

The Emperor's New Clothes - Balanced Portfolio Construction

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1. INTRODUCTION

There's a generally accepted approach¹ (often titled "Modern Portfolio Theory" or "MPT") by which 60/40 portfolios² are constructed. The effectiveness of this approach, relies upon a set of assumptions regarding the inherent behavioral attributes of the asset categories utilized. If these assumed attributes hold, then the generally accepted approach works, and adds significant value.

The objective of this article is to provide significant evidence that these assumptions do not hold. That the underlying asset categories, just flat out, lack the assumed (and required) behavioral attributes. If true, then the generally accepted approach is suspect and probably misleading. Perhaps, we reached this unfortunate circumstance through myopic thinking . . . decisioning based on:

- **Cherry Picking.** We cherry-picked both an isolated time period (from out of history) and restricted ourselves to a non-repeatable and non-representative geography. We narrowed our vision (myopia) to U.S. asset class returns during the post-industrial era (the last 74 years). Which diverge shockingly from returns representing the great breadth of geographies over the entirety of capital market history. The data³ speaks for itself. (Dimson, Marsh, and Staunton 2023), (Siegel and McCaffrey 2023).
- **Business Practicalities.** We need to sell. This earn-a-living practicality drives a business requirement for simple, easy, cheap, shiny bobbles. We seek technical solutions that readily produce an easily-communicated and resonate story, offering immediately supportive collateral (charts, graphs, metrics, wins and losses, and especially, simple-scoring), and the supposed deep relevance provided by numerous academic accolades and the occasional Nobel prize⁴. (MoneyGuidePro 2023).

¹ When I use the words "*generally accepted approach*", I am referring to the broadly accepted/utilized process, techniques, and approach by which most ultra-diversified end-client aggregate portfolios are constructed and maintained. I am referring here not to a slice or a segment of an end-client aggregate investment needs, but instead the totality of their investment needs.

² When I use the words "*60/40 portfolios*" I am using that as a short-hand label for ultra-diversified portfolios that the end-client uses as their final and complete solution. In other words, such a portfolio is viewed to be a nutritious meal as opposed to an ingredient. Obviously, I am not restricting the discussion to a portfolio allocated 60% to stocks and 40% to bonds, but am instead using that label as shorthand for ultra-diversified comprehensive client solutions. Solutions that may or may not include alternatives, and would span a vast range of risk levels. The key element here is that this article is referencing final aggregate end-client portfolios of varying risk levels.

³ In (Siegel and McCaffrey 2023) on Page 11, Roger Ibbotson states: "*I will admit that there's a selection bias with my data because I was looking at the United States. It's obviously . . . may not be representative of the future of other places around the world, or even the United States, of course . . . no question about it.*"

⁴ Harry Markowitz was awarded the 1990 Nobel Prize in Economics for having developed the theory of portfolio choice (based on his publications from the early-1950s).

- **Lack of Incentives.** No one has an incentive to question generally accepted practice. The benefits of being right are de minimis, accruing over multiple decades. The costs of being wrong are seriously painful, being immediate and severe. Logically, no rational actor would challenge existing practice and accepted norms.

If true (or sufficiently so), both retail and institutional investors would be better served by considering alternatives to today's generally accepted 60/40 portfolio construction process. But this is a difficult topic for many individuals to consider (willingly and with vigor) . . . for them to remain sufficiently open-minded so as to consider the arguments and examine the data. Here are four reasons why this is such a challenging topic:

- **Confirmation Bias.** Being good human beings, we have a strong propensity to restrict our examination of “news, data, information, articles, and thought-leadership” to those sources that are consistent and in strong alignment with, our already-held beliefs. We reject “news” and seek only “confirmation.” We don't want our beliefs changed or challenged; instead, we want them reinforced. (Aguilar 2021a).
- **Credentials.** The granting of credentials⁵ (or certifications) relies on the presumption of a pre-determined set of beliefs. Credentials are a cost-effective mechanism for signaling relevance, applicability, and usefulness . . . or just meeting some minimum standard. Many (if not most) investment credentials promote the existing 60/40 approach to portfolio construction.
- **Timeframe.** The success or failure of any investment strategy (or portfolio construction approach) doesn't reveal itself in five, ten, or fifteen years. Instead, causal success/failure is only revealed over the long expanse of time . . . which is defined by a journey through different environmental conditions (different paths taken by interest rates, inflation, GDP, energy prices, currencies, regulation, and investor risk-preference). But most people suffer from recency bias, i.e., they base their decisions on the latest information and ignore the greater history. This practical observation explains much/most of what investment products sell (or fail to sell), e.g., private debt strategies over the last dozen years. (Aguilar 2021b).
- **History.** Any valid consideration of this topic, requires a deep understanding of economic, societal, and capital market history. Not over the last 50 years, but over the last 150 years (probably more) . . . and a genuine appreciation for the overarching nature of episodic eras (and their well-grounded causality, they're not accidental) for most asset categories. For example, how the yield on the 10-year U.S. Treasury⁶ adjusted for inflationary expectations:
 - **Rose** by +1120 basis points from Dec 1976 to May 1984
 - **Fell** by -1160 basis points from May 1984 to Jul 2020
 - **Rose** by +1510 basis points from Sep 1916 to Aug 1929

Doing justice to this topic requires a book instead of a concise article . . . and unfortunately much of the validation underlying this article's argument must remain out-of-scope. Therefore, with the objective of being brief, I've restricted this discussion to:

- Defining the 60/40 portfolio construction approach,
- Assumed behavioral attributes of the underlying assets,

⁵ Examples of such certifications might include the CFA, CFP, or a PhD in Finance

⁶ The data, timeframe, and methodology can be found by considering the following reference (Brown 2022a)

- Statistical evidence that the assumptions don't hold,
- Does it matter?
- Damage doesn't end there,
- How did we get here,
- Our industry's pushback,
- Remedy - Possible paths for future research, and
- Conclusions.

2. DEFINING THE 60/40 PORTFOLIO CONSTRUCTION APPROACH

The 60/40 portfolio construction approach is relatively well-defined. If you follow certain precepts, you'll then earn certain attractive benefits (Collins 2021), (Shaw 2021). These precepts might be described as:

- Identify your investment time period,
- Specify your desired risk level,
- Determine the stock/bond split that delivers said risk level,
- Assemble a relatively constant/stable roster of asset categories to select from,
- Diversify across asset categories, ever greater diversification is better,
- Develop Capital Market Assumptions (CMAs),
- Mix asset categories according to their forward-looking expected means, standard deviations, and correlations (use an optimizer),
- Rebalance regularly so as to maintain the intended asset mix,
- Minimize costs, both direct and indirect,
- Avoid market timing,
- Bring adequate patience to the table, giving sufficient time for the portfolio to deliver its intended benefit,
- Remain humble, don't think that you can outsmart the market,
- Ignore the news and the talking heads, and
- Don't stir the pot, i.e., avoid the numerous behavioral biases.

Users of the 60/40 portfolio construction approach (Fabozzi and Grant 2001) might describe the expected benefits as follows:

- Experience a relatively dependable result,
- Earn a satisfactory rate of return,
- Outperform 80% to 85% of their less disciplined peers,
- Realize a high probability of achieving any reasonable and properly defined investment goal (i.e., "*it's just science*"),
- Achieve the approval/blessing of those who pass judgement upon them - since they've followed convention and accepted practice (Aguilar 2021a), (Keynes 1936), and (Means 2019), and

- Earn 7% per annum⁷, as claimed by the largest U.S. retail investment management firm: “*The goal of the 60/40 portfolio is to achieve . . . annualized returns of roughly 7%*” (Aliaga-Diaz 2022).

The 60/40 portfolio construction approach/process does allow for a few “extras”. These are generally considered optional. And if executed successfully, are contributive (and therefore value-added), but of insufficient size, dependability, or durability to change the fundamental outcome. Examples might include:

- Earn a little extra return through the use of talented and cost-effective active management, either:
 - Bottom-up - Individual stock- or bond-picking
 - Top-down - Temporary adjustments to the asset class or risk-factor weightings,
- Introduce a new asset category exhibiting relatively attractive differentiated attributes, e.g., physical reinsurance, farmland, timber, energy-transmission, or carbon sequestration, and
- Harvest a temporary market dislocation resulting from out-sized government intervention in the marketplace, e.g., the S&L crisis, when 32% (1,043 of the 3,234) of Savings & Loans were closed by the FSLIC and the Resolution Trust Corporation between 1986 and 1995. In 1996, the General Accounting Office estimated the total cost at \$160 billion, including \$132.1 billion taken from taxpayers⁸.

Such “extras” if successfully executed, might in a best-case scenario add an extra 100bps, net of all incremental fees, expenses, and uncertainty (risk)⁹. Why even bring up these extras? Because some suggest that these extras allow one to overcome the impediments/deficiencies upon which this article is premised . . . I suggest such a conclusion lacks both merit and basis.

3. ASSUMED BEHAVIORAL ATTRIBUTES OF THE UNDERLYING ASSETS

Few would argue with the portfolio construction precepts listed above. Most would agree that they’re contributive and value-added. But are they sufficient to deliver the expected benefits? No. Not unless certain assumptions hold concerning the inherent behavioral attributes of the various asset categories that serve as the building materials assembled during portfolio construction (Elton, Gruber, and Brown 2002). What are these required behavioral attributes:

- **Instability** - Return distributions for the various asset categories have sufficiently stable means, standard deviations, and covariance arrays. Distributions are not inherently unstable.
- **Regime Change** - Return distributions don’t experience regime change. The parameters describing a distribution, don’t have one set of values before a certain date, and a radically different set of values after that date, i.e., change meaningfully in general proximity to profound local or global events.

⁷ I take issue with this claim. But recognize that it’s a common and quite widely communicated view by almost all of the U.S.-based retail investment management industry.

⁸ This is a simple and well understood example of how outperformance has been achieved in the past (over and above simple passive Buy & Hold investment portfolios).

⁹ The words “*an extra 100bps*” should be interpreted as conceptual and not specific. However, if one examines the returns of foundations, endowments, and public pension plans here in the U.S. over the last 35 years, then the “*100bps*” figure would be considered to be unusually generous, i.e., collectively they delivered a negative alpha. That is why the words “*if successfully executed*” were used earlier.

- **Risk Without Return** - Asset categories provide positive returns if given reasonable and suitable time periods. Return distributions are not a source of uncompensated risk, e.g., investing for 40 consecutive years, not taking a single distribution, and still losing money.
- **Ex-Post Cherry Picking** - Conclusions about asset class return distributions are not based on extreme ex-post cherry-picking. Instead, they are fully representative of all time periods and all geographies. For example, basing one's conclusions on a unique and isolated time period, cherry-picked from out of all of history . . . and overlaying this sin with a second, i.e., selecting the best performing country (from out of all countries) for that cherry-picked time interval. In other words, not basing one's analysis on U.S. stock/bond returns during the post-industrial era (the last 74 years).
- **Episodic Eras** - Returns aren't inherently episodic. For example, the current yield on 10-year U.S. Treasury bonds (adjusted for the market's inflationary expectations) don't rise by 1290bps over 15 years, and then subsequently fall by 940bps over the next 26.4 years (as they did from late-1981 through early-2023)¹⁰. Or to put it more pointedly, an ultra-diversified global 60/40 portfolio doesn't deliver a loss of -4.5% over one 15-year period while also delivering a gain of +12.3% over a different 15-year period . . . forcing the investor to be always asking "*What sort of episodic era do I find myself investing in today and over the next fifteen years?*" Ideally, returns are iid (independent and identically distributed).
- **Trending And Momentum** - Returns exhibit sufficiently de minimis levels of trending and momentum. A consequence of such low levels would be that the return earned in one 15-year period is relatively independent of the return earned during the immediately preceding 15 years. High (low) returns don't inherently lead to low (high) returns.

If these attributes hold true (or sufficiently so), then one will be able to construct superior portfolios using the 60/40 approach . . . delivering the expected benefits. If not, then the foundation upon which our industry has built the 60/40 approach is unable to deliver the intended benefits and instead delivers a false and misleading sense of security, i.e., The Emperor's New Clothes. The next several sections sequentially examine these six assumed asset class behaviors. Statistical evidence is presented casting doubt on each . . . suggesting that the foundation upon which the 60/40 portfolio approach has been built is not all that dissimilar from a Florida high-rise condominium which cut corners during the design, engineering, and construction phases, ignored periodic inspections, and suffers from contrary incentive structures.

4. STATISTICAL EVIDENCE - INSTABILITY

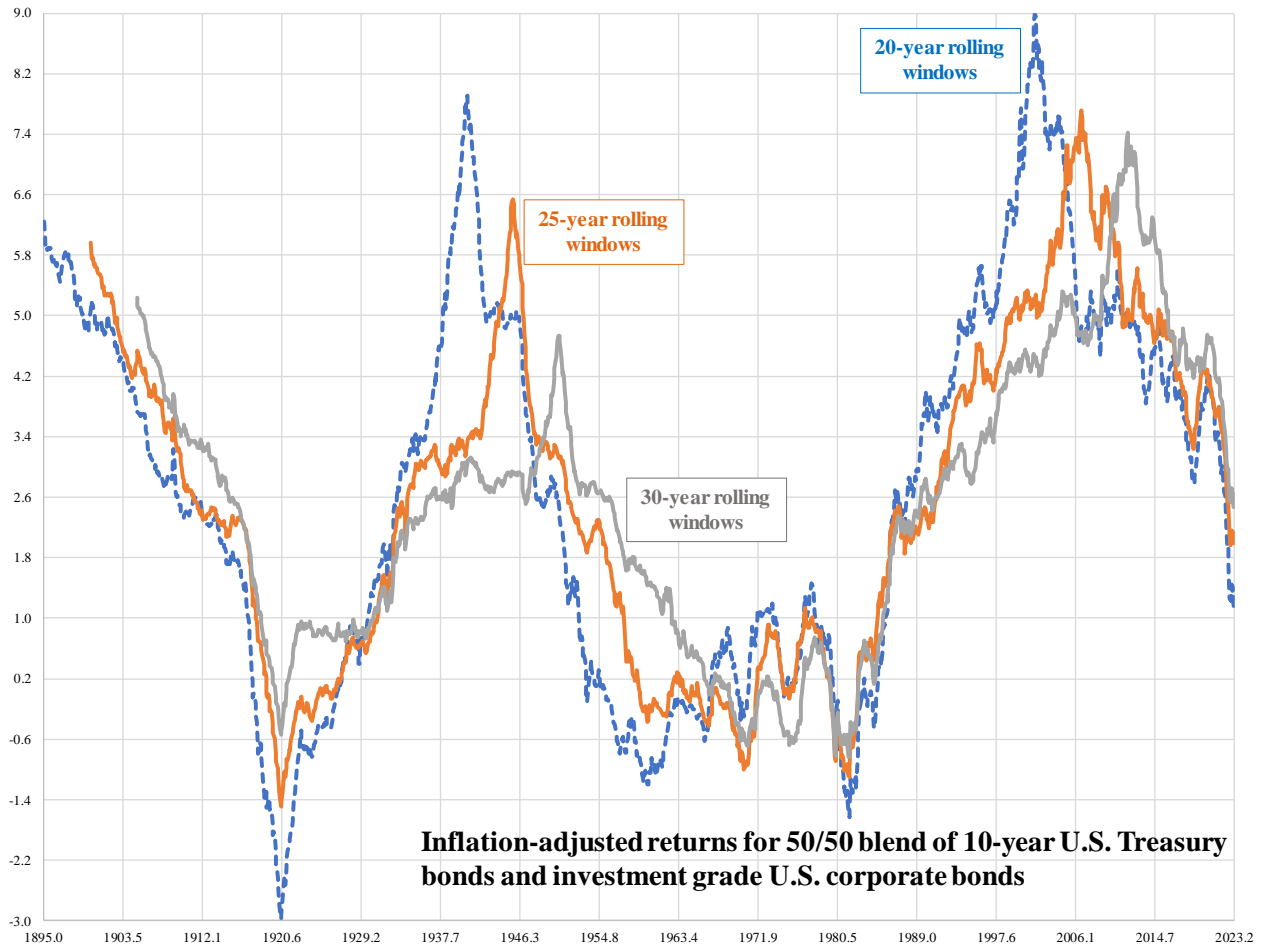
Let's begin with stability. Are asset class returns sufficiently stable? The generally accepted approach for the construction of 60/40 portfolios is to assume forward-looking summary statistics (means, standard deviations, and correlations). For example, perhaps it is assumed that investment grade U.S. bonds will return 3.3% over the next 30 years. But what if variability around this estimate of the future is too high? What if the likelihood of such a portfolio earning more than 6% or less than 0% excessive? This is an example of inherent instability. In statistical terms, this is

¹⁰ Data provided by Global Financial Data, Inc. The inflation rate used to adjust the yield on the 10-year U.S. Treasury bond is the CPI measured over a 7.5-year rolling time window that starts exactly 3.75 years in the past and ends exactly 3.75 years in the future. As a result, the inflation-adjustment is 50% backward-looking and 50% forward-looking. This approach is used because it is believed to provide a reasonable estimate as to then current inflationary expectations

characterized by a probability distribution with unstable (continuously varying) summary statistics. This article argues that asset class returns suffer from such instability.

To address this issue, we use the example of a domestic fixed-income portfolio, i.e., 50% 10-year U.S. Treasury bonds and 50% investment grade U.S. corporate bonds¹¹. Quick side note. All results presented in this article are inflation-adjusted, there are no exceptions. Exhibit 1 shows the returns for the bond portfolio over rolling 20-, 25-, and 30-year rolling time windows.

EXHIBIT 1 Asset Class Returns are Inherently Unstable



Standard deviations and correlations exhibit similar instability. Restricting ourselves to 30-year rolling time windows, the annualized standard deviation of monthly returns rose from 3.06% (30-years ending Sep 1908) to 7.91% (30-years ending Feb 2009), constituting a 159% proportionate increase. A remarkably high level of instability.

Similarly, the correlation between this bond portfolio and U.S. stocks¹² rose from 0.177 (30 years ending Jan 1906) to 0.565 (30 years ending Nov 1961), constituting a 219% proportionate increase.

¹¹ Data provided by Global Financial Data, Inc. Investment grade U.S. corporate bonds are a 50/50 mix of GFD Indices USA Total Return AAA Corporate Bond Index and the Dow Jones Corporate Bond Return Index (with GFD Extension)

¹² Data provided by Global Financial Data, Inc. U.S. stocks are defined as a 50/50 blend of S&P 500 Total Return Index (with GFD extension) and the Dow Jones Industrials Total Return Index (with GFD Extension)

Again, a remarkable level of instability. Bottom line, distributional parameters lack the required level of stability.

5. STATISTICAL EVIDENCE - REGIME CHANGE

Do asset classes experience significant regime change? Do they behave one way before some generalized moment in time, and then a different fashion thereafter? In other words, do behaviors “shift?” Exhibit 2 provides the evidence and is based on monthly returns spanning the time period from 1874 through the present. Its findings are based on shifts in the geometric mean return, standard deviation, return per unit of risk, autocorrelation (from one month to the next), and the correlations¹³ (relative to other asset classes) for each of seven asset categories¹⁴ and the ultra-diversified global 60/40 portfolio.

EXHIBIT 2

Each Major Asset Category has Experienced Regime Change

		U.S. corporate bonds (investment grade)	10-year U.S. Treasury bonds	International stocks	Gold bullion	International treasury bonds (GDP-weighted)	U.S. stocks	60/40 portfolio	Diversified commodities
Regime change (when it happened)		Jun 1914	May 1902	May 1950	Jun 1931	Jun 1920	Jan 1906	Feb 1920	Aug 1939
Return (annualized geometric mean)	<i>Before</i>	4.9	4.8	0.6	-1.2	-0.7	7.9	2.6	0.2
	<i>After</i>	3.0	1.2	7.6	1.7	3.1	6.5	5.6	2.7
Risk (annualized standard deviation of monthly returns)	<i>Before</i>	3.3	4.1	17.6	3.4	6.5	12.4	7.6	15.7
	<i>After</i>	6.6	6.6	13.9	15.3	9.3	17.9	9.5	13.8
Return per unit of risk	<i>Before</i>	1.51	1.16	0.03	-0.36	-0.11	0.64	0.34	0.01
	<i>After</i>	0.46	0.19	0.54	0.11	0.33	0.36	0.59	0.20
Autocorrelation (one month relative to the prior month)	<i>Before</i>	0.11	0.04	0.07	0.18	0.03	0.26	0.25	0.35
	<i>After</i>	0.24	0.19	0.13	0.04	0.11	0.07	0.10	0.08
Correlation (relative to other asset categories, the median)	<i>Before</i>	0.64	0.48	0.23	0.60	0.48	0.11	0.62	0.20
	<i>After</i>	0.41	0.24	0.34	0.10	0.30	0.18	0.40	0.13
Notes relevant to date of associated regime change		The US entered the 1910s as a country with a relatively undeveloped economy that operated in isolation from foreign interests. The inauguration of Woodrow Wilson as U.S. president in 1913, and with innovations from an up-and-coming new breed of bankers and businessmen, the 1910s brought awesome changes to the U.S. economy. Particularly with its entry into World War I (1914-18), the United States proved to the nations of the world that it had become a modern industrial power.	Agriculture, which had been the primary employer throughout the previous century, was gradually being replaced by industry. The US was expanding its economic interests around the globe and emerging as a world power. This business expansion meant increased wealth as raw materials became cheaper to obtain, driving prices down and consumption up. The decade was further marked by major technological innovations, such as the birth of the automobile and aviation industries.	Europe and Japan had to spend the immediate postwar decade undergoing extensive reconstruction, heavily dependent on official aid from the United States, yet over time Europe and Japan closed the technological and productivity gap with the United States.	In 1933, President Roosevelt took the U.S. off the gold standard when he signed the Gold Reserve Act in 1934. This bill made it illegal for the public to possess most forms of gold. People were required to exchange their gold coins, gold bullion and gold certificates for paper money at a set price of \$20.67 per ounce.	WWI ran from 1914 to 1918. The European Great Depression started in 1929 and ran through 1939. WWII ran from 1939 through 1945. European reconstruction began in earnest in 1947.	Although the 1900s had a generally optimistic economic outlook, the confidence of many Americans was shaken by the sharp stock market drop in 1907. The first sign of financial panic was a run on the Knickerbocker Trust Company of New York, which collapsed the banking and credit system. Confidence was restored because of the actions of the U.S. Treasury along with capitalists under the leadership of J.P. Morgan, who stabilized the banks and corporations with their own funds.	US prosperity soared in the 1920s as the manufacturing of consumer goods increased. Washing machines, vacuum cleaners, and refrigerators became every day household items. By 1934, 60% percent of households owned radios. By 1922, 60 radio stations broadcast everything from news to music to weather reports. Most of them used expanded credit offered by a booming banking industry. From 1926 to 1929, the number of people flying in planes increased from 6,000 to 173,000.	The 1950s saw the beginning of the reconstruction of a new global economy. Between 1950 and 1973 the annual real GDP growth of developed market economies averaged around 5 percent. This growth was smooth, with none of the major recessions seen in the interwar years. In the 1960s, the US began a permanent balance of trade deficit. In 1971 the US abandoned the gold standard and adopted a pure fiat currency, initiating a long-term period of US Dollar decline.

Based on data spanning Dec 1874 through Mar 2023, inclusive

¹³ The median correlation is used herein (correlations being between the identified asset class and the other seven asset portfolios identified in this exhibit)

¹⁴ International treasury bonds are defined by GFD Indices All-World x/USA Countries Government Bond GDP-weighted Return Index. Diversified commodities are defined by Reuters CRB Total Return Index (with GFD extension). International stocks are an equally-weighted blend of the following ten nations: Australia, Canada, Denmark, France, Germany, India, Ireland, Japan, New Zealand, South Africa, Spain, and UK. The ultra-diversified global 60/40 portfolio is defined as 10% commodities (5% gold bullion and 5% ultra-diversified commodities) and 90% stocks and bonds (allocated in a 60/40 blend, with the stocks equally-weighted between the U.S. an international, and the bonds similarly blended)

For each asset class, that single point in time (see the first row) when the six statistical metrics changed the greatest (collectively and in either direction). For example, consider the results for 10-year U.S. Treasury bonds. Treasuries might have experienced regime change in or around May 1902¹⁵. Prior to that date, the return, risk, return per unit of risk, autocorrelation, and median cross correlation were 4.8%, 4.1%, 1.16x, 0.04, and 0.48, respectively. But after May 1902, these six metrics came in at 1.2%, 6.6%, 0.19x, 0.19, and 0.24, respectively, i.e., the average summary statistic changed by 129%, proportionately.

Comparing these two sets of statistics suggests that the inherent and fundamental behavior of U.S. Treasuries was one thing before May 1902 and something profoundly different after that date. The animal changed its stripes, the horse became a cow. The last row of Exhibit 2 attempts to provide historical color/context surrounding the identified regime change, i.e., what were the developments that might have been associated.

Bottom line, the data suggests that regime change has been an integral part of asset class behavior, not for one asset class, but perhaps for all. If true, is this relevant for the future? Should we view regime change to be a likely prospect for the years/decades ahead? In an attempt to respond to this question, consider both the past and the future.

FIRST THE PAST

Consider the 1910s and 1920s. Are these 20 years never again to be repeated, or are they emblematic of the size/type of change/shock that is just so inevitable? These two decades witnessed:

- In Europe, the period is referred to as the "*Golden Twenties*" because of the economic boom following World War I (1914 - 1918). French speakers refer to the period as the "*Années folles*" ("*Crazy Years*"), emphasizing the era's social, artistic, and cultural dynamism.
- World War 1 (1914 - 1918).
- Russian Civil War (1917 - 1922).
- In the Soviet Union, the "*New Economic Policy*" was created by the Bolsheviks in 1921.
- After its reemergence in 1915, membership in the Ku Klux Klan rose to five million members by the early 1920s.
- In 1922, the fascist leader Benito Mussolini seized power in Italy.
- The Spanish flu (1918 - 1920) and the Russian typhus epidemic (1918 - 1922), which had begun in the previous decade, caused 25 - 50 million and 2 - 3 million deaths, respectively.
- In Germany, the Weimar Republic suffered from economic crisis in the early 1920s and hyperinflation of its currency in 1923.
- Turkish War of Independence (1919 - 1923).
- In the U.S., the era saw the large-scale adoption of automobiles, telephones, motion pictures, radio and household electricity, as well as unprecedented industrial growth, accelerated consumer demand and aspirations, and significant changes in lifestyle and culture.

¹⁵ May 1902 was the point in time when the five summary statistics changed the most, i.e., before this date versus after this date. This is not meant to imply that something happened on May 1902 to cause this change. Instead, the implication is that 10-year Treasuries behaved one way before this date and a different way after this date, i.e., regime change.

NEXT THE FUTURE

Robert J. Gordon, the respected growth-economist, suggests in his seminal works (Gordon 2016) that the rapid progress made since the end of WWII could well turn out to be a unique episode in human history (i.e., non-repeatable). The analysis links periods of slow and rapid growth to the timing of the three industrial revolutions (IR's), i.e., IR #1 (steam, railroads) from 1750 to 1830; IR #2 (electricity, internal combustion engine, running water, indoor toilets, communications, entertainment, chemicals, petroleum) from 1870 to 1900; and IR #3 (computers, the web, mobile phones) from 1960 to present. He provides evidence that IR #2 was more important than the others and was largely responsible for 80 years of relatively rapid productivity growth between 1890 and 1972. Once the spin-off inventions from IR #2 (airplanes, air conditioning, interstate highways) had run their course, productivity growth during 1972-96 was much slower than before. In contrast, IR #3 created only a short-lived growth revival between 1996 and 2004. Many of the original and spin-off inventions of IR #2 could happen only once - urbanization, transportation speed, the freedom of females from the drudgery of carrying tons of water per year, and the role of central heating and air conditioning in achieving year-round comfort across all geographies.

StepStone Group, the respected alternatives manager-of-managers, speaks to demographic collapse. By 2030, there will be around 30 million fewer people in the world's five key industrialized nations who're capable of working. With fewer workers in the future, a structural slowdown in economic growth looms, with serious consequences for innovation and prosperity. StepStone CEO: "*Alongside the climate crisis, the threat of labor shortage is the greatest economic and societal challenge of the 21st century*" (Stepstone 2022).

Bryan Walsh, editor of Vox's *Future Perfect* section (Walsh 2023), speaks to the existential risk associated with population and fertility. Fewer babies were born in New York City in 2020 than any year on record, while the US population grew by just 0.1% in the year between Jul 2020 and Jul 2021, with the country adding just 392,665 people from net migration and births over deaths. That's the lowest numeric increase since the Census Bureau began making annual population estimates back around 1900. On a percentage basis, it's the lowest growth in the nation's history. Nor is this merely an American phenomenon. Both Japan and China are currently experiencing negative population growth.

Peter Zeihan pulls these various threads together in his emotive work "*The End of the World Is Just the Beginning: Mapping the Collapse of Globalization*" (Zeihan 2022). In brief, Zeihan argues that for demographic, geopolitical, climate change, and debt-limit issues . . . the global economy has hit the wall and will now reverse course, with a significant breakdown in global trade.

Wei Li, global chief investment strategist at BlackRock suggests (Galouchko 2023) our world has taken a new direction. Driven by a new macro environment, the net-zero transition, structural forces such as demographics and weather patterns, and geopolitical fragmentation. She observes how central banks, during the Great Moderation from the mid-1980s to before the pandemic, were able to mitigate economic cycles because their tools were effective in addressing the demand side of the equation. But now that their tools need to address the supply side, they're less effective, and operate at higher cost. As a consequence, we'll experience slower growth, a weakening labor market, and systemic financial cracks.

Is future regime change inevitable? Probably. Consider the expected impact of artificial intelligence (Mitchell and Krakauer 2023).

6. STATISTICAL EVIDENCE - RISK WITHOUT RETURN

Investors are rational actors, collectively. They don't invest in order to lose money. Nor do they invest to accept risk without adequate compensation. Nevertheless, asset categories such as precious metals, U.S. Treasury bonds, international treasury bonds, and U.S. investment grade corporates have done just that . . . delivering risk without return. So, are asset class returns inherently positive (at least over sufficiently long time periods)? Exhibit 3 speaks to this issue.

EXHIBIT 3

Asset Categories Experience Long/Extended Periods of Loss

Asset category	Number of years real return was negative	Start of losing period	End of losing period	Cumulative loss (in %)
	131.1	Jan 1875	Feb 2006	-0.3
Gold bullion	12.4	May 2010	Oct 2022	-1.7
	1.5	Feb 2008	Aug 2009	-4.2
	90.2	Dec 1894	Feb 1985	-0.1
International treasury bonds (GDP-weighted)	17.8	Dec 2004	Oct 2022	-1.2
	3.8	Jun 1879	Apr 1883	-0.3
	86.7	Dec 1894	Sep 1981	-0.2
10-year U.S. Treasury bonds	19.4	May 2003	Oct 2022	-0.7
	4.7	Feb 1889	Oct 1893	-0.2
	45.8	Jan 1936	Oct 1981	-0.6
U.S. corporate bonds (investment grade)	28.5	Jan 1892	Jul 1920	-0.6
	11.0	Feb 2012	Feb 2023	-0.1
	39.7	Aug 1980	Apr 2020	-1.4
Diversified commodities	32.1	May 1917	Jun 1949	-3.0
	21.6	Dec 1950	Jul 1972	-5.4
	21.2	May 1961	Jul 1982	-1.3
U.S. stocks	19.8	Aug 1929	Jun 1949	-5.5
	16.4	Mar 1905	Aug 1921	-2.6
	18.7	Aug 1914	Apr 1933	-0.2
International stocks	16.9	Jan 1936	Dec 1952	-0.5
	15.3	May 2007	Sep 2022	-2.1
	25.7	Apr 1895	Dec 1920	-0.1
60/40 portfolio	15.4	Dec 1936	May 1952	-0.1
	10.5	Jan 1972	Jul 1982	-1.5

This exhibit identifies the three non-overlapping time periods during which each asset category experienced a cumulative negative total return (after adjustment for inflation). The colored row identifies the longest time period for each asset category that delivered a loss. Observe how even the

ultra-diversified 60/40 portfolio experienced three such unpleasant time intervals. The most recent of which lasted 10.5 years (Jan 1972 - Jul 1982) delivering a cumulative loss of -1.5%. Understand, this was for an ultra-diversified portfolio, and without any “*exotics*” (which would have made it worse).

Bottom line . . . no, asset classes do not dependably deliver positive returns over even exceedingly long time periods. Recall the Business Week lead article “*The Death of Equities*” (BusinessWeek 1979).

7. STATISTICAL EVIDENCE - EX-POST CHERRY PICKING

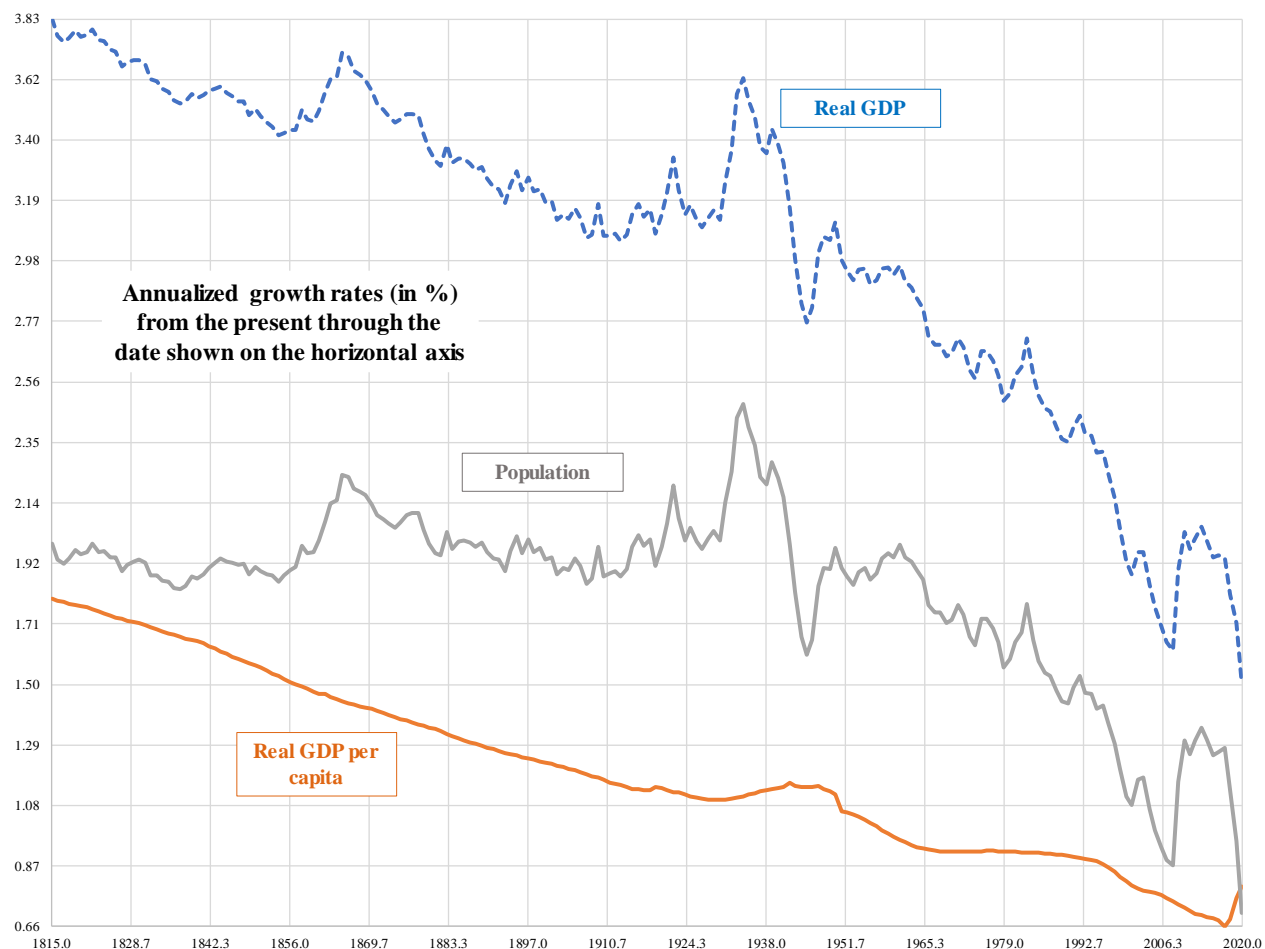
Presume that I need to develop a forward-looking financial plan for my client (institutional or retail). And I decide to base said “future plan” on the single best performing 74-year investment period drawn from out of all of history and for that cherry-picked period, I select the single best performing country from among the vast array. In other words, I base my analysis on U.S. stock/bond returns during the post WWII era. Question . . . should my client view my analysis/recommendation as valid and relevant?

The U.S. economy followed a unique and non-representative path since 1800. It started its journey as an embryonic emerging nation, progressing to that of a thriving emerging economy, transitioning to an early-stage developed country, and eventually through the fullness of time becoming the largest and most mature national economy present today. Nevertheless, as expected, the U.S. followed an unrelenting path of ever slower growth . . . for its economy, for its working-age population, and for its standard of living¹⁶. Exhibit 4 provides the statistics.

¹⁶ Data provided by Global Financial Data, Inc. All statistics inflation-adjusted

EXHIBIT 4

U.S. Economy Grows Slower and Slower with the Passage of Time



To base one's analysis on past U.S. stock and bond returns (especially during the 74 years following the end of the industrial era) constitutes the worst possible form of ex-post cherry-picking. Consider how the U.S. entered the 1910s as a country with a relatively undeveloped agrarian economy that operated in isolation from foreign interests. At the start of the decade (1910), many American workers remained on farms or were employed in small stores, factories, or mills. Wilson became president in 1913, and with innovations from an up-and-coming new breed of bankers and businessfolk, the next ten years brought remarkable change to the U.S. economy, setting it on the path to become the preeminent industrialized nation.

With its entry into WWI (1914-18), the U.S. proved that it'd become a modern industrial power. What had once been a conservative-spending public that relied on farming, general stores, and small grocery stores for food/goods was becoming a consumption-driven nation. Shopping had once been a necessity of everyday life; now it was becoming a form of recreation. Retailers developed modern techniques for displaying and selling goods, and the advertising industry grew alongside this burgeoning retailing industry.

Nevertheless, such remarkable growth can't continue indefinitely. As observed in an NBER Working Paper (NBER 2012), even if U.S. innovation were to continue into the future at the same

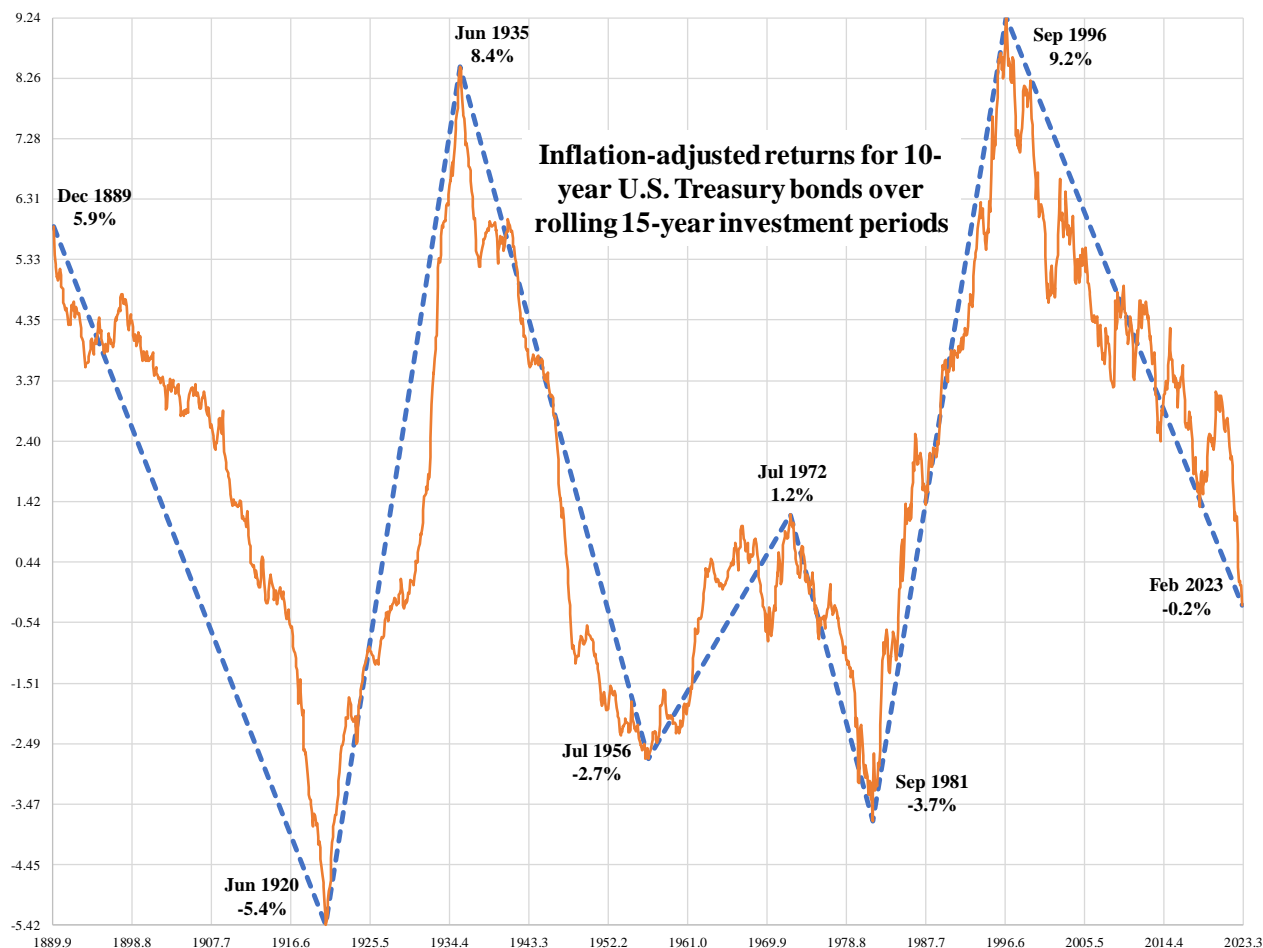
rate it experienced during the two decades preceding 2007, the U.S. still faces six headwinds that are dragging long-term growth to half or less, of the 1.9% annual rate experienced between 1860 and 2007 (growth in real GDP per capita). These include demography, education, inequality, globalization, energy/environment, and the overhang of consumer and government debt. A provocative “exercise in subtraction” suggests that future growth in real consumption per capita for the bottom 99% of U.S. citizenry will fall below 0.5% per year for numerous decades.

8. STATISTICAL EVIDENCE - EPISODIC ERAS

Consider how the yield on the 10-year Treasury (adjusted for the market’s inflationary expectations) fell by -1410bps (Sep 1874 - Sep 1916), then rose by +1510bps (Sep 1916 - Aug 1929), and next fell again by -1400bps (Aug 1929 - Nov 1944). Asset class returns are episodic if they deliver radically different average returns over extended periods of time. The consequence of such episodic behavior is that it forces/requires the investor to forever ask the question “*What kind of an episodic era am I investing in? Low return, high return, something else?*” Intermediate U.S. Treasury bonds (10-year maturity) provide a representative example. Exhibit 5 provides the data for rolling 15-year investment time periods.

EXHIBIT 5

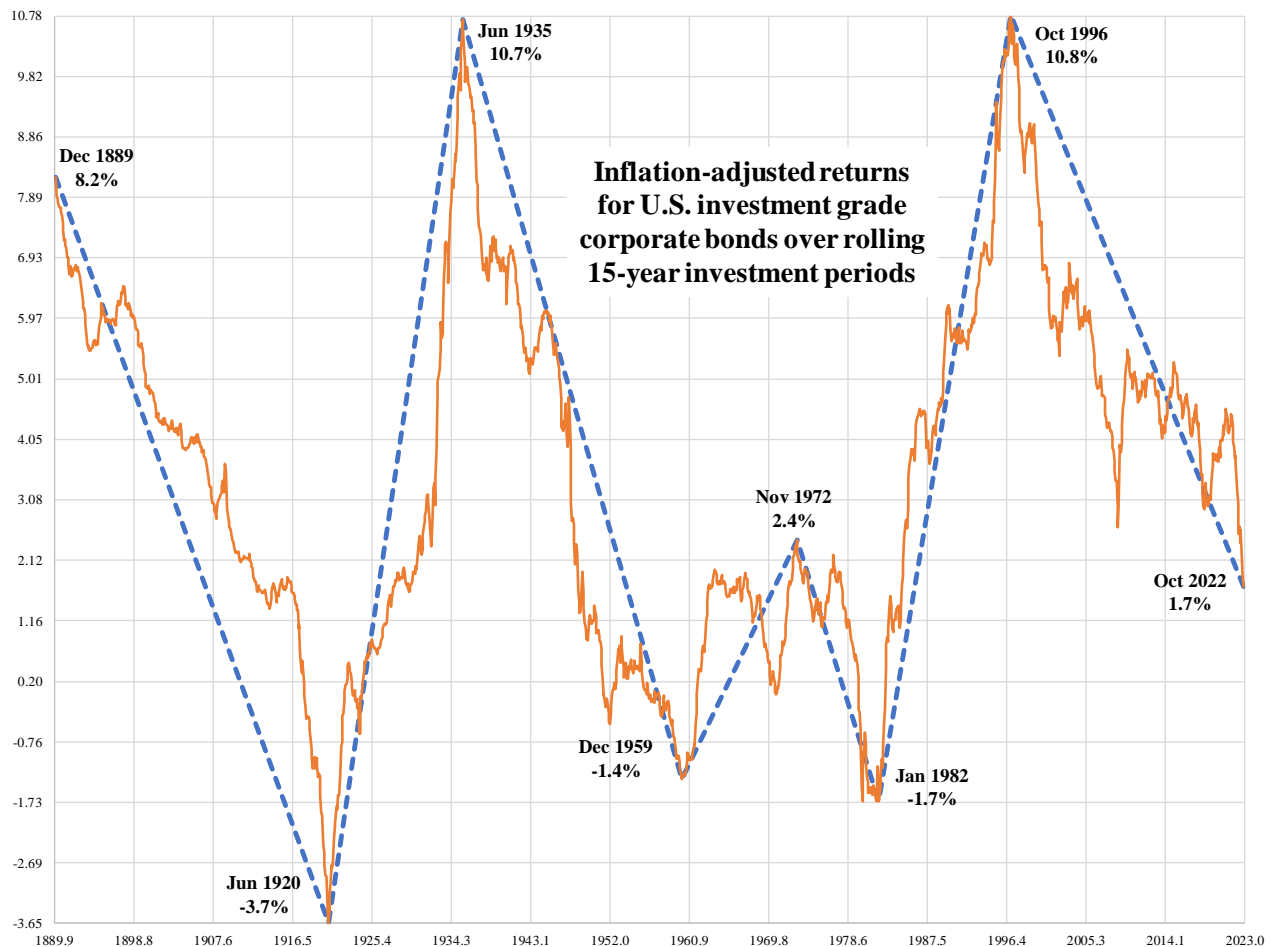
Returns are Strongly Episodic for 10-year U.S. Treasury Bonds



Most retail financial planning and asset allocation software (and numerous institutional tools) assume iid (independent and identically distributed) return distributions. In other words, such software tools assume that episodic eras don't exist, i.e., they ignore the reality expressed by Exhibit 5. This has the unpleasant consequence of causing users to meaningfully underestimate risk and mischaracterize expected return.

The challenge of episodic eras extends to all other major asset categories. Exhibit 6 shows the results for investment grade U.S. corporate bonds of intermediate- and long-maturity. Clearly, corporate bonds are every bit as episodic as U.S. Treasuries.

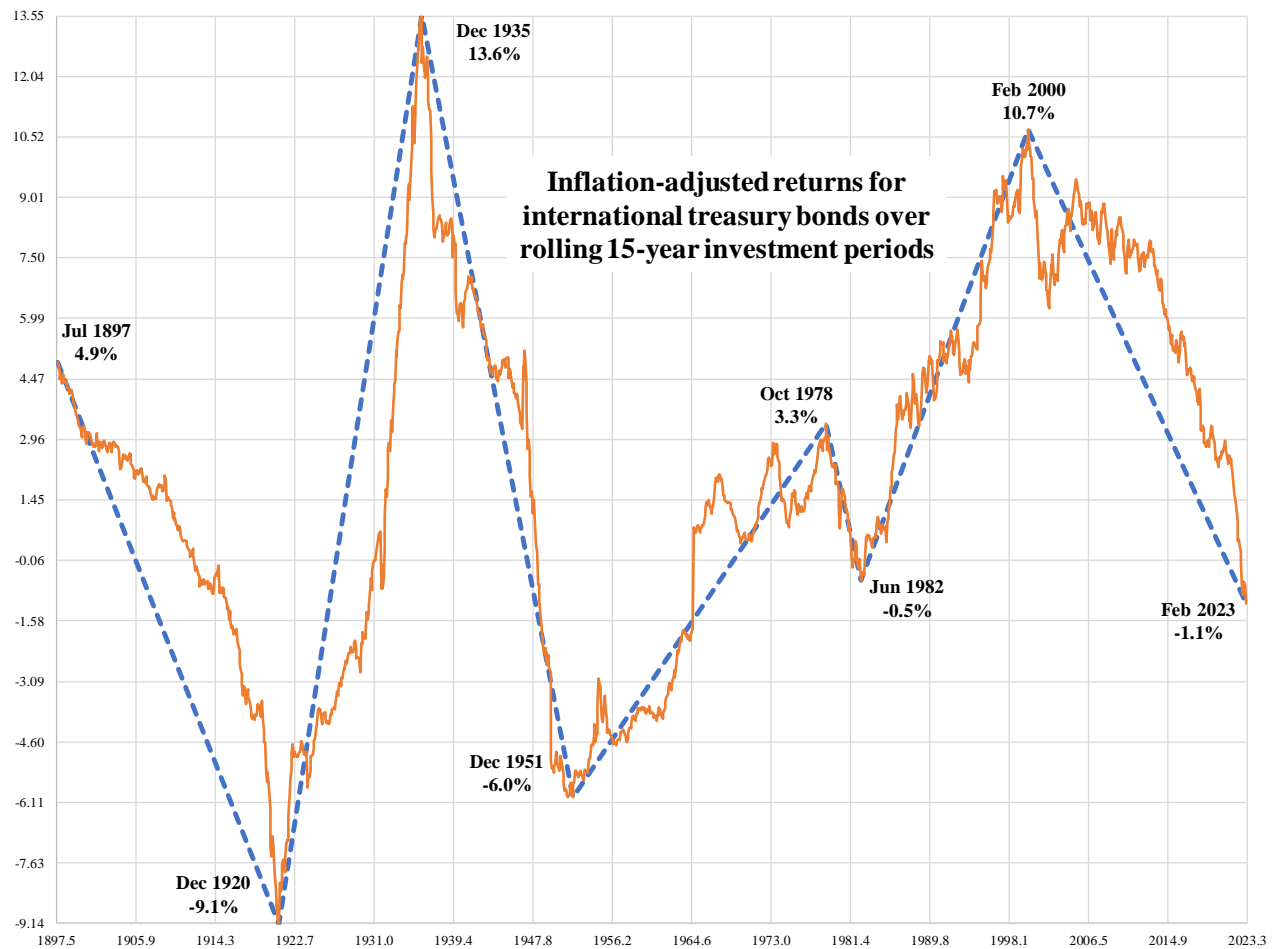
EXHIBIT 6 Returns are Strongly Episodic for U.S. Investment Grade Corporate Bonds



Moreover, this result extends even more strongly across borders. Exhibit 7 provides rolling 15-year returns for a broadly-diversified basket of international intermediate-term treasury bonds. In this case, the combined episodic nature of non-U.S. treasuries is overlaid on top of the episodic behavior of the U.S. Dollar, with the two reinforcing one another.

EXHIBIT 7

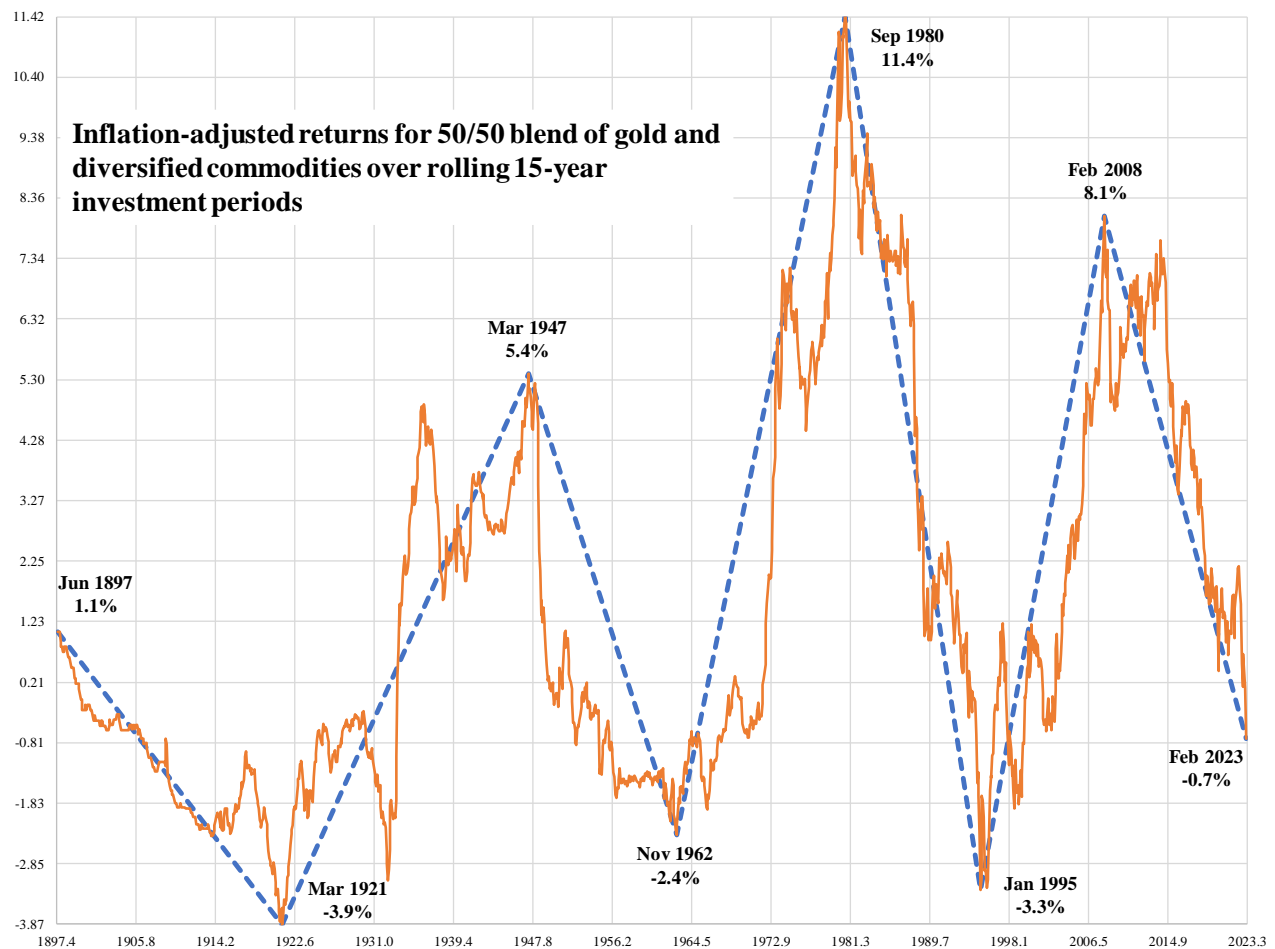
Returns are Strongly Episodic for International Treasury Bonds



But it doesn't end there. Commodities are also highly episodic. Exhibit 8 shows the 15-year rolling returns for a portfolio 50% allocated to gold bullion and 50% to broadly diversified commodities. Today, such a mixture would be approximately 24% energy and 56% precious metals.

EXHIBIT 8

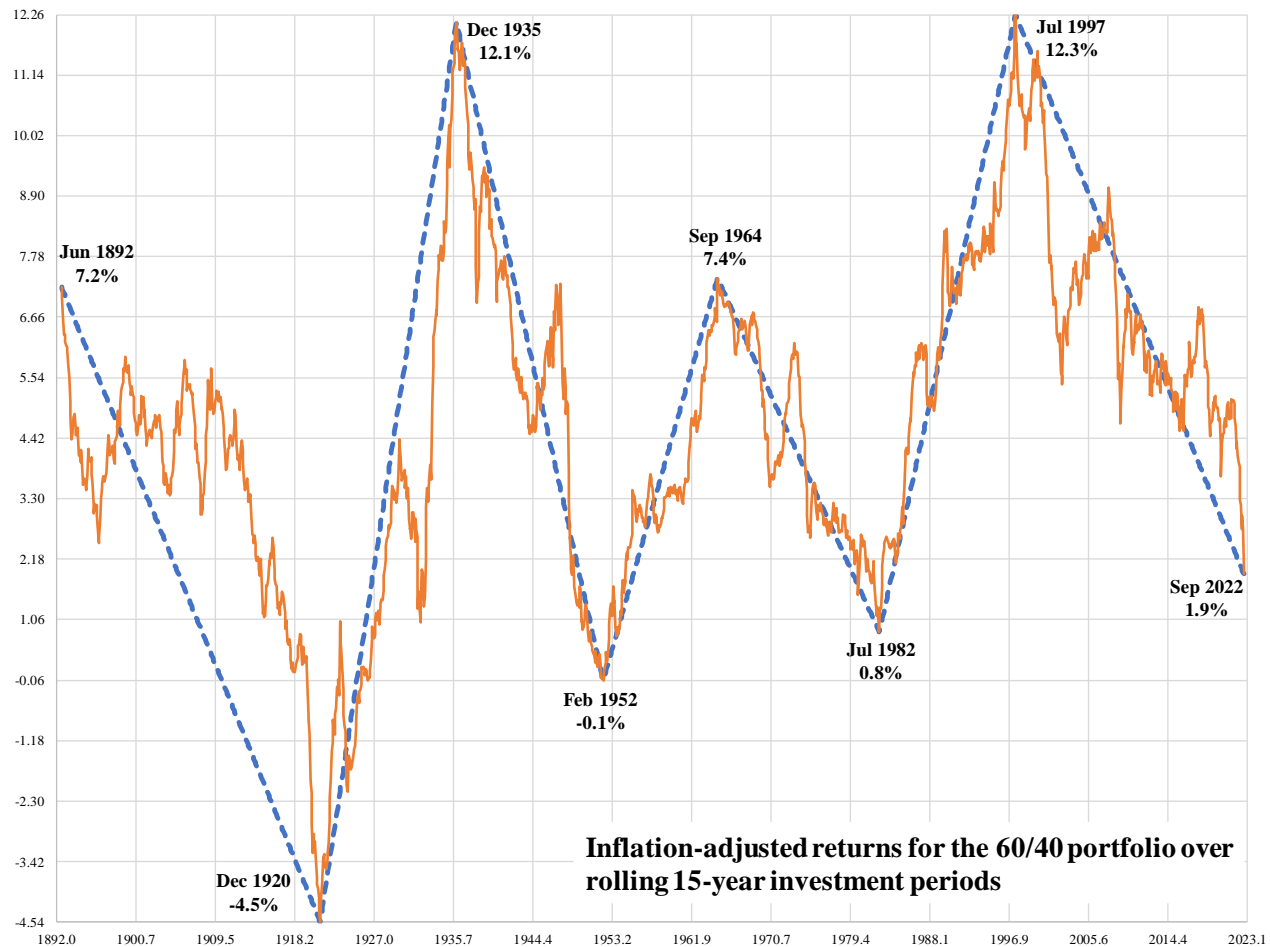
Returns are Strongly Episodic for 50/50 Blend Gold and Diversified Commodities



The traditional response to the observation that individual asset class returns are inordinately episodic is “*And that’s why we diversify broadly across stocks, bonds, commodities, domestic, and international, both developed and emerging.*” Unfortunately, such an ultra-diversified portfolio remains just as episodic . . . diversification does little if anything to solve this problem. Exhibit 9 provides the results for rolling 15-year investment time windows.

EXHIBIT 9

Returns are Strongly Episodic for the Ultra-Diversified 60/40 Portfolio



OK, so if one uses 30-year investment periods (instead of 15-year intervals), are episodic eras less pronounced? Yep! But they still exist, and painfully so. And more importantly, keep in mind Exhibit 2, i.e., before Feb 1920 the ultra-diversified 60/40 portfolio delivered 2.6%, after that date, it returned 5.6% . . . that's a proportionate increase of +115%.

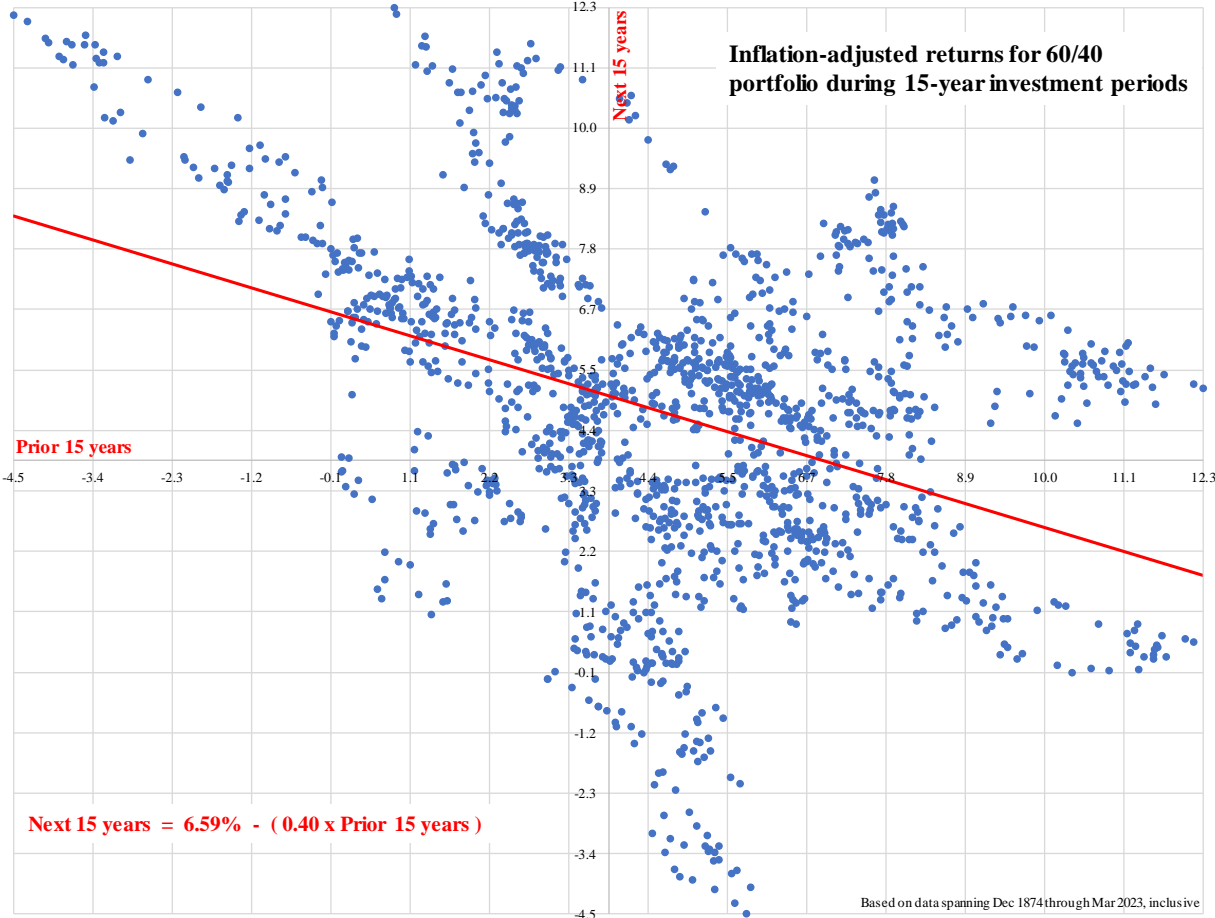
Software tools and modeling approaches that fail to take into account these episodic behaviors underestimate the risks to which investors are exposed. They also, depending upon the era, mischaracterize the expected return. Let us next turn to trending and momentum, the simplest and most straightforward demonstration of the non-iid character of asset class returns.

9. STATISTICAL EVIDENCE - TRENDING AND MOMENTUM

No one disputes that markets express varying levels of trending and momentum. The concern is, are these levels incidental, i.e., sufficiently low, so as to support today's 60/40 portfolio construction approach? There are numerous paths by which one could address this issue. For reasons of brevity, I've selected one, focusing on the relationship between past returns and future returns.

Exhibit 10 shows the results for the ultra-diversified 60/40 portfolio. The horizontal axis measures the returns for the prior 15-year time period. The vertical axis shows the returns for the subsequent 15-year time window. The two 15-year time periods are adjacent, but do not overlap.

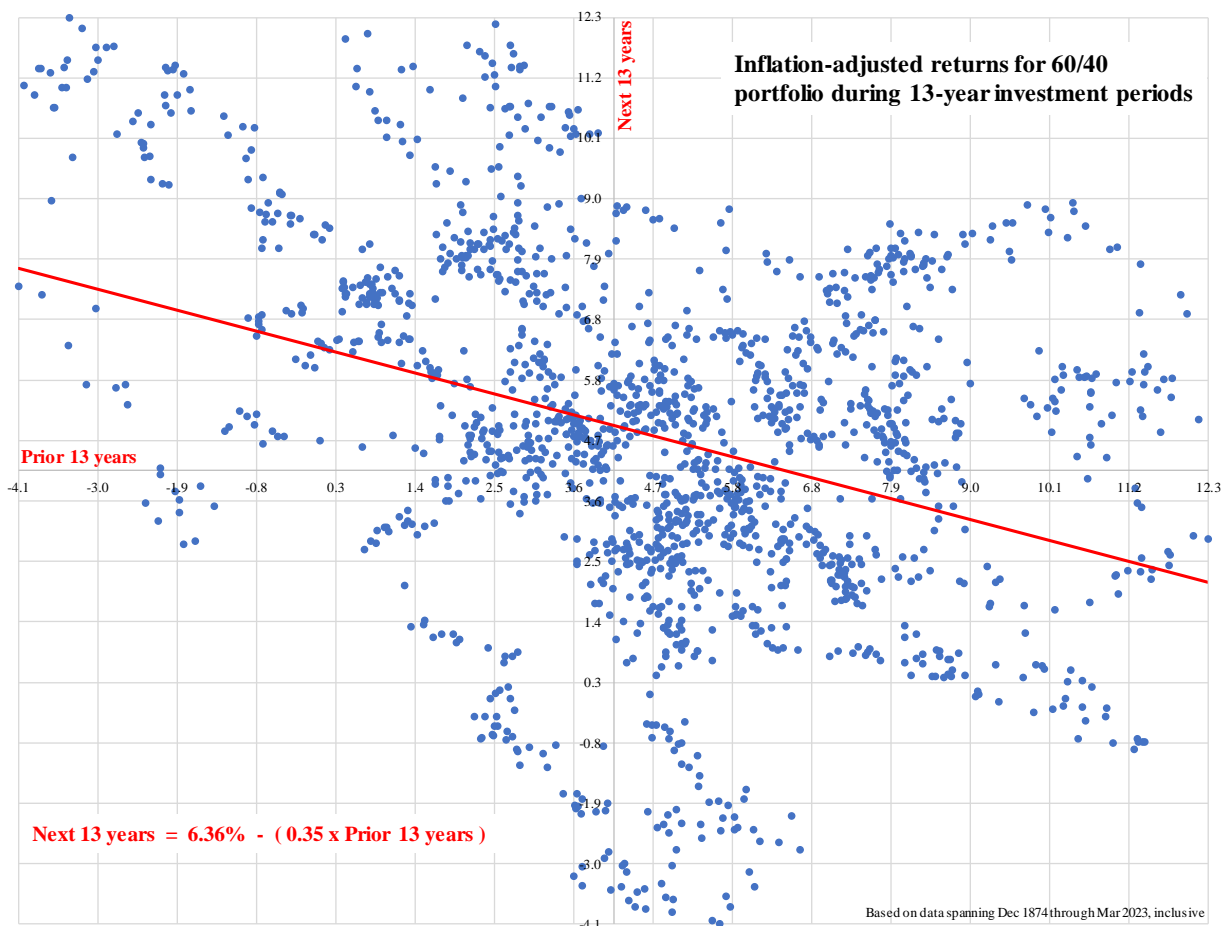
EXHIBIT 10
Future Returns are Negatively Related to Past Returns (15-year Holding Periods)



Based on data since 1874, the 15-year returns for the ultra-diversified 60/40 portfolio are highly negatively correlated with the returns experienced in the immediately preceding 15-year time period. Example - on average, if the return in one 15-year period was +10.00%, then the expected return during the next 15-year period would be +2.59%. This is a disturbing result for one using software tools (or advisors) that assume iid distributions, the lack of episodic eras, and no reversion to the mean. And it strongly suggests powerful time series properties including trending, momentum, and bull & bear markets. But is this result a simple artifact of using a 15-year holding period. No, consider Exhibit 11 that shows the results for a shorter 13-year investment time horizon.

EXHIBIT 11

Future Returns are Negatively Related to Past Returns (13-year Holding Periods)



Ok, so the results are not as strongly negative for 13-year periods. Example - on average, if the return in a 13-year interval was +10.00%, then the expected return during the next 13 years would be +2.86%. Nevertheless, Exhibits 10 and 11 support the conclusion that trending, momentum, and reversion to the mean are powerful effects for longer-term investment periods. The results presented by the preceding eleven exhibits suggest that even for ultra-diversified 60/40 portfolios, the return patterns will be surprisingly non-iid and inherently unstable. Such a result puts into jeopardy the approaches taken by almost all financial planning and asset allocation software (at least at the retail level). Pushback - but is this problem bad enough that we should be concerned?

10. DOES IT MATTER?

One can parameterize the severity of this problem, by assuming a specific investment time period (e.g., 15 years) and then comparing the results derived from the actual live returns with those derived from iid log-normal distributions utilizing the exact same means and standard deviations as the live history. Exhibit 12 provides the results for diversified U.S. bonds and for the ultra-diversified global 60/40 portfolio.

EXHIBIT 12

Comparing Return Distributions for 15-Year Investment Periods (Using Actual vs iid Lognormal)

		Percentile level expressed in %												
		0.5	1	2	3	5	10	20	30	40	50	75	85	95
U.S. bonds	Actual live results	-3.8	-3.0	-2.4	-2.2	-1.5	-1.0	0.2	0.9	1.7	2.9	4.8	5.7	7.4
	Results based on iid lognormal distribution using the same mean and standard deviation (as with the actual live data)	-0.8	-0.6	-0.3	-0.1	0.3	0.8	1.5	1.9	2.3	2.7	3.7	4.3	5.2
Ultra-diversified global 60/40 portfolio	Actual live results	-3.6	-3.2	-1.5	-0.7	0.2	1.2	2.6	3.5	4.3	4.9	6.3	7.3	9.4
	Results based on iid lognormal distribution using the same mean and standard deviation (as with the actual live data)	-1.1	-0.7	-0.2	0.1	0.7	1.6	2.6	3.3	4.0	4.6	6.4	7.4	8.9

Based on data spanning Dec 1874 through Mar 2023, inclusive

U.S. bonds is defined as 50% 10-year U.S. Treasury bonds and 50% investment grade U.S. corporate bonds

Mean and standard deviation: (a) U.S. bonds 0.2374% and 1.591% (b) Diversified 60/40 portfolio 0.4162% and 2.586%

This comparison provides a fair and highly representative example of the inaccuracies inherent in today's retail financial planning and asset allocation software tools. Consider the first two rows, which present the results for diversified U.S. bonds. The first row reports the percentile outcomes for 15-year investment holding periods using the actual live monthly returns during the timeperiod 1874 through 2023. The second row shows the same results, but now based on the assumption of an iid log-normal distribution with the exact same mean and standard deviation (as the live data). The shaded cells highlight the worst performing outcome (actual vs iid log-normal).

Notice how bonds delivered significantly greater left-hand tail risk (percentiles 0.5% through 40%) than the iid log-normal. In a similar fashion, the actual live bond returns delivered significantly greater return for percentiles 50% through 95% than the iid log-normal. CAUTION - don't then make the mistake of jumping to the conclusion that these deficiencies (live versus iid log-normal) can be rectified through the use of distributions exhibiting varying levels of kurtosis and skew. Such a conclusion is false, since doing so would still leave one with an iid distribution that fails to reflect the time series properties that generate painfully long/powerful episodic eras, bull and bear markets, regime change, trending, and momentum (Brown 2018), (Brown 2022b), and (Hurst, Ooi, and Pedersen 2017).

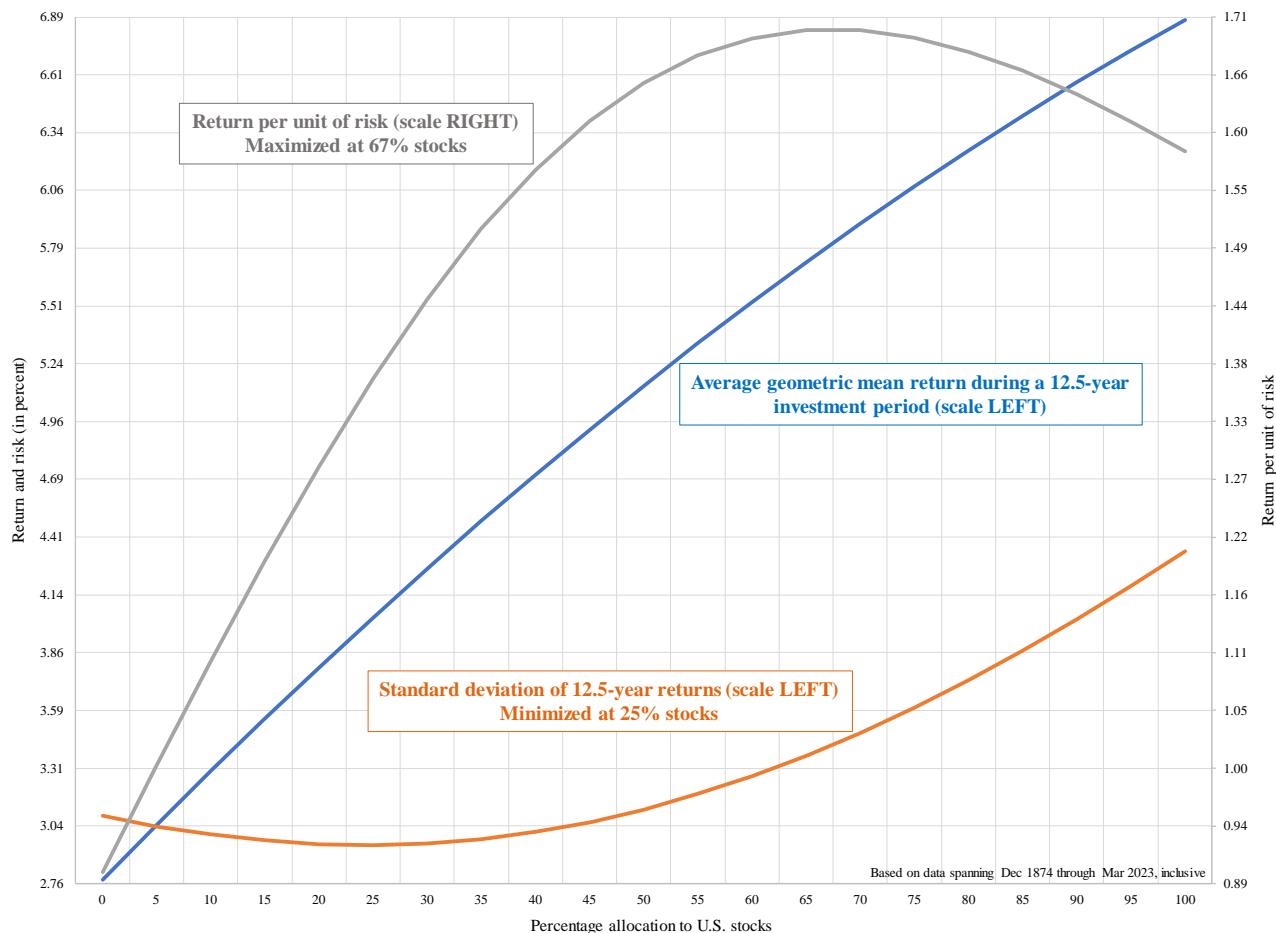
The shaded cells identify the worst performing percentile levels. The last two rows report the results for the ultra-diversified 60/40 portfolio. Once again, use of iid log-normal distributions severely underrepresent actual portfolio risk. These results are disturbing and are not just confined to retail software tools. Many institutional investors use analysis or are obtaining advice from consultants that similarly rely on iid log-normal or similar distributions.

11. DAMAGE DOESN'T END THERE

Unfortunately, the damage done through the use of software based on iid log-normal distributions doesn't end with the underestimation of risk, as demonstrated in Exhibit 12. It goes further. Often, this additional damage takes the form of factually correct summary statistics (flawlessly accurate numbers), but presented in a fashion that encourages the viewer or promoter to misunderstand or

misinterpret. Exhibit 13 provides one of the most popular and damage-inducing examples . . . but nevertheless, reports perfectly accurate simple averages.

EXHIBIT 13 Misleading Summary Statistics for 12.5-year Investment Time Periods



This exhibit is accurate, relying on the average results for a portfolio allocated to stocks and bonds (the proportions vary as indicated on the horizontal axis) over the time period 1874 through 2023. It corrects for the problem of ex-post cherry picking the most favorable period from out of history, i.e., the post-industrial era. But it still suffers from cherry picking the best country from out of the universe of all possible countries, i.e., it restricts itself to U.S. returns.

A superficial examination of this exhibit would cause most retail and institutional investors (and their advisors) to conclude something along the lines of . . . *“I need minimum risk; therefore, I should utilize a 24/76 stock/bond mix given my investment period is 12.5 years”* . . . or *“I’m moderately aggressive; therefore, I should employ a 67/23 stock/bond mix since that gives me the highest return per unit of risk.”*

But these conclusions have no basis in reality, instead they are myopic, being based on simple averages. The use of averages would be relevant (although one still needs to consider “dispersion” or “confidence”) if the underlying distributions were iid, but they’re not. This is particularly unfortunate since most TDFs (Target Date Funds), 529 plans, 401k default-option portfolios, and robo-advisor solutions are based on nothing more than this simple exhibit (Brown 2023a).

The problem is that despite their accuracy, historical averages are non-representative and inherently misleading. They problematically mask the influence of regime change, instability, incidence of non-positive returns spanning numerous decades, episodic eras, trending, momentum, and reversion to the mean. In brief, the averages tell one very little about the distribution they'll experience and in fact are misleading. It's all about what the next 12.5-years will deliver as opposed to what the average return was post WWII. Often the push-back to this observation is along the lines of "Yes, you are correct, but we have mitigated this problem through our use of forward-looking capital market assumptions." This push-back is examined in the next section.

12. HOW DID WE GET HERE

Why was the 60/40 portfolio construction approach first adopted, and subsequently became so ubiquitous? Initially, we sought a bit of science. Such was first provided by Harry Markowitz best known for developing Modern Portfolio Theory (MPT). Since Markowitz introduced MPT to the academic community in, "*Portfolio Selection*" appearing in The Journal of Finance in 1952, his original theory has profoundly changed the way that people and institutions invest. For his theory of asset allocation under uncertainty, also known as the theory of portfolio choice, Markowitz shared the 1990 Nobel Prize in Economics with William Sharpe and Merton Miller. Specifically, the Nobel Committee cited the theory of portfolio choice developed by Markowitz as the "*first pioneering contribution in the field of financial economics.*" But take note, Markowitz's work came out 71 years ago, we've learned something since then.

MPT provided a framework upon which retail financial planning and asset allocation software was built. This was a powerful development. It provided an elegant and easy to implement tool based on the rigor of mathematics, statistics, and a Nobel Prize. More importantly, it provided a story, charts, graphs, reports, and metrics . . . metrics that were flexible and lent themselves to managed interpretation!

Next came dumb luck. The 60/40 approach was adopted during the post WWII era of unusually bountiful U.S. stock/bond returns, an era that made any domestic balanced portfolio look good, no matter how it was constructed.

Adopters failed to ask the hard questions and require serious answers. They had no incentive to question, for the rewards of being right were dwarfed by the costs of fighting conventional and accepted procedures and methods. The need is to make a sale, and accountability takes decades, not years.

Finally, there's behavioral bias. Probably the two most applicable, being herding and narrow framing (aka confirmation bias). Herding encourages us to go with the group because we believe the majority can't be wrong or because standing with the majority is comfort giving. Narrow framing encourages us to restrict our information/views to those that confirm our already held beliefs and to avoid or reject conflicting perspectives or data that suggest we might be wrong.

John P. Hussman observes (Hussman 2023)

"Amid the overabundance of economic opinion, unexamined clichés, and unverified assertions, and nutrient-free word salad dispensed by talking heads on television, market observers, and even Federal Reserve officials, I often wonder how many of them have ever taken the time to carefully examine historical data. After all, one might think, this is their

profession - literally what they do for a living. Yet when one compares the claims that are regularly made about economics and finance with actual historical data, the only reasonable conclusion is that people seem more interested in having a common framework to describe their world than whether that framework is correct . . . I really do believe that, particularly in the face of uncertainty, people find comfort in having a common framework to discuss and explain their world, even if that framework is incorrect.”

I suggest in the Introduction, that one reason why this article’s topic is so difficult to explore, is that it requires a deep understanding of economic, societal, and capital market history. Not over the last 50 years, but over the last 150 years (and probably more). Consider for a moment:

- If interest rates first rise for 40-years and then next fall for 40-years, one has little hope of developing a realistic perspective unless their view encompasses well more than 80 years.
- What’s required to appreciate that the U.S. economy and capital markets followed a non-representative journey post WWII, unless one has the vision and reach to examine all countries, over the last 150 years, as opposed to over the last 50.
- If the return to diversified commodities, U.S. Treasuries, investment grade corporate bonds, and U.S. stocks have been negative (cumulative total returns) over time periods lasting 40, 87, 46, and 26 years, respectively . . . then maybe one needs an appreciation for not the last 50 years, but the last 150.
- If asset categories experience fundamental regime change (see Exhibit 2), then what’s the breadth of time, geographies, and causal macroeconomic, monetary, societal, governmental, and geopolitical issues that must be understood in order to effectively embrace this profound behavioral attribute.

13. OUR INDUSTRY’S PUSHBACK

The standard pushback to this line of thinking is provided by Wayne Gretzky, who apparently said: *“I skate to where the puck is going to be, not where it has been.”* In other words, our industry’s promotion of proprietary “capital market assumptions”. This is our industry’s attempt to finesse the arguments made above, i.e., to overcome the extreme trending, momentum, episodic, non-positive, bear/bull nature of asset class returns. Their claim is that they’re basing their portfolio construction approach not on past asset class behaviors, but instead on more relevant forecasts of the future. Nice concept, but impossible, unless one has a sufficiently accurate and consistent (dependable) crystal ball.

Think back to March 9, 2020 when the nominal yield on a 10-year Treasury fell below 50bps (with the rest of the term structure following suit). And yet, the majority (almost all) of the largest institutional investment management firms with “10-year” forward looking capital market assumptions were showing expected returns for the S&P 500 of between 5% and 10%.

Just how relevant are our industry’s capital market assumptions? Are they forward looking or are they backward looking? Do they do nothing more than tightly hug long-term historical averages, while delivering a compelling narrative? We can examine this question by exploring the benefits of being right versus the costs of being wrong (with respect to their capital market assumptions). Exhibit 14 provides the results.

EXHIBIT 14

Impact of Correct and Incorrect Estimates of Future Capital Market Assumptions

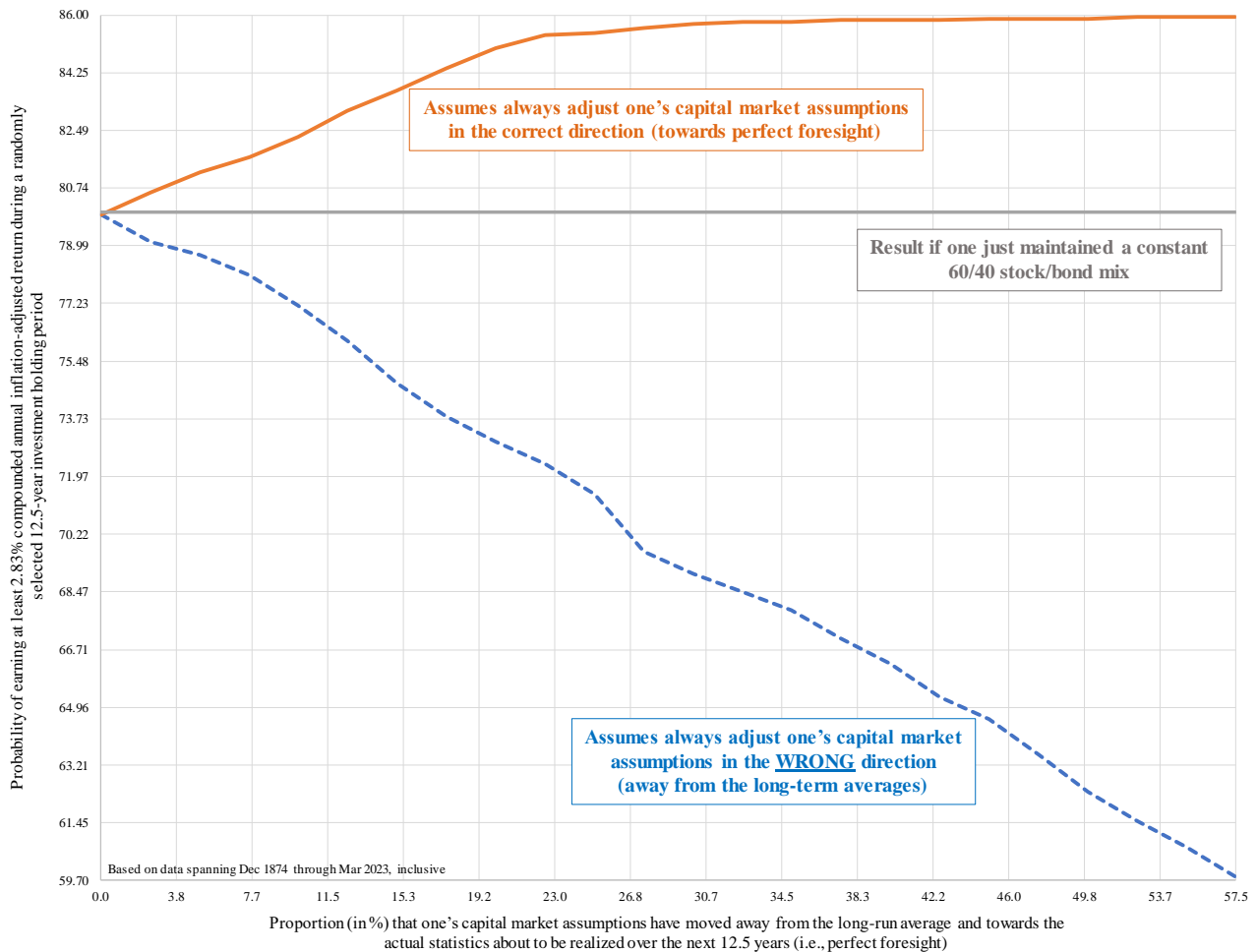


Exhibit 14 was constructed as follows. The investment time period is 12.5 years. Only two assets are available, U.S. stocks and U.S. bonds (50% 10-year Treasuries and 50% investment grade U.S. corporate bonds). Portfolios are constructed by mixing these two assets. The gray line shows the results for a portfolio allocated 60/40 stocks/bonds, never varying the mixture. Such a portfolio had an 80% probability of earning at least 2.83% during a randomly selected 12.5-year investment window. It's assumed that the investor's objective is to maximize the probability of earning at least 2.83% over the coming 12.5 years (the result for the static 60/40 mix). All results are based on monthly data spanning 1874 through 2023.

The orange and blue lines show the results of basing the portfolio's stock/bond mix on one's forward-looking capital market assumptions. It is assumed that portfolios can only be constructed (the stock/bond mix) in 5% increments, varying from 0% invested in stocks up to 100% in stocks (thus 21 different stock/bond mixes were considered). For each month, which portfolio mix was selected? The one that delivered the highest probability of earning at least 2.83% over the coming 12.5-year investment window (based on the expected means, standard deviations, and covariance).

The horizontal axis shows the proportion (in %) that one's capital market assumptions (means, standard deviations, and covariance) moved away from the long-term average (1874-2023) and

towards the actual statistics about to be realized over the coming 12.5 years (in other words, towards perfect foresight).

The orange line represents the results for always getting it right. For always moving one's capital market assumptions towards perfect foresight (by the amount shown on the horizontal axis). In contrast, the blue line shows the results for always getting it wrong. Always moving one's forecasted means, standard deviations, and covariance in the wrong direction, i.e., away from perfect foresight of the future.

Bottom line, the benefit of being right, making more accurate forecasts of the future, are quite small (when compared to a static 60/40 mix). In contrast, the cost of being wrong, are large. This is a classic asymmetric payoff pattern. The tradeoff is painful and inherently unappealing. These results strongly support the hypothesis that large investment management organizations have little incentive to allow their capital market assumptions to deviate from backward-looking long-term averages. And of course, that is exactly what is seen across our industry. The providers of capital market assumptions seriously hug historical averages, and rarely allow them to deviate in any meaningful way. Yes, there are exceptions such as GMO, but they are the extremely rare (GMO 2023). So, what's the remedy?

14. REMEDY - POSSIBLE PATHS FOR FUTURE RESEARCH

So, what's to be done. Embrace the data, let it speak for itself. If the data says that asset class returns are characterized by instability, regime change, risk without return, episodic eras, trending, momentum, reversion to the mean, and bull & bear markets, then it makes little sense to utilize the 60/40 portfolio construction approach that maximizes one's vulnerability to such behavioral attributes. Instead, adopt a construction process that harmonizes with these behaviors (makes best use of). Here are three suggestions, not as recommendations to employ, but instead as thoughts for further research. Solving for this question/need remains out of scope for this article. But several observations can be made that might identify avenues for future consideration.

Reversion to the mean. How powerful is the reversion to the mean phenomenon, and does it span asset categories, geographies, and apply to long-term returns? Could it be used as tool for balanced portfolio construction? Exhibit 15 provides an historical view.

EXHIBIT 15

Annualized Inflation-Adjusted Returns During Time Periods of Approximately 16.5 Years

Dec 1874 - Jun 1891	Jun 1891 - Dec 1907	Dec 1907 - Jun 1924	Jun 1924 - Nov 1940	Nov 1940 - May 1957	May 1957 - Oct 1973	Oct 1973 - Apr 1990	Apr 1990 - Sep 2006	Sep 2006 - Mar 2023
DJIA 7.7	S&P 500 4.9	DJIA 6.3	Germany 16.3	S&P 500 10.9	Japan 16.3	Japan 9.7	Spain 11.8	Denmark 6.8
IG Corp Bnds 7.6	DJIA 4.1	S&P 500 3.4	South Africa 13.0	Canada 10.8	Ireland 13.1	Ireland 7.6	Ireland 10.4	DJIA 6.5
S&P 500 6.3	IG Corp Bnds 3.3	IG Corp Bnds 0.8	DJIA 10.3	DJIA 9.7	South Africa 10.9	UK 7.3	Denmark 9.7	S&P 500 6.5
10-yr Treas 5.2	10-yr Treas 2.2	90-day T-Bill -0.5	India 8.5	France 5.2	Australia 10.9	Germany 7.1	India 9.4	New Zealand 5.0
90-day T-Bill 4.0	Int'l Treasury 1.7	10-yr Treas -1.3	Australia 8.5	UK 4.6	New Zealand 10.8	France 6.9	Australia 9.3	Gold 4.9
Int'l Treasury 3.5	90-day T-Bill 1.6	Gold -3.9	New Zealand 8.2	Australia 3.9	Germany 10.6	India 6.3	DJIA 9.0	India 4.8
Gold 0.1	Gold -1.0	Int'l Treasury -4.3	Japan 7.8	Denmark 2.4	Spain 9.8	Denmark 6.0	Int'l Treasury 8.6	Australia 3.2
Commodities na	Commodities na	Commodities na	S&P 500 7.4	Commodities 1.8	Denmark 9.5	South Africa 5.7	UK 8.5	South Africa 3.2
Australia na	Australia na	Australia na	Denmark 7.3	New Zealand 0.9	UK 8.0	DJIA 5.0	New Zealand 8.5	Canada 2.4
Canada na	Canada na	Canada na	Int'l Treasury 7.1	Spain 0.9	S&P 500 5.4	S&P 500 4.9	S&P 500 8.2	IG Corp Bnds 2.1
Denmark na	Denmark na	Denmark na	Canada 7.1	South Africa 0.3	Canada 5.0	IG Corp Bnds 4.6	Canada 7.6	Germany 2.1
France na	France na	France na	IG Corp Bnds 6.7	Ireland -0.1	DJIA 4.6	Australia 4.1	France 6.9	France 1.9
Germany na	Germany na	Germany na	Ireland 6.7	IG Corp Bnds -0.5	Commodities 4.6	Int'l Treasury 3.0	Commodities 6.3	10-yr Treas 0.6
India na	India na	India na	UK 5.7	India -1.3	India 3.4	Commodities 2.7	IG Corp Bnds 5.5	Int'l Treasury 0.4
Ireland na	Ireland na	Ireland na	10-yr Treas 5.5	10-yr Treas -2.8	Gold 3.3	Canada 2.5	10-yr Treas 4.9	UK 0.3
Japan na	Japan na	Japan na	Gold 4.4	90-day T-Bill -3.1	France 2.7	10-yr Treas 2.3	South Africa 4.8	Japan 0.1
New Zealand na	New Zealand na	New Zealand na	Spain 2.8	Gold -4.0	Int'l Treasury 2.4	Gold 1.7	Germany 4.3	90-day T-Bill -1.4
South Africa na	South Africa na	South Africa na	90-day T-Bill 2.7	Int'l Treasury -4.2	IG Corp Bnds 1.9	90-day T-Bill 1.7	90-day T-Bill 1.2	Ireland -1.4
Spain na	Spain na	Spain na	France 1.1	Japan -7.5	90-day T-Bill 1.1	New Zealand 1.3	Gold 0.2	Commodities -2.5
UK na	UK na	UK na	Commodities 0.9	Germany -17.7	10-yr Treas 0.6	Spain -0.8	Japan -2.0	Spain -5.5

Observe how assets at the top (bottom) of the list have a strong tendency to fall below (above) the mid-point during the subsequent “16.5-year” period. For example, Japan was at the top of the list for 1973-1990 and at the bottom during the subsequent period. Similarly, Spain was at the top of the list for 1990-2006 and fell to the bottom for 2006-2023.

Baa-rated yields surprise to the upside. Could bond yields provide a useful signal for temporarily moving out of stocks? In particular, might lowest investment grade corporates provide such a tool? Historically, when such credit yields have surprised to the upside, moving out of stocks and into treasuries has generally proven to be a beneficial trade (Brown 2023b).

Tactical asset allocation. If trending and momentum are sufficiently strong and consistent, then perhaps over-weighting (under-weighting) recent winners (losers) might prove to be a useful strategy (Brown 2018), (Brown 2022b), and (Hurst, Ooi, and Pedersen 2017).

What distinguishes these three portfolio construction approaches? First, they do not utilize forecasting or prediction of the future. Instead, they’re purely backward-looking. Second, they each in their own way, make use of one or more of the time series properties previously mentioned, e.g., trending, momentum, episodic eras, etc. How might such approaches compare to the “60/40 approach”? Exhibit 16 provides the results for three such simple rules, and an equal-weighted blend of the three. All results are shown for 15-year investment time periods, inflation-adjusted.

EXHIBIT 16

Three Portfolio Construction Alternatives to the 60/40 - That Avoid Forecasting or Prediction

	Frequency beat the 60/40 portfolio (in %)	Average return (in %)	Standard deviation of returns (in %)	Average ÷ standard deviation	Percentile outcomes						
					0.5%	1%	2%	3%	4%	5%	50%
Ultra diversified 60/40 portfolio	na	5.6	2.65	2.10	0.18	0.27	0.56	0.86	1.10	1.28	5.61
Move stocks into U.S. Treasuries when BAA current yields surprise to the upside	94.7	6.7	3.08	2.17	0.55	0.69	0.90	1.08	1.24	1.63	6.98
Equal-weight the 12 asset categories (drawn from 19) that trended the most strongly	99.7	8.8	3.10	2.84	0.70	0.79	1.00	1.25	1.76	1.94	8.95
Exclude 5 top performing asset categories over the prior 20 years, equal weight the rest	83.5	6.6	2.74	2.40	1.33	1.41	1.55	1.71	1.85	2.13	6.85
Portfolio allocated equally across the three above strategies	99.4	7.4	2.79	2.65	0.94	1.02	1.24	1.52	1.71	1.94	7.61

Results based on: (i) data spanning Jan 1919 through Mar 2023, inclusive and (ii) 15-year investment holding periods

The second row shows the results for moving out of stocks (domestic and international) and into 10-year U.S. Treasuries whenever the current yield on the BAA U.S. corporate bond index is more than 7.5% above its 11-month average (in proportionate terms). Otherwise, the portfolio remains allocated identically to the ultra-diversified 60/40 portfolio identified in the first row.

The third row shows the results for a tactical asset allocation approach. Once each month, this portfolio identifies the 12 asset categories (drawn from the universe of 19 shown previously in Exhibit 15) that trended most strongly over the just-finished eleven months. The portfolio is then allocated equally across these 12.

The fourth row shows the results for a portfolio reconstituted once each month as an equal-weighting of 19 asset categories, but excludes the 5 top performers over the preceding 20 years. Finally, the bottom row reports the results for a portfolio equally-weighted across these three portfolio construction strategies (rows two, three, and four).

The results are compelling. But are they less episodic? Again, this question is out of scope for this article. But let me offer that using a 15-year investment period, inflation-adjusted, the probability of earning more than 2%, 3%, 4%, and 5% for the ultra-diversified 60/40 portfolio was 91.1%, 79.4%, 69.8%, and 60.3%, respectively. In contrast, the probability of earning more than 2%, 3%, 4%, and 5% for the 3-fold approach (bottom row) was 94.8%, 92.7%, 89.7%, and 78.3%, respectively. That's a pretty big improvement, and it feels considerably less episodic, at least when viewed through the lens of a plausible investment objective, i.e., earn at least 4% over and above inflation over a 15-year investment holding period (resulting in a 20% improvement in the probability of success).

15. CONCLUSIONS

“*The Emperor’s New Clothes*” is a literary folktale written by Hans Christian Andersen, first published in 1837. It has become shorthand for spin over substance, or carefully-engineered illusion over truth. It tells the tale of an emperor who cares about nothing except how he looks, and spends all of his time in his “dressing-room.” This analogy feels well-suited to the questionable foundation upon which the existing 60/40 portfolio construction approach is based, and our industry’s financial planning and asset allocation shiny bobble software tools.

Yes, constructing well-diversified 60/40 portfolios using expected means, standard deviations, and correlations, particularly with a mean/variance optimizer, provides an elegant approach. One that’s easy to implement, providing attractive graphics, tables, and entertaining narratives. But those attractive features don’t then imply that the 60/40 approach is anything more than an academic abstraction from real world capital market behavior.

The success of such an approach requires that the underlying asset categories maintain certain pleasing behavioral attributes. These include stability, lack of regime change, adequate return for risk incurred, non-episodic behavior, and de minimis levels of trending, momentum, and reversion to the mean. Based on the software tools and professional advice being delivered today, these attributes could be roughly summarized as “*asset class returns are iid and adequately follow a log-normal distribution.*”

Despite the solution’s elegance, popularity, and business success, the statistical evidence suggests that it rests on a questionable foundation. One that in the fullness of time will prove it to be inadequate to the needs at hand (both retail and institutional) and likely misleading.

REFERENCES

Aguilar, Omar. 2021a. “Fundamentals of behavioral finance: Confirmation bias.” Charles Schwab Asset Management. November 2. <https://www.schwabassetmanagement.com/content/confirmation-bias>

Aguilar, Omar. 2021b. “Fundamentals of behavioral finance: Recency bias.” Charles Schwab Asset Management. November 2. <https://www.schwabassetmanagement.com/content/recency-bias>

Aliaga-Diaz, Roger. 2022. “Like the Phoenix, the 60/40 Portfolio will Rise Again.” Vanguard Information and Insights. July 1. <https://advisors.vanguard.com/insights/article/likethephoenixthe6040portfoliowillriseagain>

Brown, Rob. 2018. “Intelligent Rebalancing.” *The Journal of Investing* Spring. 27 (1) 31-42; DOI: <https://doi.org/10.3905/joi.2018.27.1.031>

Brown, Rob. 2022a. “Interest Rate History Cycles.” Author website. October 3. <https://www.robbrownonline.com/bull-and-bear>

Brown, Rob. 2022b. “Winners Repeat, Losers Repeat.” *The Journal of Investing* August, 31 (5) 119-139; DOI: <https://doi.org/10.3905/joi.2022.1.226>

Brown, Rob. 2023a. “Target Date Funds, Mis-sold and Misused.” *The Journal of Wealth Management*. November. forthcoming

Brown, Rob. 2023b. "Risk-mitigated deep value - Bigger bang less buck." *The Journal of Beta Investment Strategies*. December. forthcoming

BusinessWeek. 1979. "The Death of Equities." August 13. Pages 54-57

Collins, Matthew. 2021. "Modern Portfolio Theory: What MPT Is and How Investors Use It." Investopedia, Investing, Quantitative Analysis. September 10.
<https://www.investopedia.com/terms/m/modernportfoliotheory.asp>

Dimson, Elroy, Paul Marsh, and Mike Staunton. 2023. "Credit Suisse Global Investment Returns Yearbook 2023 Summary Edition." Credit Suisse Research Institute

Elton, Edwin J., Martin J. Gruber, and Stephen J. Brown. 2002. "Modern Portfolio Theory & Investment Analysis." Wiley, January 1

Fabozzi, Frank & Grant, James. (2001). *Modern Portfolio Theory, Capital Market Theory, and Asset Pricing Models*. Wiley

Galouchko, Ksenia. 2023. "BlackRock's Wei Li Says the 'Goldilocks' Era is Over for Markets." Bloomberg Markets. May 19 at 8:05 AM MST. <https://www.bloomberg.com/news/articles/2023-05-19/blackrock-s-wei-li-says-global-markets-goldilocks-period-is-over?sref=mNvxEQ9y>

GMO. 2023. "GMO 7-Year Asset Class Forecast: April 2023." GMO, LLC. May 16.
https://www.gmo.com/americas/research-library/gmo-7-year-asset-class-forecast-april-2023_gmo7yearassetclassforecast/

Gordon, Robert. 2016. "The Rise and Fall of American Growth: The U.S. Standard of Living since the Civil War." Princeton University Press. January 12

Hurst, Brian, Yao Hua Ooi, and Lasse Heje Pedersen. 2017. "A Century of Evidence on Trend-Following Investing." *The Journal of Portfolio Management* Vol. 44, Issue 1 (Fall): 1-15

Hussman, John. 2023. "Fabricated Fairy Tales and Section 2A." Hussman Strategic Advisors Hussman Market Comment. April 24. <https://www.hussmanfunds.com/comment/mc230424/>

Keynes, John Maynard. 1936. "The General Theory of Employment, Interest, and Money." Chapter 12. Prometheus

Means, Kevin. 2019. "Keynes and the "Fail Conventionally" Syndrome." Sapien Investments, Resources, Investment Articles. April 25. <https://sapieninv.com/investment-articles/keynes-and-the-fail-conventionally-syndrome>

Mitchell, Melanie and David C. Krakauer. 2023. "The debate over understanding in AI's large language models." *Proceedings of the National Academy of Sciences (PNAS)*. March 21.
<https://doi.org/10.1073/pnas.2215907120>

MoneyGuidePro. 2023. "Envestnet MoneyGuide." New Solution Revolutionizing Wealth Planning. <https://www.moneyguidepro.com/ifa/>

NBER. 2012. "Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds." NBER Working Paper No. 18315. August. <http://www.nber.org/papers/w18315>

Shaw, Elizabeth. 2021. "Markowitz's Theory Explained (Modern Portfolio Theory)." Shortform. August 20. <https://www.shortform.com/blog/markowitzs-theory/>

Siegel, Laurence B. and Paul McCaffrey. 2023. "Revisiting the Equity Risk Premium." CFA Institute Research Foundation. Monograph

Stepstone Group. 2022. "The Great Unemployment, Facing an Unseen Challenge in the Global Economy." The Stepstone Group, International Division. May 25. <https://www.thestepstonegroup.com/en/insights/the-great-unemployment/>

Walsh, Bryan. 2023. "The Doomers are Wrong about Humanity's Future - and its Past . The Necessity of Progress." VOX, The Highlight. March 20. <https://www.vox.com/the-highlight/23627382/progress-climate-change-poverty-global-health-doom-industrial-revolution-vaccines>

Zeihan, Peter. 2022. "The End of the World Is Just the Beginning: Mapping the Collapse of Globalization." Harper Business. June 14