000 start, \$10,000 contribution until retirement, 70-30, 50% equity market drop in 2021) and shows what happens from retirement at age 65 if the investor must withdraw a constant \$30,000 per year. For space saving purposes we condensed the table and showed the initial amount followed by a jump age 65 when withdrawals begin. Unfortunately, the account goes to \$0 by age 76. A \$250,000 account today cannot weather a 50% drop in equities even with rebalancing and contributions for the next ten years if the investor needs \$30,000 per year for expenses. That is tough news for a 55-year old. What about someone who is retired today and is already drawing on their accounts?

Date	Portfolio Type	\$ Bonds	% Bonds	\$ Stocks	% Stocks	Annual Contribution \$	Stock Return	Bond Return	Total Value \$	Client Age
12/31/2020	60-40	200,000	40%	300,000	60%				500,000	65
1/1/2021	60-40	200,000	40%	300,000	60%				500,000	
12/31/2021	60-40	155,000	55%	150,000	54%	(25,000)	-50%	-10%	280,000	66
1/1/2022	60-40	112,000	40%	168,000	60%				280,000	
12/31/2022	60-40	112,560	41%	175,840	64%	(14,000)	8%	8%	274,400	67
1/1/2023	60-40	109,760	40%	164,640	60%				274,400	
12/31/2023	60-40	113,053	43%	164,091	62%	(13,720)	8%	3%	263,424	68
1/1/2024	60-40	105,370	40%	158,054	60%				263,424	
12/31/2024	60-40	108,531	43%	157,528	62%	(13,171)	8%	3%	252,887	69
1/1/2025	60-40	101,155	40%	151,732	60%				252,887	
12/31/2025	60-40	104,189	43%	151,226	62%	(12,644)	8%	3%	242,772	70
1/1/2026	60-40	97,109	40%	145,663	60%				242,772	

12/31/2026	60-40	100,022	43%	145,177	62%	(12,139)	8%	3%	233,061	71
1/1/2027	60-40	93,224	40%	139,836	60%				233,061	
12/31/2027	60-40	96,021	43%	139,370	62%	(11,653)	8%	3%	223,738	72
1/1/2028	60-40	89,495	40%	134,243	60%				223,738	
12/31/2028	60-40	92,180	43%	133,795	62%	(11,187)	8%	3%	214,789	73
1/1/2029	60-40	85,915	40%	128,873	60%				214,789	
12/31/2029	60-40	88,493	43%	128,444	62%	(10,739)	8%	3%	206,197	74
1/1/2030	60-40	82,479	40%	123,718	60%				206,197	
12/31/2030	50-50	84,953	43%	123,306	62%	(10,310)	8%	3%	197,949	75
1/1/2031	50-50	98,975	50%	98,975	50%				197,949	
12/31/2031	50-50	101,944	54%	96,995	51%	(9,897)	8%	3%	189,042	76
1/1/2032	50-50	94,521	50%	94,521	50%				189,042	
12/31/2032	50-50	97,356	54%	92,630	51%	(9,452)	8%	3%	180,535	77
1/1/2033	50-50	90,267	50%	90,267	50%				180,535	
12/31/2033	50-50	92,975	54%	88,462	51%	(9,027)	8%	3%	172,411	78
1/1/2034	50-50	86,205	50%	86,205	50%				172,411	
12/31/2034	50-50	88,791	54%	84,481	51%	(8,621)	8%	3%	164,652	79
1/1/2035	50-50	82,326	50%	82,326	50%				164,652	
12/31/2035	50-50	84,796	54%	80,680	51%	(8,233)	8%	3%	157,243	80
1/1/2036	50-50	78,621	50%	78,621	50%				157,243	
12/31/2036	50-50	80,980	54%	77,049	51%	(7,862)	8%	3%	150,167	81
1/1/2037	50-50	75,083	50%	75,083	50%				150,167	
12/31/2037	50-50	77,336	54%	73,582	51%	(7,508)	8%	3%	143,409	82
1/1/2038	50-50	71,705	50%	71,705	50%				143,409	
12/31/2038	50-50	73,856	54%	70,271	51%	(7,170)	8%	3%	136,956	83
1/1/2039	50-50	68,478	50%	68,478	50%				136,956	
12/31/2039	50-50	70,532	54%	67,108	51%	(6,848)	8%	3%	130,793	84
1/1/2040	50-50	65,396	50%	65,396	50%				130,793	
12/31/2040	50-50	67,358	54%	64,089	51%	(6,540)	8%	3%	124,907	85

The above investor makes it through retirement, but the stock market decline significantly alters their lifestyle in retirement. Keep in mind this investor starts with \$500,000 which is roughly twice the balance of the average 401(k), and this investor also has a 60-40 allocation to equities which is arguably less aggressive than the average retiree. Even so, the account must immediately go from a 5% withdrawal rate providing \$25,000 to nearly halving the amount the retiree can access, or \$14,000. This amount only decreases over time as the 5% withdrawal rate is too large for the account to maintain its value. Again, for most of us, a drastic decrease followed by a steady annual decline of withdrawals in retirement is an insurmountable option. The numbers become more disturbing if the 65-year-old retiree needs to withdraw the same amount per year.

Date	Portfolio Type	\$ Bonds	% Bonds	\$ Stocks	% Stocks	Annual Contribution \$	Stock Return	Bond Return	Total Value	Client Age
12/31/2020	60-40	200,000	40%	300,000	60%				500,000	65
1/1/2021	60-40	200,000	40%	300,000	60%				500,000	
12/31/2021	60-40	150,000	56%	150,000	56%	(30,000)	-50%	-10%	270,000	66
1/1/2022	60-40	108,000	40%	162,000	60%				270,000	
12/31/2022	60-40	98,640	43%	162,960	70%	(30,000)	8%	8%	231,600	67
1/1/2023	60-40	92,640	40%	138,960	60%				231,600	
12/31/2023	60-40	95,419	51%	120,077	65%	(30,000)	8%	3%	185,496	68
1/1/2024	60-40	74,198	40%	111,298	60%				185,496	
12/31/2024	60-40	76,424	56%	90,201	66%	(30,000)	8%	3%	136,626	69
1/1/2025	60-40	54,650	40%	81,975	60%				136,626	
12/31/2025	60-40	56,290	66%	58,533	69%	(30,000)	8%	3%	84,823	70
1/1/2026	60-40	33,929	40%	50,894	60%				84,823	
12/31/2026	60-40	34,947	117%	24,966	83%	(30,000)	8%	3%	29,913	71
1/1/2027	60-40	11,965	40%	17,948	60%				29,913	
12/31/2027	60-40	12,324	-44%	(10,617)	38%	(30,000)	8%	3%	(28,293)	72
1/1/2028	60-40	(11,317)	40%	(16,976)	60%				(28,293)	
12/31/2028	60-40	(11,657)	13%	(48,334)	54%	(30,000)	8%	3%	(89,990)	73
1/1/2029	60-40	(35,996)	40%	(53,994)	60%				(89,990)	
12/31/2029	60-40	(37,076)	24%	(88,314)	57%	(30,000)	8%	3%	(155,389)	74
1/1/2030	60-40	(62,156)	40%	(93,234)	60%				(155,389)	
12/31/2030	50-50	(64,020)	28%	(130,692)	58%	(30,000)	8%	3%	(224,713)	75

The above account collapses in value from \$500,000 to \$0 by the time the investor is 72 years old if they attempt to withdraw a constant \$30,000 from the account per year. Clearly, a 50% drop in equities is devastating to anyone at or near retirement age, even if they rebalance their accounts according to the accepted asset allocation rules. Investors must engage in rapid and material reductions in their withdrawal rates after a market disruption of the magnitude shown in this section.

Key Points In This Section:

- According to numerous reliable long-term indicators, US stock valuations are roughly twice their fair values.
- Stocks eventually return to fair value otherwise we would be in a perpetual bubble.
- A slowing or contraction of passive market share will likely mark the top of the bubble.

- A 50% drop in stock prices causes drastic lifestyle changes for the average investor age 55 and up.

Conclusion:

Passive investment strategies have enjoyed extreme business success over the past forty years, and due to reflexivity, these investments have weakened market structure and liquidity. Only in the most recent economic cycle, as passive market share accelerated at the expense of active market share, did passive strategies reach a critical mass, overwhelming active price setting and liquidity-providing based on valuation. Currently, US equity markets enjoy a positive feedback loop where additional dollars allocated to passive strategies crowd out valuation-conscious liquidity and drive prices steadily higher. Over time, this must change, but the current environment will continue until passive market share declines.

Thought-leaders like Mike Green have identified potential end-points where US stock market liquidity collapses. Green and others have remarked on the simplicity of the “passive algorithm,” buying without regards to valuation on inflows and selling without regards to valuation on outflows. Passive strategies in aggregate have never seen annual outflows before, but since they now represent nearly half of all professionally managed money and roughly 20% of all major US stock ownership, this will inevitably occur. Therefore, a reversal of flows in passive will be devastating to US stock liquidity and result in an explosion of price volatility and instability.

Individual stocks detailed in this paper show the breakdown of the causal relationship between company fundamentals and valuation. Instead, passive flows and the removal of passive shares from float drive valuations higher. The dominance and success of the largest three passive firms has created a world where the “Big 3” own multiples of the largest non-passive shareholders. Even small percentage withdrawals from passive will require remaining existing active holders to double or triple their positions to absorb passive sales. Existing active holders will be unable and unwilling to provide buy-side liquidity for passive sellers at current valuations.

By most reliable metrics of US valuations, stocks are trading over two times their normal valuations. Other bubble periods like 1929 and 1999, where US economic prospects and demographics were arguably superior to the present, were unable to sustain extreme historical valuations. This time is not different. Stocks will revert to their long-term average valuations, which is at least 50% lower than the time of this writing. Though the authors expect stocks to continue to rise until the passive trend is exhausted, any additional appreciation will also be temporary as stocks always return to their long-term average valuations.

Demographics ensure a steady, predictable tide of selling as retirees take mandatory distributions from their accounts and reduce their percentage of equity exposure as they age. This selling will increase over time and has the potential to both reverse passive flows to net selling and overwhelm any remaining buyers of US stocks. A 50% drop in stock prices causes drastic lifestyle changes for the average investor age 55 and up. Withdrawal amounts must decrease materially or investment accounts risk depletion well before expected life spans.

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