



CRAZY TRAIN

**PROFITLESS PROSPERITY; INVESTING IN FLATION;
AND – BERKSHIRE: GETTING BETTER ALL THE TIME**

2022 LETTER TO CLIENTS

February 23, 2023

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AND – BERKSHIRE: GETTING BETTER ALL THE TIME**

CRAZY TRAIN

All aboard Ha ha ha ha ha ha ha
Ay, ay, ay, ay, ay, ay, ay
Crazy, but that's how it goes
Trillions of dollars printed as notes
Maybe it's not too late
To learn how to balance
And not always inflate
Deficits not shrinking
Cash becoming lame
I'm going off the rails on a crazy train
I'm going off the rails on a crazy train
Let's go
I've listened to bankers
I've listened to fools
I've watched all the governors
Who make their own rules
One chairman conditioned to rule and control
The government sells it, and you're on the dole
Fiscal wounds still bleeding
Driving me insane
I'm going off the rails on a crazy train
I'm going off the rails on a crazy train
I know that fiat's going wrong for me
You gotta listen to my words, yeah
Heirs of inflation
That's what we've become
Inflating all bubbles, I'm mentally numb
Crazy, I just cannot bear
I'm living with nothing that just isn't fair
Fiscal wounds not healing
Jay and Co's to blame
I'm going off the rails on a crazy train
I'm going off the rails on a crazy train

IN THE LETTER – INTRODUCTION

All aboard. Ha ha ha ha. Speculation took a much-deserved back seat to value investing in 2022. Generations got rich quick in the Roaring 1920s, the Go-Go 1960s, the 1990s tech bubble and the latest everything bubble. Earlier generations gave it all back in the ensuing collapses. At the top, stories trump price and the battle-hardened value investor is mocked as out of touch with the new reality, incapable of understanding new disruptive technologies. The madness always ends with the train off the rails. History rhymes. And it repeats. Crazy, but that's how it goes.

I never thought we would see a repeat of the late 1990s. Having now navigated both periods of grand insanity, the 90s don't hold a candle to the casino that was 2020 and 2021. A proliferation of speculative excess and charlatan promotion ran rampant. SPACs, option and cryptocurrency trading, meme stocks, promises of impossible returns, sell-side (and some ETF buy-side) research lacking basic understanding of accounting and devoid of common sense – the latest bubble had it all. Billionaires launching themselves into space and selling their shares to the speculator the next day, outright frauds, Chinese listing of no-float shells with zero underlying business purpose on U.S. exchanges, the list goes on. Business news anchors called the circus like it was a basketball game. Similar casino behavior and promotion pervaded the late 1990s leading up to the tech bubble and subsequent collapse. Perhaps only for social media and heightened awareness, but it seemed on a grander scale this go around.

The S&P 500 lost 18.1% with dividends in 2022 while the Nasdaq shed 33.1%. The Fab 5 of Apple, Microsoft, Google, Amazon and Facebook, now Meta, soon to be Facebook again, were blistered by 36.8%. The Fab 5 entered 2022 at 24.7% of the index and went out at 19.2%. Even the bond market was no safe harbor as rising interest rates instructed the risk-unaware about duration and convexity risk when starting with nascent yields. Even though some of the more speculative corners of the investment world saw warranted declines of 70%, 80% and 90% or more, if compared to the unwinding of past bubbles, the current bear has more work to do. It's not even spring. Hibernation is a long way away.

Semper eked out a 1% return after fees in 2022. The S&P declined in six of our twenty-four years. We outperformed in all six, making money in three. Last year's minimal gain was thanks to several factors; gains in our energy investments, some terrific retailers, Berkshire Hathaway, the opportunity to do a bit of buying low and selling high, plus a healthy advance in underlying business profitability among many of our holdings. The letter begins with a traditional look under the hood at the intrinsic value of the Semper portfolio and expected returns in contrast with the S&P 500. An attribution analysis of factors contributing to total return is updated with a conclusion that an 18.1% index decline is far from enough to create a starting point for healthy prospective returns. In other words, the stock market remains expensive and laden with risk. The diligent value investor in the meantime can find pockets of tremendous opportunity.

Investing in Flation touches on periods of deflation to disinflation, inflation, stagflation and ultimately hyperinflation. The working premise of this section of the letter centers on debt levels so high to inhibit productive growth. With the proverbial inflation genie now out of the bottle, we may be on the front end of an inflationary period similar to the brutal stretch from 1966 to 1982. Rolling recessions, stock market collapses, persistent bouts of rising inflation and oil shocks caused extraordinary pain for most investors. Modern-day economists and central bankers point to the tough medicine administered by Fed Chairman Paul Volcker as the key to ending inflation in the early 1980s. They cast the earlier Arthur Burns Fed as culpable of not doing enough and allowing inflation to gain traction. See if you agree with convention by the time you read the section. At the end of the day, if we have a long inflationary period, there are most definitely assets *not* to own. While most suffered from 1966 to 1982, a few savvy investors produced outsized returns.

Profitless Prosperity is a follow-up to a piece introduced in the 2020 letter. Investing is difficult. There are times when speculation runs rampant where often the best thing to do is *avoid* the places sure to induce loss. If only a method existed that allowed the investor to spot the riskiest garbage. The price paid for a dollar of sales is a crude tool requiring an understanding of margins, sustainable growth and valuation. At times, however, it can simply be used to steer both the initiated and the uninitiated away from trouble. When a growing roster of companies trades for high multiples of sales, sometimes the best approach is to simply avoid *any* investment trading for such prices. If you don't know what you are doing, you are probably best to always avoid these traps. There are times though where the risk reward tradeoff is so unfavorably skewed to warrant even the brightest bulbs from playing. Data borne out by the hypothesis may support little more than common sense, but seeing the degree of predictable suffering through the numbers is eye opening. When prices are really high, just say no.

The Nifty Fifty at Fifty is a look back at a group of companies whose shares were said to be “one-decision stocks.” An investor could buy them at any price and because they were such marvelous, growing and durable businesses, no price was too high. The group suffered far more than the overall market in the 1973-1974 bear market. Certain academicians subsequently concluded a quarter century later that over enough time the original fifty companies did grow enough to justify prices that at the time were outrageously expensive. *Lots* of investors and strategists recently leaned on this academic “truism” in justifying ownership of much of the toxic waste recently inflated and subsequently taken behind the woodshed. The academic work touted so regularly was wholly incorrect. Fifty years on, it turns out the Nifty Fifty weren't so nifty after all.

Following a few book recommendations, an ongoing analysis of Berkshire Hathaway resumes in its customary back half of the letter. Berkshire will report a 2022 *loss* this Saturday totaling an estimated \$21.4 billion. The loss is Berkshire's largest in its history by a wide margin. In fact, it will be the *first and only* annual loss reported by Berkshire under the stewardship of current management (that's since 1965). Berkshire's stock portfolio declined 15% in 2022, sending book value per share down by an estimated 5.5%. The drop in book value per share is only the third time the annual figure was negative. The reported loss will be the 15th largest recorded by any company in the world over all of time. The media is likely to have a field day. Berkshire's shares, in the meantime, *rose* 4.0% during 2022. Intrinsic value per share as an average of multiple valuation methods (some understated at present) climbed an estimated 10.7% while economic earning power surged 14.3% thanks to sizable net investments in common stocks, growth in subsidiary and stock portfolio earning power, repurchase of an estimated 1.1% of shares outstanding, ongoing spending on growth capital expenditures at BHE and elsewhere, and a superb purchase of insurance competitor (and Semper holding) Alleghany.

If you read only one section of the Berkshire portion of the letter, read *The GOAT in Pasture? Capital Allocation*. Berkshire's 92-year young Chairman and CEO may have delegated much of his day-to-day responsibilities to a team of outstanding successors, but the one role he retained is capital allocation and he is as sharp as ever. You can search high and low to find the capital allocation function performed better at any company around the world. It will be a long and fruitless search. Read through what was accomplished during 2022. At 92, the GOAT is getting better.

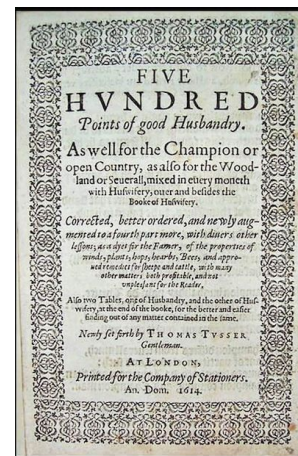
On a personal note, writing the letter this year was very difficult. My mom sadly but not unexpectedly entered hospice care in January. She's made it longer than her wonderful doctors and nurses thought possible – she's a fighter and a protector to the end. Always in my corner, it's been a blessing on so many levels to be in her corner during this most difficult period. She deserved more joy in a life filled with not enough of it. If I can offer any non-investment advice, it would be to let everyone that loves you know how much you love them. You can't say it enough, and if they need help, drop everything and be there for them. I love you, mother, and I'll miss you every day.

INTRINSIC VALUE UPDATE – VALUE ON SALE

“A foole & his money, be soone at debate: which after with sorrow, repents him too late.” – Thomas Tusser; Five Hundred Pointes of Good Husbandry, 1573

“If they pay a penie or two pence more for the reddinesse of them...let them look to that, a foole and his money is soone parted.” – Dr. John Bridges; Defence of the Government of the Church of England, 1587

The investor some refer to as an oracle famously defined two well-known rules for investing. Rule One is, of course, “Never lose money,” naturally followed by Rule Two, “Never forget rule number one.” Shrewd. The crowd becomes most mad at secular peaks, and the buildup in recent years to what will most certainly go down as one of the great tops brought ample opportunity to introduce the two maxims to a new generation of speculators – violators of both Rule One and Rule Two – parting many from their money.



Among those practicing value investing, a loss of money is best defined as a permanent loss of capital, or a PLOC. PLOCs come in myriad varieties. It can be a total wipeout, as with a bankruptcy such as Sears or Lehman Brothers. It can also be at the hands of a fraud; Enron, Madoff, or more recently FTX come to mind. It can also be paying a too-high price, overwhelming the underlying economics of a business. Tesla, bought north of a trillion-dollar market cap, may fit the bill here, perhaps as will an overestimation of car company economics. Microsoft, a great business for sure, but bought at the outset of 2000 at 31x revenues and 80x earnings on a 38% profit margin, produced a 15-year investment loss and only 8.4% total return for 23 years. PLOCs are not mere recoverable drawdowns.

On fools, money parted and drawdowns, Baron Rothschild, the eighteenth-century member of the Rothschild banking family, is known to have observed, “The time to buy is when there’s blood in the street.” What the British nobleman left out is the preference for the blood in the street not to be your own. Or at least not too much of it...

Blood ran thick and swift during 2022, Semper mercifully spilling little of it along the way, and none of it by yearend. We closed the year with a modest investment gain, below the long-run expectation for sure, but a result that few matched in a tumultuous year as most investors and asset classes succumbed to red ink. Periods of one, five or even ten years (more on this to come) cannot fully measure investment “success.” However, preserving more capital during bear markets allows more of our capital to grow during the remainder of the time. During the nearly 24 years that Semper has stewarded capital, the S&P 500 produced a loss in fully six of those years, so a quarter of the time. Our stocks outperformed in all six. In three of the six we made money.

A bit of good fortune elevated returns into the black by yearend. The portfolio began the year running hot, up more than 10% by mid-April even as the market fell. However, value seemingly went on sabbatical on June 9, sending returns for the year to a minus 6% on June 30 and nearly 12% in the red on September 30. But it was off to the races again in the home stretch. Investments in the energy patch drove the bus during the year, with several investments having earlier been made during a period when energy was universally despised. Perhaps most despised would be the way to phrase that. Berkshire Hathaway’s acquisition of Semper portfolio holding Alleghany was additive (and fortunately well-bought by Semper in March 2020 at half of book value). But portfolio activity; a small gain in our largest holding, the aforementioned Berkshire; as well as several more sizeable gains throughout the portfolio, also contributed to the nominal gain for the year. Under the hood existed yin and yang. Many other holdings declined precipitously,

affording the opportunity to add to and rebuild several positions at favorable prices. A strong dollar allowed us to increase position sizes in several European holdings and initiate an additional one in Scandinavia.

Underlying positive progression in earning power, judicious trading, and price declines in numerous positions combined to drive portfolio fundamentals to among the lowest valuations in our nearly quarter century as a firm, rivaling the pandemic low in 2020 and the lows seen during the Global Financial Crisis in 2008 and 2009.

The portfolio closed 2019 at 13.5x earnings, 12.5 in 2020, 10.7 in 2021 and now plumbs at a seldom seen sub-ten handle. Despite equity gains of 23.6% in 2019, 11.9% in 2020, 27.3% in 2021 and 2.1% in the year most recent, portfolio valuations *declined in each*, meaning fundamentals compounded faster than returns. Lower valuations suggest higher expected long-term returns. The portfolio is valued at 9.5x earnings (a 10.6% earnings yield), an even 1.0x sales and with a 1.8% dividend yield, despite a *very* low dividend payout as a proportion of portfolio earnings.

The overall 2.1% equity gain for the year was largely dividends as gains in price in some holdings were matched by declines in others. Despite little movement in aggregate portfolio price, aggregate earnings of the businesses progressed at a healthy clip, thus making valuation more favorable. Further, active management brought opportunities to trim and sell the dear; and likewise, to boost and initiate positions on the cheap. Opportunity presented itself often during the past few years and came in spades during 2022. An investment process built on owning quality businesses, and a disciplined approach to measuring intrinsic value versus the price paid, propels the value-conscious investor to act, but only to a point. Ultimately, it's the underlying economics of the businesses owned that drive returns. Activity undertaken correctly should buy undervaluation and trim overvaluation, adding what the consultants like to call "alpha."

At this point an example of Benjamin Graham's Mr. Market is appropriate. Some readers are very familiar with Ben Graham, who taught the likes of Warren Buffett at Columbia University and penned both the New and the Old Testaments to investing – *Security Analysis* in 1934 and *The Intelligent Investor* in 1949. Other readers are likely not as familiar with the Father of Value Investing, so instead of designing a Mr. Market example, it's best to cite the 1949 masterpiece:

Imagine that in some private business you own a small share which cost you \$1,000. One of your partners, named Mr. Market, is very obliging indeed. Every day he tells you what he thinks your interest is worth and furthermore offers either to buy you out or to sell you an additional interest on that basis. Sometimes his idea of value appears plausible and justified by business developments and prospects as you know them. Often, on the other hand, Mr. Market lets his enthusiasm or his fears run away with him, and the value he proposes seems to you a little short of silly.

If you are a prudent investor or sensible businessman will you let Mr. Market's daily communication determine your view as the value of your \$1,000 interest in the enterprise? Only in case you agree with him or in case you want to trade with him. You may be happy to sell out to him when he quotes you a ridiculously high price, and equally happy to buy from him when his price is low. But the rest of the time you will be wiser to form your own ideas of the value of your holdings, based on full reports from the company about its operation and financial position.

Warren Buffett later described Graham's Mr. Market as a manic-depressive fellow. Symptoms of insanity diagnosed in many corners of the investment arena in recent years suggest the old boy was most definitely off his meds. It's not often that profitless fantasies are capitalized at 20x or more times sales; or that shareholder-diluting SPACs, cryptocurrencies, exchanges and exchange-listed Chinese shells become the flavors du jour. Even classic well-run growth companies, when bid up to prices that defeat long-run

economic returns, are signs that Mr. Market is in a severe manic state and past returns have borrowed from the future. Partying to excess, and among the excesses, is a surefire way to violate Rule One. Ultimately, following every bender, Mr. Market in the form of Dandy Don Meredith appears as the game is lost, crooning, “Turn out the lights...the party’s over.” The depressive phase kicked in in 2021 and throughout 2022, ending the party for many. They just don’t know it yet. Having violated Rule One, hopefully those novice investors that lost don’t subsequently violate Rule Two. Ideally, those egregiously violating Rule One who are charged with investing money for others aren’t given the opportunity to violate Rule Two. Cockroaches are tough to kill, however.

Fundamentals Versus the Market

As you’ll see in the table below, The S&P 500 surged for the three years 2019 to 2021, then suffered an 18.1% total return loss last year. A progression of sales per share did not match stock returns, growing 5.4% in 2019, falling 3.7% during 2020’s pandemic and then logically recovering 15.0% in 2021 against a depressed base. Sales per share impressively surged 12.7% in nominal terms during 2022, well ahead of annualized sales growth in dollar terms for the past couple of decades. The year-over-year increase was no longer against a depressed base. Did profits meet Wall Street’s expectations as of a year ago and continue growing faster than sales again in 2022? Hardly. Earnings per share look to have declined by 3.9% during 2022 from what had been a record 13.3% profit margin. This was mainly caused by inflation. Wall Street analysts had expected earnings growth of more than 15% as recently as September 2022. Ouch.

Roughly half of the jump in profits and the profit margin during 2018 was thanks to changes in the tax code under 2017’s Tax Cuts and Jobs Act, or TCJA. The impact of the pandemic can be seen in the outright 3.7% decline in sales in 2020 and the outsized hammering of earnings. Sales recovered to what can be called trendline the following year while profits surged 70% from a depressed 2020 level to a record 13.3% profit margin in 2021. Way-above-trend sales growth, combined with an *absolute decline* in profits, reveals the machete that chopped down profit margins in 2022. The analyst needs to go back to the inflationary 1970s to find years like 2022 when sales grew rapidly yet earnings absolutely declined.

S&P 500 Sales, Earnings and Margin Figures

Year	Sales Per Share	Growth	Earnings Per Share	Growth	Profit Margin	Total Return
2017	1,231.57	7.0%	124.51	17.2%	10.1%	21.8%
2018	1,343.00	9.0%	151.60	21.8%	11.3%	-4.4%
2019	1,415.01	5.4%	157.12	3.6%	11.1%	31.5%
2020	1,362.39	-3.7%	122.37	-22.1%	9.0%	18.4%
2021	1,566.80	15.0%	208.21	70.1%	13.3%	28.7%
2022	1,765.43	12.7%	200.12	-3.9%	11.3%	-18.1%

A wonderful analytical method aggregates Semper’s portfolio holdings as though they are a single business, consolidated using common-size balance sheet and income statement figures, leverage and profitability ratios, and finally some valuation measures. Our “company” then compares against the S&P 500, similarly grouped as though all 500 businesses were a single business. The common size method references all measures against a unitized \$100 in sales, allowing for ease of analysis of margins, leverage and profitability. In other words, sales for the Semper portfolio and for the index both set at \$100 during each measurement period.

The fundamental common-size analysis of the Semper portfolio and the S&P 500 can be seen in the light steel blue and amethyst-shaded table below. All income statement and balance sheet figures are in

proportion to \$100 in constant sales. Valuation figures in the lower portion of the table are multiples and yields. Comparison of several year-end common-size periods illustrates the impact of stock prices on valuation and allows for ease of margin analysis by eliminating annual volatility in sales.

Key Common Size Figures for the Semper Portfolio and S&P 500

	2022		2021		2020		2019	
	S&P 500	Semper	S&P 500	Semper	S&P 500	Semper	S&P 500	Semper
Income Statement Figures								
Sales	\$100	\$100	\$100	\$100	\$100	\$100	\$100	\$100
Earnings Before Interest and Taxes	16.2	14.4	17.7	16.3	12.7	15.5	15.9	17.5
Interest Paid	2.1	0.9	1.6	0.8	1.7	1.6	2.4	1.3
Pre-Tax Profit	14.1	13.5	16.1	15.5	11.0	13.9	13.5	16.1
Tax Rate	19.5%	21.0%	17.5%	22.8%	18.5%	21.6%	17.5%	20.0%
After-Tax Profit (operating income)	11.3	10.6	13.3	12.0	9.0	10.9	11.1	12.9
Dividends	3.9	1.8	4.0	2.2	4.4	2.4	4.2	2.4
Retained Earnings	7.4	8.8	9.3	9.8	4.6	8.5	6.9	10.5
Balance Sheet Figures								
Equity (Book Value)	\$57.9	\$63.1	\$64.7	\$75.7	\$66.9	\$82.4	\$64.1	\$101.2
Debt	70.8	31.0	78.1	38.8	86.4	47.6	79.0	43.7
Cash	18.3	25.9	25.3	31.3	29.2	51.3	19.1	28.5
Net Debt	52.5	5.1	52.8	7.5	57.1	-3.7	59.8	15.3
Total Capital (Equity + Net Debt)	110.4	68.2	117.5	83.3	124.1	78.7	123.9	116.4
Leverage Ratios								
Debt / Equity	122.3%	49.1%	120.7%	51.2%	129.1%	57.7%	123.2%	43.3%
Net Debt / Equity	90.8%	8.1%	81.6%	9.9%	85.4%	-4.5%	93.4%	15.1%
Net Debt / Total Capital	47.6%	7.5%	44.9%	9.0%	46.1%	-4.7%	48.3%	13.1%
Profitability Ratios								
EBIT / Total Capital	14.7%	21.1%	15.1%	19.6%	10.2%	19.6%	12.7%	15.0%
Return on Equity	19.5%	16.9%	20.6%	15.9%	13.5%	13.2%	17.3%	12.8%
Return on Total Capital	11.7%	16.7%	12.4%	15.1%	8.3%	15.4%	10.5%	12.0%
Key Valuation Figures								
Price (Market Value)	\$217	\$101	\$304	\$128	\$279	\$136	\$232	\$174
Price / Sales	2.2	1.0	3.0	1.3	2.8	1.4	2.3	1.7
Price / Book Value	3.7	1.6	4.7	1.7	4.2	1.7	3.6	1.7
Price / Earnings	19.2	9.5	22.9	10.7	31.0	12.5	20.9	13.5
Earnings Yield (Earnings / Price)	5.2%	10.6%	4.4%	9.3%	3.2%	8.0%	4.8%	7.4%
Dividend Yield	1.8%	1.8%	1.3%	1.7%	1.6%	1.8%	1.8%	1.4%
Retained Earnings Yield	3.4%	8.8%	3.1%	7.6%	1.6%	6.3%	3.0%	6.0%
Dividend Payout Ratio	34.6%	17.0%	30.2%	18.3%	48.9%	21.9%	37.9%	18.6%
Enterprise Value / EBIT	16.6	7.4	20.2	8.3	26.5	8.5	18.4	10.9

Figures are rounded and may not sum precisely; Index data are estimates for 2022.

Sources: Semper Augustus; Standard & Poor's; Bloomberg

Think about the use of a common size approach to analysis when sales rise rapidly while earnings and stock prices head in the other direction. That was the S&P 500 last year. Holding sales constant at \$100, a 12.7% increase in sales per share coupled with a 3.9% decline in earnings per share yielded a 15% decline in the profit margin. A 19.4% drop in price (total return was a less negative 18.1% thanks to dividends) combined to crush the price paid for sales from 3.0x to 2.2x, a 29% reduction in the multiple. It may not be immediately obvious due to rounding but Price (Market Value) in the table is the same as the Price-to-Sales multiple times 100 because we are benchmarking all measures against a constant level of sales. A 29% cut in the multiple to sales is quite a shave.

The multiple paid to earnings for the index, the P/E, dropped from a heady 22.9x (particularly frothy when measured against a record 13.3% profit margin, “After-Tax Profit” in the table) to a historically still elevated 19.2x. The multiple to book value likewise descended from 4.7x to 3.7x.

You won’t see it in the table, but book value per share erodes over time as companies are spending two-thirds of net income each year repurchasing shares at big premiums to book value. Starbucks, a portfolio holding, has no book value, given extremely large repurchases made over several years. Book value for the S&P is likewise understated, given that write-offs and write-downs have averaged about 15% of annual earnings since the mid-1980s. Charges tend to be greater when profits are in the tank and the economy is weak, the proverbial big bath or kitchen sink method. Repurchases and charges to assets and equity serve to materially overstate return on equity as measured. Past letters cover these nuances in great detail.

Balance sheet financial leverage for the index remains at record levels only manageable in a world of extremely low interest rates. Rising rates in 2022 exposed risk and pushed on profitability. Cash and debt both declined a bit as a percentage of sales while net debt has remained at just under half of total capital for several years, meaning debt and equity are equally employed in the capital structure when including cash in the mix.

Interpreting the Income Statement Figures section at the top, Earnings Before Interest and Taxes, Pre-Tax Profit and After-Tax Profit are the margins for each because we are using a common-size method for analysis. For example, \$11.30 in After-Tax Profit is simply an 11.3% profit margin. After-tax profit margins reached 13.3% for the S&P 500 at year-end 2021, a record that may not again be reached. Earnings Before Interest and Taxes, the EBIT margin, likewise fell from 17.7% to 16.2%, leaving less profit to service debt. Pre-tax interest paid rose from 1.6% to 2.1% of sales in 2022, seemingly inconsequential but that’s a 31% increase. Why so much? As the Federal Reserve raised its Fed Funds rate, corporate rates likewise rose. In fact, credit spreads widened during much of the year.

Much of the mountain of corporate debt, itself at an all-time high for all corporations relative to revenues and likewise to GDP, is short-term in maturity. Further, as term debt matures, when interest rates are higher, some companies choose not to roll debt at term but instead to lean on short-term borrowing. Asset-backed commercial paper issuance surged by 50% during the second half of the year, with many CFOs banking on short rates and the entire yield curve coming back down during the next QE phase. Use of commercial paper in financing remains well below levels seen before the Global Financial Crisis. During that time, when General Electric couldn’t roll its \$90 billion in commercial paper obligations, the Fed intervened with a funding facility that essentially backstopped the entire top-rated commercial paper market. Despite funding secured, the 2008 near-death experience discouraged that much reliance on financing with commercial paper. Still, last year’s huge jump takes the commercial paper market up to \$1.3 trillion, a level of outstanding paper not seen since 2009.

The Semper portfolio migrated over the course of 2022 from undervalued and strong to more undervalued and stronger. The change in Price (Market Value) per dollar of sales followed a different path than the index. The table reveals a steady price decline from \$174 per \$100 of sales in 2019 to only \$101 at December 2022. That’s a 42% decline, despite our stocks appreciating nearly 80% over the past four years. Remember, this is a common-size analysis, and we are *active* investors. The stock portfolio earned a compound average annual gain of 15.8% over the past four years. I wrote last year that, “With the exceptions of market lows in 2020 and 2009, the portfolio has never been more fundamentally undervalued and at the same time more profitable!” Given positive earnings progression, a flat year by portfolio price and our ability to move capital from the dear to the cheap, the aggregate portfolio is even cheaper today than a year ago.

Portfolio activity, the ability to sell and buy, to trim and add to positions, works to keep the portfolio price low and earnings yield high. There are scores of investors with high levels of portfolio turnover, but one must wonder to what end? By contrast, our turnover is typically low, averaging 15% annually over 24 years. Modest activity over time has added considerably to returns. I'd guess if activity were manic, returns would be harmed. Active, but not overactive.

Fundamental measures demonstrate the degree of undervaluation and strong capitalization in the aggregate portfolio. At 10.6%, the earnings yield is more than double the index yield. Of the 10.6% earnings yield, 1.8% is earned as a dividend yield, with portfolio companies retaining and investing the 8.8% balance. The businesses are reinvesting at an aggregate 16.9% return on equity and with only 7.5% of net debt employed as a proportion of total capital (versus 47.6% for the index) our businesses earn 16.7% on total capital – nearly as much as they do on equity. Of the 5.2% S&P 500 index earnings yield, 1.8% is distributed to shareholders as dividends with only 3.4% reinvested.

The portfolio receives only 17% of profits as dividends. This is most definitely not a bad thing. The balance of 83% of profits are reliably being reinvested at the portfolio's 16.9% return on equity. Arguably, the most important aspect of our work is determining how well company managements reinvest profits. Actively sought are managements who allocate capital well. The fact that portfolio businesses reinvest at 16.9% on a *nearly net unleveraged* basis is such a favorable element. Compare again the difference here with the index. **The S&P 500's dividend payout as a proportion of profits is double Semper's, at 34.6%. Twice the payout rate but an identical 1.8% dividend yield?** Read that again. That's the degree to which price matters. But it's more telling considering that index companies invest only 65.4% at a *theoretically* higher 19.5% return on equity versus our 16.9%. But net leverage...

It takes nearly as much net debt (debt minus cash) as equity in the index companies' capital structure to produce a modestly higher return on equity. But when it comes to returns on total capital, our 16.7% aggregate return is fully 5.0% higher than the 11.7% for the index. Our businesses earn 43% more profit on each dollar of capital employed. Leverage can amplify returns, but when excessive, it can create permanent harm. Recall Rules One and Two.

After about a third of profits are sent to index shareholders as dividends, *more* than 100% of the retained balance is used repurchasing shares to merely offset the dilution that results from giving 2% of the average company to insiders each year as options and restricted shares. Share reduction of the index companies was a modest 0.7% per annum for the past decade. Said differently, companies spent roughly 60% of profits to purchase 2.7% of their market capitalization each year, yet only reduced the share count by 0.7% annually. Bully. Retained earnings are NOT reinvested at the return on equity. All retained earnings are spent repurchasing expensive shares. Repurchases made at high prices destroy capital. Shares bought at 20x earnings yield 5%, and 30x earnings gets you 3.3%. If no profits are left after paying dividends and repurchasing shares, what funds growth capital expenditures and growth research and development? Exactly.

The component members of the S&P 500 likely dropped a cool \$1 trillion in 2022 on share repurchases, easily breaking 2021's \$880 billion record, yet profits declined. A quarterly record was set in 2022's first quarter when firms spent \$281 billion buying shares and with \$138 billion in dividends paid, chewing up more than they earned in profit. Par for the course.

Imagine a year when companies spend \$1 trillion buying back shares, or 65% of shareholder profits, yet their shares decline nearly 20% in price. Now imagine how much worse the year would have been for stock market returns had the captains of industry *not* shelled out the cash. Well, the companies would have an additional \$1 trillion in cash on the balance sheet but imagine how low prices might have fallen without \$1 trillion hitting the ask throughout the year. Now imagine a recession, when companies tend to

halt repurchases, just as they did during the pandemic and in the 2008 - 2009 Global Financial Crisis. For the record, the cadence of repurchases slowed in both the second and third quarters last year, with a mere \$210 billion spent for the quarter ended September 30. Imagine inflation further hammering on profits and overlay a recession. Who will buy the shares when sellers hit the bid?

One final comment on the record share repurchases in 2022. A trillion dollars in shares repurchased bought 2.8% of the S&P 500's \$36 trillion average market capitalization during the year. However, shares outstanding shrank by only 1.1%. What happened to the remaining 1.7%? That's the dilution that comes with CFOs telling investors to ignore share-based compensation (SBC) because it's not a cash expense. Fine. Here's an idea. How about ignoring SBC but running the money spent buying shares through the income statement as an expense, but without a tax benefit? Pick your poison, pirates. You can't have it both ways. Suggesting that executives are pirates is too harsh and unwarranted? At least 40% of S&P 500 aggregate net income over the last two decades has not been used for outside shareholder benefit, but instead was paid to management. Makes 2 and 20 look like a discount. There *is* a better word than pirates, but this is a G-rated letter. Speaking of which, I need to schedule my colonoscopy. These pirates don't know which end is up.

Forward Expectations

Much of the investment process centers on evaluating the ongoing competitive position of the companies we own and the durability of their profitability. Provided the assessment of *economic* profitability proves durable, we should earn at minimum the earnings yield on the portfolio, today at 10.6%. From a base of the earnings yield, we expect additional return that can be articulated two ways. First, to the extent our process allows us to occasionally purchase businesses for less than they are worth (during Mr. Market's depressive phase), then any accretion to fair value is added to the earnings yield over some period of time. Paying 80 cents on the dollar of intrinsic value, an additional 25% ($100/80=1.25$ or 25% increase) is expected. From two-thirds of value we'd expect an accretion of 50% ($100/66.67$). Buying an asset at half off yields a double ($100/50$). Easier said than done, naturally, but a disciplined process tends to yield the expected return over time. For much of our 24-year history, the portfolio traded at a low-double-digit multiple to earnings, so say a 7% to 9% earnings yield. At a typical purchase discount of a third to a quarter of value, we've seen a "bonus" 2% to 4% additional return over time on top of the earnings yield, so a 9% to 12% return on the stock portfolio before any drag (or addition) from cash in client portfolios and before management fees.

A long-term return expectation at year-end 2022 begins with the 10.6% earnings yield. The higher-than-normal yield, again the inverse partner to a lower-than-typical P/E multiple, suggests the portfolio discount to intrinsic value is wider today than at most times. Indeed, at 57% of intrinsic, we'd add 2% to 4% upside earned over a period of years to the 10.6% earnings yield. This may sound outlandish but adding 2% to 4% to today's 10.6% earnings yield seems reasonable over time and would produce returns somewhat higher than the portfolio earned on average over the past quarter century. Periods of decline, sometimes substantial, will certainly accompany Semper's returns, but armed with a historically low absolute and relative valuation seems an advantage looking forward.

Perhaps a better way to describe expected return is to again begin with the earnings yield as a base and add the return generated on earnings not paid to us as dividends, but at the rate at which our companies produce returns on retained earnings. Expected earnings begin with the earnings yield and trend to the underlying return on equity over time, particularly if investments in companies are held over long periods of time.

In a nutshell, the earnings yield consists of two components, the dividend yield and what I like to call the retained earnings yield. Think about it in this simplistic fashion:

$$D + RE = E$$

$$DY + REY = EY$$

Where:

D = Dividends
DY = Dividend Yield

RE = Retained Earnings
REY = Retained Earnings Yield

E = Earnings or Net Income
EY = Earnings Yield

Applying this simple math using the portfolio at yearend, we had a P/E multiple of 9.5x. The earnings yield is the inverse of the P/E multiple, so E/P. It is the earnings produced by a dollar of current market value (or price). Equate it to a \$1 million asset producing \$100,000 in profit. That's a 10% earnings yield. At a 9.5 P/E, our earnings yield is thus 10.6%. With a dividend yield of 1.8%, the retained earnings yield is the difference between the earnings yield and the dividend yield, or 8.8%. It's what happens with that 8.8% retained earnings yield, or \$8.80 for every \$100 of sales, that drives incremental return.

Profitability properly measured is not so much at the margin level but instead against how much equity capital and total capital it took to produce said profit. To begin, we must determine profitability as measured against equity and total capital. Then, we must estimate the rate at which a company can durably retain that portion of profits not paid as dividends and do something intelligent with it. Some companies have abundant opportunities for reinvestment while others do not. One of the most important things we do is figure out those opportunities, or lack of them, and then measure what companies actually do with any retained money.

The aggregate collection of our businesses earns 16.9% on equity capital and 16.7% on total capital. The two figures are nearly identical given the lack of net debt on the collective balance sheet. Many holdings use no net debt or have more cash on the balance sheet than debt. The long-run investment expectation begins with today's 10.6% earnings yield and trends toward the 16.9% return on equity over time.

I'd like to largely repeat the paragraph below from last year. The math and expected return are not as simple as it seems. Discussed is a perpetual drag on expected earnings for active investors, or for investors receiving dividends or adding capital to investment portfolios over time. It's not solely a handicap of the active investor. Any passive owners of common stocks receiving dividends or contributing to investment portfolios, or who have portfolio companies acquired for cash, likewise bear the cost of this drag. Passive investors are not exempt, particularly for indices rebalancing regularly.

There exists a drag on returns, and that's the rate at which dividends are reinvested. New capital, or the proceeds from portfolio sales and trims, suffer the same fate. If we are having to pay premium prices, to book value at least, then paying not today's low [now 9.5 at year-end 2022] multiple to earnings but the more typical 11x to 14x (and far higher with some of our investments) takes the return on that portion of our capital back to the starting point, to the "go" of the earnings yield if you will. We are far better off if our investees retain and reinvest the great majority of their profits at good returns than if they dividend it out to us, forcing us to pay the premiums typically involved in acquiring new fractional shares of companies in the stock market. The luxury is choosing the businesses and prices paid upon our reinvestment of dividends, new capital, and portfolio process cash. In a sense, it's the lack of portfolio sales and trims by index investors that never have to be reinvested at premiums that is a genuine advantage to indexers. Portfolio activity must be of enough value added to overcome the drag of always having to pay the multiple to earnings with the proceeds from any portfolio sales. I think we do this well, but it's very difficult for most active investors to do so. In my experience, few investors even contemplate or understand this hurdle when selling a position. Opportunity cost, remember? There exists the alternative not to sell. It's this understanding that contributes to Semper's generally low but opportunistic portfolio turnover.

Most of Semper's portfolio businesses genuinely have opportunities to invest retained earnings at or above the return on equity of our portfolio. Some, like Berkshire Hathaway, can retain all profit and deploy it well. Others have the ability to reinvest some, but not all profit and distribute the balance to shareholders as dividends. Companies like Costco and Dollar General fit the bill here. A few have little to no opportunity set, which is where capital allocation skill and awareness of circle of competence and opportunity comes into play. This can be illustrated with a company like Olin, currently our second-largest holding.

Brass Tacks – Salt, Water, Electricity and Bullets

Olin is a 130-year-old company founded outside St. Louis in East Alton, Illinois, by Franklin W. Olin as the Equitable Powder Company. The business supplied blasting powder to midwestern coal fields and quickly expanded into small arms ammunition. The company produced brass to supply the military during World War I. They bought Winchester Repeating Arms during the Great Depression, sold the shotgun manufacturing division years later (but retained ammunition manufacturing) and, over the years, through myriad investments and divestitures, are now the largest and lowest-cost chlor-alkali manufacturer in the world, vertically integrated in many higher-margin platforms. And yes, they still make bullets with brass. The chlor-alkali process is essentially the electrolysis of a slurry of salt (NaCl or sodium chloride) which simultaneously produces chlorine (Cl) and caustic soda (NaOH , also known as lye or sodium hydroxide) along with a small amount of hydrogen (H). Reverting to freshman chemistry, the slurry of salt requires water (H_2O). Thus: $\text{NaCl} + \text{H}_2\text{O}$ yields NaOH , Cl and H . I think when I'm back on campus playing for Coach Prime this fall with my one remaining year of eligibility (after my knee and hip replacement and a few trips to the weight room), I'll duck into the Chem Department and submit this paper for extra credit. I'd love to raise one of my few Bs from 35 years ago. Still bothers me.

Getting back to Olin and capital allocation, my interest was piqued in hometown St. Louis-based Olin in 2015 when it acquired Dow Chemical's U.S. chlor-alkali and vinyls, global epoxy and chlorinated organics businesses as Dow and DuPont shed assets for antitrust reasons during their merger. The \$5.5 billion acquisition made Olin the number one global producer of chlor-alkali with the largest chlorine production capacity, membrane caustic soda and chlorinated organics, epoxy materials, and, in North America, the number one producer of chlorine, bleach and hydrochloric acid.

Following the company for a few years, it became evident that little, if any, new supply would come online over the next decade. Presuming population and industrial demand growth, an evolving supply and demand imbalance would develop over time. We started buying shares in 2019 and added to the small position in earnest in March 2020, in the teeth of the fast-evolving pandemic. Many end markets for both chlorine and caustic soda slowed. Olin and their small handful of global competitors reacted by closing low-margin commodity capacity, much of it permanently, and Olin contemplated a reduction in the dividend. The company was a dividend aristocrat, having paid a dividend since the 1930s. The market cap dipped as low as \$1.65 billion, or a bit below \$10 per share. The balance sheet was still leveraged with more than \$4 billion in net debt, much of which came with the purchase of the Dow Chemical assets. Stock repurchases were off the table when the stock was cheapest. Olin was deemed an essential business (I'd like to think all of our businesses, including Semper, are essential) and operated throughout the slowdown. Demand was naturally down for a time.

As the economy gradually recovered, a leaner, higher-margin business found itself producing as much as \$2.7 billion in EBITDA and more than \$1.5 billion in free cash by 2022. The company used cash flow to reduce debt, now sitting at roughly \$2.7 billion net of cash. The business, and we likewise believe its competitors, have no interest in playing the classic capital cycle and are not planning new capacity, per the original blueprint. The pandemic allowed for the permanent closure of some assets, accelerating the

evolving supply and demand imbalance. Maintenance capital expenditures run just north of \$200 million against depreciation charges of \$600 million.

With Olin's balance sheet now rock solid and no use for growth capital spending, what to do with the cash? The stock has traded as much as five times higher than Semper's cost and at an all-time high. The valuation must be too full for share repurchases, right? The best course would be to distribute more dividends, even special dividends to the shareholders, right? No. Management believes that in a deep recession the business will produce \$1.5 billion in EBITDA and \$1 billion in free cash. Even though the stock is up four to five fold in a couple years, at the current \$7 billion market cap and \$10 billion enterprise value, it's trading at what may be 7x both recessionary P/E and enterprise value / EBITDA. On current net profit, the earnings yield is 20%. This is not a commodity business that needs to replace reserves to be durable. The assets will be producing caustic soda, chlorine, epoxy, vinyls, and yes, bullets decades from now. The best course of action is to repurchase shares. The company could be private at current prices in a few years. There is no internal reinvestment opportunity that should be pursued. There may be room for some merger activity but at a 20% earnings yield, "Buy the gosh darn stock," as Coach Prime would likely say. I don't want more dividends on which taxable investors pay taxes. Management is executing the playbook to perfection. The share count is down by more than 20% in the last two years, with most of the reduction in the last year. If Olin traded not at 5x earnings but at the S&P 500's valuation in recent years, then share repurchases would be harmful to investors. At 5x, repurchases are exactly what the owner should want.

Contrast Semper's companies on one hand, either reinvesting in profitable growth or paying much of profit as dividends when growth makes no sense or repurchasing shares when they trade at material discounts to intrinsic value with, on the other hand, what's gone on more broadly in the stock market and specifically with the S&P 500.

Expected returns for the S&P 500 index can be similarly approximated. Despite 2022's nearly 20% price decline, we find the index still considerably overvalued. Let's presume an investor expects to earn the current 5.2% earnings yield (up from last year's 4.4%) plus any accretion to intrinsic value over some period, just as with the Semper portfolio. But what if the index trades not at a *discount* to value but at a *premium*? Combining the earnings yield with an erosion to fair value produces at best a low-to-mid-single-digit 10-year expected return with splashes of losses in the interim, a la 2022.

Our estimate of intrinsic value for the S&P 500 is well below the year-end \$3,839 closing price but closer than 2021's \$4,766 closing price. Fifteen times \$226.49, the present Wall Street analysts' operating earnings estimate for 2023, produces \$3,397 price, or 11.5% lower than at yearend. The critical question is where does the operating profit margin wind up over time? The bet here is we won't see 2021's 13.3% margin again. Should inflation prove persistently pesky, bank on lower margins over time, particularly if today's massive level of corporate debt must be refinanced at higher interest rates. Ask today's homebuyer how much less house they can afford with mortgage rates above 6% and no longer 2.625% as they were a year ago.

The first Semper Augustus Intrinsic Value report was run on March 31, 2000. The portfolio was valued at 15.6x earnings, thus a 6.4% earnings yield. The S&P 500 traded at 40x and a 2.5% earnings yield. The report measured the portfolio at 84% of intrinsic value, giving it 19% upside over some period. The intrinsic value of the index was approximated at 590, just a wee bit lower than the 1,499 price for the S&P 500 at March 31, 2000. The math suggested three possible outcomes: (1) a quick 61% decline to fair value; (2) not making any money for a long, long time; or (3) some combination of the first two. We needed the report as a tool to help make the case not to chase the tech bubble or to own index funds. Value investing was in shambles, with the Nasdaq 100 having rocketed ahead by 102% in 1999. Our stocks managed a 29% return that year, which to some was unacceptable. "You boys are too young to not

have tech.” Lots of explanation was required until sanity returned, as it always does eventually. It’s that “eventually” that was so difficult for the value set in 1999 and in recent years.

Expected returns couple the earnings yield with the purchase of stocks at a discount to intrinsic value. Accretion of the discount over some period plus the earnings yield equals the return. The process seems to stand the test of time. Since running the Intrinsic Value report for the first time in 2000, the portfolio earnings yield averaged 7.6%, or 13.2x earnings. At an average 75 cents on the dollar of fair value, the presumed 33% accretion to value earned over a period of years should add perhaps 2% to 3% to the earnings yield. A 9.6% to 10.6% expected return range compared to an 11.5% average actual return over 24 years seems to reconcile. Throw in some value added via active management (offset by the inevitable mistakes) and long holding periods where returns trend to the portfolio return on equity and you are well within the ballpark of reason.

Year	SAI Equities Only	CAGR from 2022	CAGR from 1999	Beginning Earnings Yield	Beginning P/E Ratio
1999	29.1%	11.5%	29.1%	7.7%	13.0
2000	30.7%	10.7%	33.1%	6.4%	15.6
2001	23.1%	9.8%	29.4%	6.6%	15.2
2002	-22.0%	9.2%	13.4%	7.4%	13.5
2003	38.2%	11.1%	18.2%	7.9%	12.7
2004	16.3%	9.8%	17.9%	7.7%	13.0
2005	7.4%	9.5%	16.3%	8.2%	12.2
2006	18.4%	9.6%	16.5%	7.3%	13.7
2007	3.1%	9.1%	14.9%	7.0%	14.3
2008	-21.6%	9.5%	10.5%	7.5%	13.3
2009	27.9%	12.1%	12.0%	10.0%	10.0
2010	14.4%	11.0%	12.2%	8.4%	11.9
2011	7.1%	10.7%	11.8%	8.3%	12.0
2012	6.8%	11.0%	11.5%	8.7%	11.5
2013	17.3%	11.4%	11.8%	8.9%	11.2
2014	5.2%	10.8%	11.4%	8.0%	12.5
2015	-10.3%	11.5%	10.0%	7.7%	13.0
2016	27.7%	15.1%	10.9%	8.1%	12.3
2017	18.0%	13.1%	11.3%	7.6%	13.2
2018	-1.4%	12.1%	10.6%	7.2%	13.9
2019	23.6%	15.8%	11.2%	8.2%	12.2
2020	11.9%	13.3%	11.2%	7.4%	13.5
2021	27.3%	14.0%	11.9%	8.0%	12.5
2022	2.1%	2.1%	11.5%	9.3%	10.7

Inception Date 2/28/1999

Heading into 2023 and on the heels of 2022’s flattish return, our 9.5x P/E is lower than at the outset of any year in our history. It’s the first time we’ve begun the year with a single-digit P/E and an earnings yield above 10%. Interestingly, there is but one integer where both the P/E and the earnings yield can sport double digits – think Bo Derek and Bolero – if you are still stumped you will find the singular and improbable occasion in the table. We’ll see how the subsequent decade and more evolve. There are lots of things that can derail today’s seemingly higher-than-average expected return. We could fail to adapt to

persistently high inflation. We could have a depression. We could have hyperinflation, which might make our nominal returns look pretty terrific, but adjusted for inflation might see a decline in purchasing power. Regardless, we like how the table is set.

[Did you solve the Bo Derek riddle? I hadn't thought about it at the time, but the P/E and earnings yield not only matched but matched the year into which they were heading – a trifecta! Sadly, when I now daydream about Bo Derek or hear Bolero, my mind wanders to earnings yields. The letter just re-rated to PG.]

Marketing Rules

The Securities and Exchange Commission amended its Investment Advisers Act of 1940 in November to update rules governing investment adviser marketing established in 1961 related to advertising, testimonials, endorsements, third-party ratings, and performance advertising, among others. Rule 206(4)-1 was adopted and amended to, “target advertising practices that the Commission believed were likely to be misleading.”

There are lots and lots of bad actors in the money arena, many of whom were exposed in 2022. Hats off to the SEC for pushing for more standardization of performance disclosures and an attempt to inhibit the use of cherry-picked performance returns.

The amendment impacts us in several ways. Specifically, and worth mentioning here, are two aspects that affected our processes. One, we had to tweak the way our performance composite is calculated, now imparting a hypothetical model management fee to family and employee investment accounts that don't pay management fees. The firm claims compliance with CFA Institute's Global Investment Performance Standards (GIPS – the prescribed way to phrase that), which does not impart a hypothetical fee. Further, we manage capital for different types of individual and institutional clients. Some client accounts carry varying levels of cash, for example to make annual distributions. We believe providing a supplemental disclosure of how the firm's stocks perform over time without cash and before fees is critical to gauging investment skill and the performance of stocks against various stock benchmarks. We historically present gross-of-fee equity-only returns, gross portfolio returns which include the impact of all cash in client accounts, and the net return. We are now going to be prospectively including a hypothetical net fee to the equity-only investment returns. It adds more data to performance presentation but conforms to the new SEC amendment. Our restated returns can be found at the back of this letter. The cumulative impact was a reduction in the compound annual return by 0.2%. We are adopting this new SEC-prescribed method for the GIPS calculation, taking the more conservative tack despite the methods not matching. The CFA Institute doesn't regulate us after all.

A second impact is a new prescription requiring the inclusion of a firm's 1-, 5- and 10-year returns, or the time period since the portfolio inception, if shorter. The new rule seeks to prevent “advertisers” from cherry-picking time periods that make returns appear more favorable. Believe me, we get the motivation. How many ads in magazines and on TV tout a 5-year return, but when the 5-year is no good, change advertising to showcase the latest 3-year or whatever. The problem with prescribed intervals, particularly short ones, is that end-point sensitivity will have dramatic impacts on what appear to be long-term results. The impact can be extraordinary from quarter-to-quarter reporting periods.

Too many investors have little clue about how to go about selecting investments or advisers. Thinking they have improved what genuinely is a problem in investment marketing, the method chosen by the regulator leaves a lot to be desired.

Semper is thus going to include in our composites full-period compound-return series, forward and backward, just as in past letters. The presentation will appear in the same format as our performance page for Berkshire Hathaway, with forward and backward CAGRs for change in book value per share, share return and for the S&P 500.

The SEC rule does not require disclosure of a return calculation from inception or for periods beyond 10 years. Makes no sense. Believe it or not, there are 10-year intervals where investors can look really stupid, or really smart. Required disclosure of returns for three even shorter intervals provides little insight to the otherwise uninitiated. The retail investor often chases short-term performance. Mandating a recurring performance disclosure of short-term performance intervals is likely to cause even more irrational behavior. There's no easy solution in trying to offset cherry picking by the business side with useless information in the hands of the investor side. Better, in our opinion, to provide more data than less.

If we are going to now be compelled to provide a 1-, 5- and 10-year return, know that we will also be disclosing the 2-4, 6-9, and 11 onward, including to inception. Lots of data points on a page for sure, but those examining a return series should have as much granular data as possible and draw their own conclusions.

To illustrate the degree to which recent returns can distort the 1-, 5- and 10-year returns, and all returns by year, let's compare our equity returns by year, with forward and backward CAGRs at year-end 2021 and then at year-end 2022. Recall how Semper's stocks appeared at the end of 2011.

Year	SAI Equities Only	CAGR from 2011	CAGR from 1999	S&P 500 Composite Total Return	CAGR from 2011	CAGR from 1999
1999	29.1%	11.8%	29.1%	19.9%	1.9%	19.9%
2000	30.7%	10.3%	33.1%	-9.1%	0.6%	4.8%
2001	23.1%	8.6%	29.4%	-11.9%	1.5%	-1.4%
2002	-22.0%	7.3%	13.4%	-22.1%	2.9%	-7.3%
2003	38.2%	11.2%	18.2%	28.7%	6.2%	-0.8%
2004	16.3%	8.2%	17.9%	10.9%	3.6%	1.1%
2005	7.4%	7.1%	16.3%	4.9%	2.6%	1.7%
2006	18.4%	7.0%	16.5%	15.8%	2.3%	3.4%
2007	3.1%	4.9%	14.9%	5.5%	-0.2%	3.6%
2008	-21.6%	5.3%	10.5%	-37.0%	-1.6%	-1.5%
2009	27.9%	16.1%	12.0%	26.5%	14.1%	0.8%
2010	14.4%	10.7%	12.2%	15.1%	8.4%	1.9%
2011	7.1%	7.1%	11.8%	2.1%	2.1%	1.9%

Inception Date 2/28/1999

Semper was hatched late in a secular bull market, in the teeth of the tech bubble. We navigated the three-year collapse from 2000-2002 remarkably well, earning strongly positive returns in 2000 and 2001 and then falling in line with the index in 2002. For the first four years of our existence, our stocks had compounded at a positive 13.4% per year against a *loss of 7.3% per year* for the index. In 2008 we declined by 21.6% against a 37% loss for the index. By the end of 2011 our stocks had averaged 11.8% versus 1.9% for the S&P 500.

Any prospective investor at this point might have wrongly concluded we possessed superpowers. There was no trailing interval where we hadn't crushed the market. We earned 7.1% in 2011 vs. 2.1%. That 5%

one-year advantage, coupled with the degree to which we had outperformed in several years (and in all negative years for the index), produced a now SEC mandatory-disclosed 5-year performance of 4.9% versus negative 0.2%. The backward-looking 10-year record saw our advantage at 7.3% versus 2.9%.

Hiring Semper at that point going into 2012 would have been unfortunate, surely when measured relative to the index for the next four years of consecutive underperformance. Here's the full series by year from inception through 2022. You can see in the CAGR from 1999 column that by year-end 2015 our annual return had dropped from what was 11.8% at the end of 2011 to 10.0%. The index saw its return from 1999 rise from 1.9% at 2011 to 5.0% by 2015. The delta for both series meant our four-year average annual return from 2012 through 2015 totaled 4.3% against 15.3% for the index. The cherry on top of the sundae for that stretch was a decline in the Semper portfolio of 10.3% in 2015 where the index was riding the FANGs and was up 1.4%. At that point at year-end 2015, despite our long-term result still solidly ahead of the index, the 1- and 5-year return relative to the index would have appeared abysmal. Was that a good time to conclude we were idiots? Well, perhaps on many fronts, but not ideally on the investment front. The portfolio was fundamentally undervalued at year-end 2015 thanks to the decline for the year. Our intrinsic value work suggested the portfolio was considerably undervalued versus the index.

Year	SAI Equities Only	CAGR from 2022	CAGR from 1999	S&P 500 Composite Total Return	CAGR from 2022	CAGR from 1999
1999	29.1%	11.5%	29.1%	19.9%	6.9%	19.9%
2000	30.7%	10.7%	33.1%	-9.1%	6.3%	4.8%
2001	23.1%	9.8%	29.4%	-11.9%	7.0%	-1.4%
2002	-22.0%	9.2%	13.4%	-22.1%	8.0%	-7.3%
2003	38.2%	11.1%	18.2%	28.7%	9.8%	-0.8%
2004	16.3%	9.8%	17.9%	10.9%	8.9%	1.1%
2005	7.4%	9.5%	16.3%	4.9%	8.8%	1.7%
2006	18.4%	9.6%	16.5%	15.8%	9.0%	3.4%
2007	3.1%	9.1%	14.9%	5.5%	8.6%	3.6%
2008	-21.6%	9.5%	10.5%	-37.0%	8.8%	-1.5%
2009	27.9%	12.1%	12.0%	26.5%	13.1%	0.8%
2010	14.4%	11.0%	12.2%	15.1%	12.2%	1.9%
2011	7.1%	10.7%	11.8%	2.1%	11.9%	1.9%
2012	6.8%	11.0%	11.5%	16.0%	12.9%	2.9%
2013	17.3%	11.4%	11.8%	32.4%	12.6%	4.7%
2014	5.2%	10.8%	11.4%	13.7%	10.6%	5.2%
2015	-10.3%	11.5%	10.0%	1.4%	10.2%	5.0%
2016	27.7%	15.1%	10.9%	12.0%	11.5%	5.4%
2017	18.0%	13.1%	11.3%	21.8%	11.4%	6.2%
2018	-1.4%	12.1%	10.6%	-4.4%	9.4%	5.6%
2019	23.6%	15.8%	11.2%	31.5%	13.2%	6.7%
2020	11.9%	13.3%	11.2%	18.4%	7.7%	7.2%
2021	27.3%	14.0%	11.9%	28.7%	2.7%	8.1%
2022	2.1%	2.1%	11.5%	-18.1%	-18.1%	6.9%

Inception Date 2/28/1999

A rebound came quick, with our stocks earning 27.7% versus 12.0% in 2016. From year-end 2015 to 2022, our stocks compounded at 15.1% against 11.5% for the S&P. That's seven years. The compound

annual return series from inception is now 11.5% versus only 6.9% for the index, a 4.6% annual advantage. That's taking \$1 million in 1999 and growing it to \$13.3 million where the same \$1 million in the S&P 500 only grew to \$4.9 million. Again, this is stocks against stocks, before cash and management fees are considered and which over very long periods add up.

To illustrate how severely a 1-year return that deviates by a wide margin against an index can affect compound annual returns over multiple time periods, how do the 1-, 5- and 10-year returns compare today against this time last year? How do you think our 2.1% gain against an 18.1% loss impacts trailing intervals, particularly the shorter ones? If you answered dramatically, you are correct. The 1-year return is a 20.2% advantage, which adds about 10% annually over two years, 4% annually over five years and roughly 2% annually over ten years. We had trailed the index in 2021, as well as in 2020 and 2019.

A 1-, 5- and 10-year presentation would have looked like this last year, at the close of 2021:

	Semper	S&P 500	Difference
1-Year Return:	27.3%	28.7%	(1.4%)
5-Year Return:	15.4%	18.5%	(3.1%)
10-Year Return:	11.9%	16.6%	(4.7%)
From Inception:	11.9%	8.1%	3.8%

One could conclude from this evidence that all of Semper's outperformance came in its early years. Probably a bad time to invest, right? Well, I don't think so, but one could presume bias. However, given our slight gain last year and 20.2% outperformance, here's how the current SEC-prescribed disclosure looks:

	Semper	S&P 500	Difference
1-Year Return:	2.1%	(18.1%)	20.2%
5-Year Return:	12.1%	9.4%	2.7%
10-Year Return:	11.4%	12.6%	(1.2%)
From Inception:	11.5%	6.9%	4.6%

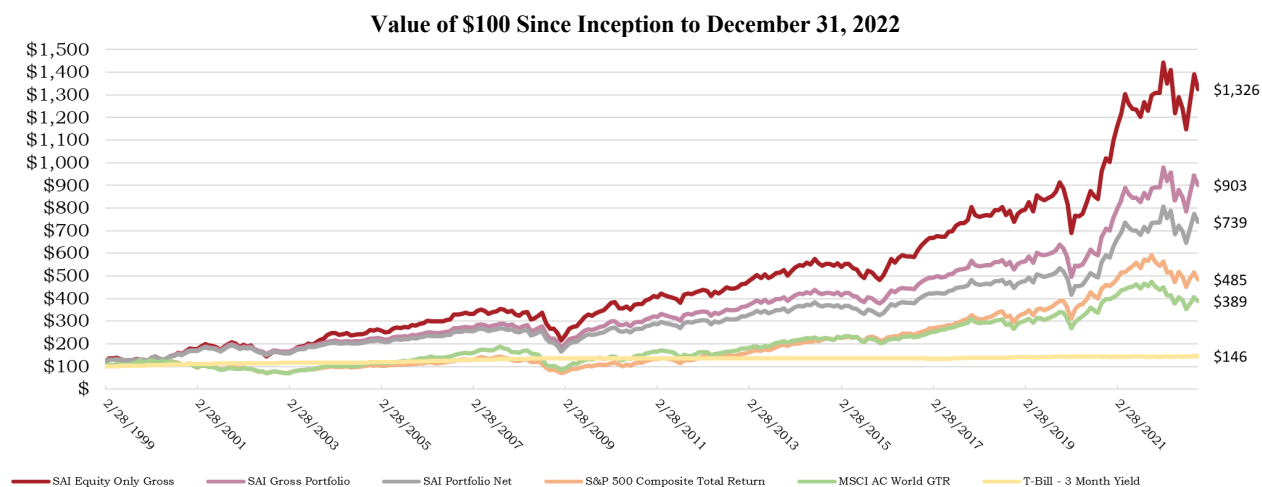
Given these two sets of figures only one short year apart, what can be concluded with this information? I hope the answer is very little. Appearing as dolts at the point of short-term underperformance, given this past year's outperformance we now look bright again? From wearing the dunce cap facing the corner to teacher's pet overnight?

Should a prospective investor hire us because in all compounded yearly intervals from years 1-9 (working backward in time) our stocks outperformed, lagged in years 10-14, but then outperformed for the remainder of intervals from year 15 to inception? If I were on the other side of the table, I'd want to examine the entire record. How was performance during bear markets? As we saw last year, the 10-year interval ended 2021 was the best 10-year interval since 1999 for the S&P 500, and 1999 was a year that would ring in a decade that produced a subsequent 10-year loss. How about comparative portfolio valuation following periods of short- or medium-term underperformance or outperformance? Did any individual positions contribute to alpha or to a shortfall? I suppose the SEC gets its wish and, if establishing conformity reduces cherry picking, then bully. It is value added. I simply don't think the SEC's prescription mandates disclosure of information sufficient to even come close to differentiate between skill, luck, stupidity, fraud or incompetence.

At the end of the day, we're taking the mandated disclosure and augmenting it with the full data set. Not to confuse, but if we must give a few numbers, to the extent anybody uses them in decision making, we want you to have the information we'd want if our roles were reversed.

To be clear here, the Semper return series presented and discussed above is *before* backing out any drag from cash that exists in client accounts and is before our management fees but inclusive of trading costs. The intent is to illustrate returns from investments in stocks. We have clients with little to no cash and some with permanent cash reserves, all of which is included in our composite return series. The drag of these varying cash reserves over 24 years lowers the long-term annual return by 1.8% and net of fees the return is 8.8%, still 1.9% ahead of the index for nearly a quarter century. The discussion of how much cash to maintain over time, and at what rate new deposits should be put to work, is an important one and specific to each investor. A foundation making 5% gifts of assets to charity annually will spend 15% of average capital over a period of two years (presume annual grants occur once yearly, meaning the first and third gifts are two years apart). Clients with little to no need for cash can remain more fully invested. Every client is different. Institutions often prefer staying fully invested when hiring a manager.

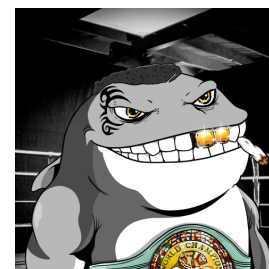
A final note on cash. Many investors likely wish they had more cash lying around last year, given declines in stocks, bonds and many alternative asset classes, even the non-marked-to-market ones. The more speculative corners of the investment arena were decimated. I'd guess that, given the necessity of having some cash reserves, that many of our investors have cash balances probably averaging 10% to 15%. Some of our larger client accounts skew the cash portion of the aggregate portfolio much higher. The question is how expensive it is having meaningful cash allocations for 24 years earning the average 3-month T-bill yield of 1.6% over those 24 years while our stocks earned 11.5%? Again, a cash drag averaging 1.8% per year sounds pretty innocent and not terribly costly, but it's the difference of growing \$1 million to \$13.3 million versus \$9.0 million. In the classic "Climb the Mountain" chart, the cumulative impact of cash drag and fees is apparent. It goes without saying that the proportion of capital invested in stocks earns the stock return over time. Obviously. But assuming prices rise over time, permanent cash reserves (or fixed-income generally) will drag on returns over time. Fees and expenses do the same and must be reasonable. You won't find many "2 and 20" climb the mountain presentation charts over 24-year periods. The other interesting thing about a chart like this reveals a truism: The greater the return *above* cash or bonds, the greater the drag. You weren't harmed as badly by owning cash instead of the S&P 500. Bond returns, not shown here, were even closer to the 6.9% earned by the index.



Expected Returns for the S&P 500 – Everyone Has a Plan Until They Get Punched in the Mouth

“It’s good to know how to read, but it’s dangerous to know how to read and not how to interpret what you’re reading.” – Mike Tyson, make that Iron Mike Tyson

“All in on Solana... Just copped a Catalina Whale... pow pow!” 84% Less-Rich Iron Mike Tyson; January 12, 2022 on Twitter



The equity investor thinking about prospective investment returns considers dollar sales growth, changes in the share count, changes in the profit margin, changes in the multiple paid to earnings and any dividends to be paid. These five factors combine to produce return. The analyst contemplates myriad considerations contributing to each factor, but these five mathematically get to total return. Presuming the stock market was perched at a secular peak, last year’s letter presented an attribution analysis of these factors for the S&P 500 and for what we call the Fab 5, the five big components that drove much of the stock market’s return for the decade ended 2021.

The S&P 500 was as secularly stretched a year ago as it was in 1929 and 1999. Both of these secular peaks led to at least a decade of losses. The presumption may have proved timely, as the S&P 500 chalked an 18.1% decline last year and the Fab 5 were collectively punched in the mouth by 36.8%. I didn’t intend to come back to the exercise this year but given the pain inflicted on many investors, I thought it relevant to show the degree to which the decline impacted prospective returns for the subsequent decade. While the forecast is much improved from a year ago, prospects for the broad market remain grim.

The total return from common stocks is most simply broken down into three components – growth in earnings per share, change in the P/E multiple, and earnings from dividends. Total return is easily calculated by multiplying the change in EPS by multiple growth and adding the dividend yield:

$$\text{Total Return} = (\text{EPS Growth} \times \text{Change in P/E Multiple}) + \text{Dividend Yield}$$

Growth in earnings per share can be further derived from change in the net margin and change in sales per share:

$$\text{EPS Growth} = \text{Sales Per Share Growth} * \text{Margin Growth}$$

It’s also imperative to know how a change in shares outstanding impacts return. Specifically, how much sales growth in dollar terms is diluted from an accreted share count or increased thanks to a reduction in shares outstanding? In the analysis below, growth over ten years is not simply a compound figure but measures the rate of dilution or accretion. For those reconciling or following the math, note for “Growth %” when measuring change in the share count, for that one figure you are really measuring annual dilution or ownership increase (a reduction in share count proportionally increases the remaining shareholders’ ownership interests):

$$\text{Sales Per Share Growth} = \text{Dollar Sales Growth} / \text{Share Count Growth}$$

Calculation of annual price return (PR below or Price Return) broken down by the full set of variables is a multiplicative function of each component. Formulaically, the amount of “1” is added to the percent growth rate for each component, with the amount of “1” then subtracted after the multiplicative function to arrive at a percent return.

$$((1 + EPS) * (1 + PE)) - 1 = PR$$

$$((1 + SS) * (1 + MG) * (1 + PE)) - 1 = PR$$

$$\left(\frac{1 + DS}{1 + SC} * (1 + MG) * (1 + PE) \right) - 1 = PR$$

And, for Total Return (TR), we add the Dividend Yield (DY) to Price Return (PR):

$$\left(\frac{1 + DS}{1 + SC} * (1 + MG) * (1 + PE) \right) - 1 + DY = TR$$

For the above formulas, the variables are:

SS = Sales per Share Growth

PE = PE Multiple Growth

DY = % Dividend Yield

DS = Dollar Sales Growth

SC = Share Count Growth

PR = % Price Return

MG = Margin Growth

EPS = Earnings Per Share Growth

TR = % Total Return

Before digging into the returns, you will notice a slight difference in this year’s return attribution tables. After calculating total return using the above formulas, a return attribution calculation was presented at a bottom row. The figures were meant to allow for an *additive* function of each variable to reconcile to the multiplicative derivation applied to each growth factor. The numbers as presented were largely correct. When single-year returns were calculated for 2022 and a number of other illustrative time series, some of the attribution results made little sense, particularly in cases where total return approached zero. In essence, what I’d like to demonstrate is the portion of total return coming from each factor. In addition to returns approaching the zero-bound creating issues, wild swings in individual factors created further problems. For example, in 2022 Amazon’s net margin collapsed 72.1%, from 5.1% to 1.4%, while its P/E multiple rose from 70.3x to 116.7x. The margin collapse in particular caused particular problems. The answer in getting the math to work lies in absolute values from an equal starting base for each factor. A logarithmic distribution may solve the issue. In short, the clock ran out on the letter. If any math whizzes follow the issue and have an answer please reach out. I’d like to come back to this in subsequent letters. In the meantime, the growth factor for each variable (now the bottom row in each table) is going to correlate closely to total return. Know that the formulas above are correct.

Let’s start with a recap of the decade ending on December 31, 2021 from last year’s letter. I noted the 16.6% annual index return for the decade was not only nearly a ten-year record but would be *impossible* to repeat during the subsequent ten years. Here’s the return distribution through 2021 with final reported figures for sales and earnings at the end of that year.

10 Years	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2011	96.44	29.12	1052.83	9,531.2	9,052.9	9.2%	13.0	2.3%	1,257.60	
12/31/2021	208.21	63.12	1566.80	13,266.5	8,467.3	13.3%	22.9	1.3%	4,766.18	
Growth %	115.9%	116.8%	48.8%	39.2%	6.9%	45.1%	75.5%	-42.8%	279.0%	362.6%
Annual Avg	8.0%	8.0%	4.1%	3.4%	0.7%	3.8%	5.8%	2.3%	14.3%	16.6%

The largest return drivers over the decade were expansion in the P/E multiple from 13.0x to 22.9x and also in the profit margin from 9.2% to 13.3%. These two factors contributed the majority of the return earned by the index. Dollar sales compounded by 3.4%, dividends added 2.3% and a net reduction in the share count added 0.7% to return. Remember, the derivation of return is a multiplicative function of the table's first four factors with the dividend yield additive. Simply totaling the percent change in each component will get close to the total return but will not be correct.

The investor at year-end 2021 expecting anything near the prior decade's returns required continued expansion in multiples and margins or outsized growth in sales despite sales growth for the past two decades averaging less than 4% annually. The pugilist landed one of the three punches (the unexpected one) in 2022's first round but was bloodied by the other two.

The index investor actually enjoyed the highest rate of two-year growth in sales per share on which I can find data. That growth was 15.0% in 2021 and 12.7% in 2022. While dollar sales and sales per share only grew 3.5% and 4.1% respectively for the decade ended 2021, dollar sales in 2022 grew a surprisingly high 11.4% and with a 1.2% reduction in the share count sales per share rose a whopping 12.7%. Had profit margins and multiples simply held at 2021's closing level the investor would have earned the 12.7% growth in sales per share plus a 1.3% dividend yield for a 14% total return. That turned out not to be the case. There were no presents under the Christmas tree. Instead, Santa (or Burlington Northern) delivered coal in 2022.

2022's body blows to both margins and multiples drove an 18.1% loss in total return. Instead of expanding, the record 13.3% profit margin deflated to 11.3%, a 15% shave. Likewise, instead of rising from an already lofty 22.9 P/E multiple, the multiple contracted to 19.2x, 16.2% lower. Dividends contributed only 1.3% from a low initial yield but saw a very high 15.2% growth per share over the year. Combination punches of rising rates worked on the multiple while inflation inflicted higher costs on companies much faster than they could raise prices. Growing sales per share by 12.7% but seeing the profit margin simultaneously fall by 200 basis points is pretty remarkable. I bet if you surveyed most investors and told them they would get 12.7% sales per share growth, few would have expected to lose 18.1%. The scorecard of a first-round knockdown:

2021-2022	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2021	208.21	60.40	1566.80	13,266.5	8,467.3	13.3%	22.9	1.3%	4,766.18	
12/31/2022	200.12*	69.56	1765.43*	14,775.0	8,369.0	11.3%	19.2	1.8%	3,839.50	
Growth %	-3.9%	15.2%	12.7%	11.4%	1.2%	-14.7%	-16.2%	43.0%	-19.4%	-18.1%
Annual Avg	-3.9%	15.2%	12.7%	11.4%	1.2%	-14.7%	-16.2%	1.3%	-19.4%	-18.1%

*Estimate

Investors were most likely surprised by 2022's decline in outright profits despite rapid top-line growth in sales. Earnings and earnings per share are front and center for investors while few think about the overall profit margin. A number of factors drove the 13.3% record 2021 profit margin, a level not likely to be seen again. First, the U.S. shifted to a service and less-capital-intensive economy over decades. Second, despite record corporate debt relative to assets and equity, near-zero interest rates contributed 3% of the 13.3% in the profit margin expansion during the 23 years of this century. Next, 2017's Tax Code and Jobs Act (TCJA) contributed 1% to the profit margin, largely via the reduction in the marginal corporate tax rate from 35% to 21% on U.S.-derived profit (earning 79% versus 65% of pre-tax income is a 21.5% increase in profit (79/65) on the roughly half of income earned domestically).

Finally, the energy sector's resurgence in profitability (and representation in the index from 1.5% to more than 5%) has a dramatic swing and impact on overall index margins. The energy sector cost overall index

EPS about 8% in the pandemic year 2020 due to sector losses (meaning index EPS would have been about 8.7% higher in 2020 than reported). Energy sector earnings surged from contributing negative 8% in 2020 to a positive 4.5% contribution in 2021 to a whopping 12.5% contribution in 2022. Had energy profits not grown to records last year, the index would have seen EPS drop from \$208.21 in 2021 to ~\$183 instead of an estimated \$200.12 including energy. With the sector contributing 12.5% to profit in 2022 but only comprising 5.2% of market cap and trading for only 8x earnings, stripping energy makes the index still that much more expensive. The energy sector comprised as much as 12.3% of index market cap as recently as 2011.

Sidebar: Extrapolating on the previous discussion about the degree to which bracketing and endpoint sensitivity can materially change even what is thought to be a long-term return: 2022's 18.1% loss reduced the 10-year S&P 500 return from 16.6% as calculated a year ago to 12.6% at year-end 2022. How can one year at minus 18.1% shave 4% per year over a decade? Shouldn't the trim be only slightly less than 1.8%, allowing for compounding? If you are following, you know there are *two ends* to a bracket. While a new year was added to the end of the series, the initial year as of a year ago fell off. Not only did the 10-year interval pick up an 18.1% loss, but 2012's 16.0% gain went bye-bye. That's a 34.1% delta, before the impact of compounding. That's how you shave 4.0% from the 10-year annual return in a year.

Semper looked relatively incompetent (perhaps absolutely) through the 10-year lens a year ago, our stocks "only" earning 11.9%, shellacked by the index's 16.6%. Fast forwarding a year, not only did our 10-year add a 2.1% gain for 2022 versus the minus 18.1% for the index, but we dropped off 2012's 6.8% compared to the S&P's 16.0%. Just wait until this time next year when our 2013 17.3% return vanishes from the 10-year record, but so does 32.4% for the index. Oh boy! The year after that we drop 5.2% as the index sheds 13.7%. Another year on and we vacate 2015's 10.3% loss versus the index's 1.4% gain. If our current 10-year equity return at 11.4% trails the index by now only 1.2%, knowing what's dropping off over the coming three years, our 7-year today at 15.1% versus 11.5% for the index has the makings for a pretty nice prospective 10-year return and index comparison. The consultants screening for investors placing importance on a 10-year number might really like it. Sigh. We'll tell you in three years how irrelevant the 1-, 5- and 10-year periods are in isolation, regardless of the numbers and regardless of whether we are far above or far below some index. Ridiculous. End sidebar.

Presuming 2021 marked a secular peak and 2022 represented the first round in a ten-round heavyweight title fight, then last year's 18.1% jolt to the canvas can be judged as a stumble, even a slip not warranting a standing eight count. Guessing here that the decade begun at the outset of 2022 will ultimately resemble something like the decade post 1999.

Year-end 1999 was a mere ear-bite from March 2000's secular peak. Recall the decade that ended 1999 looked an awful lot like the one that ended 2021, with a 6.9% annual expansion in the P/E multiple which doubled from 14.5x to 28.4x. The margin grew 49%, 4.1% per year. Dollar sales ramped by 6.0% per year. Dividends kicked in 2.9% per year. The only deleterious factor was 25% growth in shares outstanding thanks to Silicon Valley's generosity to executives. The non-insider owner was thus diluted by 20%, a harmful 2.2% net dilution. Putting it all together, the index investor earned 18.2% annually through 1999, ending with a then-high 8% profit margin capitalized at a very high 28.4x earnings. The surveyed retail and professional investor alike expected high-teens annual returns over the next decade. They were KO'd, losing 9.1% cumulative and 0.9% per year. Here are the two decades back-to-back:

10 Years	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/1989	24.32	11.45	452.90*	3,033.4	6,697.8	5.4%	14.5	3.2%	353.40	
12/31/1999	51.68	16.20	646.95	5,422.6	8,381.8	8.0%	28.4	1.1%	1,469.25	
Growth %	112.5%	41.5%	42.8%	78.8%	-20.1%	48.8%	95.6%	-66.0%	315.7%	432.9%
Annual Avg	7.8%	3.5%	3.6%	6.0%	-2.2%	4.1%	6.9%	2.9%	15.3%	18.2%
*Estimate										
10 Years	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/1999	51.68	16.20	646.95	5,422.6	8,381.8	8.0%	28.4	1.1%	1,469.25	
12/31/2009	56.86	22.64	908.40	8,087.3	8,902.8	6.3%	19.6	2.0%	1,115.10	
Growth %	10.0%	39.8%	40.4%	49.1%	-5.9%	-21.6%	-31.0%	84.1%	-24.1%	-9.1%
Annual Avg	1.0%	3.4%	3.5%	4.1%	-0.6%	-2.4%	-3.6%	1.8%	-2.7%	-0.9%

The factors contributing to the 2000-2009 decade-long loss are easy to spot. Had you told the investor heading into 2000 that a decade hence stocks would trade at 19.6x earnings on a 6.3% profit margin, and further that they would enjoy 4.1% annual growth in sales and earn 1.8% from dividends, I'd wager they would still have concluded that a high-teens expected return was valid. This is where the two Mike Tyson quotes at the outset of this section collide. If you can read but have no idea how to interpret what you are reading, then your plan sucks and you get belted in the kisser.

Math is math. Cutting the profit margin from 8.0% to 6.3%, a high-to-average level over prior decades, cost the index investor roughly 2.4% per year. The P/E multiple falling 31% from 28.4x, to a still historically high 19.6x, cut ~3.6% from your return. You got 1.8% from dividends and picked up about 4.1% from sales growth. The financial crisis sent the banking system to the ER and some "too-big-to-fails" that weren't too big to fail after all to the coroner. The share count rose 6% for the decade, but that was dilution in the banks. Most of the early part of the decade saw share repurchases slightly outpacing ongoing generous option and RSU share grants. Putting it all together, despite 19.6x earnings sounding reasonable for a terminal multiple and a historically average margin coming to pass, the index investor lost money. Further, this is no cherry-picked time series (one hopes making the SEC proud). From March 2000's peak to the trough in February 2009, the S&P 500 lost 57% in price, plunging from 1,548 to 666, the depths of hell.

The Bull Case

Let's start moderately bullish at least. The purpose of rehashing a long-ago decade (investor memories being short), one most investors would like to forget (most did forget, evidenced by wild dancing leading up to the 2021 high – Chuck Prince would be proud) is not to dredge up bad memories. The purpose rather is to question the degree to which the 2022 bear has run its course. In all likelihood, the bear is but a cub, with a long run ahead of the cutie. Let's toy with some scenarios over the decade to come, both bullish and bearish.

Jay Powell is determined to be the next Paul Volcker (sans deep recessions), so suppose he and his comrades whip inflation now. Hold the 19.2x multiple to earnings where it sits now, a high level, but "justified" with low inflation and low interest rates. Coincidentally that's pretty much where it ended in 2009. Likewise hold the 11.3% profit margin where it sits today. Presume dollar sales grow 3.4%, matching the decade ended 2021 and the same 0.7% "benefit" from a declining share count (conveniently ignoring the enormity of profit required to buy back shares in excess of the 2% given away internally to big dogs every year). In other words, holding margins and multiples constant, return will consist solely of 4.1% growth in sales per share plus the dividend yield, which at the start of the decade sat at 1.8%. Here's the look. Spoiler alert: You get 5.9% per year.

10-year at 2022 Levels	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2022	200.12*	69.56	1,765.43*	14,775.0	8,369.0	11.3%	19.2	1.8%	3,839.50	
12/31/2032	298.74	103.74	2,635.41	20,565.3	7,803.5	11.3%	19.2	1.8%	5,731.54	
Growth %	49.3%	49.1%	49.3%	39.2%	6.8%	0.0%	0.0%		49.3%	77.4%
Annual Avg	4.1%	4.1%	4.1%	3.4%	0.7%	0.0%	0.0%	1.8%	4.1%	5.9%

*Estimate

A 5.9% decade-long return would be hard to stomach, especially as it would follow, and not include as its initial year, an 18.1% decline.

Full of Bull

How about a bullish scenario that takes the profit margin back to 2021's peak 13.3% and the multiple back up to 22.9, 19.3% above where it sits today? Continue with a 0.7% benefit from repurchases, 3.4% from dollar sales growth and today's dividend payout ratio and you get 9.3% per year. This essentially allows for a full recovery in what was lost in margin and multiple during 2022. I'd bet heavily against the margin recovering to a peak 13.3% and don't find multiples at all logical unless applied against depressed earnings, which a 13.3% margin most definitely is not. If a full recovery in margins and the multiple gets you 9.3% for the coming decade, to get to 10% will require some combination of a new record profit margin, a multiple north of 22.9x on a 13.3% margin, and/or more sales growth per share than seen over the past two decades. Good luck!

Revert to 2021	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2022	200.12*	69.56	1,765.43*	14,775.0	8,369.0	11.3%	19.2	1.8%	3,839.50	
12/31/2032	350.22	121.7	2,635.41	20,565.3	7,803.5	13.3%	22.9	1.5%	8,016.87	
Growth %	75.0%	75.0%	49.3%	39.2%	6.8%	17.2%	19.3%		108.8%	143.4%
Annual Avg	5.8%	5.8%	4.1%	3.4%	0.7%	1.6%	1.8%	1.7%	7.6%	9.3%

*Estimate

The Bear Case

But enough of fairies and pixie dust. Let's move to a moderately bearish scenario. After all, you can't have a Semper annual letter without a grim reaper projection or two, particularly one year removed from a secular top. Some might call these misanthropic perturbations. Others would call them a reality check. Contemplate a return to the long-run P/E multiple (that's code for Roger Ibbotson circa 1926). Presume inflation cyclically runs hotter than the Fed's 2% made-up target and averages 4%, allowing for 6% growth in dollar sales per year. If inflation runs warm, kiss peak margins goodbye. Assume companies are forced to refinance debt at higher interest rates, leading many to delever. I won't even touch on the potential for higher corporate taxes. Lower margins leave less for share repurchases, so hold share count flat. Under this god-awful backdrop, which takes margins back to their prior 1999 peak at 8.0%, the investor earns a miserly but positive 1.9% per year.

8% Margin and 15x Multiple	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2022	200.12*	69.56	1,765.43*	14,775.0	8,369.0	11.3%	19.2	1.8%	3,839.50	
12/31/2032	252.93	87.92	3,161.62	26,459.7	8,369.0	8.0%	15.0	2.3%	3,793.94	
Growth %	26.4%	26.4%	79.1%	79.1%	0.0%	-29.4%	-21.8%		-1.2%	21.2%
Annual Avg	2.4%	2.4%	6.0%	6.0%	0.0%	-3.4%	-2.4%	2.1%	-0.1%	1.9%

Full of Bear

Yikes. Truth be told, the above is not unrealistic at all. How about an even more bearish scenario? A real bear scenario takes the margin back to 8%, the same as in the last illustration. But now, given higher than expected inflation, take a bite out of the ear of the multiple. A 10x multiple sounds about right, still well above prior trough levels, but I'm trying to avoid being too alarming here. Stick with a higher 6%-dollar sales growth assumption, but now presume the U.S. on-shores manufacturing. Inflation bites profits. Now increase the share count by a modest 0.6% per year (the same dilution seen from 1999 to 2009) to allow for businesses requiring new capital in excess of shrinking margins. Double, double, toil and trouble, alakazam. Whoa. People won't be very happy with their financial planners. Poof – a loss of 18.2%, or negative 2.0% per year.

8% Margin and 10x Multiple	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2022	200.12*	69.56	1,765.43*	14,775.0	8,369.0	11.3%	19.2	1.8%	3839.50	
12/31/2032	238.84	83.02	2,985.47	26,459.7	8,862.8	8.0%	10.0	3.5%	2,388.38	
Growth %	19.3%	19.3%	69.1%	79.1%	-5.9%	-29.4%	-47.9%		-37.8%	-18.2%
Annual Avg	1.8%	1.8%	5.4%	6.0%	-0.6%	-3.4%	-6.3%	2.6%	-4.6%	-2.0%

*Estimate

So a summary of the foregoing scenarios looks something like the following table. Readers can probability-weight the scenarios as they see fit, but a simple average approach indicates expectations should be no higher than 3.8% per year for the next decade (with the Semper bias on the downside of that). And, with the (theoretical) “risk free” 10-year U.S. Treasury rate at about the same level, one might even query the purpose of investing in a broad index. Selection matters. And don't forget, these are compounded returns below, making the potential mediocrity or wealth destruction that much more painful.

Full of Bull	Bull	Bear	Full of Bear	Simple Avg
9.3%	5.9%	1.9%	(2.0%)	3.8%

And finally, let's consider one extraordinarily bearish, perhaps impossible outcome, known as of today as the Rope a Dope. Return to 1982 margins and multiples. It took 16 ½ years for 1966's secular top to reach the next secular low in August 1982. Over this painful inflationary stretch (more on this to come), profit margins collapsed to 4% while the multiple to depressed earnings likewise cratered to 8x. If you like making boatloads of money while margins and multiples both race to highs, try the opposite. There's a reason household and institutional ownership of stocks wilted by 1982. Inflation during this stretch was high and sales followed suit, growing 8.9% per year. The dividend yield began at 2.9% and ended at 6.1%, reflective of a low multiple to earnings. The payout rate began at 52.2% and shrank to 24.4% in 1982. When you aren't making much money, you tend to need it.

16.5 Year Case From 2022	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2022	200.12*	69.56	1,765.43*	14,775.0	8,369.0	11.3%	19.2	1.8%	3,839.50	
6/30/2039	288.32	100.22	7,207.93	60,323.4	8,369.0	4.0%	8.0	4.3%	2,306.54	
Growth %	44.1%	44.1%	308.3%	308.3%	0.0%	-64.7%	-58.3%		-39.9%	0.6%
Annual Avg	2.2%	2.2%	8.9%	8.9%	0.0%	-6.1%	-5.2%	3.1%	-3.0%	0.0%

*Estimate

That's a zero-point-zero total return over 16.5 years from 2022. Here's a 16 ½-year look with the time series beginning at the outset of 2022, so back to the secular peak and prior to the recent 18.1% decline.

16.5 Year Case From 2021	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2021	208.21	63.12	1,566.80	13,266.5	8,467.3	13.3%	22.9	1.3%	4,766.18	
6/30/2038	255.88	77.57	6,396.96	54,164.7	8,467.3	4.0%	8.0	3.8%	2,047.03	
Growth %	22.9%	22.9%	308.3%	308.3%	0.0%	-69.9%	-65.1%		-57.1%	-33.4%
Annual Avg	1.3%	1.3%	8.9%	8.9%	0.0%	-7.0%	-6.2%	2.6%	-5.0%	-2.4%

Certainly a 33.4% cumulative and 2.4% annual decline over 16.5 years must be impossible? Nothing in investing is impossible. We've been there before.

Before moving to a brief recap of the damage inflicted in 2022 among, and by, the Fab 5, let's glance at the return series that kicked off this exercise in cautioning care at secular peaks. Contrary to popular belief, stock indices can suck for *lots* of years, particularly when you begin with paying high prices for high profits. From 1999 you had a nearly decade-long secular bear market, then a raging bull market to 2021, and a most recent 18.1% dip in the red. What's the long-run total return for the index investor that expected 18% returns in 1999? Try 6.3% per year over 23 years, not exactly the 10.5% annual return that Ibbotson teed up and only a third of the annual return expected by the amateurs and the pros alike. If long-term index returns have been so poor, surely the investor can't earn mid-single digits from here, right? Buckle up for the next section in the letter delving into the inflationary 1970s. The lead-up to secular peaks are great times to have been passive investors. But they expose the investor to gut-punchingly terrible times to come. Surely there are alternatives to passive and pseudo-passive?

23 Years	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/1999	51.68	16.20	646.95	5,422.6	8,381.8	8.0%	28.4	1.1%	1,469.3	
12/31/2022	200.12*	69.56	1765.43*	14,775.0	8,369.0	11.3%	19.2	1.8%	3,839.5	
Growth %	287.2%	329.4%	172.9%	172.5%	0.2%	41.9%	-32.5%	64.3%	161.3%	304.0%
Annual Avg	6.1%	6.5%	4.5%	4.5%	0.0%	1.5%	-1.7%	2.0%	4.3%	6.3%

*Estimate

Last year's 18.1% negative total return surely makes the investment prospects more favorable for the passive index investor, or the pseudo index investor. An 18.1% loss in a year is 25.5% shy of the 10% long-run expectation many investors hold for investing in common stocks. Losing 18.1% on \$100 leaves you with \$81.90 instead of earning 10% and owning \$110. To recover over the following year to what would be \$121 compounding the original \$100 at 10% requires a 47.7% return (121/81.9). Doable? Sure. However, beginning a compounding series on the S&P 500 from an 11.3% profit margin and 19.2 multiple doesn't seem a reasonable launchpad for a new bull. The attribution method presented here allows you to plug in your own assumptions for growth or contraction in sales, margins, multiples, shares outstanding and the dividend payout ratio. Plug away but know when doing so we are far from long-term median valuations and a grueling marathon from those seen as secular lows.

The Fab 5 Giveth. And the Fab 5 Taketh Away.

The quintet of Apple, Microsoft, Google, Amazon and Facebook comprised 8.5% of the market cap of the S&P 500 at the outset of 2012. The group compounded by 29.8%, growing to 24.7% of the entire market cap of the index at year-end 2021. 8.5% of the index earned a stunning 29.3% of the total return while 91.5% contributed only 70.7% of the gain. The remaining 495 stocks earned 14.3% per year, not shabby at all, but shrank from 91.5% of the index to 75.2%. The Fab 5 earned investors 13.6x their money in a decade where the rest of the index made 3.8 times. Both are extraordinary when overall sales in dollars for the index grew 3% annually.

The decade ended 2021 was nearly certain to lead to a mediocre at best subsequent decade for the Fab 5. Aggregate sales for the five companies grew 20% annually and traded at 33x earnings capitalized on a robust average 21.1% profit margin. Last year I wrote:

It's too soon to say the party is over. Even holding margins and multiples constant at high levels, the Fab 5 should collectively enjoy premium sales growth versus the index and the broad economy for several years. At what some may define as a too-conservative 10% growth in sales, the top line grows from \$1.4 trillion to \$3.7 trillion. If the index's 3% revenue growth CAGR holds steady, group sales would grow from 11% of the index total to 21.5%. Sounds like a lot. At a like 21.1% margin, \$781 billion would double the share of profits from 17.4% to 34.0%. Hmm. A 10% growth in share price versus 5% for the index takes the Fab 5 to 34% of the index market cap from just under 25% now.

I don't know what gets in the way. Regulation? Competition with each other or with others? Slowing sales growth or margin compression? There's little room for error when margins are high and so are multiples, particularly when the businesses are now Goliaths. The law of large numbers is a thing and eventually becomes an anchor. We owned Microsoft for numerous years after the stock dropped 75% from its 2000 high. Regrettably we never got to Google despite understanding the business very well. YouTube is a home run. Regardless, we are thrilled to not own the S&P 500 or the Fab 5 today, outside of a very large indirect position in Apple within Berkshire. High multiples on high margins are a recipe for either disaster or mediocrity. Buck Showalter, former major league skipper, used to say, "I like our guys." Low multiples on healthy profits, room for margin expansion, superb balance sheets and managements with the opportunities and capability to retain earnings and invest at good incremental returns.

Buck Showalter would have liked Team Semper's low-payroll but high achieving guys in 2022, the stocks gritting out a 2.1% gain. Unfortunately for investors, the managers played yesterday's hot hands. The S&P lost 18.1%, the Fab 5 went from 10-time-back-to-back World Series champs to not making the playoffs. The Fab 5 became the Not So Fab 5, thumped by 36.8%. For reference only, the S&P 500's lost 37.0% in 2008, its worst year since the Great Depression.

If the Fab 5 generated 29.3% of the S&P's total gain for the decade ended 2021, it accounted for a whopping 46.3% of the index loss in 2022. Stunning. While the 500-stock index shed 18.1% with dividends, the remaining 495 companies lost only 13.0% as a group. Restated, five companies comprising 24.7% of the S&P 500 contributed 46.3% of the index's 18.1% loss. The Fab 5's representation in the index slipped from 24.7% to 19.2%.

For perspective, \$1 million in the Fab 5 grew to \$13.6 million in the ten years to 2021. 2022's 36.8% strikeout sank \$13.6 million to \$8.6 million. The \$1 million in the index that had grown to \$3.8 million shrank to \$3.1 million.

It's not like the five were undiscovered at the outset of 2012. They comprised 3.0% of index sales and 7.7% of profits. By 2021 they grew to 11.0% of sales and 17.4% of all profits earned by companies in the index. Remarkably, the collective five lost ground in both sales and profit share in 2022. 6.8% sales growth lagged the S&P's 11.4% while a 10.2% drop in EPS slid the share of profits from 17.4% to 15.8%. Even if ignoring Amazon's plunge in net income profit share for the Fab 5 slipped to 16.9%. At a

33.7x P/E at the outset of 2022, the group was not priced for the damage to revenue growth that transpired during a very ugly year for growth investors.

Fab 5	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2011	0.07	0.01	0.29	289.6	1,000	23.1%	14.5	0.6%		
12/31/2021	0.37	0.04	1.77	1,408.6	796.9956	21.1%	33.8	0.3%		
Growth %	477.7%	554.6%	510.3%	386.4%	-20.3%	-5.3%	129.3%		1,206.9%	1,256.5%
Annual Avg	18.7%	20.7%	19.8%	17.1%	2.3%	-0.9%	8.8%	0.5%	29.3%	29.8%

Instead of continuing at their torrid pace and gobbling up S&P 500 market share, the Fab 5 were called for a technical foul for calling a timeout when they had none left. In 2022 the S&P 500 lost 18.1% while the Fab 5 posted a loss double as great, shedding 36.8%. Dollar sales didn't grow by 17.1% as they had done during the decade prior. Instead, sales grew only 6.8%. At the same time, the group profit margin slipped 17.8% from 21.1% to 17.3%. In triple whammy fashion, the Fab 5 collective P/E multiple was beat down by nearly 30%, from 33.7x to 23.6x. It seems when past growth is priced to continue, nasty surprises are rewarded with sell tickets.

Fab 5	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2021	0.37	0.04	1.77	1,408.6	796.9956	21.06%	33.7	0.3%		
12/31/2022	0.33	0.04	1.93	1,505.1	779.7560	17.31%	23.7	0.5%		
Growth %	-10.2%		9.2%	6.8%	-2.2%	-17.8%	-29.9%			
Annual Avg	-10.2%		9.2%	6.8%	2.2%	-17.8%	-29.9%	0.3%	-37.1%	-36.8%

The question before the investment house is whether the Fab 5 individually or collectively slumped enough from overpriced growth at any price to value investor undervalued? Let's spend a brief minute examining 2022's re-rating of each, contrasting what each had done for the prior decade to year-end 2021 with last year's smackdown.

Apple's shares enjoyed a 28.9% compound annual return for the decade ended 2021. A stock that traded for 11.4x in 2011 ended 2021 at 29.2x, leaving little room for error (disappointing sales or earnings as fashionably called among investing circles).

Apple	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2011	1.26	0.00	4.90	127.8	26.1064	25.8%	11.4	0.0%	14.46	
12/31/2021	6.08	0.87	23.08	378.3	16.3917	26.3%	29.2	0.5%	177.57	
Growth %	381.3%		371.3%	195.9%	-37.2%	2.1%	155.2%		1,128.0%	1,165.3%
Annual Avg	17.0%		16.8%	11.5%	4.8%	0.2%	9.8%	0.4%	28.5%	28.9%

Apple is the largest company in the world by market cap. At a \$400 billion run rate in annual revenues and 24% profit margin, moving the needle becomes like moving a battleship. Apple's growth in share of the household budget (not that many do) has been extraordinary. The company's prospects will be discussed more in full in the Berkshire section of the letter. Heading into 2022, demand pulled forward coupled with a high 29.2x multiple to earnings left little room for disappointment in sales or earnings growth. While sales advanced an impressive 11.5% per year for the prior decade, the top line slowed to a 2.4% advance in 2022. Further, despite robust share repurchases (price insensitive) commanding nearly all profit and cash produced from operations, a 2.7% decline in the share count failed to prevent a modest decline in earnings per share. What was a too-high multiple to earnings declined from 29.2x to 22.1x. The stock produced a 26.4% loss in total return. I don't know what an investor should pay for a great

business that stands to grow its revenues by 6% a year over several years but will spend all profit to shrink shares outstanding by less than 3% per year. I have better uses for money unless the multiple is expected back near 30x. To my mind last year's loss was warranted.

Apple	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2021	6.08	0.87	23.08	378.3	16.3917	26.3%	29.2	0.5%	177.57	
12/31/2022	5.89	0.92	24.31	387.5	15.9434	24.2%	22.1	0.7%	129.93	
Growth %	-3.1%	5.7%	5.3%	2.4%	-2.7%	-8.0%	-24.5%		-26.8%	-26.4%
Annual Avg	-3.1%	5.7%	5.3%	2.4%	2.8%	-8.0%	-24.5%	0.4%	-26.8%	-26.4%

Microsoft likewise enjoyed a phenomenal ten years to 2021. Sales grew 9.9% annually, margins grew to 35.7% and investors bid the stock up from a single-digit 9.4x earnings to 38.2x. Semper was a buyer in 2007 at 10x and was long gone (regrettably) well before the multiple returned to 38.2x. Crazy train was the stock valued at more than 80x earnings on a 37% profit margin in early 2000. The stock from that point posted a predictable (to some) negative total return for more than 15 years. Price again for perfection in 2021?

Microsoft	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2011	2.76	0.72	8.60	72.1	8.3820	31.5%	9.4	2.8%	25.96	
12/31/2021	8.80	2.36	24.65	184.9	7.5000	35.7%	38.2	0.7%	336.32	
Growth %	218.8%	227.8%	186.8%	156.6%	-9.9%	13.5%	306.3%		1195.5%	1250.2%
Annual Avg	12.3%	12.6%	11.1%	9.9%	1.1%	1.3%	15.1%	0.5%	29.2%	29.7%

Despite revenues growing 10.4% in 2021, augmented with share repurchases shrinking the share count by 0.8%, profit margins fell from 35.7% to 33.4% while the P/E multiple paid heed to earnings per share only growing 4.1% and slid by 31.5%, from 38.2x to 26.2x. Put it all together and Microsoft shareholders lost 28.0%, another predictable outcome. Prospectively? It's hard to not like expected revenue growth of more than 10% annually, particularly if margins prove durable. If they don't, or if sales miss, 26.2x to earnings doesn't seem overly cheap.

Microsoft	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2021	8.80	2.36	24.65	184.9	7.5000	35.7%	38.2	0.7%	336.32	
12/31/2022	9.16	2.57	27.41	204.1	7.4470	33.4%	26.2	1.1%	239.82	
Growth %	4.1%	8.9%	11.2%	10.4%	-0.7%	-6.4%	-31.5%		-28.7%	-28.0%
Annual Avg	4.1%	8.9%	11.2%	10.4%	0.7%	-6.4%	-31.5%	0.7%	-28.7%	-28.0%

Google, just like the other Fabs, produced a terrific 10-year return, 24.5% per year in the king of search and online video's case. Blistering 21.1% annual sales growth accounted for the majority of the return. At 28.6x earnings, shareholders were unprepared for sales growth slipping to less than 10% in 2022.

Google	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2011	0.77	0	2.92	37.9	12.9958	26.3%	21.1	0.0%	16.16	
12/31/2021	5.06	0	19.29	257.6	13.3530	26.2%	28.6	0.0%	144.85	
Growth %	559.7%		561.5%	579.7%	2.7%	-0.3%	35.8%		796.2%	794.0%
Annual Avg	20.8%		20.8%	21.1%	-0.3%	0.0%	3.1%	0.0%	24.5%	24.5%

If they weren't prepared for a slowing top line, they really weren't expecting margins to decline 16.0% from 26.2% to 22.0%. On a 4.2% decline in earnings per share, the combination of bad factors whammed the stock by 39.1%. Ouch. Management must have found the cheaper stock a bargain as they ramped up the share repurchase to \$60 billion which gobbled up every dollar on net profit. Cheap? If you think the company will earn \$125 billion in five years, you are paying less than 10x that number when stripping net cash from the profit margin. Like a number of businesses under survey here, tell me what will happen on the regulatory and competitive front. I have a big bin of reports on my desk with a label reading "Too Hard."

Google	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2021	5.06	0.00	19.29	257.6	13.3530	26.2%	28.6	0.0%	144.85	
12/31/2022	4.85	0.00	22.01	282.8	12.8490	22.0%	18.2	1.0%	88.23	
Growth %	-4.2%		14.1%	9.8%	-3.8%	-16.0%	-36.5%		-39.1%	-39.1%
Annual Avg	-4.2%		14.1%	9.8%	3.9%	-16.0%	-36.5%	0.0%	-39.1%	-39.1%

Amazon was the Fab 5-point leader in the decade ended 2021, posting a 34.4% compound annual return. Revenue growth was just stunning at 24.2% a year, albeit from a small base. The analyst must dig into the component businesses within Amazon to develop a framework of from where growth and profitability will be derived, overlaid where the capital in the business resides and will be spent. The stock ended 2021 at 70.3x earnings, seemingly expensive unless expecting robust top line growth and/or significant margin expansion. Yes.

Amazon	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2011	0.07	0.00	5.28	48.1	9.1014	1.3%	124.6	0.0%	8.66	
12/31/2021	2.37	0.00	46.43	469.8	10.1200	5.1%	70.3	0.0%	166.72	
Growth %	3,313.0%		778.9%	877.2%	11.2%	288.3%	-43.6%		1,826.3%	1,820.0%
Annual Avg	42.3%		24.3%	25.6%	-1.1%	14.5%	-5.6%	0.0%	34.4%	34.4%

A long run bull case may assume margins as much as double 2021's 5.1%. Those investing on headline GAAP earnings were likely surprised seeing margins come in at 1.4% in 2022, a not-insignificant 72.1% below the prior year. This was a case where deriving an additive attribution created "issues." The share count rose, so despite 9.4% sales growth, earnings per share slipped 69.6%. The P/E multiple headed the opposite direction, surging back over 100x to 116.7x. The investor might conclude a multiple over 100x to be high. Alternatively, the investor expecting sales growth above 10% for several years and an attainable margin above 2021's 5.1% (perhaps well above) might conclude value possibly exists here. Hmm. How many times do you see a stock lose 49.6% in a year and the price paid to earnings jump from 70.3x to 116.7x. May we live in interesting times.

Amazon	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2021	2.37	0.00	46.43	469.8	10.1200	5.1%	70.3	0.0%	166.72	
12/31/2022	0.72	0.00	50.51	514.0	10.1750	1.4%	116.7	0.0%	84.00	
Growth %	-69.6%		8.8%	9.4%	0.5%	-72.1%	65.8%		-49.6%	-49.6%
Annual Avg	-69.6%		8.8%	9.4%	-0.5%	-72.1%	65.8%	0.0%	-49.6%	-49.6%

Facebook. Meta. Facebook. Whatever. The company went public in mid-2012 and from a standing start grew revenues to \$118 billion and produced a 33.4% margin. Shareholders earned 25.4%. Insiders got way richer. Capitalized at only 24.0x what some may have deemed high margin perhaps posed risk if things went sideways in 2022.

Facebook	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2011	0.01	0.00	2.38	5.1	2.1424	0.6%	1,782.2	0.0%	26.62	
12/31/2021	13.99	0.00	41.89	117.9	2.8150	33.4%	24.0	0.0%	336.35	
Growth %	93,561.3%		1,663.6%	2,217.3%	31.4%	5,210.8%	-98.7%		862.5%	862.5%
Annual Avg	98.2%		33.2%	36.9%	-2.7%	48.8%	-35.0%	0.0%	25.4%	25.4%

Things did not go sideways for, let's call them Meta for now, in 2022. They went backward. Decidedly backward. Who saw an outright 1.1% sales decline coming. OK, currency. Margins just got hammered, falling by 26.2%. Investors must not have liked the bad news because they sent the stock down 64.2% (there's no dividend so the price return matches the total return). On the 26.2% margin decline with sales falling 1.1%, management put a tourniquet on the bleeding by repurchasing a net 7.1% of its outstanding shares. Earnings per share accordingly only declined by 21.4%. Imagine how much worse the stock might have plummeted had the company not spent \$32 billion buying shares, \$9 billion more than net income. It's not like the company just invented share repurchases, however. They spent \$50 billion the prior year, again way more than profit and nearly all cash produced from operations. 2021 was spectacular. On \$50 billion spent buying shares back, the share count declined all of 3.8%. It was the first time the share count actually declined despite sizable ongoing repurchases since 2017. You see, Facebook, I mean Meta's management perfected the craft of paying themselves a mountain of shares and money. This is what you do in what is apparently called a Metaverse. There is another bin of reports on my desk. I won't tell you what this one is called.

Facebook	EPS	DPS	Sales Per Share	Sales in Dollars	Share Count	Margin	P/E Multiple	Yield	Price	Total Return
12/31/2021	13.99	0.00	41.89	117.9	2.8150	33.4%	24.0	0.0%	336.35	
12/31/2022	11.00	0.00	44.61	116.6	2.6140	24.7%	10.9	0.0%	120.34	
Growth %	-21.4%		6.5%	-1.1%	-7.1%	-26.2%	-54.5%		-64.2%	-64.2%
Annual Avg	-21.4%		6.5%	-1.1%	7.7%	-26.2%	-54.5%	0.0%	-64.2%	-64.2%

If I had to put together a list of companies and their common shares most likely to dominate over the coming decade or two, the Fab 5 would not be at the top of my batting order; certainly not all five of them. It's always a fun thought exercise identifying a company of companies that an investor could own for some long-term horizon if they could never make a portfolio change. Technological obsolescence, competition from outside (or with each other), regulation, starting valuation, lack of reinvestment opportunity and brand affection are all factors making the Fab 5 tough selections. Time will tell, but the history of great businesses remaining in the leadoff spot indefinitely matches the history of sovereign nations and currencies standing the test of time, which will tell.

INVESTING IN “FLATION”

“The threat is nearly invisible in ordinary ways. It is a crisis of confidence, a crisis that strikes at the very heart and soul and spirit of our national will. We can see this crisis in the growing doubt about the meaning of our own lives and in the loss of a unity of purpose for our nation. The erosion of confidence in the future is threatening to destroy the social and political fabric of America.” – Jimmy Carter, The Malaise Speech, July 15, 1979

“The symptoms of this crisis of the American spirit are all around us. For the first time in the history of our country a majority of our people believe that the next five years will be worse than the past five years. Two-thirds of our people do not even vote. The productivity of American workers is actually dropping and the willingness of Americans to save for the future has fallen below that of all other people in the Western world.” – Jimmy Carter, More Malaise



“The top nine most terrifying words in the English language are: I’m from the government and I’m here to help.” – Ronald Reagan

“Well, by the standards of a lot of countries, by Latin American standards, it wasn’t so bad.” – Paul Volcker

Secular Peaks and Troughs – Red to Green

	9/29 Peak	7/32 Low	3/37 Peak	4/42 Low	2/66 Peak	8/82 Low	3/00 Peak	10/02 Low	10/07 Peak	3/09 Low	12/21 Peak	12/22 No Lo
S&P 500	34	4	20	7	94	102*	1527	777	1565	666	4766	3840
After-Tax Profit Margin	8.9%	-3.2%	6.4%	6.6%	6.7%	4.0%	7.4%	5.8%	9.4%	-0.1%	13.3%	11.3%
Price to Op Earnings (TTM)	26x	NMF	8x	7x	18x	8x	33x	19x	22x	NMF	23x	19x
Price to Earnings (CAPE)	30x	4x	23x	9x	25x	7x	44x	23x	28x	15x	38x	29x
Price to Sales	2.31x	0.48x	0.51x	0.46x	1.20x	0.32x	2.13x	1.11x	1.57x	.666	3.04x	2.17x
Price to Book Value	3.0x	0.3x	2.2x	0.8x	2.4x	0.9x	5.2x	2.3x	3.0x	1.5x	4.7x	3.7x
Dividend Yield	3.0%	17.5%	3.7%	8.7%	2.9%	6.1%	1.0%	2.0%	1.7%	4.0%	1.3%	1.8%
Market Cap All Stocks	93.3B	15.3B	66.2B	32.4B	624B	1.1T	14.0T	7.0T	15.9T	7.0T	48.5T	38.1T
GDP	103.7B	58.8B	91.9B	162B	789B	3.3T	9.9T	11.0T	14.6T	14.4T	24.4T	26.2T
Market Cap to GDP	90%	26%	72%	20%	79%	33%	141%	64%	109%	49%	209%	145%
Total Credit Market Debt	175B	150B	159B	227B	1.12T	5.2T	26.7T	32.2T	51.2T	54.6T	88.4T	93.3T
Total Credit Mkt Debt / GDP	169%	255%	173%	140%	142%	158%	264%	293%	352%	380%	362%	356
U.S. Government Bond Yield	3.4%	3.5%	2.6%	1.9%	4.6%	14.6%	5.9%	4.7%	4.9%	3.5%	1.9%	4.0%
U.S. Discount Rate	6.0%	2.5%	1.5%	1.0%	4.5%	10.75%	5.5%	1.25%	5.0%	0.75%	0.25%	4.5%
Inflation (CPI)	0.6%	-9.9%	3.6%	10.9%	3.7%	11.0%	3.4%	1.6%	2.9%	-0.4%	7.0%	6.4%
Unemployment Rate	2.3%	24.9%	11.7%	4.9%	4.2%	10.8%	3.9%	6.0%	5.0%	9.9%	3.9%	3.5%

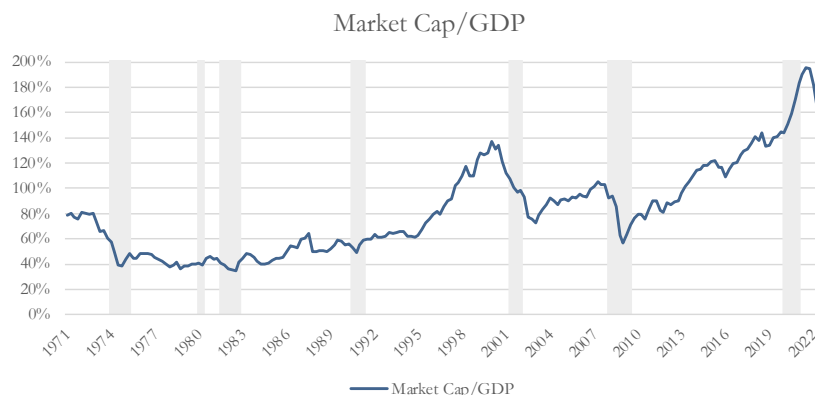
*A peak price can approximate the subsequent trough price following 17 years, especially when marked by high inflation.

Source: Semper Augustus, Federal Reserve Bank of St. Louis, Bureau of Economic Analysis, Bureau of Labor Statistics, Standard & Poor’s, U.S. Treasury

2021 likely marked the sixth secular peak dating back to 1929's Everest. Between 1929 and 2021, additional secular peaks occurred in 1937, 1966, 2000 and 2007. Half of the peaks occurred on Semper's watch and in my fleeting 32 years investing capital for clients. I hope we see another three or four peaks before they send for the pine box. The tumble from peaks comes with opportunity. Doesn't everyone love bears?

Secular peaks don't lickety split to the bottom in a single year, particularly with but a garden-variety 18.1% total return loss in 2022 for the S&P 500, the globe's most recognized equity benchmark. While painful, more severe pain was inflicted throughout more speculative [sic] corners of the stock market.

As painful as 2022 felt to many, stocks aren't washed out at 19.2x earnings, and certainly not on a still-robust profit margin a mere 200 basis points from a record high. On a market-cap-to-GDP basis, 2022's 145% is *higher* than at every prior secular peak except for the one set just a year ago at 209%. Unemployment isn't 3.5% of the workforce when



times are bad. While 304% of sales was most definitely a secular record in 2021, faces aren't ripped off at 217%, where they ended 2022. How about a dividend yield at today's 1.8%? Scan the table. A 1.8% yield, on a healthy 35% payout rate, is *lower* than yields seen at three of the six secular tops. Low yields reflect high prices and vice versa. Hades this ain't.

The economy and asset prices at secular bottoms are both hobbled and weak. Just as 1929 saw the first secular peak of the past 100 years, 1932 marked the depths of the depression and first secular bottom. The situation was very grim for the U.S. and its allies in April 1942. 1982 concluded more than sixteen years of ripping inflation, rolling recessions and high unemployment. Malaise was the situation per the Carter White House (though upon further examination the President never actually uttered the word in his famous "Malaise Speech" on July 15, 1979 – Candidate Reagan reminded the voters about it for sure). I joined the pro investing game in 1991 and lived the bubble that burst into flames at 2000's peak, leading to a three-year demolition derby that left the stock market and economy in tatters. Most readers recall the Financial Crisis, with stocks cut by nearly 60% while unemployment climbed to 9.9% and those who had been blown up in stocks by more than 50% twice in the same decade swearing off the casino once and for all. The newest generation of investors – speculators, really – over the past couple years, today likely feel pretty lousy. Those that played with fire were burned. SPACs splintered, memes were mauled, arks sank, bonds were bloodied and Tesla tanked. Blood ran in the streets, but at a mere 20% price drawdown for the S&P, history tells us we have a long way to go before green again appears as the rightmost column in the above Semper table of secular highs and lows.

The great fun of the investment arena is not knowing how the future will play out. Those with a foundation grounded in history and rationality have at their disposal a worn roadmap lacking specific detail, but a roadmap, nonetheless. Navigate the coming trail to a green column and you may just have a treasure map.

The base case from this chair on how the coming years unfold centers on the undisputed fact that the globe is awash in too much debt. The numbers are so large that they can ultimately head in one direction

as a percentage of economic output, south by south. Total U.S. credit market debt as a percentage of GDP has never been higher. The globe suffers from a similar burden.

The question necessarily is how does the system shrink debt as a percentage of GDP? The answer is likely in some form of “flation,” which is a made-up shorthand for deflation, disinflation, stagflation, inflation or hyperinflation. The unwinding of debt bubbles is never fun.

Ben Bernanke was appointed Chairman of the Federal Reserve on February 1, 2006, replacing Alan Greenspan who was ineligible for a sixth term. Bernanke studied the Great Depression and was awarded a Nobel Prize for concluding that failing banks, coupled with a too-inactive Fed, combined to cause the Great Depression. When the new man took the central bank helm (really, the start button on the printing press), the Fed’s assets totaled \$832 billion, the preponderance of which were short-term U.S. government securities. Ben stared down a banking crisis and resolved he would not go down as inactive. When he left the Fed, many too-big-to-fail money-center banks did fail or were so crippled and subsequently diluted with new capital that they effectively failed. Regardless, inactive he was not. As telegraphed in his famous 2002 “helicopter money” speech as a Fed governor, act he did as Chairman in true Schwarzenegger fashion to “GET TO THE CHOPPA!!” Ben, circa 2002:

...the U.S. government has a technology, called a printing press (or, today, its electronic equivalent), that allows it to produce as many U.S. dollars as it wishes at essentially no cost, that the existence of this technology means that sufficient injections of money will ultimately always reverse a deflation, and that using this technology to finance a tax cut is essentially equivalent to Milton Friedman’s famous “helicopter drop” of money.

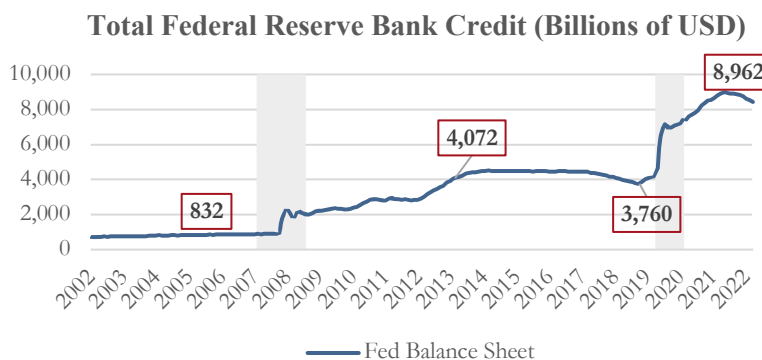
When Helicopter Ben departed the Fed in January 2014, the balance sheet at the central bank had swelled in eight years from \$832 billion to \$4.1 trillion, a nearly five-fold increase, or 22% annual growth versus 3.1% in average GDP growth. Assets consisted not simply of short-term Treasuries but \$2.3 trillion of federal debt across the yield curve spectrum, \$1.6 trillion of mortgage-backed securities and a small amount (relatively speaking) of federal agency debt.

The Financial Crisis on Bernanke’s watch ended in early 2009. The elixir of quantitative easing (QE) must be as addictive to central bankers as crack cocaine is to junkies. Barack Obama appointed Janet Yellen to replace Bernanke five years removed from the crisis, but the Fed persisted in printing money because, why not? The balance sheet grew further to \$4.5 trillion by 2015 when the Fed decided to halt growth in assets but not to shrink the balance sheet. Securities maturing were replaced by new securities until 2018 when the Fed attempted to shrink, or taper its assets, allowing maturing securities to roll off. To the extent the Treasury was running deficits (they were) and mortgage originators needed to unload mortgages (they did), no longer was the central bank there as a source of liquidity. The private market was forced to absorb the shrinkage in Fed assets, and the system did not like it. Nor did the White House, so then President Trump axed Yellen for current Fed Chair Jerome Powell. The Yellen Fed raising interest rates further incensed the White House, with the Powell Fed continuing through July 2019, from a target range of 0% to 0.25% up to 2.25% to 2.5%. By August 2019 the balance sheet had shrunk to \$3.76 trillion.

A liquidity crisis ensued in the repurchase agreement market and the Fed responded by aggressively taking rates back down to a target range of 1.5% to 1.75% by November. Enter COVID-19 in February 2020 and rates were cut to the zero bound on March 15, where they stayed until March 16, 2022.

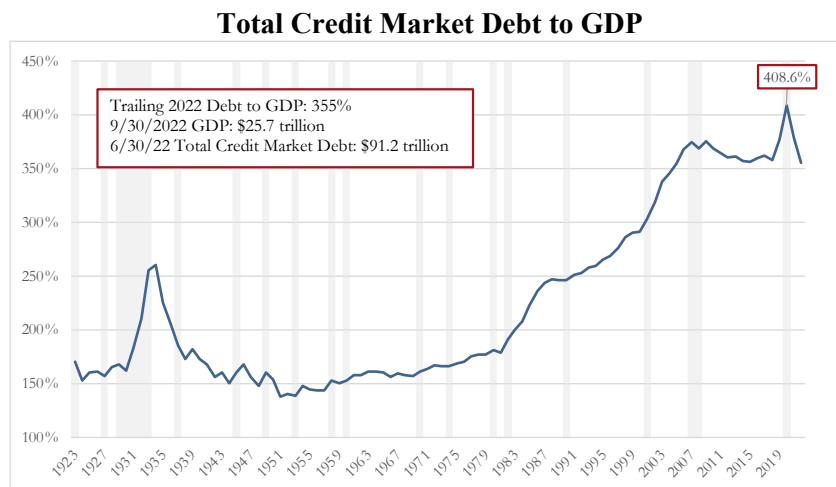
The pandemic saw the Fed and its central bank contemporaries abroad relaunch myriad liquidity tools from the Financial Crisis and then some. I won't rehash the detail from past letters, but QE took the balance sheet from \$3.7 trillion in 2019 to \$8.96 trillion on March 23, 2022, precisely two years to the day from when it lurched into action with QE4 when the globe closed for the virus.

That's a 2.4x increase in 2.5 years, a stunning 43% per year against 7.1% growth in GDP. From the appointment of Helicopter Ben through March 2022, total Fed assets ballooned from \$832 billion to \$8.96 trillion, an incredible factor of more than ten times, or 15.8% per year.



Hatching a Debt Bubble

Walking through the central bank balance sheet under the watch of Bernanke to Yellen to Powell lays the foundation for a hypothesis suggesting whether intentional or not, we are in for a painful ride that takes debt levels back to a more normal level. A disinflationary period beginning with the presumed breaking of inflation by the Volcker Fed in the early 1980s when the Fed Funds reached 19% allowed for the development of the largest credit bubble the world has ever seen. The debt bubble reached its peak in 2000 in terms of total debt outstanding to GDP, and for that we no longer enjoy economic growth when adjusted for inflation and population growth. We'll get to Volcker and the Fed during the inflationary 1970s shortly. First, spend a minute digesting this chart of total U.S. credit market debt as a percentage of GDP. Total debt here includes all outstanding household, federal, state, local government, and both financial and non-financial corporate debt.



Source: 1923-1944: Annual interpolated GDP (including estimates prior to 1929) used prior to 1946. Domestic nonfinancial Debt used prior to 1946. As of December 1946, Domestic Nonfinancial Debt represented 99.4% of Total Credit Market Data
 1945 to 2022: St. Louis Federal Reserve; FRED

When Fed Funds reached 19% in 1981 the longest-dated U.S. Treasury, then a 15.75% coupon 20-year bond reached a 15.78% yield to maturity and the bank prime interest rate, which then benchmarked mortgage rates, hit 21.5%. With interest rates at such high levels, the system simply couldn't bear large

amounts of debt outstanding. In March 1981 total credit market debt was 158% of GDP. The relationship had held steady around 150% of GDP since 1923 (our earliest data available). Federal debt exploded to 120% of GDP during World War II and constituted all but 30% of additional private debt outstanding relative to output. Businesses and households were largely unleveraged during the Great Depression and through the war. The relationship of total credit market debt to GDP thus fell modestly below 150% during the war and for ten years later, but during that time Federal debt was the preponderance of debt outstanding.

The spike in total credit market debt to GDP seen in the above chart was not an increase in outstanding debt at all. It's misleading. Nominal GDP plunged by nearly 50% from 1929 to 1932. Total debt outstanding actually declined in absolute dollar terms but not by as much as the wipeout in GDP.

As inflation steadily and gradually declined (but remained positive), a virtuous state known as disinflation, interest rates naturally followed suit. Irving Fisher famously suggested nominal interest rates will rise or fall to match the inflation rate, an academic theorem anathema to Keynesian central bankers. Keynesians presume it's in their purview, and theirs alone, to set interest rates. Odd that interest rates and inflation both existed prior to the establishment of the central bank in 1913, but that's another story. Declining interest rates, which eventually reached zero for short rates, 0.5% for long Treasuries, very-low single digits for investment grade corporations, and 2.5% for household mortgage borrowers, allowed for the utilization of increasing leverage.

With no academic background in economics required, one could view total debt at 270% of GDP at the March 2000 peak of the tech bubble and conclude a high level. I did. Alan Greenspan, on the job at the Fed from 1987 to 2006, suggested bubbles were unidentifiable, yet knew enough to raise interest rates, hiking Fed Funds from 4.5% at the outset of 1999 to 6.5% in mid-2000. "Pop went the weasels" loaded up on profitless internet stocks and incredibly high multiples on very profitable tech darlings. A recession, 50% decline in the S&P 500 and nearly 80% tar and feathering of the Nasdaq gave the Fed cover to reduce rates to 1.0% where they stayed until sufficiently allowing for a reflating of a stock bubble as well as a doozie of a bubble in housing, particularly the subprime variety.

From 2000 to 2007, debt stunningly ballooned from 264% of GDP to here-to-fore impossible 365%. GDP added \$4 trillion over those seven years, rising from \$10 trillion to \$14 trillion, 1.4x growth. Debt outstanding *nearly doubled* relative to GDP, rising from \$27 trillion to \$51 trillion. Said differently, an astonishing six dollars in new debt was required to grow the economy by a single dollar.

Six to one. By 2007, debt had grown to the point that the next dollar of debt would fail to grow the economy proportionally by more than the 365% relationship. For 26 years debt to GDP drove upward from 158% to 365% but then flatlined for the next 15 years. That's called hitting the wall at full speed. Since 2007, we enjoyed the run of central bank intervention described above. Over that stretch we've grown GDP \$12 trillion to a likely \$26.2 trillion at year-end 2022. Debt meanwhile grew from \$51 trillion to \$93 trillion. Adding \$42 trillion in new debt on \$12 trillion of nominal incremental GDP just happens to maintain the 350% relationship established in 2007, *prior to the Financial Crisis and 2020's pandemic*. What borrower do you suppose took on the most debt over this stretch from 2007 to 2022? Uncle Sam clocked in at fully \$23 trillion of the \$42 trillion in new debt was issued. Federal debt was 31% of GDP in 1981. Today it's 120%. The government increased its outstanding debt from less than \$1 trillion to more than \$31 trillion since interest rates peaked, a \$30 trillion increase, more than the \$26 trillion of GDP today.

Get Real

We're talking growth in both debt and GDP in nominal dollars, before considering inflation and growth in population. Debt surpassed 250% at the height of the tech bubble in 2000. If 250% debt to GDP marked the point at the outset of the 21st century beyond which incremental debt growth relative to economic output would not be accretive, the results can be seen in the table below. From the industrial revolution beginning around 1870, the U.S. enjoyed vibrant economic real growth per capita. Warren Buffett often talks about the tailwind investors enjoyed during his lifetime begun in the teeth of the Great Depression in 1930. The U.S. experienced strong population growth north of 1% through the end of the 1990s. Since then we've seen growth slow to 0.6% in the 2010s and for the most recent three years. Likewise, nominal GDP growth was met by modest inflation with the exception of two decades – the 1970s and 1980s. Still, real GDP per capita clipped along north of 2%. What's happened of late? Real per capita GDP growth collapsed to around 1% as debt to GDP surged beyond 250%, leading to bubbles in both financial and real assets (think real estate). More government eventually has a deleterious impact on economic output – the Law of Diminishing Returns.

Real GDP Per Capita by the Decade – What Happened at the Millennium?

	Nominal GDP	U.S. Population (millions)	10-Year Nominal GDP Growth	Population 10-Year Growth	Average Inflation Rate	Real GDP Per Capita Growth	Average Total Credit Market Debt to GDP**
1940s ^	\$280.8 B	157.3	7.7%	1.4%	2.1%	4.2%	160%
1950s	\$542.6 B	179.3	6.8%	1.7%	3.8%	1.3%	145%
1960s	\$1.05 T	203.3	6.4%	1.3%	2.1%	3.0%	158%
1970s	\$2.8	226.5	10.2%	1.1%	6.9%	2.2%	169%
1980s	\$5.9	248.7	7.7%	1.0%	4.5%	2.2%	216%
1990s	\$10.0	281.4	5.5%	1.2%	2.0%	2.3%	265%
2000s	\$14.7	308.3	3.9%	0.9%	2.2%	0.8%	344%
2010s	\$21.7	328.2	3.8%	0.6%	1.9%	1.3%	362%
2022 3-yr	\$26.2*	334.2*	6.5%	0.6%	4.9%	1.0%	381%

*estimated

Source: St. Louis Federal Reserve; BEA; U.S. Census Bureau; Semper Augustus

**At decade end, so 1949, 1959, 1969, 1979, 1989, 1999, 2009, 2019 and 3-year average to 2022

^4Q 1939 GDP \$92.2 billion; 12/31/1939 population 132.1 million

Late 2021 and 2022 saw a return of inflation with a vengeance, perhaps simply an offset for declining prices for a period during the pandemic. However, rising input costs compelled businesses to raise prices where they could, but not fast enough to avoid declining profit margins. Households paid far higher prices for many goods and services. Where do we go from here?

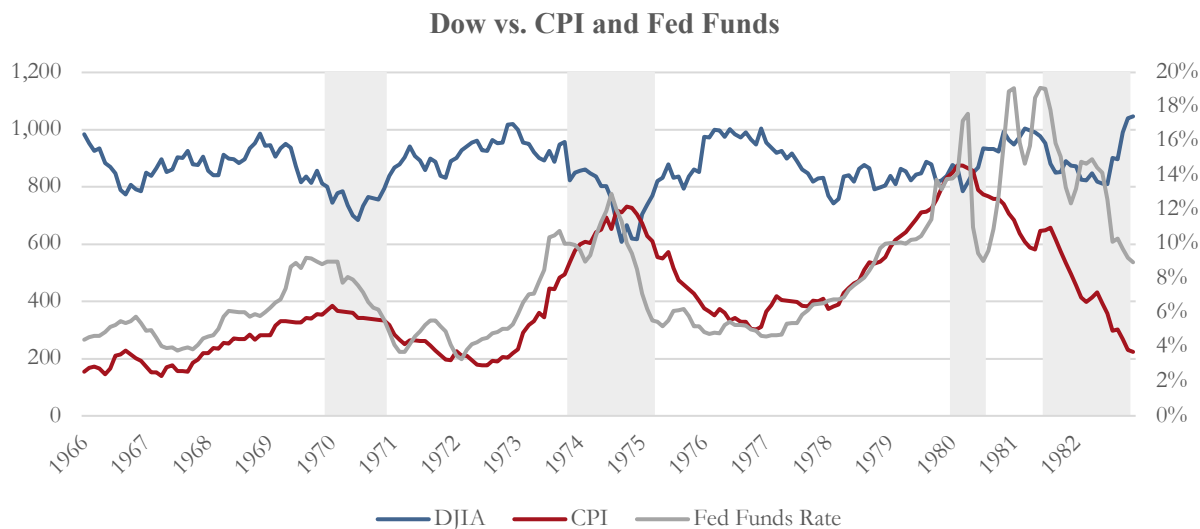
A scenario where debt to GDP fails to expand (it likely can't from nosebleed levels) and even falls to a more manageable level may take us back to a period that saw high levels of inflation. A decade-plus of inflation running well in excess of interest rates can serve to shrink nominal debt levels to GDP. If this scenario is on the table, then a survey of the years 1966 to 1982 becomes necessary. It was not a period enjoyed by many economically. Those equipped with capital allocation skill navigated it well. Most did not.

That 70's Show

The Austrian Economics School, to which I willingly admit belonging, suggests a debt bubble invariably deflates, further concluding proper policy would never encourage the bubble to inflate in the first place. Central banks from Japan to Europe to the U.S. fought deflation as far back as 1989 Japan. The quest to introduce inflation above some academically determined floor was undertaken as debt burdens rose globally. Bernanke adopted 2% as an explicit target in January 2012, bringing a 1997 *Journal of Economic Perspectives* academic article penned by none other than Ben S. Bernanke and Frederic S. Mishkin from the walls of academia to the sacred altar of Doctors of Philosophy, a distinctly gray line. Central bankers may understand that the greater a credit bubble, the greater the eventual bust. However, acknowledging any responsibility for the creation of said bubble in the first place is not part of the central banker playbook.

So, we have this bubble in credit and what do we do with it? Some (not central bankers) would argue that efforts to disallow garden variety recessions may have allowed the evolution of the current state of affairs, with total credit market debt above 350%, here and abroad. Abroad in this case means the world, all of it. Skill in running the printing press to eliminate the first whiff of deflation is the Power Sweep of Lombardi's Green Bay. We are going to perfect it and run the one play again and again. The other extreme of hyperinflation becomes the inevitable ultimate end game, but let's skip that discussion for the moment.

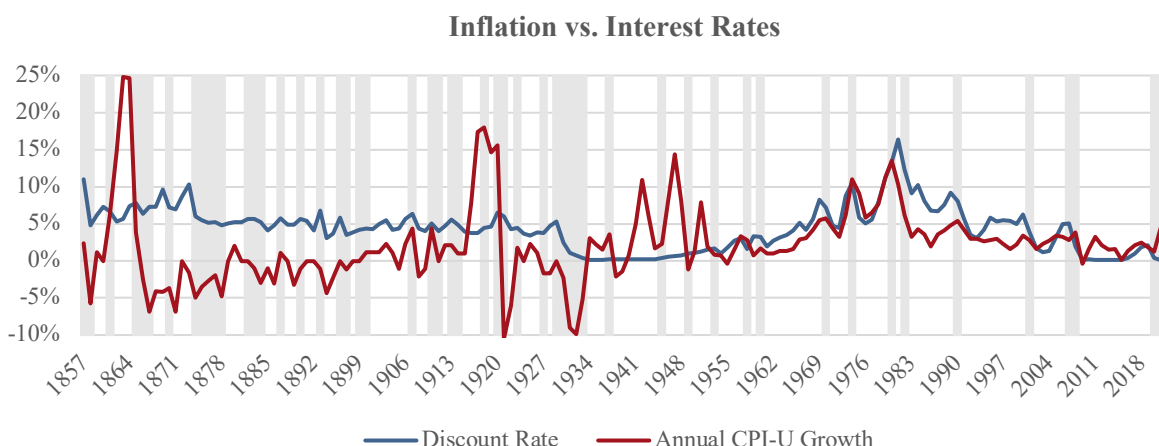
A replay of many economic and market aspects of the 1970s seems a probabilistic course. With no scientific diligence, I'd assign the likelihood of rolling waves of inflation and asset prices at 60%, with the balance split between the twin tails of ugly deflation and hyperinflation. It's entirely possible to get all three outcomes, with hyperinflation last in the queue.



As with the Great Depression, the modern all-knowing Fed blames its ancestors for faulty policy during the 1966 to 1982 great inflation. In both cases, had they only done *more!!!* Conventional wisdom at the Fed and across economics departments nationwide holds that inflation rose in linear fashion while the Fed simply sat on its hands, terrified of getting ahead of the hidden tax and disrupting post WWII prosperity. The post-World War II Fed believed higher levels of inflation were tolerable if it encouraged lower unemployment (Phillips Curve approach to monetary policy). It is firmly believed the Arthur Burns Fed, on the job from the end of the William McChesney Martin Fed in 1970, abysmally allowed inflation to

run hot and did little to stop it. Dogma holds that only until Saint Volcker arrived in 1979, parted the sea and had the fortitude to make tough decisions, and only for his will and willingness to tolerate back-to-back recessions, did he and the Fed break the back of the inflation that had run for 17 years.

Little remembered (or conveniently ignored) is the degree to which the Fed navigates by stock prices, and because the U.S. was a giant oil importer until only recently, by the oil price. The subsequent series of charts and data will dispel conventional thinking on the activity of the pre-Volcker Fed. Through this lens we examine the series of fits and starts for the U.S. stock market and for the economy that plagued the global economy and markets. If this is the fork in the road we now come to and take, prepare to be whipsawed and buckle up for the whiplash that comes with it.



1/1/1857 to 10/1/1914 US commercial paper rate: <https://data.nber.org/databases/macroeconomic/rectdata/13/m13002.dat>
 11/1/14 to 3/1/28 NY Fed Funds: <https://data.nber.org/databases/macroeconomic/rectdata/13/m13009.dat>
 4/1/28 to 5/1/32 upper bound Fed Funds: New York Herald-Tribune
 6/1/32 to 6/1/54 upper bound Fed Funds: Wall Street Journal
 7/1/54 to 10/1/22 Fed Funds Rate: St. Louis Federal Reserve; FRED
 1775-2018 CPI-U: Inflation Conversion Factors for Years 1774 to Estimated 2024 by Robert Sahr at Oregon State

Observing a very long time series of inflation and interest rates, one must conclude the two are highly correlated. Those appointed to manage the economy and maintain price stability are conditioned to believe it is the egg which comes before the chicken. Irving Fisher, dead in 1947, was a neoclassical economist who studied the relationship between nominal and real interest rates as affected by inflation. He summarized the intuitive relationship formulaically as:

Fisher Equation

$$(1 + i) = (1 + r) \times (1 + \pi)$$

Where:

i = Nominal Interest Rate

r = Real Interest Rate

π = Inflation Rate

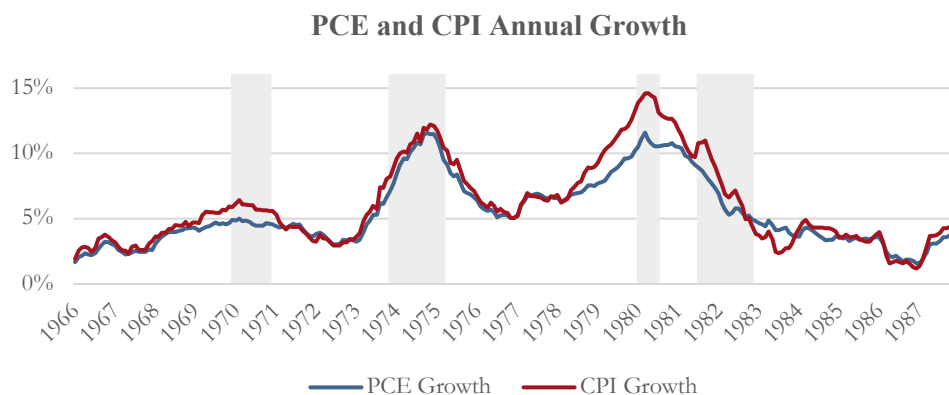
Fisher's conclusion in studying the relationship between interest rates was that the nominal interest rate would gravitate toward the inflation rate over time. He showed how changes in the money supply do not affect the *real* interest rate. Much of Fisher's life was before the advent of central banking, yet high interest rates never persisted during periods of low inflation. If inflation leads to higher nominal interest

rates, what wizards think higher interest rates are a salve for inflation? Well, when you are appointed to perform voodoo, give them voodoo.

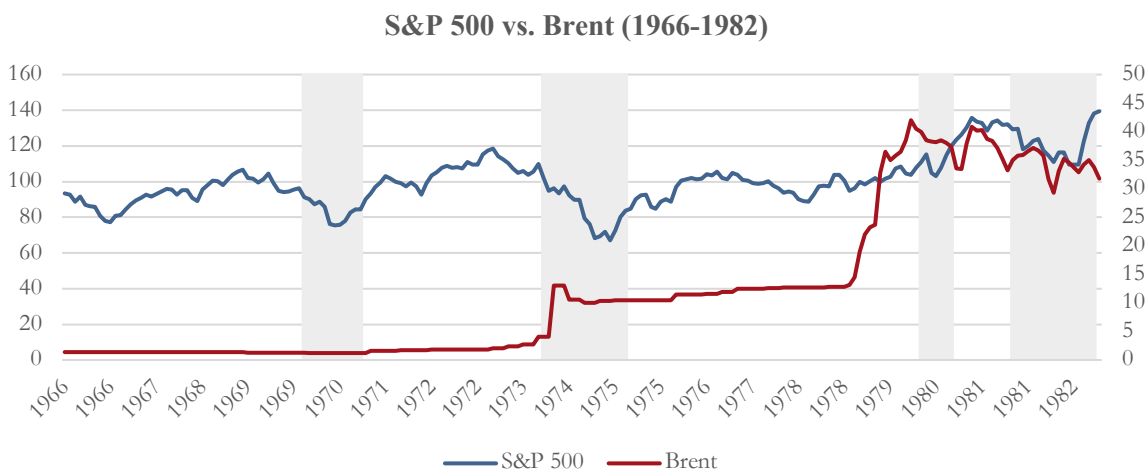
Dispel of the notion that the Fed was persistently behind inflation until the coming of Volcker. During much of the inflationary period beginning in 1966, the Fed Funds rate exceeded the rate of inflation. The only stretch where the inflation rate was higher than the money rate was 1974 to 1976, a recessionary period met with a declining price level. Nobody would argue that with inflation falling the Fed should have been more aggressive, yet that's become the current take.

This section uses the Consumer Price Index (CPI) as the Federal Reserve's proxy for measuring the inflation rate. In 2012 the Bernanke Fed formally adopted the Personal Consumption Expenditure (PCE) price index compiled by the Bureau of Economic Analysis (BEA) as its preferred

inflation measure. It excludes food and energy prices because those are not expenditures that households make. However, during the 1966 to 1982 period under examination, the Fed used the CPI. Thus, wanting to see what they saw at the time, CPI is used throughout here (technically CPI-U, the U standing for urban). Over time the two price indices are highly correlated.

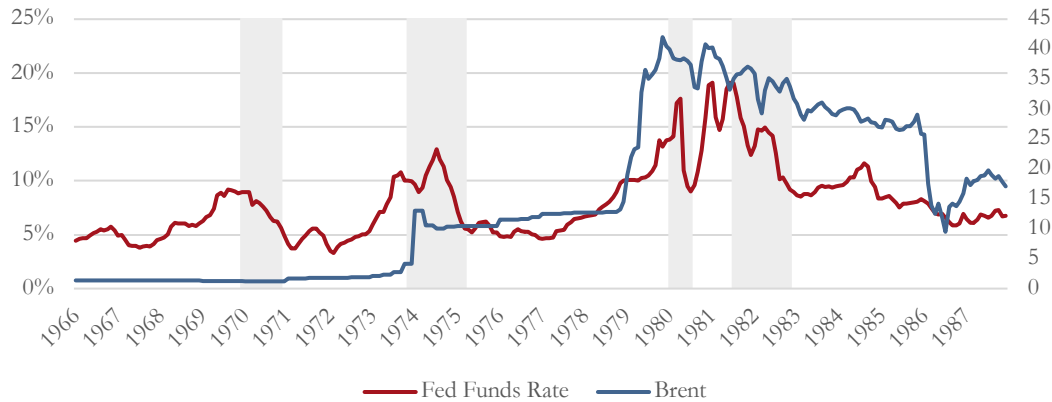


In addition to adjusting monetary policy to changes in the inflation rate, what else was going on that might have impacted central bank decision making? The central bank never acknowledges that they set rates based on the level of stock prices. Sure. Breaking down the price cycles during the inflationary 1960s and 1970s is illustrative.

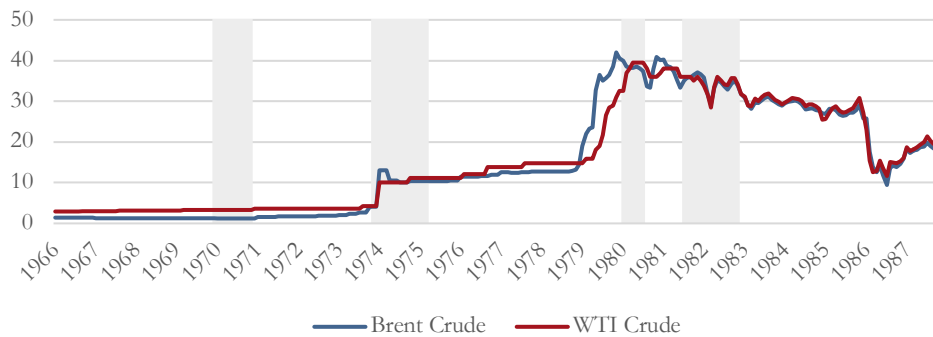


Source: S&P500 Robert Shiller Data
Brent World Bank Commodity Price Data (The Pink Sheet)

Fed Funds and Brent 1966-1987

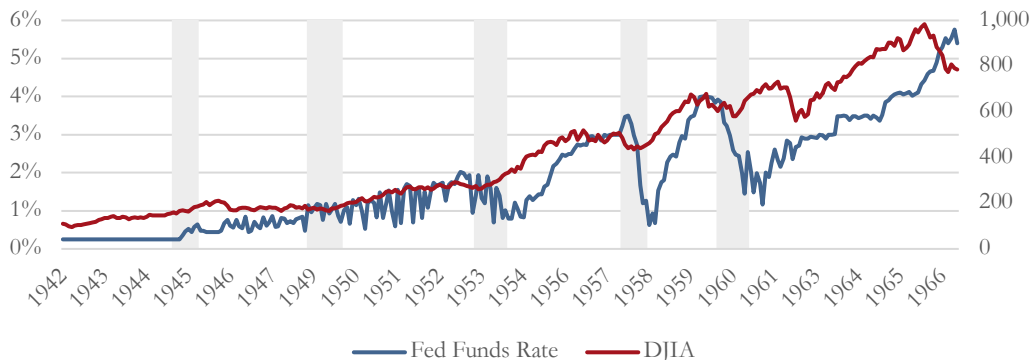


Brent and WTI 1966-1987



The 1942 to 1966 secular bull ended just as inflation began its initial climb from below 2% in 1966. By several measures stocks were as expensive in 1966 as they were in 1929. The stock market would spend the next 16 ½ years in a secular bear market marred by fits and starts of rising interest rates which sent the stock market into five major declines and subsequent recoveries to 1966 highs, plus ongoing volatility. The U.S. was at war in Vietnam, went off the gold standard, saw wage and price controls and two massive oil price shocks. Start to finish, the investor in the Dow Jones Industrial Average or similarly the S&P 500 saw a 75% erosion in real, or inflation adjusted, purchasing power. At the end of the period, few understandably wanted to own common stocks. Is a repeat of this period underway?

1942 to 1966 Secular Bull - DJIA and Fed Funds

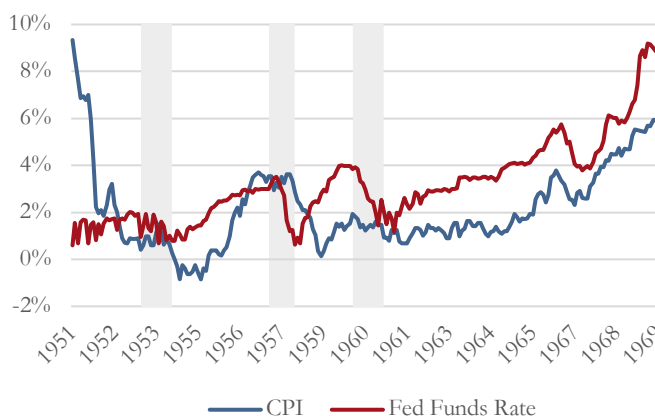


The Dow Jones Industrials peaked at \$995 in February 1966, only to decline to \$744 that year, a 25% jolt to a market that hadn't suffered a drawdown of that magnitude since the 1930s. Observing what the Federal Reserve did from 1966 to 1982 (and beyond), regardless of its protestation that it ignores stock market prices in setting monetary policy, we believe it does just that.

William McChesney Martin chaired the Fed from 1951 to 1970. Five different presidents appointed and re-appointed him. During his first fifteen years as Chair, the inflation rate remained at less than 2%. Can you imagine if he had proclaimed that the inflation rate was too low and suggested letting it run hot for some indeterminate period to offset the low and stable readings? In any event, the Martin Fed was met with rising inflation during its final four years, a sharp contrast to years of prior price stability. Inflation first breached 2%, spiking from 1.9% in January 1966 to 2.6% in February, rising to 6.2% over these four years. The Fed followed inflation

higher, raising its Fed Funds target rate (and also its discount rate, which then was its primary interest rate for setting policy). From 4% in late 1965, Fed Funds were 5.75% by November 1966. Inflation did rise from under 2% to 3.8% by the end of 1966, but something caused the Fed to cut rates from 5.75% back to 3.75% in July 1967. Perhaps stock prices?

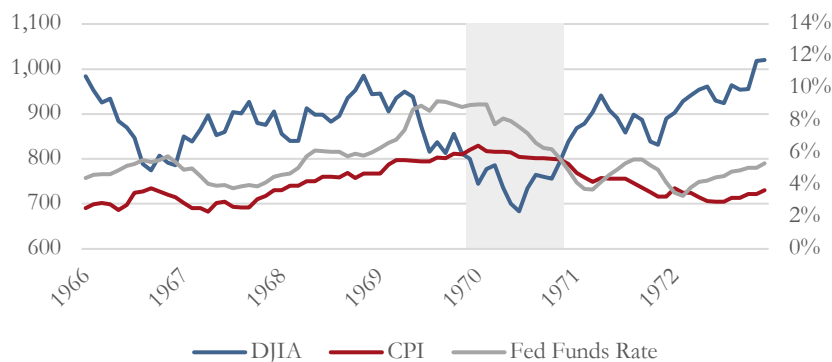
The William McChesney Martin Fed



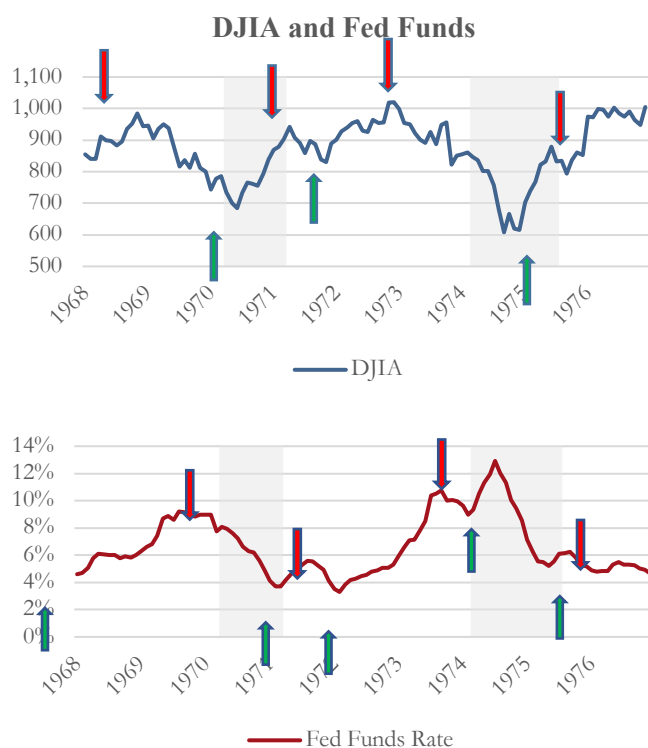
There exists no perfect assignment of causality in economics, but there is certainly correlation. However, inflation returned to 2.3% by mid-1967 and the McChesney Martin Fed cut Fed Funds dramatically, from 5.75% to 3.75%, a quarter point below where they were before rising in 1966. Perhaps again it was easy money that allowed the stock market to then recover all of the 21% 1966 decline by the end of 1968, which it did, to 985 (a very important time for your author and investor). Perhaps it was the arrival of yours truly to the world or perhaps it was inflation that continued to climb to 6% by 1970, matched by a more than doubling of Fed Funds to 9.5% (*way above inflation*). But in any event, the combination of inflation and rates played whack-a-mole with the stock market, sending it for a second ride down to 631 in January 1970, this time a 36% drawdown. What a time for a new Fed Chair to take the baton, with the stock market in the tank and an economy entering its first recession in years.

Arthur Burns replaced Martin in February 1970, just as the economy would enter the recession and a year in advance of the Nixon administration taking the economy off the gold standard. Modern-day economists (and current Fed officials) have roundly criticized the Burns Fed for cutting Fed Funds during the two recessions on his eight-year watch and for being slow to get ahead of incipient inflation. If only the critics had a mirror into which to gaze. The Burns Fed

Dow vs. CPI and Fed Funds



behaved as *EVERY* Fed regime has done, before or since, and was far more aggressive with monetary policy than is believed or remembered. Following the directions on the shampoo label the prior regime left behind, the Fed was a rinser and repeater.



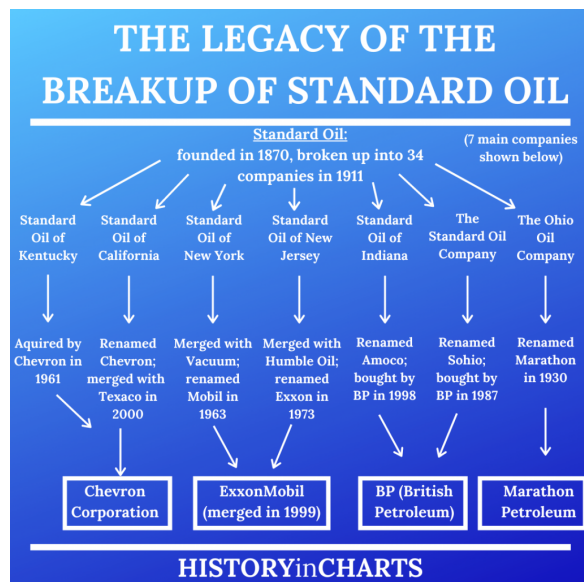
Presidents appoint Fed Chairmen with an unconditional wink and a nod that monetary policy will be kind in advance of presidential elections. Despite being Nixon-appointed, Burns needed little excuse for lowering rates once on the job. The recession and hammering of the stock market in 1970 provided more than ample coverage. What a first couple years on the job. Inflation subsequently obliged for a spell, recessions do that, and dropped from 6.4% in 1970 to 2.9% in August 1972, two months prior to the election. The economy recovered, as did the stock market, again recovering all of its losses, this time to 1,051 (first time over 1,000) in the early days of 1973, a 66% climb from 1970's lows in just over two years, and back in line with highs set in 1966 and 1969. Spend a minute with the chart of the Dow against inflation and interest rates. Stocks led the two series. Some consider stocks a leading indicator, and they were, both on this rally and the preceding decline.

The economy of the 1970s is perhaps most remembered for inflation, for Nixon's twin August 1971 impositions of wage and price controls, ending the dollar's redeemability for gold by foreign nations, and certainly for a concurrent oil embargo crisis. Wage and price controls artificially understated subsequent inflation, but the global price of oil had been set in a command sense, until it wasn't. All of the above erupted at the outset of 1973 to send the stock market into its worst decline since 1929.

Oil

Creeping on the horizon was a change in energy relations with the Middle East. Only in 2019 did the U.S. become a net oil exporter, but its energy supermajors effectively controlled the oil price until 1973. Seven large, vertically integrated oil companies dominated the world oil industry from the 1920s to the 1970s. The "seven sisters" were a cartel formed as the "Consortium for Iran" and set the global price for oil. The five American international major oil companies were Standard Oil Company (New Jersey), which became Exxon in 1972; Socony-Vacuum Oil Company, which became Socony Mobil in 1955 and Mobil Oil in 1966; Standard Oil Company of California, later Chevron; the Texas Company, which became Texaco in 1959; and Gulf Oil Company. Chevron bought Gulf in 1984, and in 1998 Exxon and Mobil merged to form Exxon-Mobil. Two European majors rounding out the sisters were Anglo-Persian Oil Company, which changed its name to Anglo-Iranian in 1935 and to British Petroleum in 1954; and Royal Dutch Shell.

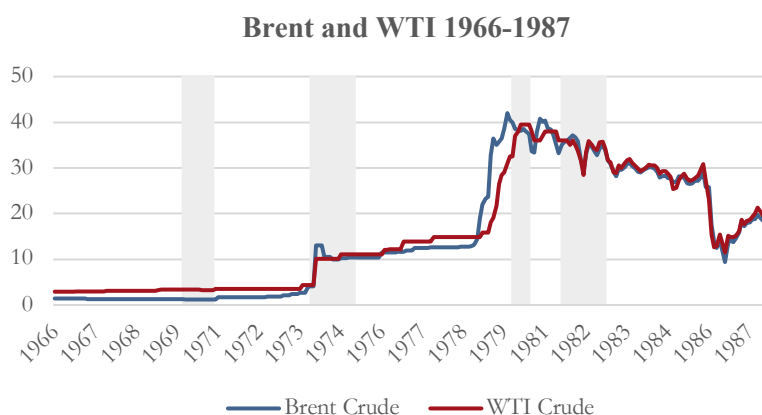
Business history buffs know that John D. Rockefeller's Standard Oil was deemed a monopolist and broken up into 34 companies under the Sherman Antitrust Act of 1890. It was an interesting decision in that its market share had already shrunk from nearly the whole shooting match to 64% and actively



competed against more than 100 refining companies. Rockefeller made more money after the breakup than he did before. He laughed all the way to the bank and continued laughing in the grave until finally turning over in disgust upon his very, very wealthy heirs divesting the energy investments of the family foundation (that he founded in 1913) in the name of thinking the world should, and could, be carbon free. What tragic irony. But that's another story. Now back to the game. By the 1920s the largest five of the "independent" oil companies, three of which were descendants of Standard Oil, formed the cartel with what are now BP and Royal Dutch Shell (now just Shell) and set the international price for oil, much of which was produced in the Middle East.

OPEC (Organization of the Petroleum Exporting Countries) was formed in 1960 to prevent its concessionaries, the seven sisters, from lowering the price of oil which the sisters had always set, or "posted." For its first 13 years OPEC wielded little power, with each OPEC member country, despite nationalizing their reserves, generally hesitant to reduce production and sacrifice revenues (to this day they still struggle with limiting production and now with shrinking reserves, may have little latitude to increase production). From 1960 through December 1970 the Brent oil price declined in a series of controlled stair-step price cuts from \$1.63 to \$1.21 per barrel. In January 1971, the price was raised to \$1.64 (with Arthur Burns chairing the Fed), a 36% hike. A series of additional bumps through August 1973 saw the price climb a further 43% to \$2.35, or 94% above where it was set in 1971. The price increases contributed to rising inflation, despite economists tending to ignore energy and food prices as "too volatile."

Interesting sidebar: During this period, West Texas Intermediate Crude, which is lighter and largely what is drilled in the U.S. had higher prices set at this time. Brent has tended to trade at a modest premium to WTI for much of the last couple decades as it requires less transportation to refineries thanks to a robust pipeline system, proximity to superior complex refining capacity, and higher blending of transportation fuels.



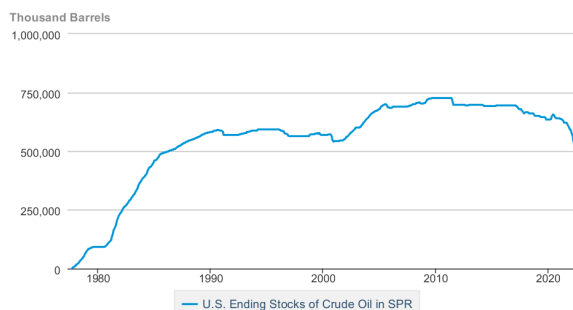
In mid-1973, OPEC flexed its muscle and greatly harmed the United States. The U.S. (and Netherlands) supported and supplied Israel in the 1973 Yom Kippur War, sending \$2.2 billion in aid. In retaliation, OPEC raised prices 75% to \$4.10 in August 1973 and then an additional 217% in December to \$13.00 a

barrel, more than five times where prices stood in early August. The embargo was lifted in March 1974 and prices were cut to \$10.60, but they remained there and higher. The U.S. and the globe would forever live with permanently higher prices. If you are charging \$1.00 for a sandwich and raise the price to \$5.00, for a year you will have high sandwich inflation. However, if the price remains at \$5.00 indefinitely, in month 13 sandwich inflation will drop to 0%. However, the consumer will still be paying \$4.00 more than they had been previously.

The U.S. Strategic Petroleum Reserve was established in 1975 to reduce the impact of disruptions in supplies of oil. With a capacity of 714 million barrels of oil, it is the world's largest supply of emergency crude. As reference, the U.S. today consumes about 20 million barrels of oil a day. The federally owned oil is stored in salt caverns at four sites along the Gulf Coast in Texas and Louisiana. Oil is sold competitively when the President determines the need during severe energy supply disruptions. Such conditions have only existed four times, most recently in March 2022

when the President authorized and released 180 million barrels, drawing the reserve down to 380 million barrels, its lowest since 1984. The crisis was seemingly high gasoline prices at the pump during a mid-term election year. The second most recent draw occurred in 2011 when the President directed a sale of 30 million barrels to offset supply disruptions stemming from unrest in Libya.

U.S. Ending Stocks of Crude Oil in SPR



eia

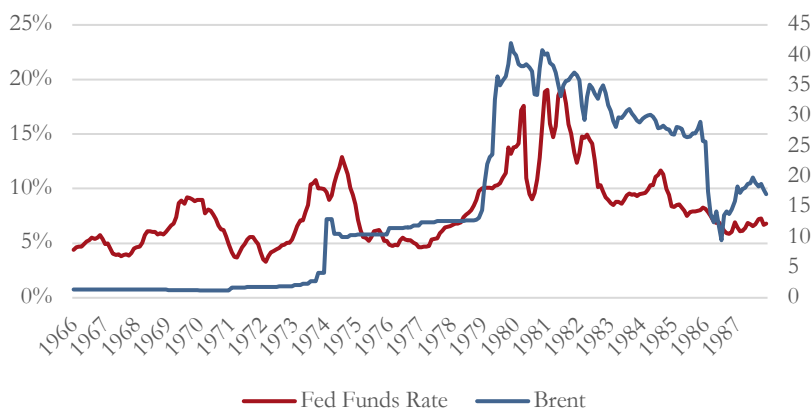
Data source: U.S. Energy Information Administration

Oil had a profound impact on inflation and the Fed response. Once clear of the Arab embargo in 1973-1974, oil prices underwent another massive shock in 1979 and 1980. The Iranian Revolution cut global oil supply by 4%, a massive percentage at the margin of supply and demand. Brent was \$12.80 in late 1979 and spiked to \$42 by November 1979. War between Iran and Iraq in 1980 further constrained Iranian oil supply and kept oil prices in the \$30s per barrel for several years. High oil prices contributed to back-to-back global recessions in 1980 and 1982.

The rise in energy prices occurred in tandem with crop shortages and thus rising food prices. With the CPI rising from 3.75% to north of 12.2% by October 1974, the Burns Fed followed suit, raising the Funds rate from 4.25% to 10.75% during the oil embargo and ultimately to 12% in late

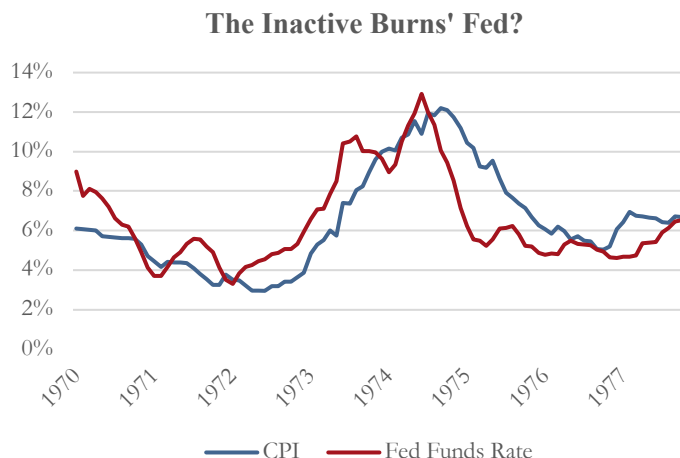
1974. The notion that the Fed sat on its hands is a myth. Rising interest rates combined with inflation's harmful impact on corporate profits to send the stock market into a face-ripping two-year bear market, seeing the Dow fall from 1,051 at the outset of 1973 to 577 in late 1974, a brutal 45% decline.

Fed Funds and Brent



Inflation headed lower in the middle of the brutal 1974-1975 recession, dropping from more than 12% to 5% by November 1974. The Burns Fed followed inflation downward, likewise more than halving the interest rate from 10.75% to 4.75% in February 1976. Stocks obliged to the parallel declines in the rates of inflation and interest, and quickly rose 75% by 1976, recovering nearly all of their bear market losses. Inflation remained with a 6 handle for a couple years and the Fed kept its Fed Funds rate below 6%. The Dow bounced around modestly below 1,000 until 1977 when inflation started a long climb to its eventual peak at 13.7% in 1981. The Dow tanked again, dropping 26% to 742 in 1978. I imagine investors kept equal supplies of Tums and Dramamine on hand.

The Fed gradually hiked interest rates from 4.7% in April 1977 to 17.6% in April 1980. Again, was the Fed sitting on its hands until the arrival of Volcker? Arthur Burns left the Fed on January 31, 1978 when Jimmy Carter did not reappoint him. When his term expired, the Fed Funds rate had already been raised 2% during 1977 to 6.8%, *precisely matching* the inflation rate which likewise stood at 6.8%. What do you say, Jay? Would you have done anything differently than Burns?

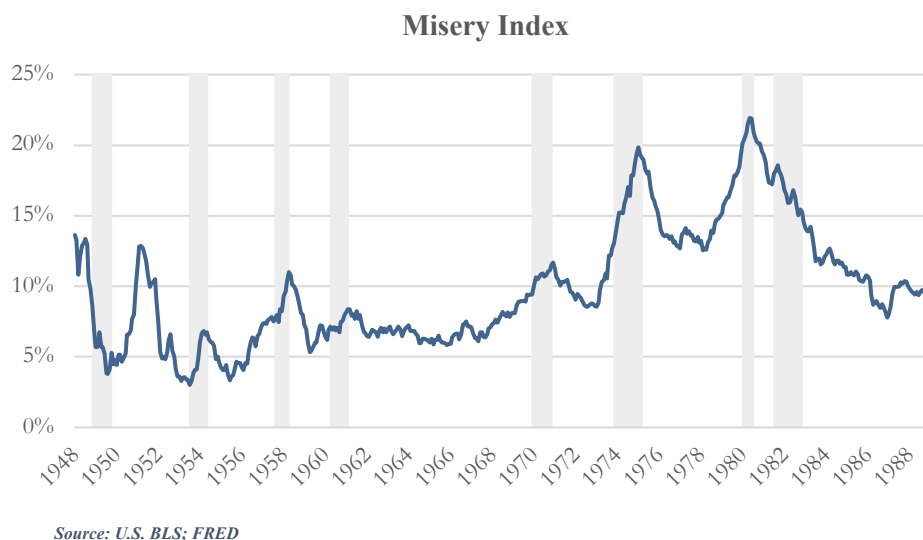


History forgets G. William Miller, who President Carter appointed to replace Burns. His reign as Fed Chairman lasted approximately 17 months. Carter delivered his infamous “Malaise Speech” on July 15, 1979, which further depressed the already depressed country and was widely criticized in the media and on both sides of the aisle in Congress. Carter reacted to the criticism with a shake and bake strategy, baby, gutting five members of his cabinet three days after the pitiful speech. Forgetful of the Turkish proverb that a dead fish rots from the head, figuratively massacred was Treasury Secretary W. Michael Blumenthal. In keeping with a desire to have Treasury Secretaries with a single letter as their first name, Carter yanked G. William from the Fed and kicked him next door as Treasury Secretary. It can be speculated that in addition to the first letter motive, Carter wasn’t thrilled about Miller’s performance in the year prior to a presidential election. The Miller Fed in 17 short months had raised rates from 6.7% to a then record 10.5%. And you thought Carter was frustrated with Burns? I suppose Carter’s appointment of Miller to Treasury may have something to do with keeping your friends close and your enemies closer. Maybe, maybe not. It is interesting that when Miller left the Fed, as was the case with Burns, the Fed Funds rate *precisely matched* the inflation rate, the identical state of affairs as when he’d taken over the job from Burns.

President Carter needed someone who wouldn’t continuously hike interest rates and screw up his reelection chances, so he appointed a big man for the job in Paul Volcker. He was literally a big man, towering 6’7”. I had the pleasure of meeting Chairman Volcker on two occasions. He couldn’t have been nicer, but at his height he was genuinely intimidating, reminding me of various offensive tackles with very long arms. In any event, if the White House expected Volcker to be docile, they badly miscalculated. Volcker determined to get inflation under control once and for all. He raised rates to 13.1% by the November election and didn’t stop there, getting Fed Funds to 17.6% by April 1980. Not unsurprisingly Carter lost the election to Ronald Reagan, who couldn’t have been thrilled to inherit a Fed Funds rate at 17.6% with inflation running 14.6% three months into the job.

Volcker is lionized for the courage to stomach two painful back-to-back recessions. The first lasted but a quarter and was over by June 1980. What happened next is lost to history. Few that praise Volcker realize that in 1980 he lowered rates from 17.6% in April to 11% in May, to 9.5% in June and to 9.0% in July 1980. All of these Fed governors discussed had a knack for halving and doubling interest rates. At this point in the story, Volcker was convinced that prior Fed Chairs hadn't established proper control of money supply growth. This must be the key, he reasoned. Whether Volcker's next actions finally put a lid on inflation, there is no question the inflation rate was in a steady freefall already. Volcker said, "Screw it, to Hell with the economy," and turbocharged Fed Funds higher than his prior record, this time to 19.1% by January 1981. This would be a good time to mention that inflation is conventionally measured on a year-over-year basis and was already down to 11.8%.

With inflation in obvious decline, the White House, Congress, business executives and the media were all in an uproar over high rates, high oil prices and high unemployment. In the mid-1970s, economist Arthur Okun "invented" the "misery index" which simply added the inflation rate to the unemployment rate. It was a nice tool to illustrate what became known as "stagflation." President Carter used the term during his presidency to cast blame for weakness on the prior Nixon administration. Between malaise and misery, the optics of his administration were unavoidable. (Use of the misery index ultimately led to Carter's loss to Reagan).



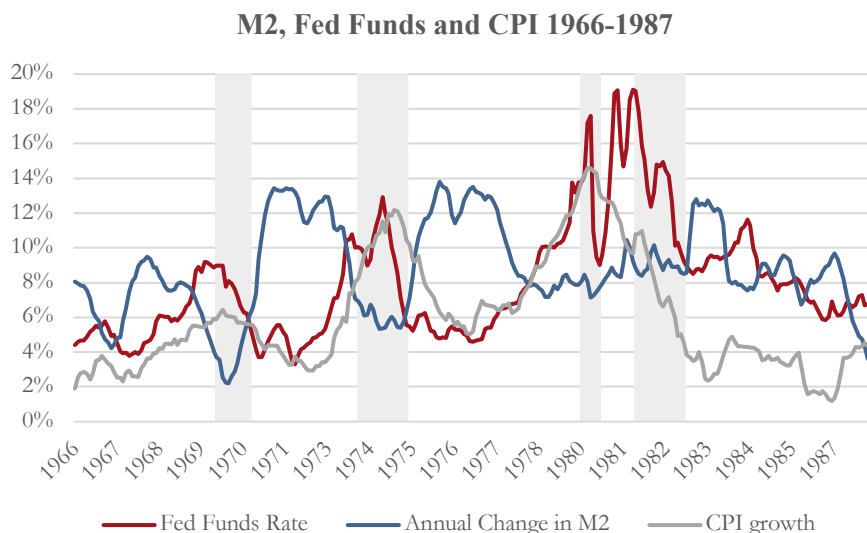
Volcker relented and again cut rates, this time to 14.7% in March 1981, only two months later! Inflation continued its descent, falling to 9.8%. Despite the steady decline in inflation, Volcker yet again jacked rates back up to the January peak of 19.1% by June 1981. Inexplicable. If Volcker wanted a recession, he got one, a doozie, lasting until the end of 1982. So much for misery. By April 1982, inflation was down to 5.3%, yet the Fed kept its interest rate at 15%. By the end of the recession that December, Fed Funds was a still high 9.0% while inflation had receded to 4.8%.

Inflation continued to decline. The Fed cut Fed Funds to 8.5% by 1983 despite inflation falling to 3.7%. Inflation then had a small resurgence, jumping to 4.3% in March 1984. Volcker, having nothing to do with any hint of rising prices, gunned rates back up to 11.6% by that August, kicking the dead horse again just for good measure. The rise in inflation proved a head fake and continued its slow roll down hill, reaching the Fed's not-yet magic number of 2% in May 1986. It would fall below 2% and stay below 2% until February 1987. By the time Paul Volcker left the Fed in August 1987, the Fed Funds rate stood at 6.7%, nearly double the 3.6% inflation rate.

What of Volcker's mission to target the money supply? When Volcker took the reins at the Fed in August 1979, M2 growth was running 8.5% year over year. The growth rate had been as high as 13% as recently as 1973. By the end of the recession in 1982, despite the gargantuan hikes, cuts and hikes again in Fed Funds, money supply growth was benign at 8.5% and stayed within a tight range. Perhaps this rate of money growth was too high for the Fed, but inflation

was in fast retreat. It doesn't seem to this lay casual observer that M2 growth presented the severe causation for policy action taken by the Volcker Fed. The Brent oil price peaked at \$42 in November 1979, three months into the Volcker regime and from there marched steadily downward. Brent was \$19 when Volcker left the Fed. Maybe it was the maintenance of Fed Funds well in excess of inflation

that finally broke the back of inflation. Maybe inflation would have fallen despite the "heroics" of the Volcker Fed. One thing remains: The preceding three Fed Chairs were far from inactive, and I would guess that our most recent cast of central bankers would have behaved no differently from the McChesney Martin, Burns or Miller Feds. Volcker in my mind was little different than his predecessors and may have inflicted more pain on the economy and households than deserved.



The inflation genie was certainly out of the bottle in late 2021 and throughout 2022. Producer and commodity prices were higher much earlier, in fact. There is no strong body of academic research that suggests that from high debt levels the Fed can help the economy. Tight monetary policy can harm it for sure, as well as harming asset prices. Easy policy can unequivocally inflate asset prices. From 1989 on, we watched the Bank of Japan try to introduce inflation into the Japanese economy, to no avail. Europe's central banks have done the same since the Financial Crisis, as has the Fed. Well, they got it. Suppose that once out of the bottle, inflation remains as difficult to contain as it did from 1966 to 1982. Suppose further that central banks don't wield the power to do so, without creating a deflationary depression. A period like 1966 to 1982 is prospectively front of mind here.

The bull market ending with the 1966 secular peak began with a trough in 1942, yielding nearly a quarter-century of prosperity. The situation and outlook in 1942 were bleak. War broke out in Europe in September 1939 when the German army rolled into Poland. The Japanese Imperial Army surprise attacked the U.S. Naval fleet on December 7, 1941, pulling the U.S. into the war. The prior U.S. role was as a supplier of armaments to the allied forces in Europe. Following a Declaration of War on Japan the following day, the European Axis nations of Germany and Italy jointly declared war on the U.S. That escalated fast. Congress responded three days later by formally declaring a state of war with Germany. I've always wondered why it took three days to respond. Was the U.S. going to reject the German and Italian declaration? Sorry, boys, but Uncle Sam can't come out to play today.

The reality is the U.S. knew it would be in the fight and its industrial sector prepared accordingly, not only supplying our allies but building sufficient military capacity in the years leading up to our joining the war to be prepared to fight. While the FDR White House pushed back, genuine private-sector

heavyweights led the politicking and the industrial effort. I highly recommend reading Arthur Herman's *Freedom's Forge*, one of the best books on the topic. What the industrial complex did in preparation for war was nothing short of heroic.

Despite industrial preparedness, after four months the inexperienced U.S. fighting force was against the ropes. Japan took Guam, Wake, Hong Kong, Singapore and the Philippines from December 1941 to April 1942. Germany and Italy dominated in Europe. The U.S. stock market understandably gave up nearly all the ground it had gained on a bounce in stocks from 1932 to 1937, losing 65% from March 1937 to April 1942. The war in the Pacific turned for the good with a U.S. win in the Battle of Midway in June 1942, and in Europe with the Soviet victory at the Battle of Stalingrad. Young readers who skipped online history classes during the pandemic lockdown may be surprised to read we were at war against current allies Italy and Germany and allied with the Soviet Union, now Russia. You may have great-grandparents who lived through and fought in World War II. Cherish any time you get with them, they were indeed the greatest generation. Life was different than the one we enjoy.

Moving on, the Allies won the war and introducing the Marshall Plan, rebuilt Europe and Japan. The United States thrived for two decades following the war. Stocks rose sharply; government debt incurred to finance the war shrank relative to the economy and inflation receded, flatlining at about 1.5% between 1958 and 1966. It was a glorious time to be an investor in stocks. Few were.

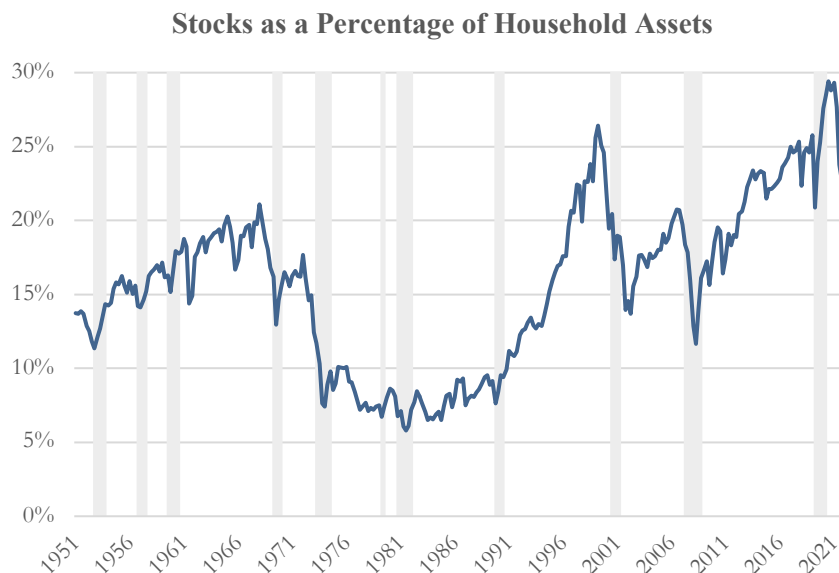
The Great Depression financially scarred most households and discouraged more than a generation from "playing the stock market" as all but one of my grandparents referred to what they believed to be a casino. The lone exception of my parents' parents was my maternal grandmother, Mary Marshall, the first female stockbroker to work in Kansas City, a pioneer and true saint. Any savvy investor owning stocks in 1942 enjoyed a compound annual total return through 1966's secular peak of 16.5%. Dividends contributed roughly 5% to the return thanks to generally low P/Es, a higher than modern 60% average dividend payout ratio and beginning yield close to 7% at 1942's secular bottom. All of which were the setup to a decade (and more) in the stock market which would live in infamy.

Value investors are typically early to buy and sell. Recall last year's story of Semper's first client presciently liquidating his stock market investments in early 1928 at the age of 25. Elsewhere, a precocious young investor in 1941 bought his first stock at age 11 in six shares of Cities Service preferred stock, three for himself and three for his sister at \$38 per share. The stock fell to \$27, and the young Warren Buffett was distraught at losing only other people's money. When the stock quickly jumped to \$40, he was relieved to sell the whole position. The now unowned stock became a quick five bagger at \$200 per share. Check, opportunity cost lesson learned.

The young Buffett went on to study under Benjamin Graham at Columbia University and ultimately went to work for Ben's partnership, Graham-Newman Corporation. Two years later the partnership closed, leaving Buffett out of work. He returned to hometown Omaha and launched Buffett Associates Ltd. Several subsequent LPs were consolidated and compounded at 29.7% gross of fees and 24.1% net for the ten years through 1966. Meanwhile, the Dow Jones Industrials produced a total compound return of 9.1% per year. With the market at 18x earnings and 25x trailing ten-year earnings, 120% of sales and a shrunk 2.9% dividend yield, Buffett stopped taking new money into the partnership. Three years later, following yearly net results of 28.4%, 45.6% and 6.6% in 1967 to 1969, respectively, he closed the partnership in 1969, encouraging his partners to buy municipal bonds and if interested to retain one of the partnership's holdings in a small textile company that had just bought a smaller insurance company. The conglomerate of textile manufacturer, insurer and a handful of marketable securities was of course Berkshire Hathaway. The moral of the story is the greatest investor of all time called a secular top. From its February 1966 peak at 995, the Dow would finally bottom at its next secular nadir in August 1982, at 776.92.

Warren Buffett had his new investment vehicle, believing stocks expensive but expecting opportunity. He went to work and so did the Fed. While the Fed fought inflation, unemployment and rising energy prices, most investors were beat up over and over. Rising interest rates hammered bonds. Inflation eroded the purchasing power of uninvested cash. Stocks flatlined for 16.5 years and lost ground to inflation. By 1982, households and institutional investors had largely given up on stocks. Who won the 1970s? Active value investors won. Warren Buffett and Berkshire Hathaway won. From 1966 to 1981, the S&P 500 produced a 6.0% annual return with dividends, less than the inflation rate.

Berkshire, meanwhile, grew its book value per share 20.9% per year while the stock compounded at 23.4%. A year later, the stock market troughed in August and was on the way to a spectacular 17-year bull market. At year-end 1982, the 17-year performance figures were 6.9% for the index, 21.9% for Berkshire's book value per share and 24.2% for the stock.



If rolling inflation, *a-la* 1966-1982 shrinks the debt bubble we face today, it's quite reasonable that the coming decade or two will be a fertile hunting ground for intelligent investing. What's the old saying, "Buy low, sell high?"

PROFITLESS PROSPERITY?



Sinking of HMS Ark Royal; 10 November 1941



"It is not hard to make money in the market. What is hard to avoid is the alluring temptation to throw your money away on short, get-rich-quick speculative binges. It is an obvious lesson, but one frequently ignored."
– Burton G. Malkiel; *A Random Walk Down Wall Street*

"Never buy anything from someone who is out of breath." – Burton G. Malkiel; *A Random Walk Down Wall Street*

"Betting your future on old-line companies is riskier than joining with entrepreneurs and startups... We're all about finding the next big thing."
-- Cathie Wood

An internet search for "gambling help" turns up pages and pages of websites, clinics and hotlines for those addicted to speculation. A search for "value investing help" yields no hotlines, only links to philosophies of investing principles and investment firms paying to rank highly in a search result.

If the last two years of torturing excesses out of the most speculative corners of the capital markets taught the uninitiated investor anything it must be that price matters. It matters a lot. Every king-size bull market is accompanied at

the end with promises of getting rich quickly. Beating the market becomes a short-term focus and watching others getting richer can be painful for the patient. The truly rational investor ignores the herd when it stampedes toward the cliff. It always eventually topples over the edge, but between here and there animal spirits run wild, as does abusive behavior by promoters and charlatans.

The value investor attempts to measure the durable earning power a business can produce over time and determines a fair or bargain price for the enterprise. There are myriad ways to skin a cat, but those in the value corner occasionally find situations where either profits can expand faster than revenues or where the price paid today represents a discount to what a reasonable investor would pay for the present value of present and future profit. In other words, where margins or multiples are low. There are all kinds of nuances to the craft. An industry may be shifting from too competitive to consolidating where the remaining businesses enjoy a more favorable environment. Or a management team may be motivated to improve processes or simply has a repeatable process but fails to block and tackle well and then goes back to basics. The converse of all of this is also part of the game. Identifying businesses and industries subject to coming disruption, or new competition, or who are overearning or spending capital in places unlikely to produce good returns. Identifying ethical managements practicing good capital allocation versus those who don't do it well, or don't have the opportunity set and don't realize it.

There are times late in cycles when fewer and fewer remain disciplined. We just experienced a period similar to the late 1920s, the late 1960s and the late 1990s where fast money became the game. The price paid becomes no longer a margin of safety but irrelevant to process and prospective returns. At secular lows, speculators have fled the game. Once bitten, twice shy. Prices are low, even in corners of business quality where prospects for profitable growth are high. Capital formation grinds downward. Wall Street culls its workforce. Those searching for employment get advanced degrees and stay in school. These are ideal times to have investable capital, when things appear darkest, the system cleared of excess. The

poorly capitalized disappear or wind up in the arms of creditors or competitors. Those with capital are sought to rescue those in need of it. Companies like Berkshire Hathaway thrive at such times.

Invariably the next bull market develops. Profits rise, as do multiples. Acquisition activity heats up. Private companies eventually regain access to public markets. Young private companies, or simply ideas, find increasing ease accessing capital on more and more favorable terms, at higher “marks,” they say. Investors stewarding other people’s money grow increasingly confident in their ability to find the next great business. Growing businesses see valuations rewarded at higher multiples relative to the staid or the slower growing.

Wall Street and Silicon Valley both innovate, often to a fault. Why practice value investing when capital forms around promise? Successes like Microsoft and Apple and Amazon and Google provide roadmaps for more of the same. Companies hit public markets at higher and higher valuations. It becomes easier to bring companies public even if they present no or little prospect of profits for years. If Amazon can do it, investors become confident in the ability to find the next Amazon. Soon portfolios consist of nothing but the next Amazons. Prices rise and investors chase funds rising faster than others. Retail money cascades in, the influx bidding up the already overvalued to the detriment of prospective return. Wall Street creates vehicles allowing promoters easy access to cheap capital backed by promises of riches. What could go wrong by seeding blank check companies who cede large chunks of ownership to operators, layering on additional dilutive capital and incentivizing the purchase of acquisition targets at any price (for failure to do a deal ends the riches for the operator)? Turns out plenty could go wrong.

A rising tide of share prices allows more and more company value to accrue to inside executives and the boards of directors theoretically hired as overseers for the shareholder. Shares are repurchased from the market to offset dilution coming from prodigious executive share grants. Repurchases serve to drive share prices even higher, exciting shareholders and discouraging fundamental analysis.

It’s this market that we just witnessed. Young professional and non-professional investors alike vie to uncover the most creative, innovative new shiny thing. Prices reach the point requiring herculean assumptions regarding revenues and profits years or even decades into the future to justify today’s price. Dilution, common sense regarding attainable margins, competition and price are ignored.

Investors who lived through prior periods of wretched excesses, or who studied those periods, can remain grounded in philosophy, approach, process and discipline, knowing what the endgame looks like. But for those charged with investing for others, the “others” are not always as rational or tolerant of not getting as rich as their neighbor or the doctor at the club. For the amateur and the pro alike, there are acid tests used to assess prudence and rationality even in the absence of skill or experience.

Sky-High Price-to-Sales – Just Say No

Perhaps the best single measure in determining overvaluation is the price paid for a dollar of sales. Not a dollar of sales expected five years from now, requiring everything going right when the odds are stacked against it. No, a dollar of sales today, last year and reasonably expected next year. I can hear the value investing parishioners howling it’s not the price to sales but the price to earnings that matters. I’ve done this long enough to know the degree to which managements strive to overstate earnings. I know the degree to which analysts fail to recognize when earnings are either impossibly elevated or depressed. Revenues are indeed a clean yardstick but also require an understanding of what drives revenues to the bottom line. That’s difficult for most people, including many in the business of managing other people’s money.

Avoiding unnecessary risk is the single greatest imperative. Risk is always greatest at the peak but also the most underappreciated or unrecognized at the peak. A nuance exists to using the price paid for a dollar of sales against the price paid for a dollar of sales. Huh? Isn't that the same thing?

My mind reflexively multiplies a P/E multiple by a profit margin to yield the price paid for sales. The typical industrial business earns a ~6.5% profit margin. When capitalized at 15x earnings, the business trades for 97.5% of sales. Call it one times sales. It's a useful benchmark.

We know from the prior section that returns can be derived as a multiplicative factor of changes in dollars of sales against changes in shares outstanding, and then against changes in profit margins and changes in the P/E multiple, finally adding dividends. It's the basis of how we think, but for the moment let's stick with the profit margin and the P/E multiple in concert.

Across the spectrum of companies exists a wide range of industries and businesses, each with evolving levels of profitability and growth. Costco and Visa, two extreme examples, are both historically terrific companies. One of the two has a more predictable future, and both are quite profitable, although that's not apparent from the table immediately below. Read on.

	Profit Margin	P/E Multiple	Price-to-Sales Multiple
Costco Wholesale	2.6%	34.2x	0.89x
Visa Inc	48.9%	25.0x	12.22x

2022 Estimated December Figures (or close for non-calendar quarter for Costco)

Now viewed identically but using per share figures for profit and price:

	Earnings Per Share	P/E Multiple	Price Per Share
Costco Wholesale	\$13.36	34.2x	\$456.50
Visa Inc	\$8.30	25.0x	\$207.76

2022 Estimated December Figures (or close for non-calendar quarter for Costco)

Costco and Visa were selected to demonstrate a hugely disparate range for a multiple to sales. Both typically trade with far higher P/E multiples than the market or most businesses. Predictable earning power and high top-line growth warrant high P/Es. Each produces dramatically different amounts of profit for each dollar of sales, the profit margin. Costco's profit margin rose from 1.7% at the time of our first purchase in 2004 to 2.6% at present. Visa's profit margin is among the highest in the world, growing from 40% a decade ago to 50% today. Is Visa a better business than Costco, given its vastly higher margin? No. Profit is most properly measured against the equity, the capital and the assets of a business. Both earn mid-20% returns on equity. The analyst double checking the respective figures will see Visa actually earning closer to 40% returns on equity, but equity has been reduced by sizable share repurchases in recent years at large premiums to book value, and also for increased use of net leverage. Both companies earn high returns on capital and neither require much profit retained to grow. Costco requires only a portion of earnings to finance new store growth. Visa has little use for incremental capital. But this is about price to sales.

Costco almost never traded for more than one times sales. The multiple at yearend is 0.89x (2.6% margin x 34.2 multiple). Only in early 2022 when the stock ran up to \$612 per share and the stock traded for close to 50x earnings did the multiple to sales climb above one. The rising net margin from 1.7% to 2.6% also contributed. Visa likewise traded for close to 50x earnings in mid 2021, so at a 50 P/E on a 50%

margin traded for 25x sales, its highest on record. Both Costco and Visa subsequently declined 30% in price after reaching P/E multiples approaching 50x.

Merck and ExxonMobil also merit brief examination for contrasting multiples to sales.

	Profit Margin	P/E Multiple	Price-to-Sales Multiple
Merck & Co.	31.8%	15.0x	4.77x
ExxonMobil	14.3%	7.9x	1.13x

2022 December Figures Estimates

Using per share terms figures for profit and price:

	Earnings Per Share	P/E Multiple	Price Per Share
Merck & Co.	\$7.40	15.0x	\$110.95
ExxonMobil	\$13.90	7.9x	\$110.30

2022 December Figures (or close for non-calendar quarter for Costco)

Here we have two completely different businesses than Costco and Visa. Merck's profit margins were in the low-to-mid-20s for decades and recently rose above 30%. Both businesses grow far slower than Costco and Visa so are accordingly awarded lower P/E multiples. Profits are also less predictable, further a cause of lower multiples. Merck and its big pharma competitors grew much faster until the late 1990s when they collectively lost many key drugs to patent expiration. An exponentially higher cost of developing new drugs further impacted the industry. The analyst figuring out the coming patent cliff early would have avoided the group when it traded at closer to 40x earnings in the late 1990s. Today Merck trades at what is probably an appropriate multiple to a very high and mostly sustainable margin. At 4.77x sales, it trades richer than the S&P 500 because of its very high profit margin.

ExxonMobil trades for 7.9x a 14.3% profit margin at yearend, so at 1.13x sales. Its profit margin perches at a record, at least for as far back as 1980 when my records start. Energy companies produce cyclical profits. With oil and gas prices relatively high over the last year, the integrated businesses in the oil patch are today extremely profitable. Those lamenting price gouging should review the period 2015 to 2020, which saw losses and only mid-single-digit returns on equity. At 7.9x earnings, investors conclude current profitability is unsustainable.

Highlighting these four companies shines light on the use of price paid to sales as an analytical tool. The S&P 500 saw an extreme, with stocks trading at 1982's secular low (an 8x multiple to earnings on a depressed 4% profit margin, so 32% of sales). That was a record low for the U.S. stock market. At the opposite end of the spectrum, the index reached a record 304% price-to-sales multiple at year-end 2021 when a record-high 13.3% profit margin was capitalized at a likewise historically high 22.9x earnings.

We've seen a range of 32% to 304% of sales for the stock market and a wider range at less than one times to 25x for companies like Costco and Visa. Risk builds at high extremes. Visa's peak 50 multiple on a 50% margin produces as extreme of a multiple as I'd ever expect, other than for businesses that can grow at extremely high rates durably over lots of years and simultaneously attain a very high eventual profit margin. It's the unforeseen decay of multiples as businesses slow that contributed to the car wreck that was the speculative class of investor last year.

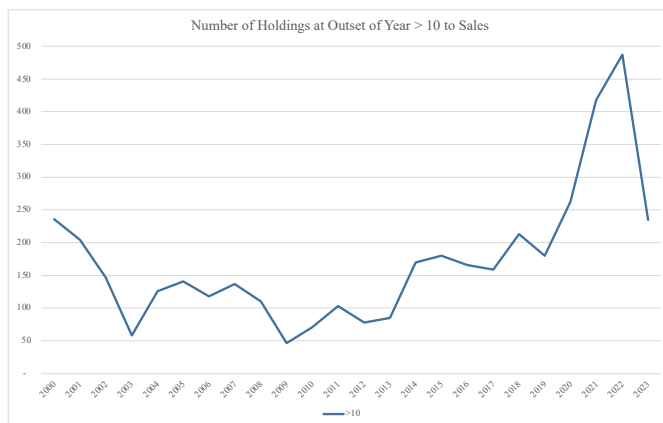
This is where the nonsense of the latest bubble comes into play. A veritable plethora of companies traded not just for more than the market's record 3x sales but a mind-blowing number trading for more than 10-, 20- and 30x sales. These were not the modern-day Visa. These were largely companies losing money or

earning very little. These were companies in new technologies, or in fashionable technologies like SaaS software. These were companies with few shares floating, or not owned by the public. Any inflows into a fund (or ETF!) and deployed into low-float companies can drive prices higher and higher. This was the Janus game of the late 1990s, when the equity funds in the fund family all owned the same rising stocks. Janus became so popular with investors that it reaped half of all money flowing into the entire mutual fund complex during the final months of the bubble. Inflows drove holdings higher and higher. Eventually the music stopped. While Janus was the two-faced god of new beginnings in Roman mythology, it proved to be the face-down fund family of bad endings. The two-year period of 2021-2022 saw a new crop of Janus lookalike ETFs, funds and hedge funds fall from grace. With room to go.

An extremely large number of high price-to-sales companies developed by late 1999. Nearly all were taken out in body bags when the Nasdaq dropped 78% from \$5,048.62 in 2000 to \$1,114.11 in 2002. The Nasdaq 100 dropped more than 81%. Numerous speculative internet, telecommunications and media stocks lost more than 90%. Many ran out of cash and failed.

The counts are telling. A total of 85 companies sported price-to-sales multiples at or above 30x at the outset of 2000. The number fell 80% to 17 over the next three years. The number recovered to 54 by 2005 and then again sunk back to 17 by the outset of 2009 in the midst of the Financial Crisis. Similarly, the numbers fell by precipitous percentages for the 20x and 10x groups. The collective group trading for 10x or more to sales in 2000 dropped from 236 to 58 companies over three years. The group at 10x or more totaled 11.3% of the entire universe and dropped to 2.8%.

The declines in the number of companies with high multiples to sales from 2000 is evident. The ballooning over the past decade should startle anyone. I never thought we'd see a repeat of the 1990s but here we are. Twice as many high-multiple-to-sales stocks existed at year-end 2021 than did so in 1999 while the number of total companies in the entire universe rose only modestly. **How stupid were things by 2021 and 2022. Question mark intentionally deleted. At the outset of 2022 fully 17% of companies traded for more than 10x sales. That's 487 companies, nearly as many components as in the S&P 500. Stunningly ridiculous. What an index fund that would have made. Well...**



The pain inflicted on speculators is reflected in the sharp decline in the highflyers during 2022. The numbers in each group roughly halved. With the sinking of arks and one particular ETF down 80% from its high on February 12, 2021, one would expect the number of nosebleeds trading at ridiculously dangerous multiples to sales to fall off. For sure the number did. Those thinking the taking to the woodshed of speculation has run its course may be in for more nasty surprises. The number of high-speculation names is *only back* to the number of companies with high multiples to sales at the end of 1999, before the group lost more than 80%. Despite a decline in count by 52%, 235 stocks entered this year at north of 10 to sales. One more than that (236) did so at the outset of 2000, *prior* to the bubble popping. There remains a veritable canyon below if the number of companies at high prices again shrivels by 80%.

What's to be gained and what's to be lost by hanging around in extremely high price-to-sales companies? Much, much more is lost by swinging for the fences. It might work in baseball but in the investing game

it's akin to trying to hit home runs when the pitcher is firing nothing but 101 mph fastballs at your head. The risk/reward simply doesn't work. Eventually, you're going to take a beanball, and it's lights out.

The methodology for this work involved pulling an enormous amount of data for each year's "class" of companies that at the outset of each year from 2000 to 2023 were at 30x sales or more; 20x sales or more; 10x sales or more; and less than 10x sales, by far the largest group (logically). We then ran the universe of all of these. If you are following, know that a company trading for more than 20x sales is also included in the group trading for more than 10x, and any company trading for more than 30x is also in the greater-than-20 group and the greater-than-10 group.

The initial yearly universe consists of companies with beginning market capitalizations above \$250 million that also had positive sales. When first running the data sets, the universe was picking up lots of tiny shell companies and penny-stocks with no underlying businesses and subject to incredible fraud and manipulation. Reason dictated setting a floor to include real and investable businesses. The cynic will note that there are plenty of huge market caps that have been and are today frauds. No doubt. The analyst needs to dig to find them and avoid them if wanting to go further than just saying no to high price-to-sales companies.

Each class by year was reestablished at the outset of each subsequent year. Returns for the first 2000 class were run cumulatively through 2022, ditto for each successive class. Companies still in existence at the end of each year remained in their original classes and were also placed in the current new year's class based on their multiple to sales at that point. In other words, with the inception of each new yearly class, all companies were assigned to their new group based on their market cap relative to sales at the outset of that year. Any companies falling below our minimum market cap threshold remained in their original classes but were not included in a new class prospectively. The result for each class by year resembles a loss-development triangle from insurance accounting. Here's the "class development triangle" for the over-30x-sales group by year and cumulatively:

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
2000	-23.4%																						
2001	-34.1%	-42.9%																					
2002	-55.7%	-51.2%	-56.2%																				
2003	78.3%	54.6%	63.8%	15.8%																			
2004	17.3%	9.4%	7.3%	-8.6%	10.6%																		
2005	10.6%	10.4%	-9.6%	11.0%	-7.7%	-12.2%																	
2006	12.6%	-0.6%	11.7%	-5.1%	-1.3%	-11.0%	-28.5%																
2007	5.3%	5.3%	6.2%	10.6%	-0.6%	-0.9%	-13.9%	-1.4%															
2008	-2.2%	-13.6%	-22.4%	-21.2%	-41.1%	-50.4%	-51.5%	-49.2%	-58.1%														
2009	12.3%	29.2%	25.3%	63.2%	65.2%	34.6%	98.2%	65.2%	60.7%	37.0%													
2010	-0.5%	16.1%	62.0%	26.8%	57.6%	35.4%	33.0%	27.5%	28.3%	30.0%	30.3%												
2011	6.5%	3.4%	2.2%	40.1%	27.0%	-0.8%	-22.3%	-25.8%	-22.2%	27.9%	16.3%	-13.6%											
2012	38.7%	18.7%	38.2%	54.7%	25.1%	27.3%	23.0%	20.7%	22.8%	-14.6%	-6.2%	3.9%	13.6%										
2013	91.1%	83.5%	64.3%	42.9%	40.1%	42.6%	82.8%	53.2%	41.0%	53.7%	65.9%	28.9%	11.2%	33.2%									
2014	25.0%	25.9%	41.3%	41.5%	17.4%	10.0%	19.7%	8.2%	2.7%	-8.6%	4.9%	32.3%	11.6%	8.3%	12.1%								
2015	6.4%	11.6%	7.1%	13.0%	6.2%	13.2%	24.2%	11.2%	5.8%	14.8%	22.5%	-0.6%	16.2%	15.9%	7.6%	3.1%							
2016	-15.4%	-13.1%	-31.4%	-32.5%	-19.8%	-0.8%	-13.0%	-24.1%	-15.3%	-10.0%	-16.4%	-19.0%	-5.5%	-30.4%	-24.8%	-31.3%	-15.6%						
2017	1.6%	4.9%	29.9%	2.5%	34.2%	49.7%	60.1%	82.9%	47.2%	57.1%	29.1%	62.0%	25.7%	26.0%	64.5%	34.6%	38.4%	43.3%					
2018	-19.7%	-24.1%	11.9%	-10.7%	-17.9%	-21.4%	-35.4%	-6.7%	-23.1%	-27.8%	-28.8%	-6.1%	-1.1%	-24.8%	-9.9%	-8.8%	-15.1%	-26.4%	-32.2%				
2019	25.5%	20.2%	16.6%	10.8%	40.7%	55.6%	60.2%	66.1%	54.4%	75.4%	42.6%	33.0%	42.3%	52.0%	27.1%	48.6%	54.1%	38.8%	17.0%	23.6%			
2020	0.2%	30.3%	16.1%	31.2%	28.5%	18.2%	10.2%	48.5%	37.3%	26.7%	21.2%	31.4%	30.4%	33.7%	55.6%	48.5%	62.2%	75.4%	56.2%	48.6%	47.7%		
2021	26.5%	24.8%	0.2%	22.4%	-7.3%	-9.7%	-7.2%	23.9%	-11.4%	26.0%	-10.8%	-14.0%	-13.2%	-27.7%	-16.4%	-16.5%	-15.4%	-27.4%	-22.4%	-22.4%	-1.3%	-15.3%	
2022	10.0%	19.6%	-36.5%	14.7%	-20.0%	-10.4%	4.2%	-8.7%	-4.3%	-30.7%	0.6%	-19.0%	-28.7%	-15.7%	-11.0%	-2.3%	-22.0%	-5.4%	-33.9%	-35.6%	-33.4%	-41.7%	-44.4%
Cumulative CAGR	203.7%	261.2%	291.0%	1155.9%	404.3%	173.2%	214.3%	243.8%	118.3%	521.6%	261.1%	128.3%	257.1%	36.4%	98.0%	56.6%	63.5%	76.4%	-36.5%	-8.1%	-2.8%	-50.6%	-44.4%
	4.9%	6.0%	6.7%	13.5%	8.9%	5.7%	7.0%	8.0%	5.3%	13.9%	10.4%	7.1%	12.3%	3.2%	7.9%	5.8%	7.3%	9.9%	-8.7%	-2.1%	-1.0%	-29.7%	-44.4%
S&P 500																							
Cumulative CAGR	304.7%	345.1%	405.1%	548.3%	403.8%	354.4%	333.2%	274.1%	254.6%	462.9%	345.1%	286.8%	278.8%	226.5%	146.7%	117.0%	114.0%	91.1%	56.9%	64.1%	24.8%	5.4%	-18.1%
	6.3%	7.0%	8.0%	9.8%	8.9%	8.8%	9.0%	8.6%	8.8%	13.1%	12.2%	11.9%	12.9%	12.6%	10.6%	10.2%	11.5%	11.4%	9.4%	13.2%	7.7%	2.7%	-18.1%

To read the table, begin in the upper left with the 2000 class of companies trading for 30x sales or more. By the end of 2000 we have only one data point. The group lost 23.4% that year. Continuing down the 2000 row, the 2000 class of +30s lost another 34.1% in 2001 and was crushed by a further 55.7% in 2002.

Ay caramba. That's a 78.3% cumulative hammering, kids. Ring a bell, or a warning bell? A huge 78.3% recovery in 2003 took the cumulative loss to "only" 61.3%. By the close of 2022, the original 30+ group in the 2000 class compounded by 4.9% per year. Many of the companies disappeared. The eagle-eyed reader will see exceptional gains for this class in 2021 and 2022. With speculative tech getting crushed, you'd think this class wouldn't have been spared. What happens over time is there are a very small handful of winners splattered across the entire +10 to +30 classes. These few winners eventually drive most of return. Most companies beginning at more than 30x sales lose money over time. The S&P 500 was itself overvalued at the outset of 2000, posting a cumulative return of 304.7% or 6.3% per year. The 30+ class was shy by 101% cumulatively compounding at only 4.9%.

**2000 "Class" Cumulative and Compound Annual Returns
12/31/1999 to 12/31/2022**

Price-to-Sales	Cumulative Return	Compound Annual Return
> 30	203.7%	4.9%
> 20	213.2%	5.1%
> 10	384.5%	7.1%
< 10	822.5%	10.1%
Universe	769.9%	9.9%
S&P 500	304.7%	6.3%

**2022 "Class" Annual Returns
12/31/21 to 12/31/22**

Price-to-Sales	Annual Return
> 30	-44.4%
> 20	-43.8%
> 10	-37.9%
< 10	-15.1%
Universe	-19.0%
S&P 500	-18.1%

Putting it all together, it should be obvious that the vast majority of time, the speculator is harming their capital by chasing dreams or disregarding price. Below are the results by class across each group, with the 30+ at the left and the under-10-to-sales group at the right. Each group is measured against the entire universe of stocks in the study. All returns shown are cumulative compounded annual rates of return, from the beginning of the year of the class through the end of 2022.

Class	>30	Universe	Delta	Class	>20	Universe	Delta	Class	>10	Universe	Delta	Class	<10	Universe	Delta
2000	4.9%	9.9%	-4.9%	2000	5.1%	9.9%	-4.8%	2000	7.1%	9.9%	-2.8%	2000	10.1%	9.9%	0.3%
2001	6.0%	9.9%	-3.9%	2001	5.9%	9.9%	-4.0%	2001	6.5%	9.9%	-3.5%	2001	10.2%	9.9%	0.3%
2002	6.7%	9.8%	-3.1%	2002	8.2%	9.8%	-1.5%	2002	8.0%	9.8%	-1.8%	2002	9.9%	9.8%	0.1%
2003	13.5%	11.6%	1.9%	2003	13.1%	11.6%	1.6%	2003	13.9%	11.6%	2.3%	2003	11.5%	11.6%	0.0%
2004	8.9%	9.9%	-1.0%	2004	8.3%	9.9%	-1.6%	2004	9.9%	9.9%	0.0%	2004	9.9%	9.9%	0.0%
2005	5.7%	9.5%	-3.7%	2005	6.3%	9.5%	-3.2%	2005	8.9%	9.5%	-0.6%	2005	9.4%	9.5%	0.0%
2006	7.0%	9.2%	-2.2%	2006	7.8%	9.2%	-1.4%	2006	8.5%	9.2%	-0.7%	2006	9.2%	9.2%	0.0%
2007	8.0%	8.7%	-0.7%	2007	10.7%	8.7%	2.0%	2007	9.1%	8.7%	0.4%	2007	8.7%	8.7%	0.0%
2008	5.3%	9.0%	-3.7%	2008	8.0%	9.0%	-1.1%	2008	8.6%	9.0%	-0.5%	2008	9.1%	9.0%	0.0%
2009	13.9%	14.1%	-0.1%	2009	17.3%	14.1%	3.3%	2009	13.1%	14.1%	-0.9%	2009	14.1%	14.1%	0.0%
2010	10.4%	12.2%	-1.9%	2010	11.3%	12.2%	-1.0%	2010	12.8%	12.2%	0.5%	2010	12.2%	12.2%	0.0%
2011	7.1%	11.2%	-4.1%	2011	10.8%	11.2%	-0.4%	2011	12.5%	11.2%	1.3%	2011	11.1%	11.2%	-0.1%
2012	12.3%	12.2%	0.1%	2012	10.7%	12.2%	-1.6%	2012	16.5%	12.2%	4.3%	2012	12.1%	12.2%	-0.1%
2013	3.2%	11.6%	-8.4%	2013	16.6%	11.6%	5.0%	2013	14.0%	11.6%	2.4%	2013	11.4%	11.6%	-0.1%
2014	7.9%	8.6%	-0.7%	2014	8.9%	8.6%	0.4%	2014	8.7%	8.6%	0.1%	2014	8.5%	8.6%	0.0%
2015	5.8%	8.2%	-2.5%	2015	6.7%	8.2%	-1.5%	2015	8.0%	8.2%	-0.3%	2015	8.2%	8.2%	0.0%
2016	7.3%	9.9%	-2.7%	2016	5.0%	9.9%	-5.0%	2016	11.9%	9.9%	1.9%	2016	10.0%	9.9%	0.1%
2017	9.9%	8.6%	1.3%	2017	12.0%	8.6%	3.4%	2017	10.2%	8.6%	1.6%	2017	8.4%	8.6%	-0.2%
2018	-8.7%	6.4%	-15.1%	2018	-6.7%	6.4%	-13.1%	2018	2.7%	6.4%	-3.7%	2018	6.7%	6.4%	0.3%
2019	-2.1%	11.1%	-13.2%	2019	-1.7%	11.1%	-12.8%	2019	1.6%	11.1%	-9.5%	2019	11.5%	11.1%	0.4%
2020	-1.0%	6.7%	-7.7%	2020	-1.5%	6.7%	-8.2%	2020	0.1%	6.7%	-6.6%	2020	7.4%	6.7%	0.6%
2021	-29.7%	4.6%	-34.3%	2021	-28.0%	4.6%	-32.7%	2021	-18.9%	4.6%	-23.6%	2021	10.8%	4.6%	6.2%
2022	-44.4%	-19.0%	-25.4%	2022	-43.8%	-19.0%	-24.7%	2022	-37.9%	-19.0%	-18.8%	2022	-15.1%	-19.0%	3.9%

An investor desiring to own a broad index of companies can add what appears to be a decent amount of surplus return by *not owning* any companies trading for more than 30x sales, particularly when a large number of these risk monsters are in existence. In only four initial classes did owning stocks trading for 30x sales or more produce any return higher than owning the universe. The years of underperforming often produced debilitating losses relative to the few times when taking the higher-risk path worked, and only modestly when it did work.

Review the “value” group, the classes beginning each year consisting of companies less than 10x sales. Measure those classes against the entire universe. The vast majority of companies are in the less-than-10x group to begin with, but when large numbers of the most-expensive stocks exist, had you not owned any over 10x you picked up a bit of alpha – 30 basis points in the 2000 and 2001 classes and 10 basis points in the 2002 class. The alpha was off the charts with the more recent 2021 and 2022 classes. If you want a study with alpha, however, dispense with measuring the sub-10s against its own universe. How would they stack up against the big boy of indices?

An extremely compelling comparison comes from the work. That’s the investor owning the entire class of stocks at the outset of each year that are trading for less than 10x sales *instead of owning the S&P 500*. The results are striking, but probably mimic creating an equal-weighted value index against a market-cap weighted index. A good time to employ this method would logically be at times when the S&P 500 is expensive. **A great time to employ it is when an abundance of stocks trade for more than 10x sales.** The results for each year’s class of sub-10s versus the S&P demonstrates advantage for each class from 2000 to the 2010 class and then again for the 2021 to 2022 classes. Those in between either tied the index or lagged behind (the years of value wandering around in the desert). The degree of outperformance during the winning years, however, dramatically outpaces the degree of lag in years underperforming. Annual returns exceeded the S&P by 1% or more in the 2000 to 2004 classes and again in the 2019 to 2022 classes. No coincidence that those years saw more companies at high multiples. Food for thought and perhaps for an academic journal.

Class	>30	S&P	Delta	Class	>20	S&P	Delta	Class	>10	S&P	Delta	Class	<10	S&P	Delta
2000	4.9%	6.3%	-1.3%	2000	5.1%	6.3%	-1.2%	2000	7.1%	6.3%	0.8%	2000	10.1%	6.3%	3.9%
2001	6.0%	7.0%	-1.0%	2001	5.9%	7.0%	-1.1%	2001	6.5%	7.0%	-0.6%	2001	10.2%	7.0%	3.2%
2002	6.7%	8.0%	-1.3%	2002	8.2%	8.0%	0.2%	2002	8.0%	8.0%	-0.1%	2002	9.9%	8.0%	1.9%
2003	13.5%	9.8%	3.7%	2003	13.1%	9.8%	3.3%	2003	13.9%	9.8%	4.1%	2003	11.5%	9.8%	1.7%
2004	8.9%	8.9%	0.0%	2004	8.3%	8.9%	-0.5%	2004	9.9%	8.9%	1.1%	2004	9.9%	8.9%	1.0%
2005	5.7%	8.8%	-3.0%	2005	6.3%	8.8%	-2.5%	2005	8.9%	8.8%	0.1%	2005	9.4%	8.8%	0.7%
2006	7.0%	9.0%	-2.0%	2006	7.8%	9.0%	-1.2%	2006	8.5%	9.0%	-0.5%	2006	9.2%	9.0%	0.2%
2007	8.0%	8.6%	-0.6%	2007	10.7%	8.6%	2.1%	2007	9.1%	8.6%	0.5%	2007	8.7%	8.6%	0.1%
2008	5.3%	8.8%	-3.5%	2008	8.0%	8.8%	-0.8%	2008	8.6%	8.8%	-0.2%	2008	9.1%	8.8%	0.3%
2009	13.9%	13.1%	0.8%	2009	17.3%	13.1%	4.2%	2009	13.1%	13.1%	0.0%	2009	14.1%	13.1%	0.9%
2010	10.4%	12.2%	-1.8%	2010	11.3%	12.2%	-0.9%	2010	12.8%	12.2%	0.6%	2010	12.2%	12.2%	0.1%
2011	7.1%	11.9%	-4.8%	2011	10.8%	11.9%	-1.1%	2011	12.5%	11.9%	0.6%	2011	11.1%	11.9%	-0.8%
2012	12.3%	12.9%	-0.6%	2012	10.7%	12.9%	-2.2%	2012	16.5%	12.9%	3.6%	2012	12.1%	12.9%	-0.8%
2013	3.2%	12.6%	-9.4%	2013	16.6%	12.6%	4.1%	2013	14.0%	12.6%	1.5%	2013	11.4%	12.6%	-1.1%
2014	7.9%	10.6%	-2.7%	2014	8.9%	10.6%	-1.6%	2014	8.7%	10.6%	-1.9%	2014	8.5%	10.6%	-2.0%
2015	5.8%	10.2%	-4.4%	2015	6.7%	10.2%	-3.4%	2015	8.0%	10.2%	-2.2%	2015	8.2%	10.2%	-1.9%
2016	7.3%	11.5%	-4.2%	2016	5.0%	11.5%	-6.5%	2016	11.9%	11.5%	0.4%	2016	10.0%	11.5%	-1.4%
2017	9.9%	11.4%	-1.5%	2017	12.0%	11.4%	0.6%	2017	10.2%	11.4%	-1.2%	2017	8.4%	11.4%	-3.0%
2018	-8.7%	9.4%	-18.1%	2018	-6.7%	9.4%	-16.2%	2018	2.7%	9.4%	-6.7%	2018	6.7%	9.4%	-2.8%
2019	-2.1%	13.2%	-15.3%	2019	-1.7%	13.2%	-14.8%	2019	1.6%	13.2%	-11.6%	2019	11.5%	13.2%	-1.7%
2020	-1.0%	7.7%	-8.6%	2020	-1.5%	7.7%	-9.2%	2020	0.1%	7.7%	-7.6%	2020	7.4%	7.7%	-0.3%
2021	-29.7%	2.7%	-32.4%	2021	-28.0%	2.7%	-30.7%	2021	-18.9%	2.7%	-21.6%	2021	10.8%	2.7%	8.1%
2022	-44.4%	-18.1%	-26.3%	2022	-43.8%	-18.1%	-25.6%	2022	-37.9%	-18.1%	-19.8%	2022	-15.1%	-18.1%	3.0%

Clearly the speculator did worse more often in the 30+ classes than in the 20+ classes, and again than in the 10+ classes against the S&P 500. Owning the 20+ classes was just about as bad as owning the 30+ classes. Just match the red outcomes for each class to the black and compare the delta for each.

A final comparison for analytical rigor contrasts the Semper-constructed universe of all stocks meeting threshold criteria with the S&P 500. Comparing these allows further ease in measuring how valuable it was to own the sub-10 classes (right side of the table) versus simply an equal-weighted basket (left side of the table) at the outset of each year.

Class	Universe	S&P	Delta	Class	<10	S&P	Delta
2000	9.9%	6.3%	3.6%	2000	10.1%	6.3%	3.9%
2001	9.9%	7.0%	2.9%	2001	10.2%	7.0%	3.2%
2002	9.8%	8.0%	1.8%	2002	9.9%	8.0%	1.9%
2003	11.6%	9.8%	1.8%	2003	11.5%	9.8%	1.7%
2004	9.9%	8.9%	1.0%	2004	9.9%	8.9%	1.0%
2005	9.5%	8.8%	0.7%	2005	9.4%	8.8%	0.7%
2006	9.2%	9.0%	0.2%	2006	9.2%	9.0%	0.2%
2007	8.7%	8.6%	0.1%	2007	8.7%	8.6%	0.1%
2008	9.0%	8.8%	0.2%	2008	9.1%	8.8%	0.3%
2009	14.1%	13.1%	0.9%	2009	14.1%	13.1%	0.9%
2010	12.2%	12.2%	0.1%	2010	12.2%	12.2%	0.1%
2011	11.2%	11.9%	-0.8%	2011	11.1%	11.9%	-0.8%
2012	12.2%	12.9%	-0.7%	2012	12.1%	12.9%	-0.8%
2013	11.6%	12.6%	-1.0%	2013	11.4%	12.6%	-1.1%
2014	8.6%	10.6%	-2.0%	2014	8.5%	10.6%	-2.0%
2015	8.2%	10.2%	-1.9%	2015	8.2%	10.2%	-1.9%
2016	9.9%	11.5%	-1.5%	2016	10.0%	11.5%	-1.4%
2017	8.6%	11.4%	-2.8%	2017	8.4%	11.4%	-3.0%
2018	6.4%	9.4%	-3.1%	2018	6.7%	9.4%	-2.8%
2019	11.1%	13.2%	-2.1%	2019	11.5%	13.2%	-1.7%
2020	6.7%	7.7%	-0.9%	2020	7.4%	7.7%	-0.3%
2021	4.6%	2.7%	2.0%	2021	10.8%	2.7%	8.1%
2022	-19.0%	-18.1%	-0.9%	2022	-15.1%	-18.1%	3.0%

A quest for riches sorting through the haystack each year of stocks trading for more than 10x sales for the few winners comes with extremely long odds. Virtually *ALL* of the positive return came from owning but a *tiny* number of eventual winners. I mean *tiny*. For example, nearly all 30+ classes posted miserable returns in 2021 and 2022. Exceptions to explosively negative returns in each year where the class posted gains are attributed to eventual severe concentration in a mere 7 stocks that grew to dominate their classes.

>30 Group. Outlier years were 2021 and 2022 where five stocks from five different classes propelled positive returns for their respective classes in years when high price-to-sales stocks declined precipitously. The speculator that failed to own Gilead and UTHR in the 2000 class; Alexion and Regeneron in the 2003 class;

Dexcom in the 2007 class; Blackstone in the 2009 class; and Tesla in the 2013 class missed nearly all of any gain produced by owning high price-to-sales stocks. Details can be found in the appendix.

The price-to-sales relationship can be an extremely beneficial analytical tool, or even better a risk management tool. The experienced value investor will incorporate margin, leverage and growth analysis for sure. However, a historical range of extremes between 32% of sales and 304% of sales for the S&P 500 provides a rough framework. High profit margins correlate with high multiples to sales. Recognizing 13.3% as the peak profit margin for the index, the investor should familiarize with the type of business that earns, or that can earn, higher margins than average. When combined margins and multiples begin to exceed 25 respectively, or 6.25x sales, *red flags for further investigation should run up the pole*. Further, when a company like Costco earning a 2.6% profit margin trades for more than 1x sales, red flags should likewise encourage digging. The ratio of price paid for a dollar of sales is a blunt instrument. However, in cases where the multiple to sales exceeds 10, and then 20, and then 30, although the valuation *may* be warranted, if Ricky Ricardo were Director of Research, his query of the analyst had better be, “Lucy, you got some ‘splainin’ to do.” Perhaps the more appropriate tack should be Nancy Reagan’s, “Just say no,” and not husband Ronnie’s, “Trust but verify.”

Speaking of trust but verify, the next section of the letter investigates the conventional wisdom that suggests paying inflated prices for 1972’s Nifty Fifty worked out in the end.

THE NIFTY FIFTY AT FIFTY – SMOKE 'EM IF YOU GOT 'EM



*"You say you'll give me
Eyes in a moon of blindness
A river in a time of dryness
A harbor in the tempest" – U2; All I Want is You*

*"I think Jeremy Siegel is demented." – Charlie Munger
"Well he's a very nice guy." – Warren Buffett
"He may well be a very nice guy, but he's comparing apples to elephants
in trying to make accurate projections about the future." – Charlie
Munger; Berkshire Hathaway 2006 Annual Meeting*

*"Ibbotson finds 10% average returns back to 1926, and Jeremy Siegel
has found roughly the same back to 1802. Jeremy Siegel's numbers are
total balderdash. When you go back that long ago, you've got a
different bunch of companies. You've got a bunch of railroads. It's a
different world. I think it's like extrapolating human development by
looking at the evolution of life from the worm on up. He's a nut case.
There wasn't enough common stock investment for the ordinary person in
1880 to put in your eye." – Charlie Munger; Unleashed*

The Nifty Fifty were a group of growing blue chips that traded for double the market multiple to earnings in 1972 and subsequently crashed far more than the market during the 1973-1974 bear market. Modern dogma suggests the high multiples paid for the Nifty Fifty stocks in 1972 were warranted, and that as great businesses, the group ultimately outperformed the stock market, justifying the case for paying outrageous multiples in the most recent mania. Conventional wisdom is wrong. The Nifty Fifty proved to be less than nifty, certainly for those paying 1972 multiples.

Bear markets in 1966 and 1969 slashed 21% and 36% from the Dow Jones Industrials and a near-identical 22% and 36% from the then-less-popular S&P 500. Despite recovering all losses by 1968 and 1972 respectively, investors concluded they had had enough of getting massacred every couple years. Resolved was an imperative to only own the best of the best companies, the growing blue chips. The late 1960's bull market was led by new, smaller and more innovative companies. Tech and medicine and anything growthy led the charge. This should sound familiar. It was lightly profitable speculative stocks that bore the brunt of the early bear markets. Even though the Dow was down 21% and then 36%, fashionable innovators sunk like leaky arks in a flood. The go-go tech darlings of the late 1960s wallowed well below peak prices during the twin recoveries when the indices climbed back to 1966 highs. Seeing a handful of big blue chips fare far better during the first two of five nasty bear markets between 1966 and 1982, by late 1972 the herd, retail and institutional investors alike, charged into the best growing businesses in the land during the five years leading up to 1973.

A portfolio consisting of the best of the blue chips came to be known as "one decision stocks" and with a catchier moniker became the "Nifty Fifty" as dubbed and defined by the white-shoe Morgan Guaranty Trust. A series of recessions and rising inflation be damned, these wonderful companies enjoyed high growth rates, paid regular dividends, wielded pricing power (important during recession), had products and services that could withstand rolling recessions, were run by great managements, and thus were so in demand by investors that the median stock in the group traded at 46x, while a harmonically adjusted mean valued the group at 36x earnings. The group averaged stellar 22% earnings growth over the five years through 1972. The group of stocks saw their share prices grow even faster than earnings, driving the earnings yield and dividend yield down to 2.4% and 1.1% respectively, less than half those of the overall

stock market. The fifty stocks, having crushed the S&P 500 and the Dow in the five years leading up to the 1973-1974 bear, much via extraordinary P/E multiple expansion combined with strong earnings growth, were expected to perpetually prosper. Built to last.

It turns out, paying high prices for apparent quality is a strategy more appropriate for lighting money on fire than growing and preserving it. While the S&P 500 posted total returns of negative 14.8% in 1973 and negative 26.4% in 1974, resulting in a 37.3% loss for the two years, the Nifty Fifty lost more than 56% over the two years. The group proved no harbor in the tempest, with many of the pricier bellwethers such as McDonalds, American Express, Coca-Cola, Xerox and The Walt Disney Company falling anywhere between 62% and 82%.

Recent comparisons of today's blue chips – certainly the Fab 5 of Apple, Microsoft, Google, er Alphabet, Amazon and Facebook, er Meta – but also those great companies possessing high sales and earnings growth like Visa, Mastercard, Tesla, Nvidia, and Salesforce among others, were valued in the last few years with multiples similar to those of the Nifty Fifty of 1972. Until about a year ago, comparisons of the new crop of “one-decision stocks” to the Nifty Fifty were met with protests about not understanding how to value growth. Gospel in the belief that no price is too high leaned on a conclusion drawn in a 1998 paper by Jeremy Siegel. The Wharton professor suggested that, disregarding the immediate wreckage of the 1973-1974 bear market and viewed through a longer-term lens, the market had gotten the Nifty Fifty right. The paper appeared in the October 1998 edition of the *American Association of Individual Investors (AAII) Journal*, surely fanning retail investor confidence at that moment's peaking secular bull market. I've long called the valuation of the blue chips in 1998 the reiteration of the Nifty Fifty.

Professor Siegel concluded that, based on returns and earnings growth not for a couple recessionary years but for the entire 26+ years to August 1998, the Nifty 50 produced a good return and one only “slightly trailing the S&P 500.” Siegel measured the P/E of the Nifties in 1972 at 41.9 versus only 18.9x for the S&P. Despite being an academician, Siegel's methodology in analyzing the Nifty Fifty contained a number of glaring mistakes. For starters, the professor calculated the Nifty Fifty P/E multiple using a simple arithmetic average. He should know better. A harmonic mean *must* be used in the calculation of a portfolio P/E (a weighted harmonic mean is appropriate but the Nifty Fifty at the outset was equal weighted). A simple arithmetic average allows high-multiple outliers to distort the overall portfolio multiple. As an example, assume a portfolio of five stocks, four with a P/E multiple of 20 and the final trading for 100x. A simple average P/E for the group is 36x ($180/5$). The 100x multiple massively overstates price paid for the aggregate earnings of the portfolio. An average of the earnings yield is the only way to properly calculate the average multiple, which is the method used to calculate the harmonic mean. Each of the four companies at 20x yield 5%. The 100-multiple stock yields 1%. A combined portfolio yield is thus 4.2% ($21/5$). The inverse of an earnings yield is the P/E; thus, the overall portfolio P/E in the hypothetical 5-stock portfolio is the harmonic mean of 23.8x.

Interestingly, low-multiple stocks are not much impacted by the use of a harmonic mean. Assume a new portfolio of five stocks, the first four at 5x earnings and the final again at 100x. A simple average suggests a 24x P/E portfolio multiple. However, the stocks trading for 5x earnings yield 20% each while the company at 100x yields but 1%. Thus, a harmonic P/E becomes 6.17x, or the inverse of a 16.2% earnings yield ($81/5$). The use of a simple average in calculating a portfolio or index P/E is a common mistake. The non-academic investor should have fluency with the importance of earnings yields. The academic can teach harmonic means formulaically as such:

$$\text{Harmonic P/E} = n / (\sum 1/x_p)$$

Where:

n = Number of Companies in a Portfolio

x_p = P/E Multiple of Each Company in the Portfolio

The weighted harmonic P/E for a portfolio can be calculated using the following formula:

$$\text{Weighted Harmonic P/E} = (\sum w_p) / (\sum w_p/x_p)$$

Where:

w_p – Weight of a Portfolio Company

x_p – P/E Multiple of Each Company in a Portfolio

For those whose heads explode trying to follow formulae, just add up the weighted earnings yields and divide by the number of companies. You are essentially arriving at the total dollar earnings of a portfolio as a percent of the dollar value of the portfolio. With formulas, what to do with a company making no money? You can't divide by zero, so use the dollar earnings. Company losses can be treated as zero or more appropriately as losses offsetting gains elsewhere. Incidentally, this is how we accurately calculated the Semper portfolio's year-beginning earnings yields and P/E ratios each year, in an earlier section of this letter.

From 1972 to August 1998 the S&P compounded at 12.7% annually, supported by 8.0% aggregate EPS growth (though only using his latest 1996 data – he argued that two years of incremental EPS growth wouldn't alter the growth rate by much if at all – while in fact operating earnings only grew 4% annually over those two years, so laziness or convenience in neglecting the lower growth). Meanwhile, despite beginning at a much higher initial P/E ratio, EPS growth of the Nifty Fifty members averaged 11.0% against only 8.0% for the index. This higher earnings growth by the Nifties drove a 12.2% annual return for a non-rebalanced Nifty Fifty portfolio and a higher 12.5% annual gain if the portfolio were (improbabilistically) rebalanced monthly from an initial equal weighting in 1972. Not sure if the professor ever thought about trading costs, spreads and market impact from monthly buying and selling, but that's a story for later.

Only Professor Siegel knows as to his motive in justifying the high prices awarded to the Nifty Fifty in 1998. Whether he had any sense in August 1998 that perhaps the blue chips were again as expensive as in 1972 seems unlikely. Valuations of 1998's blue chips, many still members of the 1972 Nifty Fifty crop, again traded at dangerously high multiples to earnings.

The S&P 500 ripped at 37.6%, 23.0%, 33.4% and 28.6% in the four years 1995-1998. Even Fed Chair Alan Greenspan spoke of "irrational exuberance," despite a public conviction at not being able to spot bubbles. At bottom he knew something was amiss.

As an example of froth, Coca-Cola, an investment made by Warren Buffett in the wake of the 1987 stock market crash, had grown 13-fold in Berkshire Hathaway's stock portfolio to a 35% weighting. At the moment Professor Siegel's paper went to press, Coca-Cola traded for more than 50x earnings, a higher multiple than in 1972. Warren Buffett *knew* Coke was expensive in 1998 and *acted* on it by buying General Re and, in doing so, diluting Coke and the equity portfolio weighting when Berkshire added General Re's large bond portfolio. From an equal-weighted start in 1972, it had grown to the fifth largest position in the Nifty Fifty by 1998, or from 2% to 4.9%. While the tech bubble raged until early 2000,

mid-1998 was the top for the blue chips. A 12.7% return for the S&P 500 and 12.2% for Siegel's non-rebalanced Nifty Fifty at August 1998 would mark the high for either return series. How bad would it get?

The S&P 500 was valued at 27.8x operating (before write-offs and write-downs) earnings on August 31, 1998. If measured on reported earnings, the index traded for 32.6x. Standard & Poor's didn't introduce the concept of operating earnings until 1988, so applying P/Es using reported earnings would be appropriate against the multiple in 1972. The index was much more expensive on a P/E basis on reported earnings in 1998 than it was in 1972, at 32.6x in 1998 versus 18.9x in 1972. While EPS growth contributed 7.7% to total return from 1972 to 1998 (adjusted for lower earnings from the dates Siegel didn't update), the expansion in the P/E multiple added 2.1% per year to return while dividends kicked in 2.7%.

Twenty-four years later, the index closed 2022 trading for 19.2x. Thus, multiple compression harmed total return from 1998 to 2022 by 2.2% per year. Growth in reported EPS slowed to 6.6% per year and dividends contributed 2.2% for a whopping annual return over the 24 years 1998 to 2022 of 6.9%. Great timing.

Earning only 6.9% annually for the index from 1998 to 2022 reduced the compound return from 12.7% for 1972-1998 down to 10.3% for the full 50 years from 1972-2022. The 50-year return for the index is derived via a negligible increase in the P/E multiple from 18.9x to 19.2x, earning the index investor about 1.6%, or roughly 4.4 basis points of investment return annually. EPS growth and dividends therefore made up nearly all of the return. EPS contributed 7.2% per year while dividends added 2.6%. The 10.3% total return is just a bit shy of Ibbotsonesque, but nobody here claimed 1972 was a bubble nor is 2022 a peak (that was last year). Further appreciate that the first 12 or so years from 1972 coincided with the great inflation. Real returns were well below 12.7% or 12.2% from 1972 to 1998.

**TABLE 1. NIFTY FIFTY RETURNS SINCE MARKET PEAK:
DECEMBER 1972 THROUGH AUGUST 1998**

Company	Annualized Return (%)	1972 Actual P/E Ratio (X)	Warranted P/E Ratio (X)	EPS Growth (thru 1996) (%)
Philip Morris Cos. Inc.	18.8	24.0	68.5	17.9
Pfizer Inc.	18.1	28.4	72.3	12.2
Bristol-Myers	16.8	24.9	49.8	12.7
Gillette Co.	16.8	24.3	45.4	10.4
Coca-Cola Co.	16.2	46.4	82.3	13.5
Merck & Co. Inc.	15.9	43.0	76.3	15.1
Heublein Inc.	15.7	29.4	47.0	n/a
General Electric Co.	15.7	23.4	37.8	10.9
Schering Corp.	15.7	48.1	79.8	12.9
Squibb Corp.	15.5	30.1	48.7	n/a
PepsiCo Inc.	15.0	27.6	41.1	11.2
Lilly Eli & Co.	14.0	40.6	50.4	10.9
American Home Products	13.8	36.7	43.6	10.5
Procter & Gamble Co.	13.2	29.8	32.4	13.9
Revlon Inc.	13.1	25.0	26.9	n/a
Johnson and Johnson	12.6	57.1	56.6	14.2
Anheuser-Busch Inc.	12.5	31.5	30.8	12.3
Chesebrough Ponds Inc.	12.5	39.1	38.2	n/a
McDonald's Corp.	12.1	71.0	63.2	17.5
First National City Corp.	11.4	20.5	16.9	9.3
Disney Walt Co.	11.3	71.2	53.6	14.6
American Express Co.	10.8	37.7	28.0	9.6
Dow Chemical Co.	10.6	24.1	17.7	12.2
American Hospital Supply Corp.	10.6	48.1	33.1	n/a
Schlumberger Ltd.	10.2	45.6	28.6	11.5
Upjohn Co.	10.0	38.8	25.3	11.3(a)
AMP Inc.	9.7	42.9	25.0	9.5
Texas Instruments Inc.	9.1	39.5	20.2	12.7(b)
Minnesota Mining & Manuf'g	8.5	39.0	20.6	8.7
Baxter Labs	8.1	71.4	29.6	10.5
Int'l Telephone & Telegraph Corp.	8.0	15.4	8.6	2.7(a)
Int'l Business Machines	7.7	35.5	17.1	6.6
Penney J.C. Inc.	7.3	31.5	14.8	5.0
Sears Roebuck & Co.	7.3	29.2	14.2	4.5
Int'l Flavors & Fragrances	7.0	69.1	27.7	9.4
Schlitz Joe Brewing Co.	6.6	39.6	15.6	n/a
Xerox Corp.	6.5	45.8	19.4	5.1
Halliburton Co.	6.3	35.5	12.7	3.9
Lubrizol Corp.	6.0	32.6	12.1	9.4
Eastman Kodak Co.	5.5	43.5	16.1	5.9
Simplicity Patterns	5.3	50.0	8.7	n/a
Digital Equipment Corp.	5.2	56.2	9.7	-12.6*
Avon Products Inc.	5.0	61.2	24.2	3.3
Louisiana Land & Exploration Co.	4.4	26.6	8.6	1.2
Black and Decker Corp.	2.8	47.8	10.5	3.4
Kresge (S. S.) Co.	2.1	49.5	10.1	1.2
Burroughs Co.	-0.4	46.0	6.6	-16.6*
Polaroid Corp.	-1.0	94.8	11.9	-2.9
Emery Air Freight Corp.	-1.9	55.3	8.0	n/a
MGIC Investment Corp.	-8.6	68.5	4.8	n/a
Rebalanced Portfolio	12.5	41.9	40.6	11.0
Non-Rebalanced Portfolio	12.2	41.9	38.4	11.0
S&P 500	12.7	18.9	18.9	8.0

* Companies had negative EPS in last year measured—used \$0.01/share to calculate EPS growth.

(a) earnings growth through 1994

(b) earnings growth through 1995

AAL Journal; October 1998

For a full 50 years the vaunted one-decision stocks produced a 10.1% annual return, trailing the index by 0.24%. Cumulatively the index earned 13,352% versus 12,073% for the Nifty Fifty. *While close, no, the Nifty Fifty did not outperform the S&P 500 over time.* Tell all your friends.

There were winners, for sure. Businesses exhibiting good growth in EPS over five decades likewise earned good returns, even as multiples compressed. One company in particular dominated the field of 50. Had a socially conscious, ESG-inspired committee (fortunately not yet a thing) instead constructed the list of Nifties in 1972 and *excluded* Philip Morris, the lag against the index would have been far more severe. The cigarette giant changed its name to Altria in 2003 and simultaneously spun off Philip Morris International, shielding the international operations from regulatory crosshairs. The combined entity compounded at 15.6% versus 10.1% for the Nifty Fifty, a stunning differential over 50 years. \$100 invested in each of the 50 companies in 1972 saw \$5,000 grow to \$609,020. The \$100 invested in Philip Morris alone grew to \$138,307. Philip Morris' weighting grew from 2% to 22.7%. Had the tobacco company been omitted from the original list, the Nifty return falls from 10.1% to 9.6%. A half point of return seems innocuous until you assess the damage over a half-century of compounding.

Nifty Fifty Performance Breakdown 1972-2022

Top Quintile	12.6%	Ex. Philip Morris	9.6%
Second Quintile	10.7%	Ex. Top 5	9.0%
Third Quintile	8.2%	Ex Top 10	8.4%
Forth Quintile	6.1%	Median	8.2%
Bottom Quintile	-11.6%	Number of Outperformers	19

Concentration of winners among the original Nifty Fifty is profound. The top five returners contributed 45.7% of the total return while the top ten accounted for 62.5% of the total. 19 of the 50 companies saw their shares outperform the total (and likewise outperform the S&P 500). One common thread can be seen among the list of 19 companies that did outperform the aggregate of the full Nifty Fifty – only two of the 19 stocks outperforming the group sported a P/E multiple *higher* than the average at the outset. 17 of the 19 outperformers were lower P/E stocks in 1972. The top three performers, Philip Morris, PepsiCo and Gillette, accounted for 35.5% of the total return and had initial multiples in the 20s. Only Merck and McDonald's of the outperformers had a higher-than-group average multiple. Merck's 1972 multiple was 43.0x, only slightly above the average 41.9 while McDonalds traded at a much higher 71.0x.

The evolution of McDonalds crystalizes the imperative of not overpaying. McDonald's growth in EPS through Siegel's 1996 averaged 17.5%, second highest among the Nifties to Philip Morris's 17.9% annual clip. EPS growth at the Golden Arches would naturally slow, averaging "only" 9.7% from 1998 to 2022. EPS growth over the entire 50 years thus averaged 13.7%. The stock's total return would badly lag, growing at only 12.15% per year. Meaningful? As the P/E declined from 71.0x to 26.3x by 2022, \$100 in earnings grew to \$61,086 while \$100 in the stock grew to \$30,932, merely half as much.

At the bottom of the heap fully 7 of the 50 companies were complete bankruptcies or zeroes. That's 14% of the companies, or \$700 of the original \$5,000 with \$100 invested in each gone. An additional two companies managed to produce a negative total return over 50 years, a difficult feat to accomplish. The bottom 30 stocks combined to produce a 6.5% total return. That's turning \$100 in each, \$3,000 in total, into \$70,887, roughly half of what Philip Morris alone contributed. The 30 losers accounted for 11.2% of the total return despite beginning with 60% of initial capital. Ouch. The top 20 winners contributed 88.8% of the total return.

Nifty at Fifty? 1972-2022

	1972 PE Ratio	Annualized Return	Beginning Dollars	Ending Dollars	Beginning Weight	Ending Weight	Cumulative Weight
1. Philip Morris Cos. Inc.	24.0	15.6%	100	138,307	2.0%	22.7%	22.7%
2. PepsiCo Inc.	27.6	12.8%	100	42,102	2.0%	6.9%	29.6%
3. Gillette Co.	24.3	12.4%	100	34,566	2.0%	5.7%	35.3%
4. McDonald's Corp	71.0	12.2%	100	30,933	2.0%	5.1%	40.4%
5. Eli Lilly and Co.	40.6	12.1%	100	30,440	2.0%	5.0%	45.4%
6. Heublein Inc.	29.4	11.5%	100	22,855	2.0%	3.8%	49.1%
7. Merck and Co. Inc.	43.0	11.3%	100	20,760	2.0%	3.4%	52.5%
8. Johnson and Johnson	57.1	11.1%	100	19,616	2.0%	3.2%	55.8%
9. Texas Instruments Inc.	39.5	11.1%	100	19,509	2.0%	3.2%	59.0%
10. Bristol-Meyers	24.9	11.1%	100	19,363	2.0%	3.2%	62.1%
11. American Home Products	36.7	11.1%	100	19,234	2.0%	3.2%	65.3%
12. Schering Corp.	48.1	11.1%	100	19,154	2.0%	3.1%	68.4%
13. Coca-Cola Co.	46.4	10.9%	100	17,542	2.0%	2.9%	71.3%
14. Procter and Gamble Co.	29.8	10.8%	100	17,223	2.0%	2.8%	74.2%
15. Pfizer Inc.	28.4	10.8%	100	16,832	2.0%	2.8%	76.9%
16. Lubrizol Corp.	32.6	10.8%	100	16,626	2.0%	2.7%	79.6%
17. Chesebrough Ponds Inc.	39.1	10.6%	100	15,740	2.0%	2.6%	82.2%
18. American Express Co.	37.7	10.6%	100	15,543	2.0%	2.6%	84.8%
19. Squibb Corp.	30.1	10.5%	100	14,529	2.0%	2.4%	87.2%
20. Int'l Telephone & Telegraph Corp.	26.6	8.9%	100	7,260	2.0%	1.2%	88.4%
21. Anheuser-Busch Inc.	71.2	8.7%	100	6,572	2.0%	1.1%	89.4%
22. Walt Disney Co.	15.4	8.7%	100	6,443	2.0%	1.1%	90.5%
23. Louisiana Land and Exploration Co.	31.5	8.5%	100	5,954	2.0%	1.0%	91.5%
24. American Hospital Supply Corp.	48.1	8.3%	100	5,479	2.0%	0.9%	92.4%
25. Minnesota Mining & Manuf'g	39.0	8.3%	100	5,327	2.0%	0.9%	93.2%
26. Dow Chemical Co.	24.1	8.3%	100	5,310	2.0%	0.9%	94.1%
27. AMP Inc.	42.9	8.2%	100	5,122	2.0%	0.8%	95.0%
28. Schlumberger Ltd.	45.6	7.6%	100	3,933	2.0%	0.6%	95.6%
29. General Electric Co.	23.4	7.2%	100	3,290	2.0%	0.5%	96.1%
30. Baxter Labs	71.4	7.1%	100	3,047	2.0%	0.5%	96.6%
31. Simplicity Patterns	50.0	7.0%	100	3,000	2.0%	0.5%	97.1%
32. International Business Machines	35.5	7.0%	100	3,000	2.0%	0.5%	97.6%
33. Joe Schlitz Brewing Company Co.	39.6	6.9%	100	2,766	2.0%	0.5%	98.1%
34. Int'l Flavors & Fragrances	69.1	6.8%	100	2,731	2.0%	0.4%	98.5%
35. Upjohn Co.	38.8	6.6%	100	2,386	2.0%	0.4%	98.9%
36. Halliburton and Co.	35.5	6.4%	100	2,201	2.0%	0.4%	99.3%
37. First National City Corp.	55.3	5.9%	100	1,760	2.0%	0.3%	99.6%
38. Digital Equipment Corp.	56.2	4.0%	100	700	2.0%	0.1%	99.7%
39. Xerox Corp.	47.8	3.9%	100	686	2.0%	0.1%	99.8%
40. Black and Decker Corp.	20.5	3.9%	100	680	2.0%	0.1%	99.9%
41. Emery Air Freight Corp.	45.8	3.0%	100	446	2.0%	0.1%	100.0%
42. Avon Products Inc.	61.2	-1.2%	100	54	2.0%	0.0%	100.0%
43. Burroughs Co.	46.0	-7.4%	100	2	2.0%	0.0%	100.0%
44. Revlon Inc.	25.0	-100.0%	100	0	2.0%	0.0%	100.0%
45. JC Penney Inc.	31.5	-100.0%	100	0	2.0%	0.0%	100.0%
46. Sears Roebuck and Co.	29.2	-100.0%	100	0	2.0%	0.0%	100.0%
47. Eastman Kodak Co.	43.5	-100.0%	100	0	2.0%	0.0%	100.0%
48. Kresge (S. S.) Co.	49.5	-100.0%	100	0	2.0%	0.0%	100.0%
49. Polaroid Corp.	94.8	-100.0%	100	0	2.0%	0.0%	100.0%
50. MGIC Investment Corp.	68.5	-100.0%	100	0	2.0%	0.0%	100.0%
Portfolio	36.4*	10.08%	5,000	609,020	100%	100%	

*Harmonic mean

A conclusion can be drawn from the table in Siegel's paper included above. The businesses exhibiting the greatest earnings growth through 1998 likewise produced the highest total returns through 1998. Makes sense. The higher multiple stocks generally also had seen slower EPS growth, a bad combination. Professor Siegel however surmised the investor could have paid materially higher multiples for those growing businesses and still earned market-beating returns, a somewhat convoluted premise and one made only in arrears.

Examining returns, had investors done as Siegel suggested, and "paying up" for growth and conversely paying down for subsequent slow growers (or failures), the result would have been disastrous. Paying 68.5x earnings for Philip Morris as Siegel calculated as "warranted" instead of its 24.0 multiple in 1972 yields \$49,255 per \$100 instead of the \$138,307 actually earned. That shaves 14.7% from all dollars earned by the Nifty Fifty and reduces the return on the Nifty Fifty from 10.3% to 9.7%. That's just one.

Siegel's "Warranted P/E Ratio" suggestion is ridiculous at face value. It simply concludes that businesses with higher earnings growth perform better than those with lower. Well sure. But price does matter and the notion of assigning a more proper multiple following nearly 26 years of return observation is preposterous. Giving the professor the benefit of the doubt by presuming the investor *could* pay Siegel's "warranted" prices for each of the 50 companies yields an entirely different result. It didn't matter if you paid 94.8x earnings for Polaroid or 11.9x because the business failed! The only warranted price paid was zero, obviously in retrospect, but it was only with retrospect that Siegel assigned his warranted multiples.

We utilized several methods to calculate a hypothetical return based on Siegel's "warranted P/Es." In one the initial equal weight of each holding was adjusted to reflect premium or discount to the actual P/E. Thus, if Philip Morris at 24.0x earnings was "warranted" at 68.5x, its initial weight was reduced from 2% (or \$100 out of \$5,000 for each company) to 0.7%. The dollar adjustment to the initial weight dropped starting capital to \$35.04. At the other extreme, MGIC Investment Corp. had already failed by 1998. Siegel suggested 4.8x was a more fitting multiple than its 68.5x in 1972 (very ironic that the worst company started at the very same actual multiple that the best performer "warranted"). MGIC warranted no investment given its failure, but I don't think Siegel could make his calculations work with a total loss. Regardless, MGIC was warranted initial capital of \$1,427. Using these adjustments for all 50 companies resulted in a portfolio return of 8.01% over the 50 years, well below the 10.1% earned by equal weighting at the outset and paying the prices that existed. Under this method, Philip Morris theoretically compounded at only 13.2% instead of 15.6% due to the theoretically higher price paid.

Another method of adjusting for Siegel's "warranted P/Es" reweighted initial capital to an equal-weighted portfolio at the outset. Doing so shrank the initial range of dollar and capital adjustment, meaning altering the price paid for Philip Morris from 24x to 68.5x is less of a modification from lowering the initial price from 68.5x to 4.8x for MGIC. Regardless of range minimization, the return still underperformed the actual return by a wide margin.

Beyond relying purely on hindsight, the Siegel paper was sloppy, particularly for an academic. In addition to failure to use a harmonic mean, the Wharton professor didn't even calculate a correct portfolio "Warranted P/E Ratio" using his simple arithmetic average. The result in his table shows a 38.4 portfolio multiple. A simple average yields 31.0. Bonkers. Further, the "warranted" multiple becomes 10.9x using a correct harmonic mean. The crazy thing about this is that a conclusion about justifying higher multiples fails when adjustments are hypothetically made. You can't make this up. Finally on Siegel, while I love Value Line printed tear sheets, Siegel used the "recent P/E multiple" found at the top of each recent page (for those companies that still existed). Better data was surely available in August 1998. We were mere months from hatching Semper and we know the technology that existed. Charlie Munger was on to something.

Instead of hypothesizing that investors pay up for growth (read as: reduce forward return), how about an examination of one conspicuous missing element to the original Nifty Fifty. Had only the creators of the venerable list of one-decision stocks cast their gaze to flyover country. There was a place in Nebraska where a high rate of durable compounding was ongoing and on sale.

The Niftiest One

No Semper Augustus analysis of the Nifty Fifty would be complete without introducing one glaring “omission” by creators of the Nifty Fifty list and by investors building portfolios in 1972. That would be failure to include and invest in Berkshire Hathaway, the Niftiest One. Had Berkshire been included in the list of Nifties, its returns would have topped the list, compounding at 18.7% from 1972 to 2022. We already saw the degree to which Philip Morris’s 15.56% annual return contributed 22.9% of the entire return of the Nifty Fifty, earning 5.5% per year more than the aggregate of the bunch. At 18.9%, Berkshire outpaced the Marlboro Man by 3.3% and by 8.8% above the combined return of the Nifty Fifty. You know this is going to be good or I wouldn’t have brought it up.

A \$100 investment in Berkshire Hathaway in 1972 compounded at 18.9%, growing to \$574,239 while \$100 invested in every member of the Nifty Fifty, \$5,000 in total, grew to \$609,020. Berkshire damn near earned as much as the entire Nifty Fifty with only 2% of its starting capital. Think about that. You got 6% more starting with \$5,000 than you got with Berkshire beginning with \$100. It took investing \$106 in Berkshire versus investing \$5,000 in the Nifty Fifty to yield the identical dollar return. Looked at another way, had you invested your \$5,000 buying Berkshire instead of the Nifty Fifty, you would have \$28,711,953, slightly more than \$609,020 earned in the Nifty Fifty. Berkshire outperformed the Nifty Fifty by a factor of 46.5x over 50 years.

Suppose the 1972 investor invested \$100 in each of the Nifty Fifty but allocated an additional \$100 to Berkshire. The Nifty Fifty-One. \$5,100 grows to the sum-total of \$609,020 earned by the original Fifty and \$574,239 earned by Berkshire. Of the total \$1,183,258 in portfolio value at year-end 2022, Berkshire would account for 48.2% of the value, up from 1.96% of initial capital.

Was Berkshire too small at year-end 1972 to be discovered? Consider that in the 8 years under the management of Warren Buffett, Berkshire’s share price had already compounded by 25.4% per year. Surely even without computers and computer screens someone was paying attention to where *real growth* was being generated. Book value per share had compounded by 16.9% over the same 8.25-year stretch through 1972. Berkshire’s stock price rose from ~\$12.59 in October 1964 to ~\$81.47 per share (imagine the investor trying to get \$100 in Berkshire and rounding up to two shares...). On 980 thousand shares outstanding, Berkshire sported an \$80 million market cap against \$68 million in book value and earned \$12.1 million in 1972. It earned 19.5% on average equity, 17.8% on ending equity, and traded for 6.6x trailing earnings. Come to think of it, the bargain price would have excluded Berkshire from Nifty consideration. Who in their right mind pays single-digit multiples to earnings and 1.18x book value for a company earning nearly 20% on equity? Silly me.

By comparison the entire S&P 500 had an estimated \$750 billion market cap, a simple average of \$1.5 billion per company. No doubt Berkshire was a small-cap by comparison with the Nifties. It’s interesting that Berkshire’s market cap today nearly matches the entire market cap of the S&P 500 in 1972.

Dividend Reinvestment Ain’t Free

Additional return considerations exist when comparing a Berkshire Hathaway to a portfolio of companies or to an index over time. These are trading costs and taxes, none of which are incurred by the Berkshire shareholder (or the shareholder of any non-dividend-paying stock). I’ve long struggled with the concept

of assuming dividends are reinvested in a paying company's shares even though they are not actually reinvested. It makes sense from a return calculation standpoint (the cash from dividends must go somewhere) but is critically flawed in reality. First, plenty of research demonstrates that companies struggle to earn returns on equity as the equity base grows. Plenty of companies pay dividends because they have *little internal use* for productively deploying retained capital. Second, the presumption that a dividend can be immediately reinvested in the share price at the moment of payment is flawed. In practice, trading involves costs, both direct and unseen. Any commissions paid on the subsequent share purchase must be considered. Only recently have investors enjoyed "free commissions." However, any spread between the bid and ask price is borne by the re-investor of dividends. Further, any repurchases undertaken in size have a not-inconsequential impact on price, a market impact. Even commission-free trading is a myth, ignoring inefficiencies such as payment for order flow adding to a bid-ask spread.

These frictional trading costs are higher for smaller capitalization stocks and those with less liquidity. They are regardless a cost for any reinvestment of dividends. They are likewise a cost to a shareholder owning a mutual fund or ETF. A company paying a dividend such as Altria for example, will pay a dividend to the fund or ETF which is then passed through to the shareholder as a fund dividend. Shareholders electing to reinvest dividends effectively are making a new deposit of cash which then must be invested by the fund manager. There is an enormous amount of reinvestment activity among mutual funds and ETFs which all suffer frictional costs. These costs are real for the shareholder, dragging returns below the headline return of an index, which assumed reinvestment at the share price with no concession for costs or impact.

How real are these costs? Compare the return of Vanguard's main S&P 500 index fund, inception on August 31, 1976. Vanguard does not delineate the breakdown of drag due to management fees from those due to frictional costs of trading. With use of futures contracts, they (and others) do a phenomenal job minimizing these costs. However, I'd guess an equal proportion of drag over time can be attributed each of those two types of fees. From its 1976 inception, the VFINX index fund earned 10.92% per year to December 31, 2022. The unmanaged index produced a "return" of a higher 11.20%. While 28 basis points of annual return may not sound like much, over more than 46 years it adds up. An even \$1 million invested in VFINX produced \$117.6 million and \$1 million theoretically invested in the index itself produced \$132.1 million, fully \$14.5 million more, or 12.3% more money. That's more than a year of long-term total return chewed up by costs and fees.

Now consider the taxable investor. The costs here are gigantic over time. If 40% of total return over the past few decades has come from dividends, the taxable investor has lost probably 30% of dividends earned to tax prior to reinvestment. For each \$100 of profits earned by a shareholder, receiving \$40 in dividends sends \$12 of that to the taxman. That's 12% of profit gone and not reinvested. Of the \$28 now reinvested, scrape probably 0.4% of that, or 11.2 cents for bid-ask spreads and trading costs. While death and taxes are unavoidable, the Berkshire shareholder *never* incurred any taxes or frictional reinvestment costs, other than a single \$0.10 quarterly dividend paid in 1967 when the stock was about \$20 per share – annualized at 2%. The thought of Berkshire paying 20% or more of its profits in dividends each year over the past 58 years is too much to bear. The record would be inferior, and the business infinitely smaller.

Whether compounding in the Nifty Fifty over 50 years or in the S&P 500 index, the purpose of the above is to demonstrate that the return of the real-world investor would fall well short of the 10.3% "earned" by the index or the 10.08% "earned" by the owner of the Nifty Fifty over the last 50 years. The costs are less severe today. Investigate commission schedules and spreads not that many years ago. The costs over time are enormous. A Berkshire, suffering no drag, would thus likely have earned more on a \$100 investment in 1972 than the investor plunking \$100 into each of the Fifty Nifties.

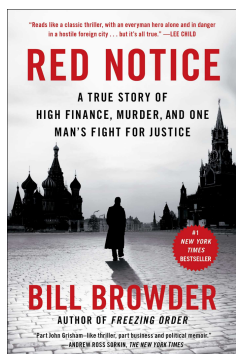
I hope this was an educational section. Falling short of the S&P 500 over a half century and dispelling conventional belief that investors were ultimately justified in paying dangerously high multiples, next time someone mentions price doesn't matter when you are buying growth, let them know the Nifty Fifty at Fifty wasn't so nifty. If propositioned for a wager over the next fifty years pitting what's left of the Fifty and Berkshire, I'd take Berkshire in a heartbeat.

Additional data on the Nifty Fifty can be found in the Appendix. Included are all capital transactions subsequent to 1972 including mergers and surviving entities, spinoffs, splitoffs, and bankruptcy filings. It makes for a fun history. Also included is the return contribution for each subsequent entity, for example the breakdown of contribution from Altria and Philip Morris International following their 2008 spinoff of International.

BOOKS AND STUFF

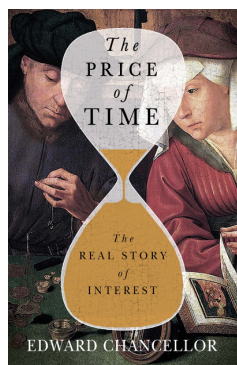
"The world is a dangerous place to live; not because of the people who are evil, but because of the people who don't do anything about it." – Albert Einstein

The world may be a dangerous place to live. It is certainly a dangerous place to invest. Honoring both rules of investment, we work to keep capital out of harm's way. While we have always had a significant proportion of capital invested abroad, we only invest in developed economies. Plenty of our companies derive substantial sales and have operations in the developing world, but we prefer to gain exposure to that corner of the growing world through our global franchises headquartered in places like the U.S., Europe, Canada and Japan. We will not invest directly in China or Russia. When asked why, instead of a long explanation about the rule of law and expropriation of capital, I will forever simply hand the inquirer a copy of my favorite read of the year, Bill Browder's terrific *Red Notice – A True Story of High Finance, Murder, and One Man's Fight for Justice*.



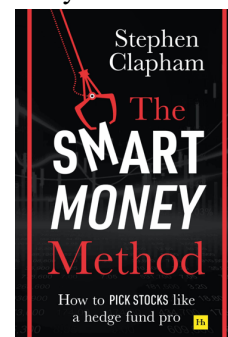
Browder ran an investment firm that invested in Russia until 2005. His account of theft of capital, the unwarranted imprisonment and eventual torture to death of one of his attorneys, and his journey spent shedding light on the corrupt and murderous Putin regime is a gripping read and alone highlights the risk not worth taking, at least here, by directly investing capital in such places. I highly recommend the read and look forward to reading his subsequent book, *Freezing Order*, also on investing in Putin's Russia.

Another great read was William Cohan's *Power Failure – The Rise and Fall of an American Icon*. From its founding in 1892 to inclusion as one of the original Dow Jones Industrial companies through much of my investing career, GE was one of the most dominant companies in the world. Cohan chronicles the history of the company from its 19th-century founding through its rise to a position as the world's most valuable business at the end of the 20th-century to the edge of the grave during the 21st-century Financial Crisis. Access to Jack Welch, who led the business to the top of the global economy and is more than partially responsible for its subsequent demise, highlights the must-read.



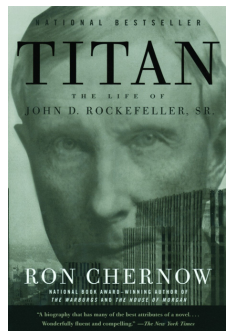
Those who know my wife know she doesn't swear (unless at her doting husband). It was on the arrival of Edward Chancellor's marvelous *The Price of Time – The Real Story of Interest* that she uttered these very words, "Oh my God; Tell me there isn't another effing (sic) book on interest rates. It seems she neither shares the same affection for my various editions of Homer and Sylla's classic *The History of Interest Rates*, including the first edition penned by Homer in the singular, nor my ability to highlight the nuances among each. If you are a fan of history and economics and less of a fan of central bankers, then run, don't walk, and get a copy of Chancellor's great book.

I'm asked all the time to recommend a book that teaches how to invest. Reflexively the answer is you won't learn it in a book, start reading 10-Ks and don't ever stop. Surely Ben Graham's *The Intelligent Investor* is a necessity, and the hard-core student of investing should work through his *Security Analysis*, though with great effort. Of the editions I favor the 2nd in 1940. However, in advance of recording on his terrific *Behind the Balance Sheet* podcast in December, I read his excellent *The Smart Money Method*. Immensely readable, Steve hits on numerous solid principles



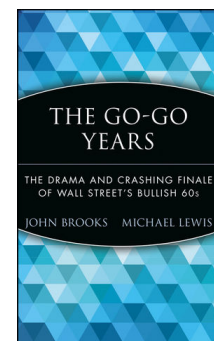
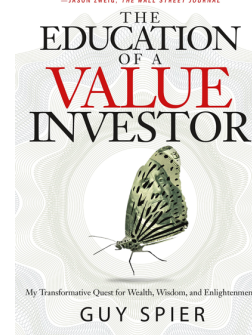
of good fundamental investing. He teaches professional investors about investing technique. If you are interested in learning how to invest, get the book.

Guy Spier and I spent time together at John Mihaljevic's MOI Global conference in Zurich in June. On arrival back stateside, Guy had sent me a copy of his excellent memoir, *The Education of a Value Investor*. As much a lesson on self-awareness as a super book on investing, Guy's book is a great read which I'm thankful he sent and for the friendship.



Two books mentioned throughout the letter this year that I haven't read in years are Ron Chernow's *Titan – The Life of John D. Rockefeller, Sr.* and John Brook's *The Go-Go Years – The Drama and Crashing Finale of Wall Street's Bullish 60s*. Commentary on each already appeared earlier in the letter. Both books are outstanding histories of Rockefeller and Standard Oil and then

of the booming 1960s. Modern investors point to the late 1990s as a parallel to some of the speculative insanity seen in recent years. The 1960s contained as much frenzy and insanity. Chernow is simply one of the best biographers extant. His outstanding books on Washington, Hamilton, Grant, J.P. Morgan and others should be required reading.



Huge thanks to those who sent books my way last year. I have two distinct handicaps, one being a slow reader and the other being an eyes bigger than the stomach buyer of books. The reading stack grows monthly and I'm quite certain if I don't buy another book in my lifetime, I still won't get to all of those I own. Regardless, I'll keep buying at scale and remain determined to read as much as I can. If you enjoyed a book enough to send a copy, if I haven't already read it, I intend to. There is one sure-fire way to free up about seven weeks in January and February, but until then I do zero leisure reading during the process of producing this near-book each year.

Thanks as well for all the great music recommendations, not only during the letter-writing process but throughout the year. My musical teeth were cut on classic rock and classic country. Of course, at the time they were just rock and country. Just wait for the moment when the music of your youth is broadcast as classic, or worse, as oldies...For whatever reason, as the musical taste evolved from classic rock and country, as well as jazz, blues, zydeco and classical to more modern punk, alternative, indie and the like. I never kept up with new country after about 2000. Turns out there's some great stuff.

The first several weeks of the letter process were spent with Chris Stapleton, Sturgill Simpson, Old Dominion, Jason Isbell, The Steeldrivers and The Marcus King Band. "Finding" Nathaniel Rateliff & The Night Sweats a few years ago thanks to my daughter, how I didn't get to these others until this past year (with the exception of Sturgill Simpson) is a mystery. I was given Sturgill Simpson in a trade several years ago with a great friend who I had introduced to Dale Watson.

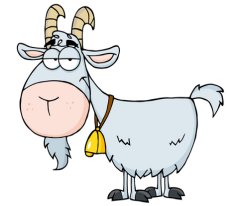
If you don't know Dale Watson and like classic country you are missing a terrific blend of Waylon, Cash and Merle. Tell me I'm wrong and tell me *I Lie When I Drink (And I Drink a Lot)* isn't one of the best songs of all time...It's right up there with Nathaniel Rateliff's *S.O.B.* in the genre of classic new country drinking.

As always, any suggestions on the reading or music front, please send them my way!

BERKSHIRE HATHAWAY: GETTING BETTER ALL THE TIME

Berkshire Hathaway Stock Is Losing to the S&P 500 This Year

Shares of Warren Buffett's conglomerate are flat year to date, while the S&P 500 index is up 8.6%. Berkshire also is behind the index over the past five, 10, and 20 years. – Barron's Headline; February 3, 2023 (Yes, the year was one month and two days old)



Berkshire's lagging performance is a tribute to the overall stock market, and technology leaders like Apple and Amazon that have paced the S&P 500. It also shows the challenges posed by Berkshire's huge size. Buffett handily topped the S&P 500 for nearly 40 years after he took control in 1965 when Berkshire was much smaller and his stock-picking was phenomenal. It has gotten tougher over the past two decades, but Buffett and Vice Chairman Charlie Munger think Berkshire can outperform in the years ahead. – Same Barron's article; February 3, 2023

BRK is a low beta underperforming stock for 20 years! He (Warren Buffett) only does better when the market is getting crushed. His stock picks, the BV chart, have lagged for 13 years. If a mere mortal was this bad, they would be fired and possibly brought up on charges...He WAS the GOAT, which ended with the financial crisis in 2008, and he has been a below-average manager since. Warren was wiped out in 2008, and the government bailed him out. He literally sent them a thank-you letter in 2010...If a Private Equity firm did this, it would be a former Private Equity firm. But everyone does backflips to rationalize why Warren doesn't suck. He's Michael Jordan on the Wizards...And yet the evidence is clear that Buffett post 2008 stock picks have not been good and no one holds him accountable...When did BRK IPO, the 19th century? – Jim Bianco; October 8, 2022



Berkshire Hathaway's "A" shares gained 4.0% in 2022. The S&P 500 and Nasdaq Composite lost 18.1% and 33.1% respectively, both with dividends. Berkshire's economic earning power surged 14.3%. Book value per share declined 5.5% as the stock portfolio produced a negative 13.5% total return. 2022 was only the third time in 58 years that Berkshire's book value per share declined year over year.

Berkshire's degree of significant undervaluation widened and is masked by last year's declining stock portfolio. Earning power advanced both organically and via investment in high-earning common stocks and a purchase of insurer Alleghany on extremely attractive terms to Berkshire. When durable earning power grows faster than the stock price, valuation improves. When the stock portfolio declines materially in price, prospective returns improve. Some relying on simple measures like price to book value might suggest that at 145% of book value the stock is no deal. Few consider the degree to which a 16% equity portfolio price decline coupled with strong earnings growth make today's book value a *better book value* and current price to intrinsic value a much wider gap.

Berkshire's earning power per share grew 14.3% in 2022. It's price to economic earnings dropped from 13.9x to 12.7x, a 7.2% earnings yield and valued at 72% of intrinsic value. The business earns more than 11% on net unleveraged equity. Capital allocation is phenomenal and drives ongoing growth in durable earning power per share. Yet, despite what seems obvious here, Berkshire's critics with microphones and soap boxes remain abundant and shrill.

Perhaps criticism of Warren Buffett and Berkshire sells newspapers and draws eyes. However, the convention that Berkshire is underperforming not only recently but for the last twenty or more years is simply misguided and wrong. If I were given a free B share for every time I heard or read how badly Berkshire lags, I'd have a new A share every year.

Berkshire's Performance page presents annual percentage change for three measures – book value per share, market value per share and S&P 500 total return. The figures are augmented with compound growth series from 1965 and also backward from 2022. Hence, the 1-year, 2-year all the way to 58-year returns are all easily ascertained.

Berkshire's Performance vs. the S&P 500: Annual Returns + Growth Rates Forward and Backward

Year		Book Value per Share	CAGR from 2022	CAGR from 1965	Market Value per Share	CAGR from 2022	CAGR from 1965	S&P 500 with Dividends Included	CAGR from 2022	CAGR from 1965
1965	58yr	23.8%	18.2%	23.8%	49.5%	19.8%	49.5%	10.0%	9.9%	10.0%
1966	57yr	20.3%	18.1%	22.0%	-3.4%	19.4%	20.2%	-11.7%	9.9%	-1.4%
1967	56yr	11.0%	18.0%	16.7%	13.3%	19.8%	16.4%	30.9%	10.3%	7.7%
1968	55yr	19.0%	18.2%	17.3%	77.8%	20.0%	28.6%	11.0%	10.0%	8.4%
1969	54yr	16.2%	18.2%	17.1%	19.4%	19.2%	26.8%	-8.4%	10.0%	5.0%
1970	53yr	12.0%	18.3%	16.2%	-4.6%	19.2%	21.1%	3.9%	10.4%	4.8%
1971	52yr	16.4%	18.4%	16.3%	80.5%	19.7%	28.0%	14.6%	10.5%	6.1%
1972	51yr	21.7%	18.4%	16.9%	8.1%	18.7%	25.4%	18.9%	10.4%	7.6%
1973	50yr	4.7%	18.4%	15.5%	-2.5%	18.9%	22.0%	-14.8%	10.3%	4.9%
1974	49yr	5.5%	18.7%	14.5%	-48.7%	19.4%	12.1%	-26.4%	10.9%	1.4%
1975	48yr	21.9%	19.0%	15.1%	2.5%	21.5%	11.2%	37.2%	11.8%	4.1%
1976	47yr	59.3%	18.9%	18.2%	129.3%	22.0%	18.0%	23.6%	11.3%	5.6%
1977	46yr	31.9%	18.1%	19.2%	46.8%	20.3%	20.0%	-7.4%	11.1%	4.5%
1978	45yr	24.0%	17.9%	19.5%	14.5%	19.8%	19.6%	6.4%	11.5%	4.7%
1979	44yr	35.7%	17.7%	20.5%	102.5%	19.9%	23.8%	18.2%	11.6%	5.5%
1980	43yr	19.3%	17.3%	20.5%	32.8%	18.5%	24.3%	32.3%	11.5%	7.0%
1981	42yr	31.4%	17.3%	21.1%	31.8%	18.1%	24.7%	-5.0%	11.0%	6.3%
1982	41yr	40.0%	17.0%	22.0%	38.4%	17.8%	25.5%	21.4%	11.5%	7.0%
1983	40yr	32.3%	16.4%	22.6%	69.0%	17.4%	27.4%	22.4%	11.2%	7.8%
1984	39yr	13.6%	16.1%	22.1%	-2.7%	16.3%	25.7%	6.1%	11.0%	7.7%
1985	38yr	48.2%	16.1%	23.2%	93.7%	16.8%	28.3%	31.6%	11.1%	8.7%
1986	37yr	26.1%	15.4%	23.3%	14.2%	15.2%	27.6%	18.6%	10.6%	9.1%
1987	36yr	19.5%	15.1%	23.2%	4.6%	15.3%	26.5%	5.1%	10.4%	9.0%
1988	35yr	20.1%	15.0%	23.0%	59.3%	15.6%	27.8%	16.6%	10.5%	9.3%
1989	34yr	44.4%	14.8%	23.8%	84.6%	14.5%	29.6%	31.7%	10.3%	10.1%
1990	33yr	7.4%	14.0%	23.2%	-23.1%	12.8%	27.1%	-3.1%	9.8%	9.6%
1991	32yr	39.6%	14.2%	23.7%	35.6%	14.2%	27.4%	30.5%	10.2%	10.3%
1992	31yr	20.3%	13.5%	23.6%	29.8%	13.6%	27.5%	7.6%	9.6%	10.2%
1993	30yr	14.3%	13.3%	23.3%	38.9%	13.1%	27.8%	10.1%	9.7%	10.2%
1994	29yr	13.9%	13.2%	22.9%	25.0%	12.3%	27.7%	1.3%	9.6%	9.9%
1995	28yr	43.1%	13.2%	23.5%	57.4%	11.8%	28.6%	37.6%	9.9%	10.6%
1996	27yr	31.8%	12.2%	23.8%	6.2%	10.4%	27.8%	23.0%	9.0%	11.0%
1997	26yr	34.1%	11.5%	24.1%	34.9%	10.6%	28.0%	33.4%	8.5%	11.6%
1998	25yr	48.3%	10.7%	24.7%	52.2%	9.7%	28.7%	28.6%	7.6%	12.1%
1999	24yr	0.5%	9.4%	24.0%	-19.9%	8.2%	27.0%	21.0%	6.8%	12.3%
2000	23yr	6.5%	9.8%	23.5%	26.6%	9.7%	27.0%	-9.1%	6.3%	11.7%
2001	22yr	-6.2%	9.9%	22.6%	6.5%	8.9%	26.4%	-11.9%	7.0%	11.0%
2002	21yr	10.0%	10.8%	22.2%	-3.8%	9.1%	25.5%	-22.1%	8.0%	9.9%
2003	20yr	21.0%	10.8%	22.2%	15.8%	9.8%	25.2%	28.7%	9.8%	10.4%
2004	19yr	10.5%	10.3%	21.9%	4.3%	9.4%	24.6%	10.9%	8.9%	10.4%
2005	18yr	6.4%	10.3%	21.5%	0.8%	9.7%	24.0%	4.9%	8.8%	10.3%
2006	17yr	18.4%	10.5%	21.4%	24.1%	10.3%	24.0%	15.8%	9.0%	10.4%
2007	16yr	11.0%	10.0%	21.1%	28.7%	9.5%	24.1%	5.5%	8.6%	10.3%
2008	15yr	-9.6%	10.0%	20.3%	-31.8%	8.3%	22.4%	-37.0%	8.8%	8.9%
2009	14yr	19.8%	11.5%	20.3%	2.7%	11.9%	22.0%	26.5%	13.1%	9.3%
2010	13yr	13.0%	10.9%	20.2%	21.4%	12.7%	22.0%	15.1%	12.2%	9.4%
2011	12yr	4.6%	10.7%	19.8%	-4.7%	12.0%	21.3%	2.1%	11.9%	9.2%
2012	11yr	14.4%	11.3%	19.7%	16.8%	13.6%	21.2%	16.0%	12.9%	9.4%
2013	10yr	18.2%	11.0%	19.7%	32.7%	13.3%	21.5%	32.4%	12.6%	9.8%
2014	9yr	8.3%	10.2%	19.4%	27.0%	11.4%	21.6%	13.7%	10.6%	9.9%
2015	8yr	6.4%	10.5%	19.2%	-12.5%	9.5%	20.8%	1.4%	10.2%	9.7%
2016	7yr	10.7%	11.1%	19.0%	23.4%	13.1%	20.8%	12.0%	11.5%	9.7%
2017	6yr	23.0%	11.1%	19.1%	21.9%	11.5%	20.9%	21.8%	11.4%	9.9%
2018	5yr	0.4%	8.9%	18.7%	2.8%	9.5%	20.5%	-4.4%	9.4%	9.7%
2019	4yr	23.0%	11.1%	18.8%	11.0%	11.3%	20.3%	31.5%	13.2%	10.0%
2020	3yr	9.8%	7.4%	18.6%	2.4%	11.3%	20.0%	18.4%	7.7%	10.2%
2021	2yr	19.5%	6.3%	18.6%	29.6%	16.1%	20.1%	28.7%	2.7%	10.5%
2022*	1yr	-5.5%	-5.5%	18.2%	4.0%	4.0%	19.8%	-18.1%	-18.1%	9.9%

*Internally estimated BRK BVPS

Fiscal years 1965 and 1966 end September 30. 1967 is five quarters ended December 31. S&P 500 returns are likewise adjusted.

Interpreting the table is straightforward. The three components, change in book value per share and total returns for Berkshire's shares and for the S&P 500 have three columns associated with each. You are comparing the first column in each set of three columns with the first column for the others, then comparing the middle columns with the middle columns and the third columns with the third columns. The first column in each set of three is the annual percentage change. Thus, for 2022 Berkshire's book value declined by 5.5%, the stock price gained 4.0% and the S&P 500 lost 18.1%.

The next, or middle column for each set, is the reverse compound annual return series. These figures are *italicized* and show the 1-year return, 2-year return, 3-year return and so forth, all the way up the page to the 58-year return. I added the second column showing the *1yr, 2yr...* in the table this year to make it easier to discern the yearly compound returns from each other. Now if you want the 37yr return it's easy to identify as 1986 and you are comparing the next three italicized figures.

To illustrate, using the row for 2021, Berkshire's 2yr compound annual change in book value per share is 6.3%, the stock averaged 16.1% while the index gained 2.7% per year. The italicized figure at the top of the table in each column labeled "CAGR from 2022" thus is the annualized return from the outset. So, Berkshire compounded book value by 18.2% for 58 years as the stock averaged 19.8% against only 9.9% for the index.

These three italicized figures for year 1965 at the top of the page match exactly the bottom "CAGR from 1965" numbers seen in the third of each of the three columns. This third column begins with 1965's return and shows the compound annual return for each yearly period beginning at the outset. Thus, at the end of 1998 (underlined), book value per share had compounded by 24.7%, the stock averaged 28.7% and the S&P returned only 12.1%.

1998 is underlined and emphasized to reflect Berkshire's pivot away from its stock portfolio. Acquiring General Re in 1998 reduced the stock portfolio concentration from 115% of book value and 65% of assets to 65% of book value and 30% of assets. The pivot allowed Berkshire to divert material proportionate surplus capital away from common stocks and to wholly-owned businesses such as what are now BHE and BNSF. From that point, book value per share compounded *faster* than Berkshire's stock, which itself compounded *faster* than the stock portfolio, which in turn *outperformed* the S&P 500. By my math, had Berkshire not acquired General Re using its stock as currency in the deal, Berkshire would be worth roughly half of its current value.

Since the table illustrates both forward and backward compound returns, the 4.0% stock price return for 2022 matches the *1yr* 4.0% annual return in the second column. Logically, Berkshire's 49.5% gain in 1965 becomes the one-year return in the "CAGR from 1965" third column.

I encourage you to spend some time with the table. Berkshire, like any company, should see total returns from the stock match returns from the business on a per share basis over time. Berkshire pays no dividend so its returns are all derived via the stock price. The 1.6% annual disparity between Berkshire's 18.2% compound gain in book value per share with its 19.8% stock market return is largely the expansion from the stock beginning at 64.7% of book value in September 1964 and ending closer to 145% of book at year-end 2022, essentially a more than doubling of the multiple to book value over nearly six decades, or 124% of premium return in the stock versus book value. For Berkshire geeks, book value per share began at \$19.46 at the outset of fiscal year 1965 while the stock traded for ~\$12.59 as I estimate it.

Provided shareholder's equity, or book value, remains a meaningful measure, changes in book value per share and in the stock price over time will match what amount of economic earnings Berkshire earns on equity capital. Deriving how much Berkshire earns in economic terms is no simple feat. I like to think

readers of this annual letter are given a framework for understanding the sources of Berkshire's earnings and how it goes about reinvesting those earnings.

Aspersions Cast

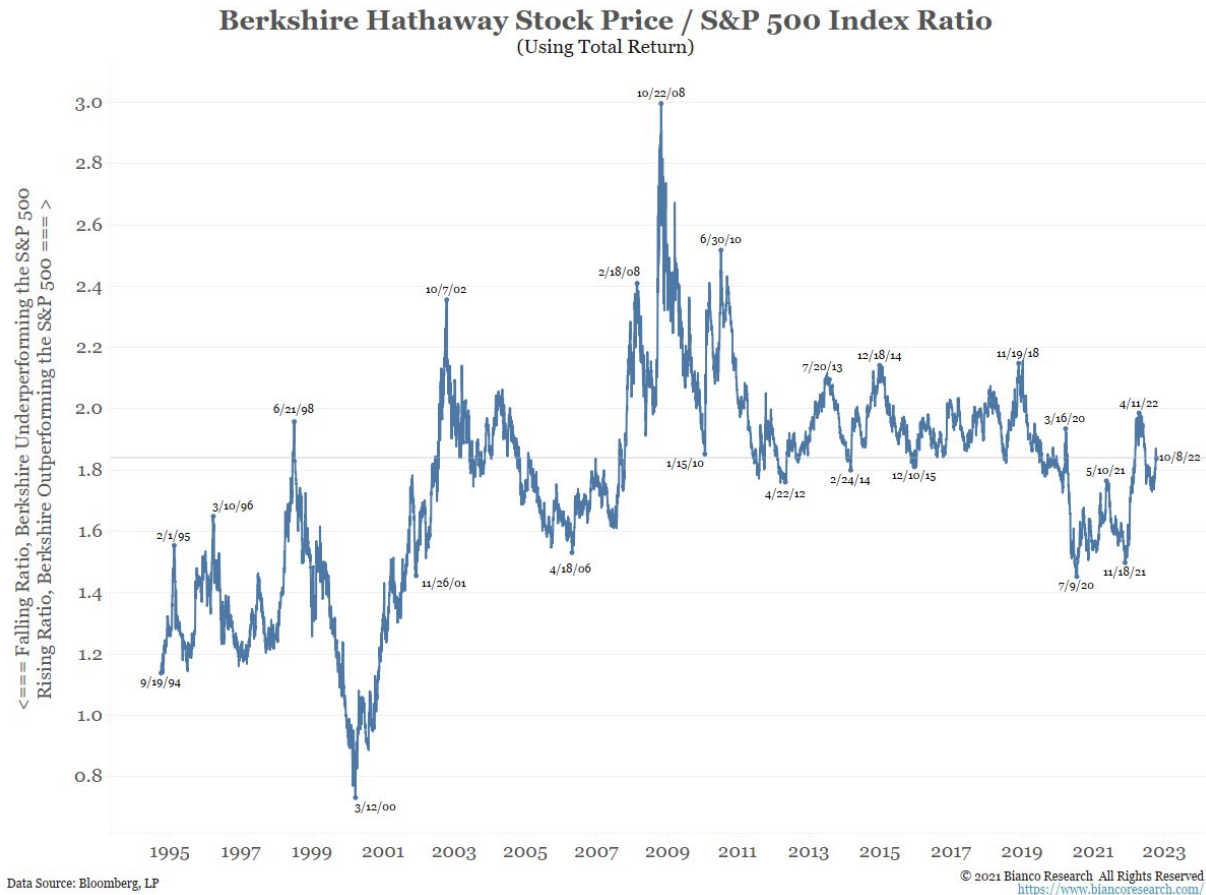
Aristotle observed that success breeds success. It also fosters envy and contempt. Of his 58 years (so far) at the helm of Berkshire, most of the early years were spent amassing perhaps the most extraordinary performance record ever. As the record became more known in widespread investment and media circles, success became familiar. If familiarity breeds contempt and contempt breeds hate, here we have the mindset of the constant Berkshire and Buffett basher.

The critic of Berkshire or its long-standing Chairman and CEO rests on the good years being long gone. None can dispute that the extraordinary years are gone, but you don't have to double the S&P's return over the next decade or six to be good. I publicly offered a wager to a critic a year ago that Berkshire would outperform the index for the next decade, the stake bracketed anywhere from a steak dinner to a two-comma stake. The offer was not accepted.

An eyeball-grabbing headline proclaiming Berkshire has underperformed the S&P 500 for 15 years will find itself oft repeated. An investor might pose the question, "Why own the dog if it's underperformed for a decade and a half?" Had an alternate headline informed that Berkshire underperformed the index for four years, or for eight years, or for fourteen years, the reader might wonder why such unusual time periods were selected to prove the point. Well, in yearly intervals from year one to year 58, there exist only *four* annualized periods where Berkshire actually underperformed. Those are precisely the 4-year, the 8-year, the 14-year and the 15-year return series. In every other compound interval as seen in the performance table two pages earlier, Berkshire wins. The four intervals with Berkshire underperforming are denoted with the numbers colored in red, with returns for the index colored green. If the table were instead shaded with Berkshire's interval *outperformance* in green and index underperformance in red, you might run out of color ink if printing the page.

Year-end 2022 is a convenient time to point out that Berkshire has outperformed the S&P 500 in 55 of 58 yearly intervals, or nearly always. Students of working with period returns know the endpoints selected can have a material impact on the results of a comparison. Shorter intervals are dramatically impacted by the most recent returns. Beating the index by 22.1% last year is going to make the more immediate return comparisons shine in Berkshire's favor. A 4% gain versus an 18.1% loss goes a long way. The delta will add about 2% advantage over a 10-year period but only about 0.3% to a delta over 58 years. Indeed, while Berkshire was ahead by 20.1% to 10.5%, or a 9.6% differential a year ago, its 4% gain shaved its now 58-year return to 19.8% while by losing 18.1% the index compound return dropped to 9.9%. The delta widened from 9.6% annually to 9.9% annually (or 19.8% Berkshire versus 9.9% S&P).

Critics of Berkshire (and also investment marketing departments) are famous for cherry-picking data to prove a point. Take the quotes from Barron's and from Jim Bianco at the outset. Both friends (maybe former friends now) are constant critics of Berkshire's ongoing performance. The fixed-income strategist from Chicago trots out a chart looking a lot like this one to periodically play whack-a-mole with Berkshire's numbers.



See if you can identify the point on the chart that the strategist selected to be able to correctly claim that “BRK is a low beta underperforming stock for 20 years!” The comment was published on October 8, 2022. Lo and behold, precisely 20 years prior marked a peak inflection point in Berkshire’s outperformance. What had happened over the prior roughly 2 ½ years? Ah yes, the stock market was taken to the woodshed while Berkshire’s shares took flight. From the lowest of low points at March 12, 2000 (conveniently a secular market peak) through October 7, 2002, Berkshire gained 40.5% while the S&P 500 lost 44.5% with dividends included. The subsequent 20-year interval from October 8, 2000 to October 8, 2022 saw Berkshire “underperform” by a few basis points. This excludes that prior 85% outperformance, and also excludes the relative comparison just a few days after October 8. From that one day did Berkshire lag.

The correct response to Berkshire’s having *underperformed* for the 20 years ended October 8, 2022 would have been to affirm that truth but to query whether the critic had looked at the 15-, 16-, 17-, 18-, 19-, 21-, 22-, 23-, 24-, 25-, you get the point, intervals as well when Old Man Buffett was delivering body blow after body blow to the index.

In the Semper table of Berkshire’s 58 years of performance, the eagle-eyed reader probably saw that for the 20 years ended 2022 that Berkshire and the S&P 500 tied with respective 9.8% annual returns. In baseball ties go to the runner and in performance calculations when rounding to hundredths and not tenths this tie goes to Berkshire. Point being the two intervals matched. Any subsequent short-term outperformance by either horse in the race would tip the scales away from tie. With Berkshire flat for the year at the date of the February 3, 2023 Barron’s story while the S&P was up 8.6% year to date (which amounts to two days over a month), any historical interval comparison that was tied or nearly tied,

particularly the shorter ones, will likely tilt in favor of the index (depending on the returns dropping off on the front end of the time-bracketed series).

Back to the bond man, whose follow-on comment was a doozie, “His (Warren Buffett) stock picks, the BV chart, have lagged for 13 years. If a mere mortal was this bad, they would be fired and possibly brought up on charges.” Seriously? If Warren Buffett were a mere mortal he’d be fired and brought up on charges? What seems plain-vanilla obvious and cherry-picking chargeable is having to resort to a 13-year interval to prove a point. Who selects 13 years to measure anything. Even the SEC in its new marketing rule mandates the use of a more conventional 1, 5 and 10-year presentation format. But thirteen? Again, as with his 20-year comparison (which lasted for a nanosecond), why choose a starting point 13 years ago. Just as selectively excluding an immediately prior 85% butt kicking in favor of Berkshire’s stock, choosing 13 years using book value per share as a proxy conveniently excludes the Financial Crisis. When Berkshire’s book value per share shed 9.6% in 2008, the S&P 500 received a 37% shellacking. In every interval including 2008 backward, Berkshire wins and wins by a lot. The 15-year interval including 2008 and ending 2022 has Berkshire’s book value beating the index 10.0% to 1.8%. The closest the disparity gets by book value per share is a 1.0% Berkshire advantage for the 20 years 2003 to 2022.

The moral of the story about those with soap boxes preaching about Berkshire underperforming ought either stick with reporting the news, not massaging it to suit a false narrative, or stick with bonds and not cherry picking in the land of stocks and goats. Make that GOATs. Oh, and give me Michael Jordan in a Wizard’s uniform or Warren Buffett at 92 any day.

The GOAT in Pasture? Capital Allocation

She's so fine, there's no tellin' where the money went – Robert Palmer



Speaking of goats, what now is the role of Berkshire's Chairman and CEO at the spry age of 92. It's been five years since Berkshire expanded its Board of Directors from twelve to fourteen and appointed Greg Abel as Vice Chairman for Non-Insurance Businesses and Ajit Jain as Vice Chairman for Insurance Operations. At around that point, Greg was charged with assuming many of Mr. Buffett's duties, largely day-to-day oversight of Berkshire's myriad non-insurance businesses. Most of Berkshire's subsidiaries were direct reports to Buffett, who oversaw big capital decisions at the subsidiaries as well as crafting compensation structures for each subsidiary's heads. Greg now largely wears those hats.

The CEO was left with the one thing that made Berkshire Berkshire under his watch since 1965. With a nod to Robert Palmer, that's **CAPITAL ALLOCATION**. The role has been and continues to be played masterfully. Simply irresistible.

There exist but a handful of capital allocation tools available to company managements. The analyst can search high and low, at present and across time, and not find a company that's allocated capital better than Berkshire, or for longer.

The Tools of Capital Allocation Available to Management

- Internal Spending: Capex, R&D, Advertising
- Dividends: Pay / Increase or Reduce / Suspend
- Debt: Pay Down or Take on New, Including Shifting Terms
- Acquisitions: Using Company Stock, Cash, Debt, or a Combination
- Repurchase Shares: Open Market and Via Tender Offer
- Issue Shares: Sell to Raise New Capital; Issue to Executives (a C-Suite Favorite)
- Increase Employee Wages
- Business Jet(s): Also New HQ; Art; Birthday Party with Vodka-Micturating Cherub Ice Sculpture

One tool Berkshire does not employ is payment of a dividend. Thank goodness for that. Money to spend in Berkshire's hands is better than money held elsewhere. With the exception of a single \$0.10 per share dividend paid in 1967, Berkshire under Warren Buffett's watch never distributed profit to shareholders. I bet they would like to have that dime per share back given the subsequent record. Ten cents invested in Berkshire in 1967 is now \$2,475. Next time you see a dime on the sidewalk, pick it up, put it in a jar, and once you have enough dimes saved up, buy a B share. A company retaining all profit needs to have a home for reinvestment and intelligent deployment. The majority of businesses squander retained profit and do not spend it for the long-term benefit of the shareholder, aka the owner. That has never been the case at Berkshire. It doesn't mean they don't make investment mistakes – there have been plenty. But the cumulative record, forward and backward, speaks for itself. And you won't find ice sculptures at Berkshire HQ corporate outings. Or cherubs...

Berkshire occasionally uses its shares as currency in making acquisitions but has not done so since partially financing its 2010 purchase of BNSF with shares. Previously it acquired General Re using entirely \$22 billion worth of Berkshire shares trading for nearly three times book value in 1998. The stock traded for north of two times book value during much of the 1990s and Berkshire spent it in a number of

acquisitions. I won't rehash the brilliance of the Gen Re deal in this year's letter. The past couple letters delved into the economics of what Berkshire gained and gave up in the acquisition. Any investor or manager of a public company charged with strategy should be able to recite exactly what Berkshire did in that acquisition before undertaking any deals of their own.

Excessive executive compensation is not a thing at Berkshire. Its Chairman and CEO as well as its Vice Chairman have been paid matching \$100,000 salaries for decades. They earn no bonus and have never been awarded a share of stock in any form as compensation. Every employee owning stock in Berkshire paid for their shares out of pocket. The same goes for the Board of Directors, who are paid \$2,100 annual compensation and as much as \$6,100 if they chair various committees. You don't go to Berkshire's Board to get rich; you go to preserve the culture of the place. Greg Abel recently sold his 1% ownership position in BHE to Berkshire. He turned around and purchased 168 A shares, bringing his total to 173 A shares and 2,363 B shares. I expect Greg to materially increase his ownership of Berkshire over time, all with purchases out of pocket. Ajit Jain is a regular purchaser of Berkshire shares, owning 316 A shares and 170,958 B shares as of last year's proxy. He regularly makes gifts of shares to charity from his \$135 million position. You won't find another management team and Board of Directors anywhere in the world that both own more dollar value in their company and were never given a share by the company.

The company generally operates with net cash on the balance sheet. That likely won't be the case at year-end 2022 after purchasing Alleghany for \$11.6 billion cash in October. The majority of debt is used at the energy operation, BHE, as well as at the BNSF railroad. Debt at these two subsidiaries is not hypothecated to the parent company and is utilized conservatively and in conformity with how each respective industry is capitalized. In 2022, Berkshire earned more interest on its roughly \$110 billion in average cash and T-bill balance than it paid on its \$116 billion in outstanding debt obligations. Think about that.

Berkshire is a gargantuan operation. It is the largest company in the world when measured by tangible assets (money-center banks control more gross assets on vastly more leverage than Berkshire employs). Firm assets will total on the order of \$927 billion at year-end 2022. Shareholders' equity is expected to be \$473 billion. Berkshire's stock portfolio largely resides in its insurance operation and will total \$316 billion, which excludes another \$25.5 billion invested in the common shares of Kraft Heinz and Occidental Petroleum that are treated as equity method investments. Cash balances have run north of \$100 billion for the last five years (but may dip below at year-end after paying for Alleghany in October).

Berkshire allocates cash earned from its operations (or the portion of economic profit earned as cash) in four primary activities.

1. Repurchases: Over the past five years Berkshire has repurchased its shares at material discounts to intrinsic value (it spends shares on acquisitions but only when the stock isn't undervalued);
2. Net Purchases of Common Stocks: Using Berkshire's growing insurance reserves and surplus capital in the insurance operation;
3. Acquisitions: It acquires entire businesses or partial controlling interests in entire businesses. Some deals are substantial while some are smaller bolt-on acquisitions for its myriad operating subsidiaries; and
4. Fixed Assets: Finally, Berkshire invests capital in fixed assets to grow its energy operation and elsewhere in excess of maintenance requirements. The energy business *retains all profit* and on a roughly dollar-for-dollar basis augments all retained earnings with a like amount of debt. The combination of equal portions equity and debt capital finance expansion of power generating and distribution on a regulated return basis, much of which is heavily subsidized with tax credits and incentives for capital spending.

Whether using cash flow from operations or my definition of GAAP-adjusted economic earnings, a portion of Berkshire's "profit" is already accounted and not available for Berkshire's direct use on capital allocation activities. To illustrate, cash flow from operations will total just over \$40 billion in 2022. My estimate of economic earning power is \$53.9 billion. Cash flow from operating activities includes depreciation expense. While it's a non-cash expense, every bit of it is real in Berkshire's case. I assume maintenance capital expense roughly matches depreciation expense, a relationship that has held over time. You won't find regular charges against assets, equity and earnings. Maintenance capital must be spent from operating cash flow and is thus removed from discretionary spending on the "good stuff." For 2022, \$40 billion in operating cash flow is reduced by \$9.6 billion in depreciation expense leaving just north of \$30 billion for capital allocation. Alternatively, Semper's estimate of economic earnings includes the portion of its stock market holdings profits that are not distributed to Berkshire as dividends. At a 12/31/2022 run rate, those profits retained by Apple, Bank of America, Coca-Cola, Chevron and the rest amount to \$17.7 billion, reducing \$53.9 billion in economic earnings to about \$36 billion. There are a number of additional non-cash adjustments to GAAP earnings that reduce funds available for allocation closer to \$32 billion. It's reasonable to think about investable cash at the current rate of about \$8 billion a quarter (holding debt outstanding and cash balances constant).

Let's examine where Berkshire spent its operating cash flow over the last five years in aggregate. There is a lumpiness to when Berkshire spends in certain areas in any individual year that lends to analysis over a longer, more intermediate timeframe. We'll look at the last five years in aggregate and then at the extraordinary 2022 in isolation.

Berkshire Hathaway Investable Cash Flow and Capital Allocation 2018 – 2022; Dollars in Billions

	Past 5 years	Average	2022	2021	2020	2019	2018
Cash Flow from Operations	195.3	39.1	40.0	39.4	39.8	38.7	37.4
Depreciation/Maintenance Capex	45.5	9.1	9.6	9.5	9.3	8.7	8.4
Investable Cash Flow	149.8	30.0	30.4	30.0	30.5	29.9	29.0
Capital Allocation	174.7	34.9	75.3	23.9	22.3	18.1	35.2
Berkshire Share Buybacks	65.2	13.0	7.2	27.1	24.7	4.9	1.3
Net Purchases of Common Stocks	63.6	12.7	50.9	-7.4	-8.6	4.3	24.4
Growth Capex	26.2	5.2	5.4	3.8	3.7	7.2	6.2
Acquisitions of Businesses	19.7	3.9	11.8	0.5	2.5	1.7	3.3
Other	4.1	0.8	3.3	-3.2	4.6	1.8	-6.2
Net Proceeds from Debt	11.3	2.3	-0.3	-0.8	6.8	6.1	-4.1
Net Change in Cash	-17.8	-3.6	-48.5	8.4	10.3	16.1	-4.1

Berkshire earned \$195.3 billion in cash flow from operations over the past five years. Maintenance capital expense is real and non-discretionary so sent \$45.5 billion out the door, leaving about \$150 billion remaining for investable cash for capital allocation.

Share Buybacks

Share buybacks matched net purchases of common stocks and between the two consumed the majority of cash spent. Buybacks were greatest in 2020 and 2021. Over the five years Berkshire's repurchased 11.1% of its shares outstanding, reducing the A-share-equivalent count from 1,644,846 to 1,461,531. Berkshire invested \$65.2 billion to repurchase 183,315 shares at a \$355,721 average price, or 109.9% of 2022 year-end book value (which likely declined by 5.5% last year). That equates to 12.5x average economic earnings, or an 8% earnings yield. This is how share repurchases should work.

Net Purchases of Common Stocks

Purchases of common stocks, largely for the insurance investment portfolio, consumed \$63.6 billion of cash over the last five years. More than all of the buying was done in 2022 and 2018, which happen to be the two years when the stock portfolio declined in value. The portfolio traded at 12.4x earnings at the end of 2018 and 13.6x most recently. It just so happens that Berkshire was a net seller of stocks in 2020 and 2021, not coincidentally the two years when it was the largest net buyer of its own stock.

Activity in common stocks added a veritable ton of less-than-apparent earning power to Berkshire's core profitability. For perspective, Berkshire's cash flow from operations grew from roughly \$37 billion to what should be just over \$40 billion this year. My estimate of Berkshire's economic earnings grew from \$31.8 billion at year-end 2017 to an estimated \$53.9 billion today. The 2017 figure is adjusted to reflect an immediate upward change in profitability thanks to the 2017 TCJA tax code change. The five-year compound growth in economic earnings is 11.1% while cash flow from operations merely grew by 1.6% per year. The key difference is an enormous increase in earnings from Berkshire's common stock portfolio. Over five years Berkshire added \$63.6 billion in net purchases to what was a \$170 billion portfolio at year-end 2017. While the portfolio advanced by an additional \$82 billion in unrealized gain, the price to earnings multiple declined from 17.8x to 13.6x. For those that think reflexively about earnings yield and not P/Es, that's a 7.3% earnings yield today up from 5.6% a year ago. Holding any price changes aside, the stock portfolio produces \$23.2 billion in earnings for Berkshire's benefit up from only \$9.5 billion five years ago. Dividends grew 49% while the "retained earnings" portion of profit swelled by 205%, from \$5.8 billion to a whopping \$17.7 billion.

	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22
Market Value **	\$170 B	\$173 B	\$237 B ^	\$278 B ^	\$351 B ^	\$316 B ^
Earnings	\$9.5 B	\$13.5 B	\$14.8 B	\$14.4 B	\$17.5 B	\$23.2 B
Dividends	\$3.7 B	\$3.7 B	\$4.5 B	\$4.3 B	\$5.1 B	\$5.5 B
Retained Earnings of Investees	\$5.8 B	\$9.8 B	\$10.3 B	\$10.1 B	\$12.5 B	\$17.7 B
Price to Earnings (P/E)	17.8x	12.4x	16.3x	19.3x	19.1x	13.6x
Earnings Yield (E/P)	5.6%	8.0%	6.1%	5.2%	5.1%	7.3%
Dividend Yield	2.2%	2.2%	1.9%	1.5%	1.4%	1.7%
Retained Earnings Yield	3.4%	5.8%	4.2%	3.6%	3.6%	5.6%
Dividend Payout Ratio	39%	27%	30%	30%	29%	30%

Earnings from the stock portfolio comprise 43% of Berkshire's \$53.9 billion economic profit, up from 30% five years ago. Only \$5.5 billion of dividends are included in cash flow from operations. Those ignoring the \$17.7 billion in earnings retained by Apple and the others as not inuring for Berkshire's benefit will materially undervalue Berkshire's intrinsic value. Further, if the stock portfolio earns more than today's 7.3% earnings yield, one can add any additional return to Berkshire's economic earnings. Any premium gain is excluded from my GAAP adjusted earnings. The \$82 billion in additional unrealized gain is not imaginary, particularly not on a portfolio now trading for 13.6x earnings, the lowest valuation on the stock portfolio since 2018.

Growth Capex

Following share repurchases and net purchases of stocks, growth capex consumed the next largest slug of investment over the past five years. Berkshire spent \$26.2 billion on capex in excess of depreciation expense or an average \$5.2 billion per year. Growth capex at BHE consumed nearly two-thirds of the total. The energy operation consisting of three electric utilities and a wide-spanning network of energy pipelines and other distribution assets is rapidly expanding wind and solar generating capacity with the new electric grid needed to send power from remote locations to where it is needed. Conventional natural gas pipelines are properly maintained, but it's the retention of earnings and ongoing investment in heavily subsidized and regulated power creation assets that will make BHE Berkshire's second largest operation in less than five years.

Additional capex was spent in the immediate years following Berkshire's purchase of BNSF in 2010. Adding capacity to its network, expanding tunnels to accommodate dual-stacked intermodal traffic and adding multiple rails of track in heavily traversed corridors greatly improved the capacity and efficiency of the railroad. From a rate of spending double maintenance capex to now only spending a bit more than 30% above depreciation, there is little more that the railroad can do on the growth front. Maintenance capex will always run somewhat higher than depreciation in railroads. BNSF economically earns more than 13% on equity capital (which includes nearly \$15 billion in goodwill from the acquisition). It would not be nearly as profitable without Berkshire committing to as much growth capex in its early years of ownership. No longer, however, will the rail be a big source of accretive capital allocation.

The balance of growth capex is spent among Berkshire's myriad manufacturing and service businesses. The leasing operation provides a terrific use of capital.

Acquisitions of Businesses

Berkshire spent nearly \$20 billion over five years making a number of bolt-on acquisitions and finally in 2022 a purchase of insurance competitor Alleghany for \$11.6 billion cash in October. The media and Berkshire's critics yearn for the big headline deal, the hunted elephant, but rarely pause to consider price and opportunity cost. An insane mountain of private equity and venture money, not to mention SPACs, is in competition to put money to work. Berkshire buys knowable and predictable durable earning power, but only does so when the price is right. When faced with control premiums allowing for mid-to-low-single-digit earnings yields, opportunity cost would suggest buying common stocks when on sale at high-single-digit earnings yields (or more) or repurchasing Berkshire itself when on sale. This is precisely what Berkshire has done.

On the bolt-on front, I'd guess we'll see more of this type of activity. Greg Abel spent much of the last five years working with and developing relationships with Berkshire's non-insurance subsidiaries. For years it was logical and easy to default to sending subsidiary profit to Omaha for intelligent redeployment rather than finding equally intelligent or better uses for retained profit in the sub. To the extent profit can be retained at good returns, there will be motivation to do so.

Alleghany is a gem of an investment for Berkshire. Alleghany consists of Trans Re writing \$5 billion of premiums, two specialty insurers writing a combined \$2 billion in premiums and a collection of wholly-owned or majority-owned private businesses with nearly \$1.5 billion in equity capital. Semper first bought shares in the company in the teeth of the pandemic for about half of book value. Berkshire announced its purchase of Alleghany in March of last year for \$11.6 billion, which at the time was a 26% premium to book value. A rising interest rate environment since the deal was struck, coupled with a falling stock market sent Alleghany's \$22 billion investment portfolio downward by about 10%. Coupled with losses from hurricane Ian, the third costliest disaster on record, Berkshire wound up closing the

purchase in October for likely more than 150% of book value. Interestingly, with the deal closing on October 19, the world will never see Alleghany's 3rd quarter 10-Q. Still, for its purchase price Berkshire picks up roughly \$20 billion of investment assets and nearly \$13 billion of float.

Within Berkshire, Alleghany will retain more premium versus laying it off to retrocession, eliminate debt from the balance sheet, distribute annual underwriting profit to Omaha, and thanks to Berkshire's massive surplus capital will reallocate the investment portfolio from 15% in common stocks to more than 70% over time. Roughly three-fourths of Trans Re's business is proportional reinsurance. Profitability lags pricing and price has been very strong over the past couple years. The business stands to be nearly twice as profitable inside of Berkshire, meaning Berkshire paid about six times Alleghany's potential earnings power. Weston Hicks built an insurance powerhouse during his 18-year run as CEO from 2004 through retiring at the end of 2021. He hired Joe Brandon when Joe left Berkshire's Gen Re. Joe replaced Weston at the outset of 2022 and brings a talent-rich team of insurance execs to Berkshire. It's not inconceivable that Joe becomes Ajit Jain's replacement if Ajit retires.

Other

The five-year capital allocation table contains a fifth component, "Other." At \$4.1 billion or roughly \$800 million a year on average, it's a smallish leg which allows cash flow from operations to reconcile with Berkshire's capital allocation and net changes to debt and to cash. Included here are purchases and collections of loans and finance receivables.

Net Change in Cash Balance and Net Change in Debt Outstanding

Over the last five years Berkshire's capital allocation activities exceeded cash flows from operations by \$25 billion, financed by a \$17.8 billion decline in cash and increasing total debt outstanding by \$11.3 billion. Those lamenting Berkshire's lack of activity aren't paying attention. When the Federal Reserve suppressed interest rates in late 2019 and certainly during the pandemic, Berkshire took to the debt markets. In addition to adding \$12.9 billion in net debt during those two years, they took the opportunity to materially lengthen the maturity of outstanding borrowings, locking in record-low borrowing costs on very attractive terms. Berkshire's aggregate \$116 billion in borrowings bear a 3.6% average interest rate. Management of debt outstanding gets little notice but is done exceedingly well at Berkshire.

The "too much cash on Berkshire's balance sheet" crowd had a curve ball thrown their way in 2022. \$75 billion in capital allocation activity likely exceeded cash flow from operations by \$45 billion. \$50.9 billion in net purchases of common stocks was the largest annual outlay in Berkshire's history. Growth capex ran a predicted \$5.4 billion and, with an expected \$2 billion in shares repurchased during the fourth quarter, total repos for the year likely totaled \$7.2 billion. The \$11.6 billion Alleghany purchase closed in October making \$11.8 billion spent acquiring businesses. The huge outlays on capital allocation drew cash down by \$48.5 billion during the year, shrinking cash as a percent of total firm assets to 11% from 17% five years ago.

A final thought on capital allocation. Berkshire first bought stakes in five Japanese trading companies in August 2020, buying roughly 5% of Itochu, Mitsubishi, Mitsui, Sumitomo and Marubeni. In a filing dated November 14, 2022, Berkshire disclosed it had increased its stakes in the five companies to ownership positions of 6.21% in Itochu to 6.75% in Marubeni. Presuming Berkshire spent about \$2 billion in the increased holdings over the prior month or two, see if you can identify where on this 30-year price history of the Japanese yen to the U.S. dollar

Berkshire made its latest investments. As a hint, the yen traded for 150.15 to the U.S. dollar on October 20, 2022, a 32-year high. Yep. The GOAT. Capital allocation at Berkshire. What's not to like?



Japanese Yen/U.S. Dollar 30-Years 12/31/1992 to 12/31/2022; Source: Bloomberg

Last, two critical developments to keep an eye on are components of last year's "Inflation Reduction Act," which does nothing to reduce inflation.

First, a little-noted tax change introduces a 15% alternative minimum tax on "the adjusted financial statement income" of corporations earning over \$1 billion for years beginning after 2022. With Berkshire now including both realized and unrealized appreciation on marketable securities on its income statement, it appears they may be obligated to pay the minimum tax on *unrealized capital gains* on a rolling three-year basis. The notion is insane. I read the entire applicable portion of the bill before signed into law. With hope for an exemption by the Treasury Department, if Berkshire does end up writing checks on unrealized gains, an 8% average price gain on the stock portfolio has them sending \$3 billion to \$4 billion per year on average to Washington *above* what they pay today. If they are harmed by the legislation, I wouldn't expect the law to be on the books for long.

Second, a final ridiculous component of the new law imposes a 1% excise tax on the dollar value of share repurchases beginning this year. This is gross. Berkshire's repurchases since 2018 would have sent \$652 million to the IRS. While excessive executive compensation is troubling, don't tax the offsetting repurchase which masks dilution. Share repurchases are an extremely valuable allocation tool when done well. The abuse is not the repurchase. If you want to tax something, tax the share grant. We elect idiots.

Berkshire Hathaway: Ten-Year Expected Return

What a difference a year makes. Last year at this time, shares in Berkshire had trailed the S&P 500 for the prior decade earning “only” 14.7% to 16.6% for the index. With the index shedding 18.1% in 2022 to Berkshire’s 4% gain, Berkshire is again ahead of the S&P 500 over ten years, 13.3% versus 10.2%.

Those who understand Berkshire and its component parts understand the share price will match the underlying economics of the business over time. Expecting 16.6% in a decade is unrealistic, unless starting from a depressed level or presuming a major expansion in price relative to economic earning power or to the size of its balance sheet. Paying no dividend, Berkshire’s share price will roughly match its return on equity over time, plus or minus any expansion or contraction in its valuation. If the multiple to book value as a measure of valuation holds constant over the next decade, the investor will earn Berkshire’s return on equity. The same statement can be made holding the price to earning power constant. For the last decade, while the stock compounded by 13.3%, book value per share grew by 11.0%. For the past 20 years the stock gained 9.8% annually while book value per share grew 10.8%. I’d be very surprised if Berkshire compounds either measure by less than 10% per annum.

The following table was included in the Semper 2015 annual letter and has been updated annually. Over the ensuing seven years, our estimate of Berkshire’s economic earning power more than doubled from \$25 billion to \$53.9 billion at year-end 2022. That’s an 11.6% compound rate of growth. Over the same stretch, Berkshire’s market cap expanded from \$325 billion to \$685 billion, or 11.2%, yet the stock compounded 13.1%, fully 1.9% greater. How can the stock compound faster than the market cap? Share repurchases, naturally. Berkshire began repurchasing shares in 2018, and over the next five years, has shrunk its share count 11.1%.

Annual Progression of Berkshire’s Market Cap, Profit, Multiple and Stock Price Change

	2014	2015	2016	2017	2017	2018	2019	2020	2021	2022	2023 (e) At Int Val
Market Cap	\$371 B	\$325 B	\$401 B	\$489 B	\$489 B	\$502 B	\$552 B	\$537 B	\$665 B	\$685 B	\$1,018 B
Net Income	\$23 B	\$25 B	\$27.5 B	\$29.1 B	\$31.8B (H)	\$36.4 B	\$42.1B	\$41.1 B* add \$2.9 B	\$46.9 B	\$53.9 B	\$56.6 B
P/E	16.1x	13.0x	14.6x	16.8x	15.4x	13.8x	13.1x	13.1x	14.2x	12.7x	18x
Earnings Yield	6.2%	7.7%	6.9%	6.2%	6.5%	7.3%	7.6%	7.7%	7.1%	7.2%	5.60%
Gain in Stock Price		-12.5%	23.4%	21.9%	21.9%	2.8%	11.0%	2.4%	29.6%	4.0%	48.60%

Source: Berkshire Hathaway; Semper Augustus

Depending on Berkshire’s market valuation and opportunity cost among each capital allocation lever, the rate at which Berkshire buys back its own shares will dictate how large Berkshire becomes. The greater the repurchases, the less retained earnings reinvested and the slower Berkshire grows. If Berkshire repurchases no additional shares and assuming an average 10% return on equity (on current equity *and* on incremental equity), then Berkshire should double in size over seven years. Assuming an extreme repurchase program consuming 100% of profit, Berkshire only grows organically and not at all from reinvested earnings. The more shares Berkshire buys as a proportion of cash earned from operations; the less Berkshire will grow by dollar size. Fewer repurchases mean more retained capital for growth via investment.

Last year’s letter included a table illustrating two sets of projected 10-year returns. The two cases had Berkshire earning either 8% on equity per year or 10%. For both, half of profit was assumed spent repurchasing shares at five multiples to book value ranging from half of book to twice book. The most

likely range where Berkshire would repurchase shares and levels at which the shares will trade fall between 120% of book value and 150% presumed profits under the 8% and 10% return on equity scenarios were capitalized at 13-, 15-, 18- and 20x earnings. I'm embarrassed to note the table had an error in the compound annual growth formula and overstated expected returns for all cases. Two eagle-eyed readers of the letter noted the error – Mike Scanlon, a software engineer in Hong Kong, and Andrew Millette, an analyst at Akre Capital in Virginia. It should have been intuitively obvious that a repurchase at book value of a company earning 10% on book value and assuming no future change in the multiple to book will earn the return on equity, not more. I've built all of my Berkshire reconciling models by hand and should have been more vigilant double checking the math when introducing a CAGR formula to the projection.

I'm relieved in a way that the table contained the error. In choosing an 8% bear-case return on equity and a 10% base case, the model immediately calculates next year's profit at the assumed ROE. In fact, Berkshire is earning more than 10% on equity, earning 11.4% at year-end 2022. Presuming an 8% return drops this year's \$53.9 billion to an impossibly ridiculous \$37.8 billion which would then compound at 4% annually to \$56 billion in a decade. Berkshire should be earning \$56 billion next year.

This year's table thus presents two more logical return on equity cases, 10% and 12%. A 12% return on equity assumption for Berkshire may sound aggressive but know that my GAAP-adjusted earnings assume Berkshire *only* earns the earnings yield on the equity portfolio. At today's 13.6 P/E and 7.3% earnings yield, should the stock portfolio instead earn 10.3% annually, 3.0% above the earnings yield, that adds \$9.5 billion pretax to today's \$53.9 billion economic earnings.

As was the presentation in last year's table, the higher ROE case is shaded in green, with profit at a 12% return on equity, capitalized at 18x earnings. Under the base, if shares are bought back at 120% of book value, \$95.9 billion in net income capitalized at 18x yields a market capitalization of \$1.726 trillion. The earnings projection at \$95.9 billion is constant across cases using a 12% return on equity. Half of profit is assumed retained. That half of profit is assumed earning 12% incrementally. The multiple paid to book value dictates how many shares can be repurchased, the lower the multiple allowing for more shares to be bought.

Continuing with the 12% ROE and repurchases at 120% of book value, on a share count of 787 million, a 5% decline per year, the shareholder earns 321% over the next decade at a terminal 20x P/E multiple, an annual return of 15.5%. On a more modest increase in the multiple to earnings, at 15x the annual return drops to 13.4%.

Worth mentioning in understanding the math behind the tables, the valuation begins at the outset at today's 12.7x P/E and with Berkshire earning 11.4% on equity. If either 10% or 12% ROE case had an intersecting row and column for a terminal P/E and ROE matching today, the investor would earn the ROE. The 10% ROE case shaded green pulls today's \$53.9 billion profit down by 12.3% to \$47.3 billion (10.0/11.4) while the 12% ROE case elevates current profit by 5.3%, or \$56.7 billion.

**Ten-Year Expected Return at Year-End 2032 With ROE at 10% and 12%
Share Repurchases With 50% of Normalized Annual Profits Illustrated
2023 Initial Valuation: 11.4% ROE, 12.7x P/E, 1.45x P/B**

		Repurchase with 50% of profits at 50% of BV						Repurchase with 50% of profits at 50% of BV			
		10-Year: 2032 10% ROE (\$53.9B base)						10-Year: 2032 12% ROE (\$53.9B base)			
		13x	15x	18x	20x			13x	15x	18x	20x
Repurchase with 50% of profits at 50% of BV	Market Cap	954	1,101	1,321	1,468	Market Cap	1,247	1,438	1,726	1,918	
	Net Income	73.4	73.4	73.4	73.4	Net Income	95.9	95.9	95.9	95.9	
	Share count	510	510	510	510	Share count	407	407	407	407	
	P/E	13	15	18	20	P/E	13	15	18	20	
	Earnings Yield	7.7%	6.7%	5.6%	5.0%	Earnings Yield	7.7%	6.7%	5.6%	5.0%	
	Stock Price Change	299%	361%	453%	514%	Stock Price Change	553%	654%	805%	905%	
	Annual Gain Per Year	14.9%	16.5%	18.7%	19.9%	Annual Gain Per Year	20.6%	22.4%	24.6%	26.0%	
	Share Count Reduction	65%	65%	65%	65%	Share Count Reduction	72%	72%	72%	72%	
	Annual Share Reduction	10.0%	10.0%	10.0%	10.0%	Annual Share Reduction	12.0%	12.0%	12.0%	12.0%	
		Repurchase with 50% of profits at 100% of BV						Repurchase with 50% of profits at 100% of BV			
		10-Year: 2032 10% ROE (\$53.9B base)						10-Year: 2032 12% ROE (\$53.9B base)			
		13x	15x	18x	20x			13x	15x	18x	20x
Repurchase with 50% of profits at 100% of BV	Market Cap	954	1,101	1,321	1,468	Market Cap	1,247	1,438	1,726	1,918	
	Net Income	73.4	73.4	73.4	73.4	Net Income	95.9	95.9	95.9	95.9	
	Share count	875	875	875	875	Share count	787	787	787	787	
	P/E	13	15	18	20	P/E	13	15	18	20	
	Earnings Yield	7.7%	6.7%	5.6%	5.0%	Earnings Yield	7.7%	6.7%	5.6%	5.0%	
	Stock Price Change	133%	168%	222%	258%	Stock Price Change	238%	290%	368%	420%	
	Annual Gain Per Year	8.8%	10.4%	12.4%	13.6%	Annual Gain Per Year	12.9%	14.6%	16.7%	17.9%	
	Share Count Reduction	40%	40%	40%	40%	Share Count Reduction	46%	46%	46%	46%	
	Annual Share Reduction	5.0%	5.0%	5.0%	5.0%	Annual Share Reduction	6.0%	6.0%	6.0%	6.0%	
		Repurchase with 50% of profits at 120% of BV						Repurchase with 50% of profits at 120% of BV			
		10-Year: 2032 10% ROE (\$53.9B base)						10-Year: 2032 12% ROE (\$53.9B base)			
		13x	15x	18x	20x			13x	15x	18x	20x
Repurchase with 50% of profits at 120% of BV	Market Cap	954	1,101	1,321	1,468	Market Cap	1,247	1,438	1,726	1,918	
	Net Income	73.4	73.4	73.4	73.4	Net Income	95.9	95.9	95.9	95.9	
	Share count	955	955	955	955	Share count	875	875	875	875	
	P/E	13	15	18	20	P/E	13	15	18	20	
	Earnings Yield	7.7%	6.7%	5.6%	5.0%	Earnings Yield	7.7%	6.7%	5.6%	5.0%	
	Stock Price Change	113%	146%	195%	228%	Stock Price Change	204%	251%	321%	368%	
	Annual Gain Per Year	7.9%	9.4%	11.4%	12.6%	Annual Gain Per Year	11.8%	13.4%	15.5%	16.7%	
	Share Count Reduction	35%	35%	35%	35%	Share Count Reduction	40%	40%	40%	40%	
	Annual Share Reduction	4.2%	4.2%	4.2%	4.2%	Annual Share Reduction	5.0%	5.0%	5.0%	5.0%	
		Repurchase with 50% of profits at 150% of BV						Repurchase with 50% of profits at 150% of BV			
		10-Year: 2032 10% ROE (\$53.9B base)						10-Year: 2032 12% ROE (\$53.9B base)			
		13x	15x	18x	20x			13x	15x	18x	20x
Repurchase with 50% of profits at 150% of BV	Market Cap (billions)	954	1,101	1,321	1,468	Market Cap	1,247	1,438	1,726	1,918	
	Net Income	73.4	73.4	73.4	73.4	Net Income	95.9	95.9	95.9	95.9	
	Share count	1,041	1,041	1,041	1,041	Share count	972	972	972	972	
	P/E	13	15	18	20	P/E	13	15	18	20	
	Earnings Yield	7.7%	6.7%	5.6%	5.0%	Earnings Yield	7.7%	6.7%	5.6%	5.0%	
	Stock Price Change	95%	126%	171%	201%	Stock Price Change	174%	216%	279%	321%	
	Annual Gain Per Year	6.9%	8.5%	10.5%	11.6%	Annual Gain Per Year	10.6%	12.2%	14.3%	15.5%	
	Share Count Reduction	29%	29%	29%	29%	Share Count Reduction	34%	34%	34%	34%	
	Annual Share Reduction	3.3%	3.3%	3.3%	3.3%	Annual Share Reduction	4.0%	4.0%	4.0%	4.0%	
		Repurchase with 50% of profits at 200% of BV						Repurchase with 50% of profits at 200% of BV			
		10-Year: 2032 10% ROE (\$53.9B base)						10-Year: 2032 12% ROE (\$53.9B base)			
		13x	15x	18x	20x			13x	15x	18x	20x
Repurchase with 50% of profits at 200% of BV	Market Cap	954	1,101	1,321	1,468	Market Cap	1,247	1,438	1,726	1,918	
	Net Income	73.4	73.4	73.4	73.4	Net Income	95.9	95.9	95.9	95.9	
	Share count	1,135	1,135	1,135	1,135	Share count	1,078	1,078	1,078	1,078	
	P/E	13	15	18	20	P/E	13	15	18	20	
	Earnings Yield	7.7%	6.7%	5.6%	5.0%	Earnings Yield	7.7%	6.7%	5.6%	5.0%	
	Stock Price Change	79%	107%	148%	176%	Stock Price Change	147%	185%	242%	280%	
	Annual Gain Per Year	6.0%	7.5%	9.5%	10.7%	Annual Gain Per Year	9.5%	11.0%	13.1%	14.3%	
	Share Count Reduction	22%	22%	22%	22%	Share Count Reduction	26%	26%	26%	26%	
	Annual Share Reduction	2.5%	2.5%	2.5%	2.5%	Annual Share Reduction	3.0%	3.0%	3.0%	3.0%	

Let's analyze the 10% return on equity case for a moment. We are again hammering next year's profit down to a 10% ROE with book value only growing by 5% (because half of profits are not retained but are spent buying shares). 2023 earnings become \$47.3 billion, a 12.2% decline. Profits only grow to \$73.4 billion by 2032, 5% annual growth from a depressed base. Using today's actual \$53.9 billion profit figure, growth by 3.1% gets us to \$73.4 billion. Seems unlikely to be so low, even with half of profit dedicated to share repurchase.

The two scenarios at the bottom of the page suggest Omaha goes crazy and spends half of profit buying shares at twice book value. That's at a 5% earnings yield in the 10% ROE case and a 6% earnings yield in the 12% ROE case. Who would buy shares back at such prices? Well, the aggregate of the S&P 500 spends 60% of annual profit buying shares at 5% earnings yields or below for the better part of the last two decades. That's in part how the S&P compounds at 6.3% since 1999. Should Berkshire follow suit, allowing for P/E expansion from today's 12.7x to 13x, with Berkshire earning a lower 10% on equity and buying shares at twice book, the stock compounds by 6.0% per year for the next decade.

The table illustrates unlikely extremes for repurchasing shares as low as half of book and twice book value. The more realistic scenarios would place repurchases between 120% and 150% of book value. Should Berkshire maintain its current 11.4% ROE and trade at its current 12.7x multiple to earnings a decade from now, the investor will earn the 11.4% ROE. Bake in your own assumptions about how many shares Berkshire will buy and at what valuation, ongoing profitability and any expected multiple expansion or contraction. Go back to the 58-year performance page and run your finger up the CAGR from 2022 columns for change in book value per share and change in market value per share. I'd guess the 10- and 20-year returns for both are likely to look pretty similar. Should the S&P 500 compound by 16.6%, Berkshire will have more critics than today. Should the index do 6.6%, the index investor will lament not owning the conglomerate.

A more concise summary of the ten-year expected return table, brought to you by world-class editors:

Berkshire PE Multiple -->		13x	15x	18x	20x	13x	15x	18x	20x
Book Value of Repurchase	50%	14.9%	16.5%	18.7%	19.9%	20.6%	22.4%	24.6%	26.0%
	100%	8.8%	10.4%	12.4%	13.6%	12.9%	14.6%	16.7%	17.9%
	120%	7.9%	9.4%	11.4%	12.6%	11.8%	13.4%	15.5%	16.7%
	150%	6.9%	8.5%	10.5%	11.6%	10.6%	12.2%	14.3%	15.5%
	200%	6.0%	7.5%	9.5%	10.7%	9.5%	11.0%	13.1%	14.3%
		Shaded Average = 10.0%				Shaded Average = 13.9%			

Estimating Fourth Quarter and Full-Year GAAP Net Income and Change in Book Value

Expected 2022 Fourth Quarter and Full Year Results

(In billions of USD)	First 9 months	SAI Q4 Est.	SAI 2022 Est.
Change in Investment Portfolio (Ex KHC) *	(\$82.1)	\$16.0	(\$66.1)
Derivative Contract gains (losses)	(0.3)	0.1	(0.2)
Operating Earnings	29.6	9.5	39.1
Earnings Before Tax	(52.8)	25.6	(27.2)
GAAP Income Tax	(12.4)	5.9	(6.6)
Effective Tax Rate	NMF	23.0	23.0
Net Income	(40.4)	19.7	(20.7)
Earnings Attributable to Noncontrolling Interests	0.6	0.1	0.7
Net Income Attributable to BRK Shareholders #	(\$41.0)	\$19.6	(\$21.4)

*Includes gain/loss on fixed income

May not sum due to rounding

A decline in Berkshire's investments in common stocks contributed to an estimated \$21.4 billion loss in 2022. Last year's \$89.8 billion profit was the highest reported profit in company history. Both headline figures are equally materially misleading when assessing core economic profitability at Berkshire. Berkshire's GAAP earnings include dividends and, as of a 2017 accounting rule change, now include realized *and* unrealized gains and losses on investments in the income statement. Previously, only realized gains were included. Both flowed through the balance sheet and still do. Now, in addition to excluding realized gains we also exclude volatile quarterly and annual unrealized gains from the income statement. Our adjusted method adds retained earnings of Berkshire's portfolio holdings in their place. Over time, gains in the stock portfolio will prove correct. Mixing short-term volatility from investment swings, however, distorts analysis of genuine shorter-term profitability.

Semper's measure of economic earnings progresses more steadily than GAAP-reported results. Over five years our GAAP adjusted earnings per share compounded by 13.7% and 11.1% in dollars. Premium growth in per-share terms reflects an 11.1% reduction in shares outstanding. An lay investor attempting to measure growth using GAAP figures will encounter lots of not applicables and confusion.

Berkshire Net Earnings 2018 – 2022

	2022	2021	2020	2019	2018
GAAP Reported Net Income	(\$21.4)	\$89.8	\$42.5	\$81.4	\$4.0
Semper Adjusted Net Income	\$53.9	\$46.9	\$41.1	\$42.1	\$36.4
Net Earnings Per Avg A Share Out GAAP	(\$14,463)	\$59,460	\$26,668	\$49,828	\$2,446
Net Earnings Per Avg A Share Out Semper Adjusted	\$36,680	\$31,056	\$25,777	\$25,765	\$22,144
Average Equivalent A Shares Outstanding	1,469,480	1,510,180	1,594,469	1,633,946	1,643,795
Annual Growth in Semper Adjusted Earnings Per Share	18.1%	20.5%	0.1%	16.4%	11.4%*

*2017 SAI EPS \$19,336 Post-TCJA

A number of key Berkshire subsidiaries saw profit weakness during the latter half of 2022. While sales grew handsomely, with many businesses capable of passing on cost increases, weakening volumes worked against profitability. Berkshire's combination of insurers likely produced an underwriting loss during the year with catastrophe losses from Hurricane Ian and higher expenses to fix cars and people at

GEICO. Revenues at the railroad likely soared 14.7 % thanks to fuel surcharges and higher rates per car, but net income was probably flat for the year due to materially lower volumes and higher fuel and other operating costs. BHE continues investing retained profit for growth and maintained expected profitability. The diversified collection of businesses within Berkshire's Manufacturing, Service and Retail group, now including finance and leasing, continues to post strong operating performance and margin expansion. Profitability slowed in the third quarter and was expected to continue weakening in the fourth. Still, the group posted the highest return on equity since Berkshire first provided consolidated summary financial statements in 2003.

Overall, Semper Augustus adjusted earnings per share likely climbed 18.1% in 2022. Per the last section in the letter on masterful capital allocation at Berkshire, much of the improvement is on a much higher level of earnings in the equity portfolio with sizable net common stock purchases and underlying earnings growth among portfolio companies driving the total higher. The stock portfolio is producing \$23.3 billion in earnings up from \$17.4 billion last year. Net purchases in low-multiple positions and declining portfolio prices pushed the earnings yield to 7.3% from 5.1%.

Underwriting profit from Berkshire's combined insurance group will be below our long run assumed 5% pre-tax combined margin. The Semper estimate excludes what are typically GAAP reported losses from development in retroactive and periodic payment annuity lines. Over time we expect the use of premiums for many years to produce profits in in these lines, but they will not show yearly profit. If losses develop sooner than expected the business will not be as good as anticipated when the policies were written. Lifetime losses are capped.

All in all, 2022 was a great year for Berkshire in terms of driving economic earning power higher and deploying lots of capital intelligently across the enterprise. The media will focus on Berkshire's loss when it reports earnings for the year. Little mentioned will be Berkshire's 18.1% gain in earning power. Durable profit growth coupled with superb capital allocation drive intrinsic value.

The Stock Portfolio

Berkshire's stock portfolio produced an estimated negative 15.2% total return (with dividends) in 2022 versus a negative 18.1% for the S&P 500. The portfolio outperformed the S&P 500 in each of the past four years.

Berkshire's stock portfolio compounded by nearly 30% for three decades through 1998. By mid-1998 the portfolio traded for more than 40x earnings. Berkshire itself traded for three times book value. The stock portfolio was 115% of firm book value. Berkshire bought General Reinsurance that year and in doing so absorbed a large bond portfolio and shrunk Berkshire's stock allocation to 69% of book value without paying a dime in taxes. Evaluating the stock portfolio alone from that point, time was required to work off excessive overvaluation. Despite a total return of 2.0% in 1999 versus 21.1% for the index, Berkshire would outperform the index for the next two decades. Still, from the end of 1998, Berkshire's stocks compounded at 8.0%, beating the S&P's 6.9%, also expensive in the late 1990s as discussed earlier in the letter.

Berkshire Hathaway Stock Portfolio									
Year	Berkshire 13F Portfolio Total Return	CAGR from 2022	CAGR from 1999	Berkshire Portfolio Total Return	CAGR from 2022	CAGR from 1999	S&P 500 Total Return	CAGR from 2022	CAGR from 1999
1999*	2.0%	7.3%	2.0%	2.0%	8.0%	2.0%	21.1%	6.9%	21.1%
2000	8.6%	7.6%	5.2%	8.6%	8.3%	5.2%	-9.1%	6.3%	4.9%
2001	-17.4%	7.5%	-2.9%	-17.4%	8.2%	-2.9%	-11.9%	7.0%	-1.0%
2002	0.2%	8.9%	-2.1%	0.2%	9.6%	-2.1%	-22.1%	8.0%	-6.8%
2003	27.5%	9.3%	3.2%	30.7%	10.1%	3.7%	28.7%	9.8%	-0.6%
2004	5.6%	8.5%	3.6%	5.5%	9.2%	4.0%	10.9%	8.9%	1.3%
2005	6.0%	8.6%	3.9%	8.0%	9.4%	4.5%	4.9%	8.8%	1.8%
2006	18.5%	8.8%	5.6%	21.7%	9.4%	6.6%	15.8%	9.0%	3.4%
2007	1.3%	8.2%	5.1%	7.2%	8.7%	6.6%	5.5%	8.6%	3.7%
2008	-24.4%	8.7%	1.7%	-24.3%	8.8%	3.0%	-37.0%	8.8%	-1.4%
2009	19.6%	11.5%	3.2%	22.6%	11.7%	4.7%	26.5%	13.1%	0.9%
2010	15.0%	10.9%	4.2%	13.1%	10.9%	5.4%	15.1%	12.2%	2.0%
2011	6.5%	10.6%	4.3%	5.1%	10.7%	5.3%	2.1%	11.9%	2.0%
2012	14.7%	11.0%	5.1%	15.0%	11.2%	6.0%	16.0%	12.9%	2.9%
2013	28.8%	10.6%	6.5%	29.0%	10.8%	7.4%	32.4%	12.6%	4.7%
2014	7.7%	8.8%	6.6%	7.3%	9.0%	7.4%	13.7%	10.6%	5.2%
2015	-4.5%	8.9%	5.9%	-4.1%	9.2%	6.7%	1.4%	10.2%	5.0%
2016	13.1%	11.0%	6.3%	12.9%	11.2%	7.0%	12.0%	11.5%	5.4%
2017	15.3%	10.6%	6.7%	15.9%	10.9%	7.5%	21.8%	11.4%	6.2%
2018	-13.6%	9.7%	5.6%	-13.6%	10.0%	6.3%	-4.4%	9.4%	5.6%
2019	39.8%	16.4%	7.0%	39.2%	16.8%	7.7%	31.5%	13.2%	6.7%
2020	20.7%	9.5%	7.6%	22.2%	10.2%	8.3%	18.4%	7.7%	7.2%
2021	29.3%	4.3%	8.5%	29.2%	4.7%	9.1%	28.7%	2.7%	8.1%
2022**	-15.8%	-15.8%	7.3%	-15.2%	-15.2%	8.0%	-18.1%	-18.1%	6.9%

*Internally estimated BRK portfolio return

**Holdings as 12/31/21

Source: Berkshire Hathaway; Semper Augustus Calculations; Bloomberg Data

The table above is modified from the one presented last year and now includes returns from Berkshire's non-13F holdings that we have been able to identify. Precise sales proceeds can only be estimated and as method defaults to the market value at the prior quarter end before the position was known to be sold. Our return presentation for Berkshire's common stock portfolio in past letters and appearing in the left portion of the table was derived from Berkshire's SEC form 13F filings. There are nuances to the 13F that don't paint a complete picture of Berkshire's total portfolio. Berkshire controls a number of entities that aren't required to file a 13F. A primary difference involved the requirement to disclose only securities listed and traded on U.S. stock exchanges. The Semper portfolio, for example, owns ten internationally headquartered companies, but we are only required to disclose three of them. Berkshire, likewise, owns and has owned a number of positions not requiring disclosure. These include current positions in BYD, Diageo, and five Japanese trading companies: Itochu, Mitsubishi, Mitsui, Sumitomo and Marubeni. A small position in Australian insurer IAG was recently sold as a policy renewal no longer compelled Berkshire to own a position. Since 2003, Berkshire formerly owned shares in PetroChina, POSCO, Tesco, Sanofi, Swiss Re and Munich Re.

The success of Berkshire's BYD investment is well publicized. It's not the first time Berkshire made a killing investing in China. Until reconciling Berkshire's stock portfolio I never realized how much money Berkshire earned on its PetroChina investment made during 2003 and sold in 2007. On a cost basis of

Price Chart 04/07/00 - 02/21/23 Period: 1W

Start 1.21 Change 2.98 (246.28%) High on 11/02/07 19.60 Low on 04/21/00 1.18

Volume 146.05M SMA(15) 432.25M

Current Price: 4.19

Current Volume: 432.2

Beyond the past four years, the S&P 500 produced very difficult to beat and not likely repeatable returns. For the ten years through year-end 2022 the index averaged 12.6% (was 16.6% as of last year) beating Berkshire's 10.8% on the stock portfolio. Berkshire has outperformed the index for years 1-5 and then in every time period beyond 20 years. Given the strong decade for the index ended 2021, intermediate comparisons will favor the index. The prospective question is: How will the Berkshire portfolio compound for the next ten years?

Approximately 73% of Berkshire's stock portfolio is invested in its five largest positions. As go these investments in Apple, Bank of America, Chevron, Coca-Cola and American Express so goes the portfolio. Are these five individually and collectively expensive? My expert opinion is I don't know, but they were acquired at the right prices and appear well-positioned. Four have enormous embedded long-term capital gains. Three declined while two rose in 2022.

Apple's revenues nearly tripled over the past decade and the business maintained a healthy 26% net margin. A rising share count peaked ten years ago and has since fallen 40%. Profits funded 6% of

revenues spent on research and development and allowed for the repurchase of 40% of shares outstanding, as well as sending a quarter of profits to shareholders as dividends. Midway through the decade the stock traded for 12x earnings, which is when Berkshire came on board, buying \$36 billion between 2016 and 2018 at an average cost of \$35 per share. While Apple shareholders saw a total return of more than 12x their money, Berkshire reaped a five-fold gain excluding dividends in five years (and sold roughly 11% of the position through 2020). During the first five years of the decade, sales in dollar terms grew 15% annually and slowed to 10% for the past five. Revenue growth dropped to only 2.4% over the past twelve months to December 31, 2022. Berkshire enjoyed a lift in the multiple from 12x to 30x at its peak last year back down to 20x at yearend. It's reasonable that from what's now a \$400 billion run rate in annual revenues that the law of large numbers will exact further slowing of the top line. Apple's appetite for buying shares seems price insensitive, with repurchases of \$89 billion, \$85 billion and \$72 billion over the last three years consuming a whopping 97% of cash earned from operations and all net profit. I thought Apple was dead money at best for several years at this time last year. With a \$2.1 trillion market cap at yearend, despite last year's 26.4% thumping of the stock, there remains little room for disappointing revenue and profit growth.

Berkshire's Six-Year Ownership of Apple (2016 to 2022)

Date	Shares (millions)	Cost Basis (millions of USD)	Cost Basis per Share	Market Value (millions of USD)	Market Value per Share
Q1 2016*	39.2	\$1,000	\$25.48	\$1,069	27.25
Q4 2016	245.0	6,747	27.54	7,093	28.95
Q4 2017	666.9	20,961	31.43	28,213	42.31
Q4 2018	1021.2	36,044	35.30	40,271	39.43
Q4 2019	1003.5	35,287	35.17	73,667	73.41
Q4 2020	907.6	31,089	34.25	120,424	132.68
Q4 2021	907.6	31,089	34.25	161,155	177.56
Q4 2022***	915.6	32,404	35.39	118,964	129.93

*Initial Buy by Todd or Ted

**All shares adjusted for 4-for-1 split in 2020

***Sharecount reflected at 9/30. New basis calculated using average cost method

Bank of America is the next largest position at just under 11% of the portfolio, down from 14% in a year. Berkshire paid \$14.6 billion for what's now a \$33.4 billion holding, excluding dividends earned during 11 years of ownership. Adding a third rule of investing: Buy banks during deep recessions and financial crises, but only buy those that don't fail. The best way to ensure you are buying a bank that won't fail is to be the buyer of last resort, or at least the buyer of optical enhancement. Despite Bank of America insisting the capital position was strong (it wasn't), Berkshire bought a 5% coupon, \$5 billion preferred, redeemable at 5% over par. Berkshire is famous as a buyer of last resort. From a position of strength, it often gets warrants. In addition to the 5/5/5 preferred, Berkshire got warrants which allowed them to buy 700 million shares of common stock at \$7.14 anytime over the next decade. The stock closed 2022 at \$33.12, down from \$44.49 per share last year. If the majority of upside in your position is in unconverted warrants, ensure the bank is limited on paying dividends. Before the Great Financial Crisis, the bank paid dividends at a \$2.40 annual rate. When in need of capital, which they swore they didn't need, but "accepted" anyway, regulators limited dividends going out the door when sending bailout capital. The annual dividend rate was thus cut to \$0.04, or a penny per quarter, and held there until 2012. In the meantime, total shares outstanding rose by 150%. Repurchases didn't resume until 2017. Thus, profits were retained, strengthening the already "strong" capital position of the bank. Once things were humming along, if a pandemic pops up but the Fed intervenes massively, you can buy additional shares on a dip, which Berkshire did in July 2020. Bank of America shares entered 2020 at \$35 and Berkshire bought \$2.1 billion at an average \$24 per share. The dividend rate was hiked to \$0.88 in 2022. Since repurchases were reintroduced in 2017 the bank retired 22% of the outstanding shares.

What is Bank of America worth? When is the next deep recession or crisis? Loss reserves are never at a peak at an economic peak. Quite the opposite. Trading for 97% of book value and about 10x earnings, on paper the bank is cheap. Until it isn't. Outside of the Bank of America, Berkshire continues to swing the machete at what was a large concentration of banks with ongoing 2022 reductions in U.S. Bancorp and Bank of New York Mellon. Berkshire still holds a less than 1% portfolio position in Citigroup but gone are sizable holdings in Goldman Sachs (also a Berkshire bailee in the financial crisis), JPMorgan Chase, longtime holding M&T Bank and the remainder of another long held and sizable position in Wells Fargo. Wells was bought in the teeth of the 1989 and 1990 recession and California real estate downturn. To answer the question on Bank of America, presuming no deep economic malaise, it's cheap. One of these days we'll have a crisis, the bank will be really cheap, losses will rise, reserves will follow, book value will plummet and Berkshire will do big deals providing capital at Berkshire terms when banks publicly swear they need no such thing. They will get more warrants.

Chevron surged into Berkshire's top five holdings taking the number three position at yearend. Berkshire initiated its position beginning in 2020's third quarter when energy commanded only 1.5% of the S&P 500. If large institutions are self-inflicted sellers for optical reasons, count on Berkshire to provide liquidity when great assets are being given away. Chevron is now a 9.6% portfolio position. Like Bank of America, on paper its cheap. Chevron earned \$38 billion on \$236 billion revenue in 2022. Its market cap at yearend was \$347 billion. A decade ago the energy giant earned \$24 billion on \$211 billion revenue. Revenue would plunge to \$114 billion in 2016 and to \$95 billion in 2020. Between 2015 and 2020, when Chevron wasn't losing money it was earning 2% to 5% on equity capital. Capital expenditures were running close to \$40 billion a year in the handful of years leading up to 2015 (when the oil price headed south from over \$100 per barrel). Today, annual capital expenditures run \$12 billion. You may gather from the above that oil and gas are cyclical and capital intensive. Without refined petroleum and natural gas the modern world does not operate. If enough politicians suggest their mission is to kill your industry, perhaps you will practice caution when laying out money. The merits of Chevron and its competitors as investments is beyond the scope of this letter and enough pages are already spoken for. My guess is Berkshire is seeing what Semper is seeing – genuine scarcities that have developed in part due to public policy. Our guess is the energy patch will produce high profits for the foreseeable future. To date, Berkshire's large investments in Chevron and Occidental Petroleum are nice complements to the capital BHE is deploying building out wind, solar and grid capacity. A balanced approach to energy is the only viable approach. In the meantime, be on the lookout of misguided public policy. It often comes with investment opportunity on sale.

Coca-Cola shares returned 10.6% in 2022. The stock passed American Express to close the year as Berkshire's fourth largest common stock holding. Coke is now 8.2% of the stock portfolio. On a \$1.3 billion investment made in the aftermath of 1987's stock market crash, Coke was 40% of the portfolio and 46% of Berkshire equity by 1998, trading for nearly 50x earnings. If there had ever been a time to sell Coke, that was it. On a thirteen-bagger in a decade, however, sending 35% of any gain realized to Washington was unappealing, so the purchase of General Re was the next best thing, ultimately even better. The Coke holding reached \$17.4 billion in 1998 and is now only \$25.4 billion. Twenty-four years of working the multiple down by half, from 50 to 25 coupled with little business growth yielded a mediocre result for what was by far Berkshire's largest holding. Viewing it as a bond yielding 4% would be a reasonable way to view the position. The position draws the attention of the supremely health-conscious, questioning the conscience of anyone so contemptible to own such a cancer. I'm sure if those casting aspersions were willing to pay the tax bill, Omaha would consider selling it. Not a likely outcome, it's now 5.4% of Berkshire's book value, down from 46%. Not a share was sold. In Coca-Cola's corner is pricing power in an inflationary environment. Big-brand consumer staples can flex when costs are on the rise. Coke's average selling price rose 11% in 2022 (rival PepsiCo's jumped 14%) on flat volume. Look for more price hikes in 2023. If we have an inflationary decade, Coke fares well.

American Express traded places with Coca-Cola last year in the Berkshire portfolio and rounds out the top five holdings. Amex is a superb company. They issue credit cards and extend the credit that rides on their own their own payment rail, serving both merchants and cardholders. Berkshire owns 20.4% of the company. I don't expect Berkshire to treat the position using the equity method of accounting as it is not in a position of control. A victim of the pandemic, particularly the lack of international business travel, the stock dropped by nearly half to March 2020, trading at \$67. Despite travel not bouncing back globally, most consumer and commercial activity is back. Profits surely are, now 17.4% higher than in 2019. The stock produced a negative 8.5% total return in 2022 but trades at a mid-teens multiple to earnings power. The capital position was not impaired during the financial crisis, and the company only took a minimum of required capital. The share count rose by less than 3% and there were no preferreds or warrants issued. The next downturn will harm the stock, but the business will be fine. Berkshire's \$1.3 billion investment in Amex was worth \$22.4 billion at yearend, excluding dividends regularly received.

Below Amex sit Berkshire's \$13.3 position in Kraft Heinz and its \$12.2 billion investment in the common shares of Occidental Petroleum (excluding is \$10 billion 8% OXY preferred stake plus warrants). The positions appear in Berkshire's quarterly 13F filing but, as discussed, each position is accounted for using the equity method of accounting where proportional share of earnings is added to income and cost basis and dividends received reduce cost basis. Ultimately, when or if Berkshire sells either position, it will realize the sale proceeds and I'll be explaining how the gain is taxed relative to adjusted cost basis.

If the Kraft Heinz and Occidental common share positions are included in the stock portfolio and not as equity-method holdings, positions six to ten total 13.4% of the portfolio. The big positions drive the bus, but never dismiss the farm team. You never know when \$232 million investments in things like BYD come along and produce billions of return.

Nearly all of Berkshire's stock portfolio is owned within the insurance operation and largely exists as surplus capital. The insurers will report roughly \$314 billion in equities at yearend, presuming no fourth-quarter portfolio activity and depending on whether Alleghany's stock portfolio is sold upon receipt or beforehand (most likely either way). BHE owns Berkshire's now diminished \$3.5 billion position in BYD with a cost basis of \$232 million in 2008 (unadjusted for sales during 2022). BHE also owns another \$800 million of equities, largely held by nuclear decommissioning trusts and Rabbi trusts.

Berkshire owns several holdings not included in its quarterly SEC 13F filings. Five Japanese trading companies bought originally for about \$6 billion in 2020 with another roughly \$2 billion added to in late 2022 trading for \$12.1 billion at yearend, financed with what is now \$6.3 billion in 0.6% coupon Japanese yen denominated debt at current exchange rates. The debt is at the holding company and the equity interests in the trading companies are held by the insurers. A small \$724 million position in Diageo is also held by the insurance operation. An even smaller \$321 million investment in IAG, an Australian agribusiness insurer, was liquidated in 2022 when a reinsurance renewal no longer needed an equity position by Berkshire. Finally, what's now a \$3.5 billion holding in BYD is not reported on the 13F. Between trimming the position and a price decline in 2022, the shares are no longer a top-ten position.

The Stock Portfolio and Semper's Valuation

Berkshire's Semper-normalized net earning power is \$53.9 billion at yearend. Pre-tax earnings are \$60.6 billion. Of the pre-tax normalized earnings, \$5.5 billion comes from dividends earned and \$17.7 billion is the portion of Berkshire's share of the stock portfolio companies retained and not distributed as profit. Dividends plus retained earnings total the earnings yield, again 7.3% at yearend. From an earning power standpoint, assuming Berkshire only earns the earnings yield presumes an annual expected return equal to the earnings yield. If instead the analyst believes the stock portfolio will earn 10.3% annually, 3% above the earnings yield, then my normalized earnings from the stock portfolio are understated by \$9.5 billion

pre-tax. Presuming retained earnings are invested at adequate returns, then over time it's not unreasonable to expect at least a dollar of retained earnings producing a dollar of market value. Earnings retained at higher and higher returns should translate into more earnings than are recorded as current earning power. This is a conservative aspect of the Semper valuation.

Take note of the way dividends are taxed and retained earnings are presumed taxed. Dividends received by corporations from other U.S. companies receive a 50% dividend received deduction on holdings less than 20% owned. Thus, at the 21% Federal tax rate, corporations pay a 10.5% rate on dividends received. For businesses more than 20% owned, the deduction is 65% making the rate 7.35%. However, for property and casualty companies, 25% of the deduction is disallowed under a proration rule. Thus, 62.5% of dividends received, and not 50% received, are taxed at 21%, making the tax rate on dividends from U.S. companies less than 20% owned 13.125%. Dividends are already taxed by the distributing company, hence the deduction. Mr. Buffett has mentioned Berkshire's blended tax rate on dividends received is about 13% from all sources.

Two out-of-place-gratuitous return charts with no text support other than Berkshire typically wins either by growth in book value per share or stock price.

10-Years Ended	Avg. Book Value per Share Growth	Avg. Market Value per Share Growth	Avg. S&P 500 Market Value per Share Growth
1982	26.4%	25.5%	6.6%
1992	26.5%	31.2%	16.1%
2002	18.4%	20.0%	9.3%
2012	10.6%	6.3%	7.1%
2022	11.0%	13.3%	12.6%

From 2021	Book Value per Share Growth	Market Value per Share Growth	S&P 500 Market Value per Share Growth
10-year CAGR	11.0%	13.3%	12.6%
20-year CAGR	10.8%	9.8%	9.8%
30-year CAGR	13.3%	13.1%	9.7%
40-year CAGR	16.4%	17.4%	11.2%
50-year CAGR	18.4%	18.9%	10.3%
58-year CAGR	18.2%	19.8%	9.9%

Berkshire Hathaway Intrinsic Value Update

Berkshire grew intrinsic value by 10.2% in 2022 driven by 15.6% growth in economic earning power. Berkshire's 4.0% stock price return trailed intrinsic value growth, making the shares cheaper at the outset of 2023 than they were a year ago. A substantial addition to a declining stock portfolio, share repurchases, growth capex at BHE and an astute purchase of insurance competitor Alleghany combined to add significant value in a year when the market was taken to the woodshed. An understanding of how Berkshire produces earnings requires a great deal of effort adjusting its reported results. A simple metric of assigning a constant multiple to stated book value per share misses the mark by a mile in a year like 2022. A 15.2% decline in the stock portfolio (with dividends) sent book value per share down by 5.5%, masking gains among multiple of the key drivers at the conglomerate.

Ongoing analysis of Berkshire involves several methods, tweaked and refined each year. I've followed the company closely since 1996 when the year B shares were offered to the public. Semper first acquired shares of Berkshire in February 2000, after the stock was cut in half following its purchase of General Re during the tech bubble. We bought our initial large position for \$43,707 per A share, or 105% of then book value per share. My understanding of Berkshire grows each year when I take the better part of a week during the letter-writing process to update my models and think about valuation. I'm relieved that after countless hours across the years reconciling and assigning myriad data points recently allows for what I believe is now a fairly accurate depiction of where capital exists among the major groups and the portion of normalized profit derived from each.

Berkshire's consolidated financial statements include two primary segments: (1) Insurance and Other and (2) Railroad, Utilities and Energy. Insurance and Other consists of Berkshire's entire insurance operation including GEICO, Berkshire Hathaway Reinsurance (a combination of National Indemnity and its affiliated subsidiaries along with General Re, purchased in 1998), and a variety of primary insurers writing commercial business lines. The insurance operation is among the world's largest insurers by premiums but by far the largest by capital. As crazy as it may sound, in addition to the vast insurance operation Insurance and Other also includes a collection of dozens of wholly-owned operating companies under a "Manufacturing, Service and Retail" umbrella, plus the roll-in of a smaller but hugely profitable group of leasing and finance companies. Insurance and Other finally includes a constantly evolving number of assets and liabilities held at the holding company level. That's the first consolidated accounting group.

The second group, Railroad, Utilities and Energy is a bit more straightforward. It includes the Burlington Northern Santa Fe Railroad (BNSF) which operates one of the largest railroad systems in North America with over 32,500 route miles of track in 28 states. The reporting group also consists of Berkshire's 92% ownership interest in Berkshire Hathaway Energy (BHE), which operates three domestic regulated utilities – PacifiCorp, MidAmerican Energy and NV Energy. BHE also owns regulated electricity distribution businesses in Great Britain and Canada. Natural gas pipelines consist of five domestic regulated interstate natural gas pipeline systems with 21,100 miles of pipeline with capacity of 21 billion cubic feet of natural gas per day. Other assets include independent power projects, a partial interest in a liquefied natural gas export, import and storage facility which is operated and consolidated for reporting purposes, and the largest residential real estate brokerage firm in the U.S. plus one of the largest residential real estate brokerage franchise networks in the country.

Among the two groups myriad collection of subsidiaries, a vast array of deferred tax assets and liabilities are created. These are consolidated as a stand-alone line item, "Income taxes, principally deferred," on Berkshire's consolidated balance sheet. An analytical framework attempting to identify each primary group's profitability measured against the capital employed in each group is faced with quite a challenge.

Berkshire made the task somewhat manageable from 2003 to 2016 when the Chairman's letter included an extremely useful supplemental financial presentation of Berkshire's main subsidiaries. This presentation disappeared from the 2017 annual report and more granular data was distributed among the MD&A, the footnotes to the financial statements, supplemental segment reporting of a handful of measures and finally a summary financial statement of holding company figures not directly allocated to the subsidiaries.

Combination of the insurance group and holding company assets and liabilities along with Berkshire's large and diversified Manufacturing, Service and Retail group is a complicated collection to unwind. The analytical task grew ever more complicated in 2018 when the separately reported finance operation was rolled into the MSR group. Several investments in common stocks are not held by the insurers and over time exist at different subsidiaries. Minutia for sure on many fronts but assessing Berkshire's MSR group is an extremely important component to understanding where profitability waned for a number of years and is finally recovered.

Returns on equity within the MSR group ground downward from nearly 10% in the mid-2000s to 6.15% in 2016, the final year group financials were presented. Equity of the MSR group totaled \$56.8 billion in 2015. Paying \$37.2 billion including debt for Precision Castparts made the new subsidiary a material piece of MSR. The new equity balance in MSR was presumably north of \$90 billion. Given immediate weakness in PCC's turbine business, already strained pre-merger, group return on equity declined from 8% to an inadequate 6%. Inclusion of the finance group likely masked deterioration among much of Berkshire's MSR group. Clayton Homes in particular has knocked the cover off the ball for years and grew into one of Berkshire's more profitable and important non-stand-alone subsidiaries.

The Semper letter includes an annual summary financial statement for the MSR group, despite known data shortcomings. Isolating cash, debt, other intangibles, and deferred-tax liabilities, which are reported unassigned to any group as a standalone item on Berkshire's consolidated balance sheet, made the job of getting the numbers correct very difficult. Through a series of prorations and assumptions about reported segment figures I think the presentation now in the last two years is finally close to what Berkshire would see internally. The very good news is by 2021 the MSR group was earning far healthier returns than it was in 2018 and 2019. Despite high inflation in 2022 which also came with volume declines among many MSR companies, the group's aggregate profitability stands at a record not only in dollar profit but more importantly a record return on equity since Berkshire first broke out the segment on a stand-alone basis in 2003.

I believe there is a renewed focus on profitability and operations among many MSR businesses. Benches are deeper. Greg Abel spent the past five years immersing himself into the non-insurance group. Whether for Greg's involvement or simply for Berkshire having great people, results among Berkshire's MSR companies are much improved. It looks like the MSR group earned 11.0% on equity and 11.2% on capital in 2021 (return on capital is higher because I have more cash than debt assigned to the group). Regardless, even when adding \$10.6 billion written down for PCC in 2020 back to equity, return on equity still adjusts to a record 10.1%.

I remain embarrassed for having criticized Berkshire's lack of proper disclosure. More diligence on my part and the puzzle pieces were largely there all along. Enough data existed to make reasonable assumptions as to assignment of key figures. Earlier attempts weren't far off, but lacking precision I lacked a filter and chose to criticize when none was warranted.

Berkshire's Barely-Legible Manufacturing, Service, Retail and Finance Group 2003 – 2022

Assets	2022E	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Cash and Equivalents	\$21,923	\$17,863	\$27,830	\$19,547	\$18,313	\$13,519	\$8,073	\$6,807	\$5,765	\$6,625	\$5,338	\$4,241	\$2,673	\$3,018	\$2,497	\$2,080	\$1,543	\$1,004	\$899	\$1,250
Accounts and Notes Receivable	\$40,383	\$35,388	\$32,681	\$33,711	\$32,332	\$28,881	\$11,183	\$8,886	\$8,264	\$7,749	\$7,382	\$6,584	\$5,396	\$5,066	\$5,047	\$4,488	\$3,793	\$3,287	\$3,074	\$2,796
Inventory	\$25,102	\$20,954	\$19,208	\$19,852	\$19,069	\$17,366	\$15,727	\$11,916	\$10,236	\$9,945	\$9,675	\$8,975	\$7,101	\$6,147	\$7,500	\$5,793	\$5,257	\$4,143	\$3,842	\$3,656
Other current assets	?	?	?	?	?	?	\$1,039	\$970	\$1,117	\$716	\$734	\$631	\$550	\$625	\$752	\$470	\$363	\$342	\$254	\$262
Total current assets	\$87,408	\$74,205	\$79,719	\$73,110	\$69,714	\$59,766	\$36,022	\$28,579	\$25,382	\$25,035	\$23,129	\$20,431	\$15,720	\$14,856	\$15,796	\$12,831	\$10,956	\$8,776	\$8,069	\$7,964
Goodwill and other intangibles	\$58,584	\$60,422	\$61,358	\$72,219	\$70,611	\$71,503	\$71,473	\$30,289	\$28,107	\$25,617	\$26,017	\$24,755	\$16,976	\$16,499	\$16,515	\$14,201	\$13,314	\$9,260	\$8,362	\$8,351
Fixed assets	\$20,378	\$20,834	\$21,200	\$21,438	\$20,628	\$19,868	\$18,915	\$15,161	\$13,806	\$19,389	\$18,871	\$17,866	\$15,421	\$15,374	\$16,338	\$9,605	\$8,934	\$7,148	\$6,161	\$5,898
Other assets (Equipment Held for Lease)	\$15,139	\$14,918	\$8,360	\$8,215	\$9,307	\$9,391	\$3,183	\$4,445	\$3,793	\$4,274	\$3,416	\$3,661	\$3,029	\$2,070	\$1,248	\$1,685	\$1,168	\$1,021	\$1,044	\$1,054
Total assets	\$181,509	\$170,379	\$170,637	\$174,982	\$170,260	\$160,528	\$129,593	\$78,474	\$71,088	\$74,315	\$71,433	\$66,713	\$51,146	\$48,799	\$49,897	\$38,322	\$34,372	\$26,205	\$23,636	\$23,267
Liabilities and Equity																				
Notes payable	\$374	\$342	\$1,062	\$1,472	\$1,857	\$1,832	\$2,054	\$2,135	\$965	\$1,615	\$1,454	\$1,611	\$1,805	\$1,842	\$2,212	\$1,278	\$1,468	\$1,469	\$1,143	\$1,593
Accounts Payable	\$31,154	\$30,376	\$29,279	\$27,611	\$31,314	\$26,545	\$12,464	\$10,565	\$9,734	\$8,965	\$8,527	\$15,124	\$8,169	\$7,414	\$8,087	\$7,652	\$6,635	\$5,371	\$4,685	\$4,300
Total current liabilities	\$31,528	\$30,718	\$30,341	\$29,083	\$33,171	\$28,377	\$14,518	\$12,700	\$10,699	\$10,580	\$9,981	\$16,735	\$9,974	\$9,256	\$10,299	\$8,930	\$8,103	\$6,840	\$5,828	\$5,893
Deferred taxes (net)	\$11,449	\$9,756	\$9,900	\$12,325	\$10,100	\$9,550	\$12,044	\$3,649	\$3,801	\$5,184	\$4,907	\$4,661	\$3,001	\$2,834	\$2,786	\$828	\$540	\$338	\$248	\$105
Term debt and other liabilities	\$21,923	\$17,521	\$17,795	\$16,215	\$16,247	\$19,810	\$10,943	\$4,767	\$4,269	\$4,405	\$5,826	\$6,214	\$6,621	\$6,240	\$6,033	\$3,079	\$3,014	\$2,188	\$1,965	\$1,890
Total liabilities	\$64,900	\$57,995	\$58,036	\$57,623	\$59,518	\$57,737	\$37,505	\$21,116	\$18,769	\$20,169	\$20,714	\$27,610	\$19,596	\$18,330	\$19,118	\$12,837	\$11,657	\$9,366	\$8,041	\$7,888
Non-controlling interests	\$920	\$921	\$635	\$607	\$572	\$570	\$579	\$521	\$492	\$456	\$2,062	\$2,410	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Berkshire equity	\$115,689	\$111,463	\$111,966	\$116,752	\$110,170	\$102,221	\$91,509	\$56,837	\$51,827	\$53,690	\$48,657	\$36,693	\$31,550	\$30,469	\$30,779	\$25,485	\$22,715	\$16,839	\$15,595	\$15,379
Equity w/ PCP \$10.6B W/D Added Back	\$126,289	\$122,063	\$122,566																	
Income Statement																				
Revenues	\$168,290	\$153,012	\$134,097	\$142,675	\$148,809	\$126,533	\$120,059	\$107,825	\$97,689	\$95,291	\$83,255	\$72,406	\$66,610	\$61,665	\$66,099	\$59,100	\$52,660	\$46,896	\$44,142	\$32,106
Operating expenses	\$151,498	\$137,874	\$122,410	\$129,332	\$128,501	\$117,026	\$111,383	\$100,607	\$90,788	\$88,414	\$76,978	\$67,239	\$62,225	\$59,509	\$61,937	\$55,026	\$49,002	\$44,190	\$41,604	\$29,885
Net interest expense	\$282	\$586	\$798	\$416	\$265	\$264	\$214	\$103	\$109	\$135	\$146	\$130	\$111	\$98	\$139	\$127	\$132	\$83	\$57	\$64
Pre-tax income	\$16,510	\$14,552	\$10,889	\$12,365	\$12,308	\$9,243	\$8,462	\$7,115	\$6,792	\$6,742	\$6,131	\$5,037	\$4,274	\$2,058	\$4,023	\$3,947	\$3,526	\$2,623	\$2,481	\$2,157
Non-Controlling Interest	\$63	\$63	\$63	\$64	\$64	\$61	\$53	\$65	\$64	\$57	\$249	\$310	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Income taxes	\$3,755	\$3,340	\$2,526	\$2,929	\$2,880	\$2,974	\$2,778	\$2,367	\$2,260	\$2,455	\$2,183	\$1,688	\$1,812	\$945	\$1,740	\$1,594	\$1,395	\$977	\$941	\$813
Net Income	\$12,692	\$11,149	\$8,300	\$9,372	\$9,364	\$6,208	\$5,631	\$4,683	\$4,468	\$4,230	\$3,699	\$3,039	\$2,462	\$1,113	\$2,283	\$2,353	\$2,131	\$1,646	\$1,540	\$1,344
Income Tax Rate	22.7%	23.0%	23.2%	23.7%	23.4%	32.2%	32.8%	33.3%	33.3%	36.4%	35.6%	33.5%	42.4%	45.9%	43.3%	40.4%	39.6%	37.2%	37.9%	37.7%
Profit Margin	7.54%	7.29%	6.19%	6.57%	6.29%	4.91%	4.69%	4.34%	4.57%	4.44%	4.44%	4.20%	3.70%	1.80%	3.45%	3.98%	4.05%	3.51%	3.49%	4.19%
Return on Equity																				
Return on Equity	10.05%	9.13%	6.77%																	
Return on Tangible Equity	22.23%	21.84%	16.40%	21.05%	23.67%	20.21%	28.10%	17.64%	18.84%	15.07%	16.34%	25.45%	16.89%	7.97%	16.01%	20.85%	22.67%	21.72%	21.29%	19.12%
Return on Capital	11.21%	10.56%	8.93%	8.63%	8.91%	5.96%	6.19%	8.73%	9.09%	8.48%	7.82%	8.19%	7.25%	3.59%	7.06%	9.36%	9.36%	9.59%	9.59%	8.79%
ROE w/ \$10.6B PCP W/D Added Back	10.05%	9.13%	6.77%																	

Methods Employed in Assessing Intrinsic Value

Berkshire followers often conflate earnings power and balance sheet nuances by double counting or under counting in places. Our analysis reconciles across methods. Measurement of economic earning power is preferred, primarily our GAAP adjusted financials and sum of the parts approaches. Both favored methods are joined at the hip, requiring adjustments to the published financial statements. The balance, simple book value per share and the classic two-pronged methods, are reconciling tools, and are also more impacted in the short term by swings in the publicly traded stock portfolio, more than 95% of which is held in Berkshire's overcapitalized insurance group.

Much of this section will be somewhat repetitive from last year's letter, particularly descriptions of the nuances to each method. Methodologies are unchanged but continue to be refined and each year. All tables and charts are updated. Commentary on performance and operations specific to 2022 are included. Areas where assumptions may be either conservative or not are highlighted and allow the reader to judge or substitute freely. An understanding of the moving parts goes a long way to an understanding of the whole of Berkshire.

Net Income Basis

Net Income Basis – 2022 Year-End Estimated (dollars in billions)

	Pre-Tax Income	After-Tax Net Income
Operating Groups		
Berkshire Hathaway Energy (Net of all NCIs)	\$2.9	\$4.7
BNSF	8.0	6.8
Manufacturing, Service, Retail and Finance	<u>16.5</u>	<u>12.7</u>
Operating Group Subtotal	<u>27.4</u>	<u>24.2</u>
Insurance and Investment Income		
Insurance Underwriting Normalized Gain	4.1	3.2
Insurance Investment Income	25.5	23.7
Holding Company Net Income	4.0	3.1
SAI Pension Expense	-0.4	<u>-0.3</u>
Insurance and Investment Income Subtotal	<u>33.2</u>	<u>29.7</u>
Totals	\$60.6	\$53.9
Cash Tax Rate		11.1%

Source: Semper Augustus; Includes estimate for Alleghany in Q4 2022

Profit figures for Berkshire's primary operating groups are derived in concert with our sum of the parts analysis and the normalization of GAAP earnings approach utilized to remove certain aspects of volatility from reported results. One primary nuance not captured when deriving earning power is the degree to which a subsidiary or group is cyclically over or under earning.

The Manufacturing, Service and Retail group, which now includes the former Finance and Financial products (leasing mostly) group, was hammered during much of the pandemic year. Much of retail closed entirely for a time. Supply chains suffered and non-essential manufacturing likewise slowed or stopped. In all, the pandemic took a toll on the group, with pre-tax income declining from \$12.3 billion in 2019 to \$10.9 billion, with after-tax profit declining 15% to \$8.1 billion. Sale and restructuring of some underperforming subsidiaries combined with a robust recovery and operating efficiencies drove pre-tax and after-tax profits to an estimated record \$16.5 and \$12.7 billion in 2022. Net income compounded by 5.5% over the three years to 2022. Any analysis beginning with depressed figures in 2020 will make objects in the mirror appear larger than in real life. We find measuring profits across Semper's holdings from at least as far back as 2019 to the present most useful and conservative. Berkshire's subsidiaries send the vast majority of profit among these MSR companies to Omaha for capital allocation elsewhere. Recognize that 5.5% annual growth over three years comes largely with no reinvested capital. That's how the ROE can drive from 8% pre-pandemic to a record 10%, even when including a \$10.6 billion write-down at Precision Castparts back into equity.

BNSF likewise was hammered in 2020, with volumes substantially lower. Railroads are blessed with lots of variable costs, so profits only declined 6% in 2020. The railroad shipped 9.5 million carloads in 2020, down 7.2% from 2019. Volumes recovered to 10.1 million by 2021 but will likely fall 5% to 9.6 million when reported for 2022, nearly as low as in 2020. China closed lots of manufacturing capacity last year allegedly for COVID measures. While the U.S. supply chain saw substantial relief last year, inflation and parts shortages hammered business activity. Wholesale inventories are way up in many industries. While higher fuel prices could be passed along to customers by railroads, volumes were and are very weak. BNSF is likely to report a \$6 billion GAAP profit for 2022, flat against 2021. Conditions and profitability at BNSF can be described as mildly depressed, despite record revenues likely 14.7% above 2021. We adjust economic net earnings \$800 million above GAAP reported net income reflecting the degree to which cash profits benefit from the use of accelerated depreciation on capital spending. Sizable "growth"

capital improvement took place from 2009, when Berkshire bought the railroad, through 2016. Recently the degree to which capital spending outpaces depreciation charges is slowing, necessitating a reduction in the ongoing benefit. Our figure may be too high by perhaps \$200 million at present. The railroad is unlikely to add to track miles. It has room to add significant volumes and we'd expect higher profitability in coming years.

Berkshire Hathaway Energy is booming (as far as regulated utilities and distribution assets can boom). Already discussed was the enormous capital opportunity in the utility and energy businesses. Retaining capital instead of paying dividends to Omaha and having a bounty of greenfield and expansionary projects producing attractive, regulated returns is a major source of value creation. Much of BHE's spending on capital projects are tax incentivized, and there is no better group of businesses to seize the opportunity to expand. Tax credits for wind and solar provide so much benefit to have driven the tax rate downward to where it is remarkably deeply negative. We expect a negative 40% tax rate for 2022. How many businesses do you see where net income is larger than pre-tax income? Think about that. The allowed use of accelerated depreciation for tax purposes by regulators further rewards spending of capital beyond maintenance levels for the benefit of society. Accelerated depreciation further drives the Semper-adjusted cash tax rate well below the GAAP-reported tax rate. The deferred-tax liability balance for PP&E exceeds \$14 billion at BHE and \$32 billion for all of Berkshire. Both will march higher in the years to come. An updated reconciliation between cash taxes and GAAP taxes is again included in the appendix.

One thing to watch closely at BHE is a coming phase-out of production tax credits for spending on newbuilt wind energy. Presently wind projects started in 2021 qualify for production credits at 60% of the full rate on electrical output for ten years. The credit was extended in 2022 under "The Inflation Reduction Act" (IRA) which extended and increased investment and production tax credits through 2024. It has now been extended 13 times since 1992. The preponderance of growth capital expenditures at BHE has been on wind at MidAmerican and PacifiCorp, leaders in wind in their respective geographies. We'll see the degree to which BH Energy can add wind capacity. Solar tax credits are set to run longer, so expect to see more spending here over the years. For the time being, the capability of spending enormous sums on renewables and the building of the grid is a huge competitive advantage for the group. BH Energy should be Berkshire's second most valuable group next to insurance within five years.

You can see in our Net Income Basis presentation above normalized \$4.1 billion pre-tax and \$3.2 billion after-tax underwriting gain. Our method for measuring insurance underwriting assumes an average 5% pre-tax underwriting profit over time. Berkshire likely lost money underwriting in 2022 due to catastrophe and other losses from Hurricane Ian and elsewhere, plus high inflationary loss costs repairing cars and people at GEICO. Our method strips volatile underwriting results, just like we strip quarterly and annual gains on marketable securities. Both are replaced with a more normalized estimate for profitability expected to be earned over a number of years. The analyst not agreeing with an assumed 5% pre-tax underwriting profit can plug in whatever estimate they choose or stick with the lumpy reported results. I find capitalizing lumpiness to be very difficult.

Other Methods for Valuing Berkshire

Below is a summary table for our valuation of Berkshire. Prior year 2021 figures are updated from last year's expectations to conform to Berkshire's reported (and adjusted per Semper methodology) results. 2022 figures are estimates. More detailed data can be found in the Appendix.

2021 Intrinsic Value by Market Cap and Per Share

	Market Capitalization	Price Per A Share	Price Per B Share
Sum of the Parts Basis	\$885 billion	\$599,014	\$399
GAAP-Adjusted Financials	844 billion	571,263	381
Simple Price to GAAP Book Value	885 billion	599,589	400
Two-Pronged Approach (Ours)	943 billion	638,271	426
Simple Average	\$889 billion	\$601,890	\$401

2022 Intrinsic Value by Market Cap and Per Share: EXPECTED

	Market Capitalization	Price Per A Share	Price Per B Share
Sum of the Parts Basis	\$928 billion	\$634,951	\$423
GAAP-Adjusted Financials	965 billion	660,267	440
Simple Price to GAAP Book Value	828 billion	566,365	378
Two-Pronged Approach (Ours)	970 billion	663,688	442
Simple Average	\$923 billion	\$631,359	\$421

Source: Semper Augustus

A simple average of our four valuation methodologies values Berkshire at \$923 billion, up \$34 billion over the estimate a year ago. Intrinsic value grew 4.9% in per-share terms versus only 3.8% in dollar terms. The difference is due to Berkshire buying back an estimated 1.1% of its outstanding shares, a lower cadence than in prior years. We expect \$7.2 billion in share repurchases for the year with \$2 billion acquired in the fourth quarter. One of the methods in particular understates intrinsic value at the moment by a wide margin. A reasoned equal weighting of the most relevant measures; Sum of the Parts Basis and GAAP Adjusted Financials suggest intrinsic value per share grew by 10.7% in 2022. I'll hang my hat on this figure.

Some methods are more conservative at times and less so at others. The Two-Pronged Approach, used intermittently by Berkshire and with changing methods since 2005 makes no judgment about the degree to which the stock portfolio is under or over-valued. It likewise makes no determination if operating earnings are likewise deviant from "normalized" levels. Use of a Simple Price to GAAP Book Value methodology will also lose efficacy over time as share repurchases made above book value will shrink book value per share proportionally more than book value itself. Also, many assets are fully depreciated or carried at values well below a conservative assessment of replacement cost. 2022's decline in the stock portfolio was largely responsible for a 5.5% decline in book value per share. A year ago, we estimated the stock portfolio was \$50 billion overvalued largely due to overvaluation in Berkshire's Apple position that totaled 46% of the stock portfolio. Apple produced a 26.4% loss in 2022, wiping out the discount. We assume the stock portfolio is at least fairly valued today, and book value again is understated. An appraisal of Berkshire's intrinsic value today would exclude the simple price to book method. At a minimum, today's book value is a far better book value given no overvaluation in the investment portfolio. The two-pronged method likewise understates value today.

Semper's methods of valuation are described *briefly* below. Past letters delve into more detail of each. In total, Berkshire trades at a considerable discount to intrinsic value. The A and B shares closed 2022 at

\$468,711 and \$308.90 per share respectively. Using the average of methods, at \$631,318 and \$421 per share, Berkshire's shares trade at 74% of fair value, giving us 35% upside to fair value. Excluding our price to book method for valuing Berkshire, an average of the remaining three methods suggests fair value at \$652,968 per share, or \$954 billion by market capitalization, making the discount to intrinsic value 71.8%. At this figure for intrinsic value, Berkshire's shares would trade for 17.7x current economic earnings. As it is, the shares trade at yearend for 12.7x.

Of the four methods for valuing Berkshire, the Sum of the Parts Basis and GAAP Adjusted Financials approach should be more heavily emphasized in today's environment. Some assumptions and adjustments made top-down in the GAAP Adjusted Method are likewise incorporated at the group level. When earnings are neither depressed nor above normal profitability, the two approaches should yield similar results. Any valuation figures are not meant to imply precision. The methods are assumption based and modeled to yield a normalized, smoothed result such that when profits or investments bounce around with significant volatility, our figures will move with less deviation. As a simple example, an investment earning 7% made with cash earning nothing will have nearly zero impact on our profitability assessment. With T-bills now yielding more than 4%, investments today similarly have nearly no impact on normalized profitability. More on why this is the case to come.

Sum of the Parts Basis

Sum of the Parts Valuation (dollars in billions)

Operating Groups	December 2018	December 2019	December 2020	December 2021	December 2022
Berkshire Hathaway Energy	\$50 - 57	\$50 - 58	\$62 - 72	\$75 -86	\$81-86
BNSF	95 - 105	100 - 110	100 - 110	115 - 135	117-137
Manufacturing, Service and Retail <i>and now Finance</i>	140 - 150	170 - 180	170 - 180	200 - 210	228-241
Finance and Financial Products	30 - 33	To Black Hole	Now in MSR	Now in MSR	Now in MSR
Operating Group Subtotal	\$315 - 345	\$320 - 348	\$332 - 352	\$396 - 431	\$426-464
Insurance Underwriting Norm Capitalized Value	33	36	39	41	49
Operating Group Plus Insurance Underwriting	\$348 - 378	\$356 - 384	\$371 - 391	\$437 - 472	\$475-513
Investments					
Insurance Investments	241	330	372	453	415
Insurance Investments Valuation Premium/Discount	34	-19	-39	-50	None
Holding Company Investments (Net of debt)	21	34	32	28	19
Investments (Insurance and HoldCo) Total *	\$296	\$345	\$365	\$431	\$434
TOTAL VALUATION	\$644 - 674	\$701 - 729	\$736 - 756	\$868 - 903	\$909 - 947

*Excludes Investments and Cash in Operating Groups
Source: Semper Augustus

Valuing Berkshire through a sum of the parts assessment is the best approach to understanding the company. Four primary operating groups – Berkshire Hathaway Energy, BNSF, a collection of businesses under the Manufacturing, Service, Retail and Finance umbrella, and the greatest collection of property/casualty insurance and reinsurance companies in the world – are each among the largest businesses in the world on a standalone basis. Berkshire's holding company also owns a collection of investments and liabilities not specifically assigned or owned by the subsidiaries.

Profits at the railroad and most MSR businesses are sent to Omaha for reinvestment elsewhere. Some of these businesses have slight opportunities to reinvest incremental capital. However, if good returns on equity capital can be maintained, even with no or little growth, these businesses serve their purpose of creating free cash above Berkshire's cost of capital. Surplus capital accumulated by the insurance operation over the years financed nearly everything at Berkshire outside of issuance. The energy businesses are growing in value and retained all profits since Berkshire bought MidAmerican Energy in

1999. Retained earnings are matched with traditional gearing, growing Berkshire's far faster than most in the creation and distribution of power.

Berkshire Hathaway Energy

Berkshire Hathaway Energy is a collection of three Western U.S. regulated electric utilities and distribution assets throughout the U.S. as well as Alberta and Great Britain. The regulated utilities, MidAmerican Energy, Nevada Energy and PacifiCorp (Pacific Power and Rocky Mountain Power) serve customers in Iowa, Nevada, Oregon, Washington, Northern California, Utah, Wyoming, and Idaho, with growing renewable energy production assets in a growing roster of additional states. The territories served by Berkshire grow faster than the overall U.S. population. The group produces more than 34,000 megawatts of power per year providing energy substantially below the U.S. national average cost and far cheaper in markets with direct competition. Distribution assets include more than 21,000 miles of natural gas pipelines transporting 15% of natural gas consumed in the U.S. An ongoing \$18 billion investment is modernizing and building electrical grid capacity in the Western U.S. and Canada.

Half of BHE's owned and contracted generating capacity comes from renewables, a figure that will grow materially higher. Cumulative renewables investments total over \$37 billion to date. Wind and solar production assets are built in geographically disparate locations where much of the grid does not exist.

The energy group likely earned \$2.9 billion in pre-tax income (excluding a share price decline in BYD and a few smaller investments) in 2022 and \$4.8 billion after taxes and non-controlled interest. The larger net figure is not a typo. BHE's tax rate will run negative 40% this year, earning sizable production and investment tax credits which help Berkshire in whole. Use of accelerated depreciation also drives the current tax rate downwards. Since the acquisition of MidAmerican in 1999, Berkshire's growing roster of energy businesses have *never* sent a dime of profit to Omaha, instead retaining all profit to grow the asset base. For the last 18 years, BHE spent an estimated \$82.4 billion in capital expenditures against only \$33.7 in depreciation charges. Capex at BHE will total \$7.1 billion and likely rise to \$10 billion annually over the next several years. A table breaking down annual and cumulative capex and depreciation for BHE, BNSF and the whole of Berkshire can be found in the appendix. Where Berkshire's energy operation retains all profit and adds a like amount of debt to finance growth, competitors send 75% of profits, on average, to shareholders as dividends. To the extent competitors want to grow, they must find new capital to replace funds sent out the door. The difference is a huge competitive advantage in Berkshire's favor, as is Berkshire's willingness to spend massive sums growing the energy operation.

Berkshire Hathaway Energy (92.0% owned)	
Revenues Total	\$26.5 B
Energy Operating Revenue	\$21.2 B
Real Estate Operating Revenue	\$5.5 B
Other Income (Loss)	-\$0.11 B
Pre-tax Income (Excludes gain/loss BYD and invest.)	\$2.9 B
Income Tax Expense (Benefit)	-\$1.8 B
Net Income (GAAP)	\$4.8 B
Non-Controlling Interests of BHE Subs	\$0.4 B
Net Earnings Attributable to BHE	\$4.4 B
Non-Controlling Interests	\$3.69 B
Preferred Stock Dividend to BRK	\$0.80 B
Net Earnings Attributable to BRK	\$3.9 B
Net Earnings Attributable to BRK (Adjusted for cash taxes)	\$4.7 B
Net Earnings Attributable to BHE (Adjusted for cash taxes)	\$5.6 B
Reported Tax Rate (Derived MD&A-not cash adjusted)	-40.0%
Cash Tax Rate (Deferred taxes exceed reported tax)	-47.0%
Goodwill (From BHE 10-Q, 10-K)	\$11.4 B
Deferred Tax Liability (Including \$1.7B for investments)	\$12.5 B
Amortization of Intangibles	\$0.275 B
Depreciation	\$4.090 B
Capital Expenditures (Mgt. Estimate)	\$7.1 B
BYD and Other NDC Trust Stocks; BYD \$6.868B)	\$4.3 B
BHE Equity (Including BYD, NDCs, Rabbi and Non-Control)	\$50.0 B
BHE Non-Controlling Interests (50% ETT, 50% Iroquois)	\$3.9 B
BHE Equity Net of BHE Non-Controlling Interests	\$46.1 B
BHE Equity Net of NCI and Net of BYD/Investments	\$42.4 B
BRK Non-Controlling Interests	\$3.68 B
BRK Equity in BHE	\$42.4 B
BRK Equity (Including \$3.5 B Investments Net of DTL)	\$45.9 B
BRK Equity (Excluding \$3.5 B Investments Net of DTL)	\$42.4 B
Total Assets (Including BYD and Investments)	\$132 B
Debt	\$47.9 B
Cash	\$2.7 B
Interest	\$2.182 B
After-Tax Interest	\$1.724 B
ROE GAAP w/ % DTL (includes \$9.7 billion goodwill)	9.9%
ROE (Adjusted for cash taxes)	11.6%
ROC Net of Cash	8.4%
Estimated BHE Value (Gross of BRK NCI and With Investments)	\$88-93 B
Estimated BRK Value With BYD Net of Tax and NCI	\$81-86 B
Implied P/E	15-16

BHE has \$50 billion in equity capital (including non-controlling interests and what was a big investment in BYD that Berkshire started selling last year). Equity capital will more than double in size over the next decade. BHE has a number of non-controlling assets as a result of a number of natural gas distribution assets and an LNG export terminal acquired from Dominion two years ago. In addition, Berkshire itself only owns 92% of BHE. As a result of these layers of non-controlling interests, Berkshire's share of total equity is only \$45.9 including BYD and a few other stocks in Rabbi Trusts and \$42.4 billion excluding these investments.

Total assets of more than \$132 billion are more than 14% of Berkshire total assets. It should surpass the railroad in value to Berkshire within the next five years, perhaps, and using a conservative valuation may pass the passive investment in Apple in size, even assuming no further sales of Apple shares. Either side of that bet would be a good one.

Coal is materially deemphasized, putting BHE far ahead of the curve in the transition of the grid to renewables. Only 5% of BHE net property and equipment was related to coal generation. The three regulated utilities closed 16 coal-fired plants from 2006 to 2021, will close another 16 by 2030 and phase out its final 14 by 2049. 22 of the remaining coal units are owned by PacifiCorp. BHE further intends to retire all of natural gas-fired production units by 2050. Our infrastructure growth, here and abroad, cannot be fueled exclusively with alternatives, making Berkshire's energy assets in the U.S., Canada and the U.K. increasingly valuable in a world inclined to not make large investments in "dirty" assets. Underinvestment alongside a growing population will make evident the attractiveness of this terrific group. You should expect to see the utility and energy businesses grow and grow in importance to Berkshire's shareholders. While far from "sexy" assets, the collection will generate very good returns in a world of low interest rates for years to come.

An oddity of Berkshire's structure is within which subsidiaries various investments are made. Two such creatures exist within BHE. In addition to the energy operation, MidAmerican energy houses what is now the country's largest residential real estate brokerage firm and equally large brokerage franchisee networks. Home Services of America is rolling up many of the nation's major metro market high-end residential brokerages. Some are formally rebranded as Berkshire Hathaway Home Services while others retain their original branding. Huge by revenues but skinny by margin, the real estate business will do \$5.5 billion in revenues (25% of BHE total) on more than \$150 billion in sales volume and probably \$400 million in net profit, a margin of less than 1% of revenue. It's a capital-lite business with huge volumes and top-line revenues. Rising interest rates during the second half of 2021 and throughout 2022 crushed demand for mortgage refinance activity and volume, and thus profits. Mortgage rates rising from less than 3% to as high as 7%, coupled with what was rapidly rising housing prices made housing affordability quite poor. The industry still has a shortage of supply, but demand has materially softened.

Those believing technology will disrupt the traditional brokerage business and drive commissions downward like discount brokers have with retail stock trading, I wouldn't hold your breath. I was in that camp, buying and selling a house with no agent years ago. What a fool. I now have a front row seat watching how much work goes into selling a home. The DIY approach leaves money on the table and causes countless headaches. Top agents invest in marketing, do their own staging and coordinate with contractors, inspectors and title companies. They also manage what has become an enormous regulatory burden. Transacting in residential real estate is far from buying or selling a stock on Robinhood. Myriad carving of the overall commission means long, hard hours. Good agents, like good professionals in any field, are worth their weight in gold. People spend more time car shopping than finding a great real estate agent. If you are selling a nice home, I highly recommend not doing it alone. How welcome do you think the appraiser or inspector is having the homeowner in tow? It's what the good agents do.

BHE's other oddball investment is a \$232 million investment at cost in BYD, a Chinese electric vehicle and battery manufacturer, which soared to \$7.7 billion at year-end 2021. The stock slid 27% in 2022 and Berkshire began trimming the position, leaving \$3.5 billion in market value on December 31. The analyst must set aside the BYD position in analyzing BHE's utility and energy operations. Investments in common stocks are certainly not assets included in the utility rate base!

The Berkshire family sadly lost Director Walter Scott in September 2021. Mr. Scott spent a career at Peter Kiewit Sons, rising to Chairman and CEO upon Peter Kiewit's death in 1979, where he served until 1998. He joined Berkshire's board in 1988 and owned nearly 8% of BHE at his death. A philanthropist throughout his life, most of his estate was left to the Suzanne and Walter Scott Foundation. It is highly likely Berkshire will purchase the remaining share of BHE held by the foundation. It won't be a small check, with my BHE appraisal between \$88 and \$93 billion, *including* the remaining BYD position.

Greg Abel likewise owned 1% of BHE. With Greg now "kicked upstairs" to Vice Chairman of Berkshire overseeing all non-insurance operations and having handed the CEO torch at BHE to Bill Fehrman (though still Chairman of BHE), Berkshire did buy Greg's 1% share of BHE (as expected) for \$870 million last year, valuing BHE at \$87 billion, matching our appraisal. After setting aside a healthy payday for Uncle Sam, Greg in turn purchased a large block of Berkshire with his new-found liquidity. I'd be surprised if he doesn't make ongoing purchases of Berkshire's shares out of pocket. That's not the way most public company executives acquire shares, but it's the Berkshire way (and the right way).

Net of the investment in BYD we value BHE between 15x and 16x earnings. Debt cost of capital is 4.2% pretax. Utilities in recent years are typically valued at higher multiples and lack the opportunity set BHE possesses to reinvest profit. On a GAAP basis the business, ex gains or losses in BYD, earned 9.9% on equity, including goodwill, and 8.4% on capital. We estimate profitability higher for the economic use of accelerated depreciation, at 11.6% in adjusted return on equity. Given the predictability of return and for the time being seemingly unlimited ability to absorb growth capital expenditures, the valuation may be quite conservative.

BNSF

Berkshire acquired the 77.5% of BNSF it didn't already own in 2009, having figured out that the economics of railroading had changed for the better following decades of subpar profitability. Cascade had come to the same conclusion, as had the folks at Allegheny, with their long history in the rails. The deal closed and cost Berkshire \$34.5 billion, for which it paid \$15.9 billion cash, \$10.6 billion in Berkshire shares trading for 1.3x book value and assumed \$8 billion debt. The equity piece of the purchase was \$34 billion, which was marked up to reflect a \$1.1 billion on the original \$6.6 billion investment that was worth \$7.7 billion at the valuation of the deal. Berkshire "really" paid \$33 billion. The acquisition added \$15 billion in goodwill to the BNSF balance sheet. Regardless, since BNSF joined Berkshire in February 2010, *all* profits earned by the railroad were and are sent to Omaha. The rail retained no profit for more than a decade, and our valuation of the business is in a range of \$117 to \$137 billion. With 32,500 route miles of track in 28 western states, the railroad is closely

BNSF	
Revenues	\$25.8 B
EBIT	\$9.1 B
Pre-tax Income	\$8.0 B
Net Income (norm tax rate now 24.0%)	\$6.0 B
Net Income (cash tax adjusted)	\$6.8 B
Goodwill (BNSF SEC and STB filings)	\$14.9 B
Equity (estimated from STB and GAAP filings)	\$47.6 B
Total Assets	\$92.9 B
Debt (ex-lease)	\$21.9 B
Cash	\$1.9 B
Interest	\$1.025 B
After-Tax Interest	\$0.810 B
Deferred Tax Liability	\$15.2 B
Equities as an Investment (None now)	n/a
Depreciation and Amortization	\$2.5 B
Capital Expenditures	\$3.2 B
ROE GAAP Net Income	12.9%
ROE Adjusted for Cash Taxes	14.4%
ROC Net of Cash	11.3%
Estimated Value	\$117-137 B
Implied P/E (on net adjusted for cash taxes)	17-20

comparable in size to Union Pacific, which closed 2022 with a \$127 billion market cap, down from \$161 billion at year-end 2021. Revenues and profit are very similar between BNSF and Union Pacific. It's never a good idea to look to market comps, as often the market is wrong, sometimes wildly so. Many had gotten to thinking 40x earnings was conservative in the late 1990s, including some insurance analysts. Still, with equity of \$47.6 billion, only \$12.1 billion higher than at year-end 2010, the rail earns a moderately depressed 12.9% on equity, 14.4% with our tax adjustment, and 11.3% on capital.

BNSF is likely to report \$6.0 billion in GAAP income on \$25.8 billion in revenues for 2022. Like BHE, a portion of capital expenditures at the railroad benefit from use of accelerated depreciation, creating a large deferred-tax liability (guessing \$15.2 billion now). On a cash tax basis, BNSF earns closer to \$6.8 billion. As stated earlier, the degree to which capex exceeds depreciation is in decline. You can't add track miles to a mature network, and much of the improvements in additional track in high-traffic corridors and tunnel expansion to accommodate intermodal's double stacking of containers has largely run its course. We'll see where this heads prospectively. From 2010 to mid-2016 capex ran double depreciation. The rate came down to where the rail will spend only \$754 million north of \$2.5 billion depreciation expense in 2022. Cumulative capex of \$46.5 billion was \$25.6 billion, about 81% higher, down from double.

BNSF derailed in the 2020 pandemic following a weak 2019. 2021 saw records in sales and profits. Inflation and supply chain problems led to record revenues in 2022 but only flat expected profits, meaning margin compression. The rail operates with a high degree of variable expenses. Fuel, equipment rentals and materials fluctuate with volume. Labor is more fixed, but during years like 2020 payrolls shrank and some workers took early retirement. Compensation and benefits, still the single largest expense line items in most years, is a lower percentage of revenues in the low 20s now that it was years ago – productivity!

Operating revenues across all mixes of freight shipped were strong in 2022. Top line growth likely approached 15% over 2021. Revenue growth was driven by BNSF's ability to pass along rising fuel cost to customers via surcharges. Rates per car/unit also rose. However, volumes as measured by carloads declined, particularly in the second half of the year. Consumer, industrial and agricultural products all saw strong volumes and price gains. Coal revenues had been in decline for years but boomed in 2021. Volumes in coal likely rose modestly for the year due to increased electricity generation, higher natural gas prices and rising exports. Operating revenues grew 33% in the third quarter and 19% for the nine months through September. Revenues per car/unit rose, with increased electricity demand, higher natural gas prices and export demand way up. No doubt Europe, particularly Germany, regrets the decision to close coal and nuclear-fired capacity. Burning coal when wind and solar capacity are insufficient is a superior alternative to freezing to death. There are some hard cores that likely would prefer hypothermia, though the count there is likely in decline.

Coal will no doubt phase out in the U.S. and Europe, but perhaps more slowly than those racing to net-zero carbon believe we can get there. It's a product category that will weaken which BNSF will have to replace or lose that portion of volume over time. BNSF further benefits from a lack of new pipeline construction. Shipping oil by rail is far less efficient than by pipeline. Thank goodness the rail network is already in place.

Despite perhaps fewer avenues for growth capex at BNSF, modernization in network and assets continues, and like the energy businesses, the rail benefits from its location in the faster growing west. Trade with Asia, depressed for several years, finally picked up. The industry was a *huge* beneficiary of the TCJA tax code change at the end of 2017 on myriad fronts.

BNSF is naturally hostage to economic growth but has also been late to adopt logistical efficiencies that its peers already implemented or are in the process of doing so. Specifically, all the major Class 1 rails

except BNSF adopted “Precision Scheduled Railroading” which in a nutshell runs trains on a fixed schedule between points on the network, regardless of number of cars, or units. It essentially replaces a hub and spoke method of delivering freight. Observing operating ratio improvement at the competition will likely compel BNSF to adopt PSR despite the growing pains that would come with any major logistical change. It’s likely a more difficult logistical tool to implement in a more geographically distributed footprint, but cost and efficiency benefits are likely to compel adoption.

Manufacturing, Service, Retailing and Finance

2022 was a record year for Berkshire’s collection of businesses in its Manufacturing, Service, Retailing and Finance group. I believe great strides were taken over the last several years focused on operating efficiencies among this eclectic assortment of businesses. The group will see revenues 10.0% above 2021 but also 18.0% higher than reported in 2019. A 5.7% three-year annual growth may not seem like much, but many businesses here are mature and see not much more than modest price and volume increases over time. Some are in decline. That said, a focus on cost and operational execution will see group profits at a record \$12.7 billion, up 14.4% above 2021’s \$11.1 billion. After-tax profit grew 10.9% annually since 2019. With most top-line group organic due to little profit retained in the group, the collection of MSR businesses is performing at the highest level in two decades at least. Given a higher confidence that group equity is now \$15.7 billion, return on net unleveraged equity at 11.0% is the highest since Berkshire reported group results in its 2003 Chairman’s letter. Even adding back 2020’s \$10.6 billion write-down for underperforming Precision Castparts, return on equity is 10.1%. Recall 2017’s tax code change which lowered the corporate federal tax rate from 35% to 21%, an immediate 21.5% boost to the bottom line, presuming an increased level of profitability is durable and not subject to being competed away. Among more industries than I would have imagined the benefit seems to have largely stuck. Fully adjusting backward for the write-down and tax benefit, group return on equity is still at least a two-decade record. Sure, there are some individual components needing attention, closure or delivery to private equity, but there appears to be some good blocking and tackling going on. I’m quite certain Greg Abel has a hand in this.

MSR Businesses + Finance & Financial Products	
Revenues	\$168.3 B
Pre-Tax Income	\$16.5 B
Pre-tax Margin	9.8%
Net Income at 23.4% assumed tax rate	\$12.7 B
Profit margin	7.5%
Goodwill (net of 2020 PCP \$10B write-down)	\$31.1 B
Other Intangibles (net of 2020 PCP \$600m write-down)	\$27.5 B
Total Assets (Identifiable + Intangibles)	\$181.5 B
Equity (Write-down 10.0 and 0.6 PCC 2020)	\$115.7 B
DTL (Unallocated estimate)	\$11.45 B
Depreciation of Tangible Assets	\$3.4 B
Capital Expenditures	\$3.7 B
Total Debt (allocated interest expense Ins & Other & Unallocated to Subs)	\$22.3 B
Cash (Offset to Debt; Balance to HoldCo)	\$22.3 B
Interest	\$0.357 B
After-Tax Interest	\$0.282 B
ROE (If equity 10.6B higher for PCP writedown: 8.8%)	11.0%
ROTE (excluding goodwill & other intangibles)	22.2%
ROC Net of Cash	11.2%
Estimated Value	\$228-241 B
Implied P/E	18-19

Precision Castparts (PCC) is showing signs of life. The existence of vital signs is thanks to a pickup in increased commercial air travel and a rebound in narrow-body commercial aircraft deliveries by original equipment manufacturers (OEMs). Deliveries of wide-body aircraft remain relatively low, in part attributable to the pause in the Boeing 787 program, which resumed deliveries in the third quarter of 2022. The 787 platform is a big customer of PCC. Growth and strong demand for air travel and aerospace products will increase over time. The pandemic-induced weakness in PCC’s aerospace business could never have been forecast when Berkshire bought PCC. However, the turbine business was already on life support at the time of acquisition. The purchase by Berkshire was negatively affected by a too-high price paid in the deal, already acknowledged. The write down is something seldom seen at Berkshire across the entire 57-year history with present management in charge. If Berkshire were the typical U.S. company, it would write down \$7 billion per year on average at today’s level of profitability, assets, and equity. That’s

15% of profit *every* year. I have yet to see the CEO who says our return on equity would be a lot lower if analysts would add back our cumulative write downs and write-offs over time.

Within the balance of the industrial products group after PCC, Marmon and IMC continue growing, with revenues and profits up more than 12% and 5% respectively, well off 2021's pace. Marmon's bottom line matched top-line growth in 2022 while IMC saw slight margin compression on higher raw material costs and impact from the war in Ukraine. Lubrizol's revenues likely grew by low-single digits on higher selling prices but on lower and weakening volumes throughout 2022.

Clayton Homes continues as the star of not only the building products group, not only the MSR group but among all of Berkshire. Revenues continued to grow at a 20% clip in 2022 with profits growing more than 40% through the third quarter. Management believed both revenues and profit growth would materially decelerate from its torrid pace. The builder of manufactured and site-built homes has grown north of 20% for years. Unit sales of site-built homes grew more than 20% in 2021 but only by a likely 5% in 2022 harmed by rising interest rates. Factory-built homes regained the growth lead over site-built homes during 2022, growing by nearly 10% for the year. Should mortgage rates persist at high levels, both sides of the business will weaken.

Clayton's annual revenues are pushing \$12 billion with pre-tax earnings approaching \$2.0 billion. As reference, Berkshire paid \$1.7 billion cash for Clayton in 2003, which had \$1.2 billion in revenues at the time. Let's just say Berkshire paid less than one times current after-tax earnings. Clayton benefits enormously by being part of Berkshire, who provides the financing for much of Clayton's mortgage business. A pivot to building site-built homes in booming markets has so far proven brilliant.

None of the businesses in the building products group were spared by supply chain problems and inflation. Delays for materials and inputs such as steel, lumber, energy, petrochemical-based materials, freight, and labor all hampered volumes. The businesses are raising prices accordingly. Expect 15% revenue growth in 2022 primarily due to higher unit selling prices. Volumes likely grew but only at a low-single-digit clip. Expect several points of margin expansion thanks to the volume growth and product mix.

Within the smaller consumer products group, Forest River's business exploded over the past couple years but ran smack into a wall mid-year 2022. Revenues were up 25% through June but collapsed 7% in the third quarter. Unit sales of RVs were off by 5% for nine months but by 28% in the quarter ended September 30. Price increases drove top-line growth but ultimately harmed unit sales. Expect continued weakness in unit volumes during the fourth quarter and into this year.

Volume weakness among the balance of Berkshire's consumer products businesses; apparel, footwear and Duracell, were weak throughout 2022. With high fixed-costs, margins collapsed. If anything could go wrong with this group, it all seemed to at once. Lower sales volumes, manufacturing inefficiencies, higher raw material, freight and labor costs took a toll on the bottom line.

The service business group was a 2022 highlight. The pair of aviation businesses NetJets and FlightSafety, electronics distributor TTI, franchisor Dairy Queen, transportation equipment lessor XTRA, furniture lessor CORT, petroleum and chemical industry logistics provider Charter Brokerage, electronic news and regulatory filing distributor Business Wire, and a Miami TV station likely saw sales and profits grow by a high-teens pace. Expect weakness at year-end 2022 into 2023.

Berkshire Hathaway Automotive (BHA) is the largest business in the retailing group with over 80 auto dealerships. Revenues and unit sales of new and used cars likely grew by high-single digits during 2022 while profits ballooned by a mid-20 percent thanks to high gross margins plus finance and service

contract earnings. New vehicle gross profit margins are surging due to supply chain issues impacting auto manufacturers. When your wife's SUV is broadsided three days before Christmas and you are forced to buy a new vehicle before the old one was run into the ground, a 5-month delay on getting a new vehicle will tell you all about the current condition of margins.

Berkshire's home furnishings companies; Nebraska Furniture Mart, R.C. Willey, Star Furniture and Jordan's comprise about a quarter of the retailing group. Other retailers include three jewelry retailers; Borsheims, Helzberg and Ben Bridge, See's Candies, Pampered Chef, Oriental Trading Company and a German retailer of motorcycle accessories Detlev Louis Motorrad. Outside of BHA, the retail group likely saw a ~5% decline in revenues in 2022 with profits collapsing by perhaps 20%. A slowing housing market is hammering the furniture retailers and Pampered Chef needs some pampering itself.

McLane is a wholesale distributor to grocery stores, convenience stores and restaurants. The company was acquired from Walmart in 2003. It subsequently added wine, spirits and beer distribution. Grocery distribution is about 60% of the business with foodservice comprising most of the balance. The business is so large by revenue that it merits stand-alone accounting treatment in the service and retailing group presentation. Pre-tax profits recovered to a still weak 0.8% pre-tax margin. The business suffers from ongoing supply chain issues, labor and truck driver shortages and high inventory costs. The business has been weak and earning inadequate returns on capital invested. Despite a large \$50 billion in annual revenues, about 18% of total Berkshire firm consolidated revenues, profit isn't even a rounding error in the total, nor is the capital committed to the business.

Insurance

There exists no rival insurance operation on the planet to Berkshire's. There isn't a close second. Berkshire's collection of insurers underwrites property/casualty insurance and reinsurance through three groups and combined is the highest rated insurance operation in the world. GEICO underwrites directly marketed private passenger auto insurance is the second largest auto underwriter in the U.S. with 14.3% market share. The Berkshire Hathaway Primary Group includes an assortment of commercial insurers writing medical malpractice, workers' compensation, auto, general liability, and several property and specialty coverages for businesses of all sizes. The Berkshire Hathaway Reinsurance Group writes excess-of-loss and quota-share coverages through National Indemnity since 1967 and General Reinsurance since 1998. The reinsurance group also underwrites life and health reinsurance coverages. The reinsurance group is the fourth largest reinsurance operation in the world by premiums written but by far the largest by surplus, or book value. Berkshire acquired Alleghany in October. Alleghany operated Trans Re, a \$5 billion premium volume reinsurer, and RSUI and CapSpecialty who write \$2 billion in combined specialty premium volume.

GEICO

The private passenger auto insurance industry experienced the most unusual three-year period. The pandemic took cars off the road for a year. Fewer drivers mean fewer accidents, so claims frequencies were far below historical and thus actuarially assumed levels. Offsetting fewer claims was an increase in severities. Fewer cars on the roads, and the perception of fewer ticket-writing police, encouraged speeding and reckless driving, hence more expensive claims paid to fix cars and people. With a welcome surprise of far lower frequencies of claims, GEICO initiated a "giveback" program of crediting policyholders with discounts on renewals. Some insurers simply cut checks as refunds to policyholders. Auto insurance is written on an admitted basis, whereby underwriters file rate applications with each state insurance commission for approval. Regulators were not going to let the industry reap a huge one-time economic benefit at the expense of drivers on the roads for fewer miles than presumed.

Refunds and credits drove reported written and earned premiums downward for the duration they were in place, reducing premiums by \$2.9 billion. In GEICO's case the givebacks ran through a portion of the fourth quarter in 2020. Once clear of the givebacks, premiums earned rose 18% over 2020 through 2021. Underwriting results in 2021 produced a satisfactory 96.7% combined ratio (losses and underwriting expenses combined as a percentage of premiums earned – essentially a profit margin). Not unexpectedly, claims frequencies rose in tandem and by the second half of 2021 severities rose substantially again. Competitors likewise saw a deterioration in margins due to the same inflationary factors. Inflation is a real thing in auto repair and medical expenses. Both are rising very quickly and just eviscerated private passenger auto underwriters in 2022. The industry bled money, exacerbated to capital hits from both declining bond and stock prices on the investment front.

GEICO and Progressive are both taking market share from State Farm, who not long ago had 25% of the auto market in the U.S. Both companies are likely to pass State Farm's 15.9% share in the next three or four years. GEICO operates largely with no agents or brokers involved in distribution. Paying a gecko is cheaper than paying commissions, thus GEICO's underwriting expenses are at a far lower portion of premiums earned than the competition. For this cost advantage, they tend to incur higher losses. Losses have been too high; thus, Berkshire shook management, placing Todd Combs temporarily in the CEO role, also retaining management responsibilities for a matching portion of Berkshire's equity portfolio managed by Ted Weschler. Tony Nicely had run GEICO for 25 years before retiring in 2018.

GEICO is severely behind Progressive in using technology in underwriting and claims management. Progressive leads in telematics, or the use of GPS in monitoring cars and driving habits to help properly rate risk and in setting premium. While the gap can be closed, Progressive has been more profitably gobbling up market share and may pass GEICO over the next couple years. GEICO maintains a huge cost advantage over the field but needs to solve losses that are running too high. I don't think Todd Combs is the answer in the current role as CEO.

GEICO's will likely see an underwriting loss exceeding 5% in 2022. The good news about auto insurance is it's very short-tail in nature. Premiums are reset every six or twelve months and losses develop quickly. Roughly 60% of losses are settled in the first year subsequent to a claim being filed. Nearly 100% of losses are developed and paid by five years. Inflation in auto parts, vehicle replacement, medical costs and litigation expenses are running at very high levels. GEICO and its competitors will see several rounds of price increases granted by most state insurance commissioners during 2022. Price tends to fix problems quickly, but it will take great ongoing effort to regain its low-cost provider position versus Progressive. Progressive tends to lead when filing for rate increases. There exists a natural lag in profitability between the two. It will take more than a bunch of rate hikes to fix GEICO's loss of competitive advantage.

BH Primary

Berkshire's Primary Group includes its long-held Homestate Companies, MedPro, GUARD, National Indemnity Primary, U.S. Liability, Central States Indemnity and MLMIC. The largest company in the mix is Berkshire Hathaway Specialty which Berkshire seeded on a de novo basis (started from the ground up) in 2013 with a management team hired away from AIG, specifically Lexington Insurance, AIG's excess and surplus division. It quickly became the largest company in the Primary group of commercial insurers. It's always worth keeping an eye on new insurers charging ahead in the capture of market share. Berkshire is famous for a willingness to walk away from underwriting when prices are inadequate. BH Primary saw 2022 written premium up 15.3% through September, with BH Specialty up 20% in professional liability, casualty and property lines. Underwriting was only slightly profitable for the first three quarters of 2022, pulled downward with a 108.1% combined ratio in the third quarter due to catastrophe losses from Hurricane Ian.

Reinsurance

Berkshire insures and reinsures against a large and diverse number of loss events. Prior pandemics and epidemics, particularly the SARS outbreak in 2003, heightened the insurance industry's awareness of the risk posed by a widespread global outbreak. Business interruption coverage is often sold as part of a business owner's policy and covers damages to property or equipment. It is a *property* cover. SARS is/was a highly contagious and lethal coronavirus, much more so than COVID-19. The SARS outbreak spread to 29 countries and fortunately killed fewer than 1,000 people, none in the U.S. Despite being a property cover, policy language then often didn't specifically exclude pandemics, viruses and communicable diseases. Even if an outbreak does physically cause the closure of a place of business, a restaurant for example, loss claims are limited to loss of income and remediation over the short period of time to clean and disinfect the property. Subsequent to SARS, most of the industry specifically included exclusions with clarifying policy language.

When the degree of activity suspended by the pandemic became apparent, it became clear that insurers would be challenged legally, furthered by some public policy makers suggesting that even though business interruption is a property line that the industry should be responsible for its "fair share" of the cost of business losses. It became apparent that even though the industry had learned their lesson with SARS and others, (MERS, H1N1/Swine Flu, Ebola, Zika and the bird flu) there were policies in force with loosely written or non-exclusionary policy language. Several European reinsurers writing in the Lloyd's market were at big risk of loss. Berkshire likewise had some exposures that would likely be challenged. In aggregate, given policy limits and Berkshire's extremely diversified book of insurance business, it was going to be in relatively better shape than most from the outset.

Industry losses developed (so far) far better than many expected in the teeth of the pandemic. Swiss Reinsurance, the largest reinsurance company in the world by net reinsurance premiums written suggested industry losses might approach \$100 billion. Losses are still developing but it looks like COVID-19 will be half as expensive, but still the third largest catastrophe behind Hurricane Katrina and the 9/11 terrorist attacks on the U.S.

In response, rates materially hardened in 2021 and 2022. Berkshire's reinsurance property/casualty's premiums written rose 6.4% in 2021 and likely by 10% in 2022 to \$15.6 billion. Hurricane Ian harmed underwriting in 2022's third quarter with the underwriting margin only slightly positive. Storms and freezing weather will impact the fourth quarter but expect an underwriting profit for 2022 of about 12%.

Berkshire maintains a stronger capital base than any in the reinsurance industry and is massive in scale. Berkshire's combined statutory surplus (conservatively defined as equity or book value) against which it writes business dwarfs all players. Expect Berkshire's statutory surplus to total \$254 billion at year-end 2022, down a whopping \$47 billion, or 15% from \$301 billion in 2021 but above \$237 billion in 2020 and \$219 billion in 2019. The decline in Berkshire's common stock portfolio in the insurance operation hammered capital, but they were far from alone.

GEICO writes more premium volume than any of Berkshire's insurance companies, \$39 billion in 2022, but requires by far the least amount of capital, no more than \$15 billion. Private passenger auto insurers write on an admitted basis and can write \$3 in premiums for every \$1 in statutory surplus. GEICO *could* write current volume with only \$13 billion in capital. They more likely assign \$25 to \$30 billion to GEICO, thus write at 1.5x or less, leaving loads of surplus capital.

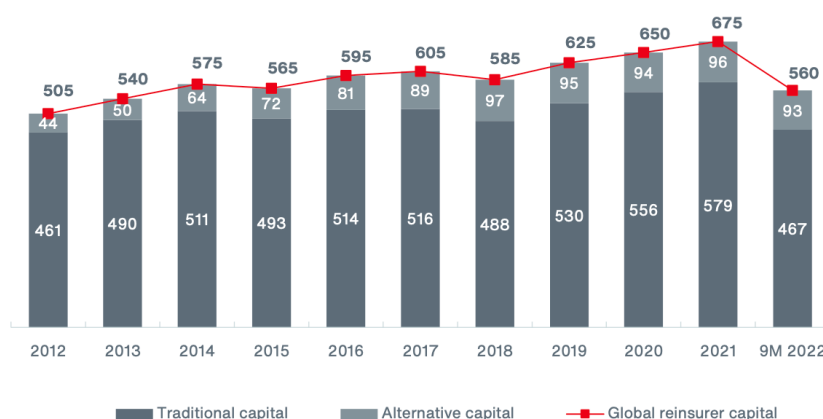
BH Primary will write just over \$14 billion in premiums in 2022, 14% above 2021. This group of insurers requires more capital per dollar of business written than in auto, but with \$14 billion in annual premiums requires perhaps 5% of Berkshire's combined insurance capital. Primary could write current volume with

\$14 billion in statutory surplus, but for conservatism's sake, assign it \$25 billion, thus writing less than 60 cents of premium per dollar of capital.

The reinsurance operation at Berkshire, National Indemnity (including retroactive reinsurance and periodic payment annuity) and General Reinsurance, holds and requires most of the insurance capital. Berkshire Hathaway Reinsurance Group, as the combined entity is now known, wrote \$20.6 billion in premium volume in 2021. Expected written premiums in 2022 should be roughly \$21.4 billion with reinsurance surplus of more than \$200 billion.

By comparison, the entire global reinsurance industry has combined surplus of roughly \$560 billion at September 30, 2022 when including \$93 billion in alternative capital such as catastrophe bonds and insurance-linked securities. The industry will write roughly \$320 billion in premiums. **Berkshire writes less than 7% of combined reinsurance industry premium volume but has 45% of industry equity capital.** If anybody wonders how Berkshire can have so much of its insurance companies' investments in common stocks instead of fixed-income securities, look no further.

Global Reinsurer Capital (\$ billions)



Sources: Company financial statements / Aon's Reinsurance Solutions / Aon Securities, LLC

Reinsurance industry capital took a beating in 2022, largely due to the pummeling of most investment asset classes. The industry faced inflation levels not seen in four decades which pushed interest rates upward (and bond priced downward). A deteriorating global economy compelled a widening of credit spreads. Real estate prices plateaued and fell in some markets. Total industry capital plummeted 17% in nine months from year-end 2021 to September 30, 2022. With

many insurers writing maximum business that capital would allow, pricing could only go one way. Pricing was strong during most of the last two years. My understanding is January 1, 2023 renewal pricing was extremely strong, narrowing coverage definitions and writing in more exclusions. It is a good time to be the big dog with the fortress balance sheet. A number of companies don't have the balance sheet strength to write as much business as they would like.

Berkshire's insurance operation can be valued differently than any insurer on the planet. By assigning \$25 billion in surplus to GEICO and another \$25 billion to BH Primary, reinsurance group surplus of more than \$200 billion headed into 2023 is 45% of traditional global reinsurance capital and 36% including alternative capital like insurance linked securities and cat bonds.

Underwriting requires reserves to cover losses. Equities are a risk asset. North American reinsurers excluding Berkshire allocate more than two-thirds of invested assets to investment grade fixed-income and nearly 10% to cash. Risk assets comprise less than a quarter and in addition to common stocks of public companies include non-investment grade bonds and alternatives such as private equity, real estate, venture capital and hedge funds. Markel, Fairfax, and formerly Alleghany (now part of Berkshire) are often compared to Berkshire in structure, but none come close to Berkshire by surplus capital. Of all North American Reinsurers, Fairfax and Markel come closest to Berkshire in asset mix, but with only a third or so of invested assets in risk assets. Fairfax writes more premiums than equity but must lean

heavily on the retrocessional market to do so. Earned premiums are \$8 billion less than written and three times equity. Stocks are less than 15% of investment assets. Fixed income and cash exceed written premium. It's a similar story at Markel, where risk assets comprise roughly a third of invested assets. Markel retains more premium volume and premiums earned match statutory capital. Stocks comprise one-third of investments with bonds and cash totaling the remaining two-thirds. Several investments in private businesses are made largely with surplus capital but will necessitate having the preponderance of investments in fixed income and cash.

The two largest insurers in the world by premium written are Swiss Re and Munich Re. Where Berkshire's reinsurers typically write less than 10 cents per dollar of capital, Swiss Re writes more than a dollar, Munich Re typically writes a dollar. Equities are 4% of investment assets at each. At neither has equity grown for a decade. These are leveraged bond portfolios requiring new capital at every major catastrophe.

Berkshire will likely end 2022 with \$313 billion in equity securities, 75% of its \$415 billion investment portfolio. Total insurance group premiums earned for all of Berkshires insurers will total \$74 billion in 22, or 27% of average statutory capital over the course of 2022. Reinsurance premiums earned are less than 10% of reinsurance capital. I mentioned this to recently retired CEO at Alleghany, Weston Hicks, a couple years ago, to which he joked, "Well, the Europeans never met a policy they didn't like." He also noted this year that one of Berkshire's great insurance advantages is its location in Nebraska and under the regulatory watch of the state insurance commission. His point is Berkshire has latitude to own more common stocks as a percent of reserves thanks to favorable regulation. I countered the "lax" oversight was earned. In any event, the insurance and investing worlds will miss Weston. What a great run at Alleghany. And what a great insurer he built to now be part of Berkshire.

Berkshire's insurance group's intrinsic value at year-end 2022 is estimated at \$464 billion, half of Berkshire's total intrinsic value per our sum of the parts method. The appraisal of Berkshire's insurance operation presumes a 5% pre-tax underwriting profit, so \$4.1 billion on \$74 billion of earned premium in 2022. After-tax normalized underwriting profit is capitalized at only 15x earnings, or \$48.6 billion. I've been asked about whether the combined insurance entity can durably underwrite at 5% pretax in a low interest rate world. Two comments here. One, the reinsurance group intermittently underwrites retroactive reinsurance policies and periodic payment annuity coverage. Both involve large upfront premium payments, with capped losses developing over time. On a GAAP reported basis, yearly reported losses will nearly always pull downward overall underwriting margins, even if over time the benefit of use of float greatly exceeds actual losses paid. We ignore the premiums received here and reported losses as they develop. Doing so properly casts the reinsurance group in a much more profitable and correct light.

Insurance Operations - Estimated at December 31, 2022		Insurance Investments (December 31, 2022 estimated)	
Premiums Earned with 4Q Alleghany (Excludes Retroactive Premiums Earned)	\$76.0 B	Equity Securities (Includes \$12.1B OXY Warrants)	\$313.5 B
Statutory Surplus (Equity) \$237B 2020;	\$254.1 B	Fixed Income Securities	\$18.5 B
Book Value GAAP (Reconciling to Subs; S/B lower than stat surplus; not accurate)	\$248.3 B	Cash (Assumed \$11.6 B Alleghany Buy funded by HoldCo - Could be Surplus Insurance Cash)	\$59.7 B
		Other (\$0.850 BHE Pfd: Was 3.75, 1.45 paid 21, 800 paid 22; \$2B Seritage Term Loan)	\$3.35 B
Float (\$147B '21; \$150B 9/30/22; FY Includes Y	\$163 B	Alleghany Y Investments (Presume \$2.9 B Stocks sold. Likely 70% eventually to Stocks)	\$20 B
Losses Paid (Includes 4Q Y)	\$58 B	Total Investment Assets (326.1 Y/E 2019; 363.1 2020; 446.3 Y/E 2021)	\$415 B
Expected After-Tax Underwriting Gain 2022:	-\$0.643 B	<u>Investment Income and Earnings (to reconcile)</u>	
Normalized Underwriting Margin: 5% Pre-tax (Ex Retro and PPA Amortization)	\$4.1 B	Dividends (Annualized at 12/31; Excludes OXY Pfd) Tax at 13.125% for less than 20% owned	\$5.2 B (1.74% div yield)
Normalized Underwriting Net Profit	\$3.2 B	Retained Earnings of Common Stocks; Tax at 3%	<u>\$16.9 B (5.60% REY)</u>
Capitalized Value from Underwriting ***	\$48.6 B	Total Earnings of Common Stocks	\$22.1 B (13.63 P/E; 7.34% EY)
Goodwill (Includes \$3.1 B from Y; Other Intangibles immaterial)	\$17.9 B		
DTL (Investment Gain+Def Charges Reins-Unpaid Losses/LAE-Unearned Premiums)	\$38 B	Divs on OXY Preferred (Recently paid as cash)	\$0.800
		Interest on Fixed Income and Cash; Tax at 21%	\$2.522 B
Insurance Estimated Value			
Total Investment Assets (Includes \$20 B from Y)	\$415 B	Total Pre-Tax Earnings of Investments (\$17.3B 2019)	\$25.4 B
Equity securities valuation premium/discount 15% 2021 (-19B 2019; -39B 2020)	\$0 B	Optionality of Cash > One-Year Losses Paid #	\$0.051 B
Capitalized Value from Underwriting	\$49 B	Pre-tax Earnings with Optionality of Surplus Cash **	\$25.5 B
Estimated Value	\$464 B	Paid and Hypothetical Taxes (11.0% blended; RE of stocks 3%)	\$1.8 B
		Investment Net Income	\$23.7 B

Two, whether Berkshire underwrites at a pre-tax 5% or at breakeven really doesn't matter. Where underwriting drives the profitability bus at most insurers, investments drive it at Berkshire's massively overcapitalized insurance group. Two aspects of the appraisal are conservative. One, at times of perceived equity portfolio overvaluation, my appraisal will assign a discount to the value of the investments. Last year that discount was \$50 billion, almost all applicable to Apple. The market took a 26.4% total return bite out of Apple in 2022. Therefore, with a stock portfolio valued at 13.5x earnings, no discount is applied at year-end 2022.

Finally, when assessing the earning power of the insurance enterprise, investment income consists of interest and dividends received, not quite \$8.5 billion (including \$800 million in dividends on an Occidental preferred). The balance comes from ignoring unrealized gains and losses and recognizing retained earnings of the stock market holdings, totaling \$16.9 billion today. Adding \$5.2 billion in dividends from the stock portfolio to \$16.9 billion in retained earnings totals \$22.1 billion of earnings on the stock portfolio. The earnings yield of 7.3% is the only amount derived in the appraisal of group earnings from the stock portfolio. If the portfolio earns more than 7.3% over time, then the appraisal is conservative. A 10.3% return on Berkshire's stocks adds an additional \$9.4 billion to earning power above the earnings yield on the portfolio.

One final element in deriving net investment income at the insurance operation. The assessment assumes Berkshire will always maintain a cash balance within the insurance group equal to one year's balance of losses paid in cash, \$58 billion at yearend (including losses at Alleghany). Any cash above that figure, oddly nearly matching at an expected \$59.7 billion, is hypothetically assumed to eventually be invested in something higher yielding than cash. A 7% return is used minus any yield currently earned on Treasury bills and cash. With cash yields at 4% (higher when the Fed raises rates again this year), merely \$51 million is picked up as additional "income to be earned." Optionality on cash a year ago was \$3.5 billion in pre-tax hypothetical earning power due to cash balances being much higher and T-bill rates being nearly zero. Those disagreeing with the method can surely ignore the hypothetical income but must remember to immediately add the yield of any net new investments. When a new investment replaces a gross 7% optionality premium on cash, no such day-to-day or quarter-to-quarter jumping around is necessary. The reality is Berkshire's new investments typically yield north of 7%. Alleghany was purchased for what I calculate as less than 6x normalized earnings under Berkshire's umbrella. That's a 16.7% earnings yield. We'll see how Y fits in to BRK.

Skeptics of the Semper approach to valuing Berkshire, instead taking the more "conservative" tack, invariably scratch their heads wondering how Berkshire compounds by more than 10%. Take note, the insurance company can and does occasionally distribute dividends to the holding company or make wholly owned investments in subsidiaries. The capital to purchase BNSF, BHE and myriad of the Manufacturing, Retail, Service and Finance businesses wasn't created out of thin air. It came from Berkshire's overcapitalized insurance operation, whose value is largely derived from investments and not underwriting. That the insurers happen to be underwriting powerhouses, underwriting profitably over decades (providing float that is better than free) and willingly conservative when pricing doesn't compensate for risk. They can also back the truck up when appropriate to do so. We should see ongoing material premium growth in the present environment.

Holding Company Assets and Liabilities

Berkshire controls several assets and houses certain liabilities at the holding company level that don't get assigned to the subsidiaries. Assets include a sizable portion of cash and Berkshire's interest in several partially owned companies where Berkshire owns more than 20% and is deemed in a control position. This latter group are carried with accounting treatment known as the equity method, which essentially adds pro rata profit to cost basis and likewise subtracts any portion of profits received as dividends. Liabilities include \$21.8 billion in debt not assigned to any subsidiary and a nominal \$1.0 billion portion of Berkshire's total net deferred-tax liability, likewise unassigned. The annual reconciliation has \$19.0 billion in net asset value held at the holding company producing \$2.8 billion of Berkshire's \$53.9 billion normalized profit for 2022. As of September 30, 2022, holding company assets now include a growing common stock investment in Occidental Petroleum that now exceeds 20% ownership by market value and by voting rights.

The position had previously been accounted for as an insurance company investment. The insurance operation still owns a \$10 billion 8% Occidental preferred and warrants which give Berkshire the right to purchase 83.86 million Occidental shares at an exercise price of \$59.62 per share. The preferred is redeemable by Occidental beginning in 2029 at a redemption price equal to 105% of the liquidation preference.

Equity Method Investments

Kraft Heinz

Kraft Heinz's common shares posted an 18.3% total return for 202, including dividends. As an equity method investment, the gain isn't reflected in Berkshire's financial statements. Berkshire owns 325.6 million shares of Kraft Heinz, 26.5% of the outstanding shares. The cash cost basis is \$9.8 billion. Carrying value under the equity method reflects a tax value markup (non-cash) when Heinz bought Kraft, with book carrying value increased quarterly for Berkshire's proportionate share of reported earnings minus dividends received. Kraft Heinz has also taken writedowns, which Berkshire proportionally reflected. On September 30, equity method carrying value was \$12.9 billion and the market value of the position was \$13.3 billion. Carrying value includes Berkshire's proportional share of Kraft's earnings, even if retained by Kraft, and are added to cost basis. Basis is reduced by cash dividends received. Our holding company value includes a mark-to-market adjustment reflective of market value. Effectively, equity method accounting is a decent proxy for the way we value Berkshire's profits. By stripping market value movement but picking up dividends and retained earnings by the investee, you get to a similar place. No deferred-tax liability is created on unrealized gains using the equity method.

HoldCo	
KHC 26.5%; 325,635m shares (MV 13,260 2022; cash cost \$9.8 B)	\$12.902
KHC Market Value Adjustment	\$0.358
Additional KHC Deferred Tax Liability/Asset not on BS	-\$0.075
OXY 20.9% common; 194.350m shares (MV \$12.24B; cash cost \$ 11.180)	\$11.553
OXY Market Value Adjustment	\$0.687
Additional OXY Deferred Tax Liability/Asset not on BS	-\$0.144
Other Equity Method (PFJ, Berkadia, ETT(in BHE)) from 4.0 roc	\$4.932
Itochu, Mitsubishi, Mitsui, Sumitomo, Marubeni) (\$12.4B in Insurance)	\$0.000
Diageo \$724M, IAG AU Sold, Taiwan Semi \$4.477 (In Insurance)	\$0.000
BHE Holdings (BYD \$3.496B; Rabbi Trusts/NDCs \$0.800B in BHE)	\$0.000
Cash (MSR cash assumed to offset MSR debt; Annual in HCO financials)	\$23.182
Cash Paid for Alleghany (Assumed from HoldCo not Insurance cash)	<u>-\$11.600</u>
TOTAL HOLDCO ASSETS	\$41.795
Debt (Interest Paid MSR 66.8% of MSR + Not segment allocated)	\$21.779
Additional HoldCo Deferred Tax Liability (All balance to MSR)	<u>\$1.000</u>
HoldCo Net Assets	\$19.016
KHC Eq Method Earnings (increase cost basis; (e) full 21% tax difference)	\$0.887
Divs KHC (Reduce basis of investment; full 21% tax)	-\$0.521
OXY Equity Method Earnings Normalize \$6B (increase cost basis; (e) full 21% tax)	\$1.254
Divs OXY (Reduce basis of investment: \$0.82/share)	-\$0.159
Other Equity Method Earnings (\$683m 2019 increases basis)	\$0.984
Distributions Received Equity Method Earnings (Reduce basis; full 21% tax)	\$0.325
Interest Income; tax 21%	\$1.043
Retained Earnings of BYD and other BHE Stocks; Tax 7%	\$0.247
Retained Earnings of BYD; Owned in BHE but earnings not attributed to BHE	\$0.056
Optionality of holdco cash with \$30B permanent: \$4.8B @ 7% - 4%; tax 21%	\$0.144
Interest Expense (Not allocated to subs)	-\$0.355
Normalizing Net Pension Expense for GAAP Adjustment	-\$0.322
Net Investment Income Pre-Tax	\$3.6
Net Investment Income After-Tax	\$2.8
Estimated Value (Investments - HoldCo Debt)	\$19.016

Occidental Petroleum

As mentioned above, Berkshire began accumulating common stock shares of Occidental during the first six months of 2022. During 2022's third quarter Berkshire acquired additional shares pushing ownership of Occidental voting rights above 20%. Berkshire thus adopted equity method treatment of the common stock position as of August 4, 2022, and included the investment as an equity method holding at September 30, 2022. Semper journaled the position from an insurance investment to the holding company where we house all equity method investments, including ETT which is a BHE investment. Right or wrong, we treat equity method income at the holding company level. For those reconciling Berkshire's stock market investments to its quarterly SEC 13F filings, know that the Kraft Heinz and Occidental common stock positions remain publicly traded. Our holding company assets include a quarterly mark-to-market adjustment to reflect the current market price.

Berkshire has three additional equity method investments, deemed to have significant influence but owning less than 50% of each (and generally more than 20%). Control positions of more than 50% ownership would be consolidated in Berkshire's financial statements, with balance sheet and income statement offsets for noncontrolling interests (which is how the 8.0% of BH Energy that Berkshire doesn't own is treated). Instead, like Kraft Heinz, pro rata profit is added to carrying value, offset by dividends, which reduce carrying value and are taxed. Carrying value for these three businesses is an estimated \$4.9 billion at December 31, 2022, up from \$4.3 billion in 2021, \$4.0 billion in 2020, \$3.7 billion at year-end 2019 and \$3.5 billion the year before that. Collectively, Berkshire's pre-tax share of these three investees' earnings is approaching \$900 million, annual returns of approximately 19% on current carrying value. These businesses have been home runs for Berkshire. The decline in basis in 2021 reflected a \$1.2 billion distribution received, which included a non-recurring distribution of \$849 million.

Pilot Flying J

Pilot Flying J is a great, evolving acquisition. Berkshire's ownership increased from its original 38.6% investment for \$2.8 billion in 2017 to 80% on January 30, 2023. I estimated at the time of the 2017 acquisition that the entire business was valued at \$7.2 billion. With 800 locations across the US and Canada, the travel center business generates \$50 billion in revenues. Pilot Flying J is opening new locations, presumably financed internally with retained cash flow. Pilot Flying J's website identifies new location information. Most are smaller format centers located away from the interstate highway system. In late 2019 Pilot Flying J launched the "One9 Fuel Network," which gives drivers and smaller truckers access to personalized credit and consolidated rewards points at smaller locations under the Speedway, Mr. Fuel, Pride and Stamart travel center brands. 250 locations will either be acquired or partnered with, with Pilot Flying J operating the stores. The bulk of the stores are/were under the Speedway umbrella, owned by Marathon Petroleum. Pilot owns a fleet of tanker trucks, a LNG business, and partnered with GM to install 2,000 charging stations at each of its travel centers. If you must kill time to charge, what better place than Pilot and Flying J. Get a shower. Watch a movie. Grab a bite.

Berkadia

Berkshire owns a 50% interest in a commercial real estate loan servicer with Jefferies as the partner and operator. Long-standing clients will remember we had owned Leucadia, run by two outstanding investors, Ian Cumming and Joe Steinberg. The duo had no succession plan, so they bought Jefferies, making the investment bank's CEO Dick Handler the succession plan. Berkadia purchased Capmark Financial Group's mortgage loan and servicing business for \$437 million in 2009. Over the years, Berkshire provided a secured commercial paper credit facility of \$1 billion, later increased to \$1.5 billion, to fund mortgage loans, servicer advances, purchase servicing rights and to fund working capital. We rounded up summary figures from Leucadia and then Jefferies for their 50% share of carrying values and earnings to

infer Berkshire's piece. Updated numbers can be found in the appendix and presume Berkshire's equity share are identical.

Electric Transmission Texas (ETT)

ETT is a joint venture with American Electric Power created in 2007 to construct and manage transmission assets in AEP's territory in Texas. Berkshire's piece of the JV is owned by MidAmerican a subsidiary of BHE. The venture operates as a regulated transmission-only utility. Total investments between the partners were announced to total approximately \$7 billion over many years. In 2007 the utility was granted an allowed return of 9.96% by the Public Utility Commission of Texas. It appears combined investment capital totals \$3.5 billion. A summary of AEP's carrying value and income can be found in the appendix, and we'd infer that Berkshire's position would look the same.

Iroquois Gas Transmission System

Additional Equity method assets owned by BHE include; 50% of Iroquois, which owns and operates an interstate natural gas pipeline in New York and Connecticut; 50% of JAX LNG, which is an LNG supplier in Florida serving the growing marine and truck LNG markets; and two-thirds of Bridger Coal, which is a coal mining joint venture that supplies coal to the Jim Bridger generating facility.

Our subsidiary appraisals are conservative, and we have not fully moved multiples upward to capture the full effect of the tax code change. Even without the tax changes, our valuations are very conservative. If the subsidiaries were publicly traded, they would generally command much higher valuations.

The valuations for each operating group are included in the Net Income Basis table seen at the beginning of this section. More granular data for each reporting group is in the appendix.

Simple Price to GAAP Book Value Basis

Simple Per-Share Price to Book Value Basis- "A" Share Data										
	BVPS	Avg BVPS	1x BVPS	1.2x BVPS*	1.75x BVPS	2x BVPS	High	Low	Range vs.	Avg
1994	10,083	9,469	10,083	12,100	17,645	20,166	20,800	15,150		
1995	14,426	12,255	14,426	17,311	25,246	28,852	30,600	20,250	250%	165%
1996	19,011	16,719	19,011	22,813	33,269	38,022	38,000	31,000	227%	185%
1997	25,488	22,250	25,488	30,586	44,604	50,976	48,600	33,000	218%	148%
1998	37,801	31,645	37,801	45,361	66,152	75,602	84,000	45,700	265%	144%
1999	37,987	37,894	37,987	45,584	66,477	75,974	81,100	52,000	214%	137%
2000	40,442	39,215	40,442	48,530	70,774	80,884	71,300	40,800	182%	104%
2001	37,920	39,181	37,920	45,504	66,360	75,840	75,600	59,000	193%	151%
2002	41,727	39,824	41,727	50,072	73,022	83,454	78,500	59,600	197%	150%
2003	50,498	46,113	50,498	60,598	88,372	100,996	84,700	60,600	184%	131%
2004	55,824	53,161	55,824	66,989	97,692	111,648	95,700	81,150	180%	153%
2005	59,337	57,581	59,337	71,204	103,840	118,674	92,000	78,800	160%	137%
2006	70,281	64,809	70,281	84,337	122,992	140,562	114,500	85,400	177%	132%
2007	78,008	74,145	78,008	93,610	136,514	156,016	151,650	103,800	205%	140%
2008	70,530	74,269	70,530	84,636	123,428	141,060	147,000	74,100	198%	100%
2009	84,487	77,509	84,487	101,384	147,852	168,974	108,450	70,050	140%	90%
2010	95,453	89,970	95,453	114,544	167,043	190,906	128,730	97,205	143%	108%
2011	99,860	97,657	99,860	119,832	174,755	199,720	131,463	98,952	135%	101%
2012	114,214	107,037	114,214	137,057	199,875	228,428	136,345	113,855	127%	106%
2013	134,407	124,311	134,407	161,288	235,212	268,814	178,900	136,850	144%	110%
2014	145,619	140,013	145,619	174,743	254,833	291,238	229,374	163,039	164%	116%
2015	154,935	150,277	154,935	185,922	271,136	309,870	227,500	190,007	151%	126%
2016	171,542	163,239	171,542	205,850	300,199	343,084	249,711	187,001	153%	115%
2017	211,750	191,646	211,750	254,100	370,563	423,500	299,360	238,100	156%	124%
2018	212,503	212,127	212,503	255,004	371,880	425,006	335,900	279,410	158%	132%
2019	261,417	236,960	261,417	313,700	457,480	522,834	341,785	287,000	144%	121%
2020	287,031	249,767	293,698	344,437	502,304	574,062	352,450	239,440	141%	96%
2021	342,622	302,020	293,698	411,146	599,589	685,244	454,550	341,820	151%	113%
2022^	323,637	305,334	293,698	388,364	566,365	647,274	544,389	393,012	178%	129%

Source: Semper Augustus; Berkshire Hathaway

Berkshire's shares closed 2022 trading at 145% of expected year-end book value. A year ago, the shares traded at 132% of 2021 year-end book value. Despite the higher multiple to book value the stock is cheaper now than a year ago. Factors discussed earlier in the Berkshire section of the letter explain how book value per share declined 5.5% during 2022 while the stock rose 4% but gains in economic earning power and intrinsic value outstripped all measures. Said differently, book value per share is a more understated book value relative to economic reality than a year ago. It's a better book value. The valuation of the stock portfolio is lower; Berkshire added a ton of value and earning power via investment activity; and core operating power progressed nicely. As a simple example, if an asset is worth \$100 and declines in price by 50%, if the price paid for the asset remains the same, is the underlying value lower, the same or higher?

The shares traded in a range of 129% to 178% of average book value during the year. The shares traded in a range from 0.5x to 3.0x book value over the past 57 years. In its earlier years, the lower bound more closely approximated intrinsic value at the time, while three times book value in 1998 most certainly did not. A 1.75 multiple has approximated fair value in recent years. I offer that book value is depressed today. In any given year, book value can get ahead of itself or behind, largely due to period volatility in the stock portfolio. It can also get distorted at times such as year-end 2017 when the new marginal tax rate saw deferred-tax liabilities rerated downward and deferred-tax assets revalued upward. Berkshire properly points out that if it is going to become a large repurchaser of its shares at premiums to book value, then book value and book value per share will decline. Subsequent repurchases at increasing premiums will further and more quickly erode book value.

In a normalized steady state Berkshire conservatively earns at least 10% on unleveraged net equity. Thanks to the durability and knowability of the earning power we are comfortable with a 75% premium to book as a reasonable valuation. The multiple should be higher when book value is understated. If the sustainable return on equity as projected changes, upward or downward, the valuation would be affected. Likewise, if book value becomes so diminished, it will properly be eliminated as a valuation proxy, looking to ongoing absolute profitability relative to retained and past profit. Price to book value should be excluded at present if using a constant 175% at the proper multiple.

Two-Pronged Approach

Two-Pronged Basis #																		
(dollars in millions)																		
	Per-Share Pre-Tax Earnings	Per-Share Investments + Capitalized Pre-Tax Earnings										Market Cap Intrinsic Value				5% UW Capped	Add Cap UW	
		10x	12x	13.5x	15.4x ^	Investments	Per-Share	Investments +	Capitalized	Pre-Tax Earnings	shares out M	at 10x	at 12x	at 13.5x	at 15.4x^			
2005	2,441	24,410	29,292	32,954	37,591	74,129	98,539	103,421	107,083	111,720	1.541	151,849	159,372	165,014	172,161	10,998	176,012	
2006	3,625	36,250	43,500	48,938	55,825	80,636	116,886	124,136	129,574	136,461	1.543	180,355	191,542	199,932	210,559	11,982	211,914	
2007	8	80	96	108	123	90,343	90,423	90,439	90,451	90,466	1.548	139,975	140,000	140,018	140,042	15,891	155,909	
2008	3,921	39,210	47,052	52,934	60,383	77,793	117,003	124,845	130,727	138,176	1.549	181,238	193,385	202,495	214,035	12,763	215,258	
2009	2,250	22,500	27,000	30,375	34,650	90,885	113,385	117,885	121,260	125,535	1.552	175,974	182,958	188,196	194,830	13,942	202,138	
2010	5,926	59,260	71,112	80,002	91,261	94,730	153,990	165,842	174,732	185,991	1.648	253,776	273,308	287,958	306,513	15,375	303,333	
2011	6,990	69,900	83,880	94,365	107,646	98,366	168,266	182,246	192,731	206,012	1.651	277,807	300,888	318,199	340,126	16,038	334,237	
2012	8,085	80,850	97,020	109,148	124,509	113,786	194,636	210,806	222,934	238,295	1.643	319,787	346,354	366,280	391,519	17,273	383,553	
2013	9,116	91,160	109,392	123,066	140,386	129,253	220,413	238,645	252,319	269,639	1.644	362,359	392,332	414,812	443,287	18,342	433,154	
2014	10,847	108,470	130,164	146,435	167,044	140,123	248,593	270,287	286,558	307,167	1.643	408,438	444,082	470,814	504,675	20,627	491,441	
2015(S)	11,562	115,620	138,744	156,087	178,055	148,675	264,295	287,419	304,762	326,730	1.643	434,237	472,229	500,724	536,817	20,647	521,371	
2015(B)	11,186	111,860	134,232	151,011	172,264	159,237	271,097	293,469	310,248	331,501	1.643	445,412	482,170	509,737	544,657			
2016(S)	10,421	104,210	125,052	140,684	160,483	168,902	273,112	293,954	309,586	329,385	1.643	448,723	482,966	508,649	541,180	22,941	531,590	
2016(B)	11,718	117,180	140,616	158,193	180,457	186,520	303,700	327,136	344,713	366,977	1.643	498,979	537,484	566,363	602,944			
2017(S)	11,123	111,230	133,476	150,161	171,294	190,161	301,391	323,637	340,322	361,455	1.644	495,427	531,995	559,420	2018 would	25,199	584,619	
2017 (B)	15,002	150,020	180,024	202,527	231,031	202,322	352,342	382,346	404,849	433,353	1.644	579,180	628,500	665,491	712,345			
2018(S)	13,037	130,370	156,444	176,000	200,770	174,846	305,216	331,290	350,846	375,616	1.641	500,838	543,623	575,713	616,359	33,000	649,359	
2018(B)	14,697	146,970	176,364	198,410	226,334	188,626	335,596	364,990	387,036	414,960	1.641	550,689	598,923	635,098	680,920			
2019(S)	14,052	140,520	168,624	189,702	216,401	235,822	376,342	404,446	425,524	452,223	1.625	611,540	657,208	691,459	734,843	36,000	770,843	
2020(B)	14,309	143,090	171,708	193,172	220,359	253,676	396,766	425,384	446,848	474,035	1.625	644,728	691,231	726,108	770,286			
2020(S)	13,399	133,990	160,788	180,887	206,345	297,636	431,626	458,424	478,523	503,981	1.544	666,413	707,788	738,820	778,126	39,000	817,126	
2020(B)	13,924	139,240	167,088	187,974	214,430	314,600	453,840	481,688	502,574	529,030	1.544	700,711	743,707	775,954	816,801			
2021(S)	19,845	198,450	238,140	267,908	305,613	333,785	532,235	571,925	601,693	639,398	1.475	785,287	843,848	887,768	943,401	41,000	984,401	
2021(B)	18,127	181,270	217,524	244,715	279,156	347,815	529,085	565,339	592,530	626,971	1.475	780,640	834,131	874,249	925,065			
2022(Se)	22,476	224,760	269,712	303,426	346,130	311,300	536,060	581,012	614,726	657,430	1.475	790,931	857,255	906,999	970,007	41,000	1,011,007	
2022(Be)	20,228	202,280	242,736	273,078	311,511	329,704	531,984	572,440	602,782	641,215	1.475	784,917	844,608	889,376	946,082			

Source: Semper Augustus; Berkshire Hathaway

The Two-Pronged Approach begins with two simple figures, per-share pre-tax earnings of all subsidiaries excluding gains and income from marketable securities and a per-share value for all marketable securities. Berkshire provided the two per-share figures for the better part of two decades to help investors assess fair value. The figures disappeared from the Chairman's letter for five years and then reappeared. The method proves durable but requires some understanding and adjustment of certain data points. The method was covered in detail in our 2016 letter and in the appendix to the 2017 letter. Our method differs from the one used by Berkshire and altered over the years. Berkshire's method included underwriting gains and losses, then did not, and then did again. Ours eliminates current underwriting, substituting a capitalized value to a normalized underwriting profit margin. We'd also look to the stock portfolio to determine any degree of material under or overvaluation. Berkshire's method included cash held at non-insurance subsidiaries. Ours does not. It's a nice reconciling tool but required alteration to its original presentation by Berkshire beginning in 1995. It's a simple tool that happens to still get in the ballpark.

GAAP Adjusted Financials Approach

The GAAP or IFRS statement of earnings can only be a starting point for the investor seeking to measure economic profitability and the capital required to produce it. Reported profits only ever approximate economic profitability by coincidence at Berkshire. At some companies reported profits more closely align with genuine profitability. The majority of companies strive to cast their condition in the most favorable light, often distorting economic reality. Berkshire's financial reporting and the derivation of economic earning power proves a wonderful case study in how useless financial statements can be without diving deep into the footnotes and into the moving parts of the business. Berkshire's require so many adjustments that any student of investing should endeavor to understand the steps required in doing so. A great project for a summer intern would place a stack of Berkshire annual reports in front of the mentee and tell them to figure out what the company is worth. The uninitiated would require steady guidance, but what a teaching tool (just don't give them the Semper letter in advance). Our adjustments are by no means authoritative, and each can be debated as to merit. Much of the process serves to smooth volatility – distorting aspects that make Berkshire's GAAP consolidated financial statements, particularly the statement of income, of little utility.

Primary adjustments to the GAAP Statement of Earnings:

- Remove realized (and now unrealized) gains and losses on the investment portfolio of the insurance companies and other groups.
- Remove derivative contract gains and losses.
- Add retained earnings of equity investees in the investment portfolio (this is the offset to the removal of realized and unrealized gains and losses). It is a normalizing factor that assumes retained earnings will translate into at least an equal dollar of market value.
- Remove underwriting gains and losses.
- Add a normalized underwriting profit margin.
- Add income for deferred-tax liabilities that are created with property, plant and equipment capital expenditures, reflecting the degree to which cash taxes paid are less than reported GAAP taxes.
- Add a portion of any amortization charges against intangible assets created in acquisitions not reflective of economic decay.
- Add the present value of an optionality premium to the portion of cash balances likely to be invested at higher yields in the near to intermediate future.
- Reduce net income to reflect a higher normalized pension expense and cash outlay than assumed.
- Other adjustments that are one-off are made as needed (the above are more recurring in nature).

- 2020 saw a \$10.6 billion pre-tax and \$10.4 billion after-tax write-down of Precision Castparts. \$10 billion of the charge was a non-tax-deductible reduction of goodwill. The analyst should not be fooled by apparently higher future profitability by ignoring the charge.
- 2017 required a \$28.2 billion non-taxable downward adjustment to restate net deferred-tax liabilities, which increased taxable income by the same non-taxable amount.
- The equity method treatment of Kraft Heinz required a one-time 2017 downward income adjustment of \$2.9 billion pre-tax, \$1.2 billion after-tax, reflecting investee Kraft Heinz's similar non-cash gain in net income for revaluation of net deferred-tax liabilities.

Balance sheet adjustments for things such as overvaluation or undervaluation in the common stock portfolio are separate from these adjustments to earnings. I can't tell you how many times analysts conflate things such as float with investment assets and earning power. Float is a *net* insurance liability. Investment returns are not earned on float. Liabilities must be paid but are not an offset to economic earning power.

The balance of this section is repetitive from last year's letter with updated figures for each 2022 adjustment. Consider it my contribution to little-changing footnote disclosures. The analyst can save time with a redline comparison!

Remove Realized and Unrealized Investment Gains and Losses

FASB rule ASU 2016-1 required the income statement under GAAP accounting to include unrealized gains and losses each quarter in the income statement beginning in 2018. Previously only realized gains and losses were included in income. Unrealized gains and losses were recognized on the balance sheet, net of a deferred-tax liability for taxes to be paid if, or when, holdings are sold. Unrealized gains and losses naturally remain a balance sheet item. In periods of price declines, as in 2018 and the first quarter of 2020, declines are offset by a correspondent reduction of the portion of deferred taxes no longer carried as a liability. These unrealized gains and losses are taxed as deferred at 21%, where prior to the 2017 TCJA tax change were taxed at 35%. In other words, investment securities move up and down in price, and the movement in either direction is offset by a 21% deferred tax liability now, with the net amount impacting shareholder's equity only by the net amount. Deferred taxes mute the impact of stock volatility on the balance sheet.

We remove a not insignificant \$66.3 billion pre-tax loss, \$52.4 billion after-tax, from the projected 2022 income statement for losses in Berkshire's investment portfolio, which included both realized gains and unrealized losses. The loss contributed \$13.9 billion to a reduction in Berkshire's deferred tax liability on the investment portfolio. By September 30, Berkshire had sold \$17.3 billion of common stocks *realized* modest gains of \$660 million. We make no assumptions about realized gains during the fourth quarter, so the entire portfolio gain as estimated is assumed unrealized. Berkshire bought \$66.2 billion in common stocks during 2022's first nine months and disclosed in a regulatory filing purchase of an additional ~\$2 billion.

Our treatment always removed *realized* gains and losses from the income statement. Their timing can be arbitrary and controlled by management. It's not uncommon to see a management book gains to mask a decline in profitability. Numerous companies mastered this trick over the years. Prior to the tax code change, realized gains always helped the reported result. Portfolios could decline in value and managements had the discretion to realize gains large enough to offset or more than offset any unrealized losses. Alternatively, you see subsidiaries or assets sold or accounted for as to be sold and excluded from "adjusted" results. The most redeeming aspect of marking to market unrealized gains and losses for income statement purposes was to limit the hijinks of selecting gains in an investment portfolio to

augment results. Companies would book gains and write checks for taxes just to boost short-term profits. There is zero history of Berkshire having done this. Rather, Berkshire historically goes out of its way to avoid paying cash taxes.

Including both realized and unrealized gains and losses in the income statement *is* more economically correct than excluding them as irregular. It's just that inclusion is correct but comes with volatility that can distort operating results. If stock prices reflect the earning power of the business over time, then inclusion of gains and losses, whether realized or unrealized, will be correct – over time. It's "over time" that's the problem. To satisfy the logic for removal, eliminating short-term price volatility, we must offset the removal with a better proxy for tracking economic gains and losses. To serve that purpose, we add the retained earnings not paid as dividends by Berkshire's investees in common stocks.

Add Retained Earnings of Holdings

Offsetting the removal of realized and unrealized gains, add back the portion of profits earned by Berkshire's publicly traded investees not paid as dividends. For 2022 we added back \$16.9 billion, which is net of assumed taxes paid at 3%. The de minimis 3% rate is used in recognition that taxes owed on realized gains will be paid *later* and probably many years in the future, if ever (it's discounting for the time value of the 21% tax rate). The deferred-tax liability assumes immediate liquidation of the portfolio, taxed at 21%. Berkshire minimizes realized gains paid as cash, and the present value aspect accounts for the difference in our assumption.

As discussed earlier, we'll see if Berkshire winds up being forced to pay a 15% alternative minimum tax on *unrealized* gains as prescribed under passage of the "Inflation Reduction Act of 2022." Companies reporting income of more than \$1 billion are liable for the tax over a rolling three-year period. Berkshire's insurance operation may be at risk of bearing the tax. The law is unclear about exemptions allowed by the Treasury Department. The tax begins this year. If Berkshire winds up liable and paying tax on unrealized gains, it's an enormous hit to profitability. If Berkshire's \$313 billion common stock portfolio held by its insurers earns 1.7% from dividends and 8.7% in unrealized gains, the \$27 billion unrealized gain may be taxed at 15%, depending on the level of underwriting profit taxed at 21%. The tax payment on the unrealized gain is \$4 billion. Capitalized at 18x that's a potential \$73 billion hit to intrinsic value. If taxed, I'd expect a repeal within short order. An earlier corporate alternative minimum tax (albeit not taxing unrealized gains) was an unmitigated disaster and short lived. Discussion of any impact was purposely vague in Berkshire's latest SEC 10-Q filing. I'm certain management will address the subject at the coming annual meeting. The Chairman and Vice Chairman generally have opposing views on taxation, though Berkshire is very good at structuring its affairs to only pay minimum cash taxes. Stay tuned.

The removal of gains and losses as irregular and unpredictable, whether realized or unrealized, requires an offset when assessing earnings power. The offset is the addition to reported earnings of the retained earnings of publicly companies not paid to Berkshire as dividends. Profits retained should (and need to) inure for the ultimate benefit of the shareholder. It is simply a reinvestment of shareholder profits, a choice made by others if you happen to not be in control. This is a normalizing factor that assumes retained earnings will ultimately translate into at least an equal dollar of market value. At Berkshire, these retained earnings are a significant component of Berkshire's overall profitability. The stock portfolio will likely total 37% of Berkshire's total assets at yearend, matching 2021's proportion and the highest level since totaling 65% prior to Berkshire's acquisition of General Re in 1998. As a percentage of overall profit, \$17.7 billion (\$17.2 billion net of tax at 3%) in retained earnings represents a quarter of total normalized profit. As a mental reconciling item, when \$17.2 billion in retained earnings is added to after-tax dividends received, "earnings" from the stock portfolio total 38.8% of total after-tax earnings, very close to stocks as 37% of total assets.

Berkshire's stock market investments in the table below (repeated from earlier in the letter) now include Berkshire's investment in Occidental preferreds and warrants but exclude its equity method investments in Kraft Heinz and recently Occidental common stock. Combined the Kraft Heinz and Occidental common stock positions total \$25.5 billion. Since they are publicly traded, the two positions should probably be included here. Retained earnings of portfolio holdings grew by 41.5%, \$5.2 from 2021.

Berkshire's Stock Market Investments, Dividends and Retained Earnings

	12/31/17	12/31/18	12/31/19	12/31/20	12/31/21	12/31/22
Market Value **	\$170 B	\$173 B	\$237 B ^	\$278 B ^	\$351 B ^	\$316 B ^
Earnings	\$9.5 B	\$13.5 B	\$14.8 B	\$14.4 B	\$17.5 B	\$23.2 B
Dividends	\$3.7 B	\$3.7 B	\$4.5 B	\$4.3 B	\$5.1 B	\$5.5 B
Retained Earnings of Investees	\$5.8 B	\$9.8 B	\$10.3 B	\$10.1 B	\$12.5 B	\$17.7 B
Price to Earnings (P/E)	17.8x	12.4x	16.3x	19.3x	19.1x	13.6x
Earnings Yield (E/P)	5.6%	8.0%	6.1%	5.2%	5.1%	7.3%
Dividend Yield	2.2%	2.2%	1.9%	1.5%	1.4%	1.7%
Retained Earnings Yield	3.4%	5.8%	4.2%	3.6%	3.6%	5.6%
Dividend Payout Ratio	39%	27%	30%	30%	29%	30%

** Market Value here includes stocks in insurance group plus holdings at BHE and other subs. MV excludes market value KHC \$13.3 B at 2022, \$11.7 billion at 2021, \$11.3 billion at 2020, \$10.4 billion at 2019, \$14.0 billion at 2018 and \$17.9 billion at 2017. KHC earnings are picked up as equity method. KHC cash cost basis is \$9.8 billion, now higher for Kraft merger with Heinz and equity method accounting.

** Market Value estimated for 12/31/22 and assumes \$2 B purchases in Japanese Trade Companies and no additional net 4Q purchases.

^ Excludes Occidental preferreds and warrants \$10.8 B 2019, \$9.3 B 2020, \$11.5 B 2021, \$12.1 B 2022. Excluded OXY common and KHC. Includes \$32.9 B non-13F holdings: TSMC, DEO, BYD, 5 Japanese Trading Companies. Reconciling short by ~\$2 B unidentified non-13F securities.

Source: Sempet Augustus

Remove Derivative Contract Gains and Losses

This adjustment disappears by the close of 2023's first quarter. Realized and unrealized gains and losses on derivative contracts were removed from GAAP earnings along with those on investment securities.

Berkshire wrote a series of put option contracts just prior to the financial crisis with several life insurance companies as counterparties. The life insurers write a type of annuity that guarantee a smaller percentage of the gain on named stock market indices accompanied by a base minimum annual return and a guarantee of either no loss or a loss capped at a certain percentage. Naturally the insurers lose big if the stock indices decline, and so look to hedge their downside exposure. For a price, Berkshire provided the protection. The options written were European style, meaning they are payable only at the expiration of the option, which in the case of those Berkshire wrote were all well over ten years. Berkshire received \$4.9 billion upfront as a premium between 2004 and 2008 and unwound 8 of the original contracts in 2010 at a gain of \$222 million. Several of the contracts subsequently expired worthless, which means Berkshire keeps the entire premium, plus the gains and income on invested float, and pays no losses. Most contracts are already expired. The balance of the contracts expire this month and contain no collateral posting requirements. The balance sheet liability was \$1.1 billion at the outset of 2021, only \$99 million a year later and is now gone. The liability reflected the undiscounted value of the amount Berkshire would have to pay out at a point in time calculated using the Black-Scholes option pricing formula to determine fair value. Declining European markets and surging volatility combined to balloon the liability in March 2020 as the market fell.

Few understood the incredibly remote likelihood of ever incurring an actual loss. The options were written "at the money," meaning the strike price was set at the market price of the indices at the time the contracts were written. The strike for all four (three were European indices) were written at a time when the S&P traded for no higher than 1,400. Changes in the currencies underlying the contracts also impacted

the estimation of potential losses. Of course, the derivative contracts didn't look so good at the depths of the crisis – at year-end 2008, the liability on the contracts outstanding at the time was \$10 billion with a notional value of \$37 billion. The notional value would be the amount owed to the insurance companies if each stock market index was at *zero* at expiration.

We've always believed writing the contracts was brilliant, a great risk assumed. The length of the contracts and the fact that retained earnings over a long enough period invariably push share prices upward provided margins of safety. With the options being European style, the indices would have to be *below* the strike price on the *exact day* of exercise. These contracts were originally written with 12 to 19 years to maturity. Sure, markets were negative in price for more than 12 years before, and in fairness the options were written close to a cyclical/secular peak, but they would have to be negative on the specific day, *and* the contracts have staggered maturities.

There did exist a minute chance that Berkshire would have paid at expiration on some of the index put contracts. It wasn't a zero chance. We saw how quickly assets can lose value in March 2020 and during the Great Financial Crisis. Stock markets were negative for periods of 12 years or more in our markets several times. Japan remains materially underwater since 1989, which is extraordinary. Our markets were negative from 2000 to 2012, traded consistently below 1966's high until 1982, and took 25 years to regain 1929's peak. With the strikes written at the money, to lose would have required material declines over most of the contract's lives to the precise day of expiration.

Writing the index puts was a *great wager* by Berkshire – a permanent collection of \$4.9 billion in put option premium, the use of the entire \$4.9 billion for 12 to 17 years and losses risked that would never be paid. Lots of interesting conversations over the years since the contracts were written with some thinking these were terrible investments. In summary, **Berkshire pocketed the entire \$4.9 billion premium and enjoyed investment use of the capital for nearly two decades. Not a dime of losses was paid.** I recall “idiot” being called several times when stock prices declined and the stated balance sheet liability ballooned. At the end, laughter could be heard in Omaha on the journey to the bank. Add it to the list of the greatest investments made by the GOAT.

Adjust Earnings to Reflect Accelerated Depreciation Tax Treatment for Capital Expenditures

Berkshire spends enormous sums on capital expenditures, much of which takes place in its energy and railroad businesses. Deferred-tax liabilities are created on qualifying investments in property, plant, and equipment. Companies like railroads and utilities are incentivized to make infrastructure investments for the public good. The use of accelerated depreciation for tax purposes arises from higher depreciation of fixed assets allowed for tax purposes in the early years of amortizing an asset's life, made up for with lower tax-deductible depreciation expense in later years. The higher early depreciation results in lower taxes paid in the early years and consequently higher taxes in later years. The future higher taxes are carried on the balance sheet as a deferred liability. It's a present value benefit, and we adjust net income upward reflecting the benefit.

The 2017 TCJA tax code change more broadly expanded the allowed use of accelerated depreciation to most industries, instead of limited to those such as rails and regulated utilities. The code change allows for depreciable assets (excluding structures) to be expensed in one year instead of being amortized over many years, effectively accelerated depreciation on steroids for many businesses. Equipment must have been purchased after September 27, 2017, and by December 31, 2022 (with an additional year for longer production property and certain aircraft). The immediate 100% expensing is reduced by 20% annually beginning this year, in 2023, and is to be phased out entirely after 2026. Regulated *public* utilities were largely excluded from the new benefit – having already applied the tax treatment, albeit over more years. With the change in the tax rate to 21% from 35%, regulators logically made downward adjustments to

customer electricity rates or to the rate base to maintain allowed returns on equity. Said differently, the tail of lower future depreciation expense had been determined using a 35% rate. The new lower rate would have unfairly benefited a utility at the expense of the customer.

The recent election brings proposals to alter or eliminate many aspects of the tax changes introduced by TCJA. An early end of accelerated depreciation for non-rail and utility industries may transpire. We don't expect a change to current treatment for utilities (who already used the tax method but were compelled to refund or lower prospective rates due to the change in the tax rate applied to the carried deferred-tax liability). As of now it's too early to have any color on prospective changes.

For 2022 after-tax net income is increased by \$1.6 billion, up from \$1.4 billion reflecting growing investment at BHE offset by lower amounts of growth capital expenditures at BNSF. The deferred-tax liability for property, plant and equipment is expected to be \$32.4 billion when reported for 2022.

Over the last five years since TCJA, the use of accelerated depreciation benefitted not only the railroad, but also Berkshire's other non-regulated businesses that in many cases are also now enjoying the tax benefit of accelerated depreciation where previously they weren't. Berkshire's non-rail and energy businesses will have spent more than \$23 billion on capital expenditures, with much of that qualifying for one-year expensing. As assets depreciate over their actual useful lives, approximated by depreciation charges in the GAAP income statement, the beneficial tax benefit eventually runs its course, and in the later years of an asset's useful life, an even higher effective tax rate than the marginal rate will be applied for the tax books. Total capital expenditures will be \$15 billion in 2022 against \$9.6 billion GAAP depreciation expense. BH Energy and the rail will spend \$7.1 billion and \$3.2 billion respectively, \$3.8 billion above depreciation expense. Some of the capex is genuinely spent on maintenance, but in the case of the energy businesses largely increases the rate base, against which regulated utilities are allowed to earn up to an established return on equity.

Berkshire will continue spending large amounts of capital expenditures, much of which drives down the current cash tax bill. The appetite for capital expenditures above maintenance outside of the rail and energy businesses is likely to wane over the course of the phaseout beginning this year. For the balance of 2023 we should see large expenditures barring the passage of unfavorable tax legislation.

Remove Underwriting Gains and Losses; Add a Normalized 5% Underwriting Profit

Underwriting profits can be extremely volatile from year-to-year, not unlike stock prices. Our method for valuing Berkshire's insurance operations removes reported underwriting profits and replaces them with a normalized 5% pre-tax underwriting profit on premiums earned. It's a similar approach to removing investment gains and losses and replacing them with the retained earnings of the stock market holdings. The volatility of the underwriting cycle is stripped in favor of estimating what we think is a sustainable and achievable profit earned *over time*. Our 5% pre-tax underwriting estimate is a blended rate across all of Berkshire's insurers and types of business written *over time*. Over time is emphasized via an example. Catastrophe reinsurance can produce large underwriting gains for many years. A single year of large losses producing an underwriting loss must be averaged among the majority of years with gains.

A low interest rate environment makes underwriting at a profit imperative. Berkshire enjoys unusual advantages thanks to surplus capital built over the years. It can retain more business than its competitors and maintain much larger allocations to common stocks. Surplus capital derived from best-in-class underwriting and higher returns from longer duration investment assets allows dividend and capital distributions to the holding company and into its non-insurance businesses. We'll closely watch developments like GEICO's growing market share and the progress of the new specialty business. We may well alter our profit assumption. A more conservative approach would assume breakeven

underwriting over time, which strips \$48.6 billion from the capitalized value of underwriting profit that's included in our appraisal of Berkshire's intrinsic value.

Berkshire has a history of including, then excluding, then including then dropping altogether underwriting profit in their dual yardstick method of calculating intrinsic value from 1995 to 2015. Our method of removing volatility and replacing it with what we think Berkshire will earn on underwriting allows us to determine the worth of the insurers, and the business at large, without having to think about the degree to which insurance profits are under or over a "normal" level of underwriting for a year or period of years.

When we analyze property casualty insurers and reinsurers, we spend a lot of effort trying to determine sustainable underwriting margins, which can be positive or negative depending on the type of insurance written and the economic climate, particularly with interest rates, inflation, capital required and competitive capacity.

Berkshire's collection of insurers will likely report an underwriting loss in 2022 unless the fourth quarter produces a sizable gain, which can be a current year gain or positive reserve development from prior periods' insurance written. Through September 30, the insurers produced a collective \$334 million underwriting loss, close to breakeven and well below our long-term target. 2021 saw a modest \$728 million 1.0% underwriting gain against matching 1.0% in 2020, 0.5% in 2019, 3.5% in 2018 and a loss of 6.5% in 2017. 2016's margin was 4.6%, close to target, an anomaly in any given year. The six years through 2022 were marked by higher-than-average catastrophe losses, largely from hurricanes and California wildfires, winter storms, Asian typhoons in 2018 and 2019, wildfires in Australia in 2019, a Mexican earthquake in 2017 and COVID-19 losses in 2020. Mercifully Berkshire (and the reinsurance industry) escaped with no major storms in the second half of 2020 given early year pandemic losses. The first half of the year is conventionally the time to get fat in reinsurance. Despite six years of underwriting below our long-term estimate, aggregate profitability exceeds most industry participants across the lines that Berkshire writes. Beyond underwriting, Berkshire's outsized allocation of insurance reserves and capital to common stocks drives overall profitability far ahead of peers. Berkshire's insurers play the long investing game while competitors are forced to the short game of underwriting and market share. I'm sure I've said this at least three or four different ways in the letter.

For 2022, the first step of removing actual underwriting profit eliminates an estimated after-tax \$600 million loss from GAAP earnings. The next step of adding our 5% normalized pre-tax underwriting profit adds \$4.1 billion pre-tax and \$3.2 billion after-tax underwriting profit on \$74.0 billion in anticipated premiums earned, up from \$69.5 billion in 2021. The quarter just ended included an expensive winter storm (four broken pipes and a flood here at the Bloomstran residence on Christmas Eve), so reported underwriting profit may come in worse than projected.

Add a Portion of Intangibles Amortization Expense to Income

Economic earnings are increased by \$1.1 billion to reflect the amortization of intangibles created in acquisitions that do not economically decay. Berkshire recognizes this reality each year, formerly in a supplemental presentation in the Chairman's letter and beginning two years ago in the MD&A segment presentation of the Manufacturing, Service and Retail group in the 10-K. Unlike many public companies, Berkshire does not present a pro-forma or supplemental set of financials excluding various expenses. The goodwill and intangibles footnote make clear the types and amounts of intangibles being amortized. The balance of intangibles being amortized with no economic decay is now much larger and growing. We had been adding back 80% of the amortization charge for intangibles, which resulted in economic earnings being roughly \$600 million higher after-tax than GAAP profits for 2010 to 2015. We are now adding back 90% of the intangibles charge thanks to ongoing amortization and a lack of recent acquisition activity. It will be interesting seeing how goodwill and intangibles are allocated on the Alleghany

acquisition. I have \$3.1 billion temporarily allocated to only goodwill. There will be a small portion of that likely assigned to intangibles.

Gross intangibles were \$42.4 billion on September 30, 2022. Accumulated amortization is \$13.6 billion. In addition to trademarks, intangible assets such as trade names and customer relationships generally lose little, if any, economic value over time.

Add an Optionality Premium to a Portion of Cash Balances

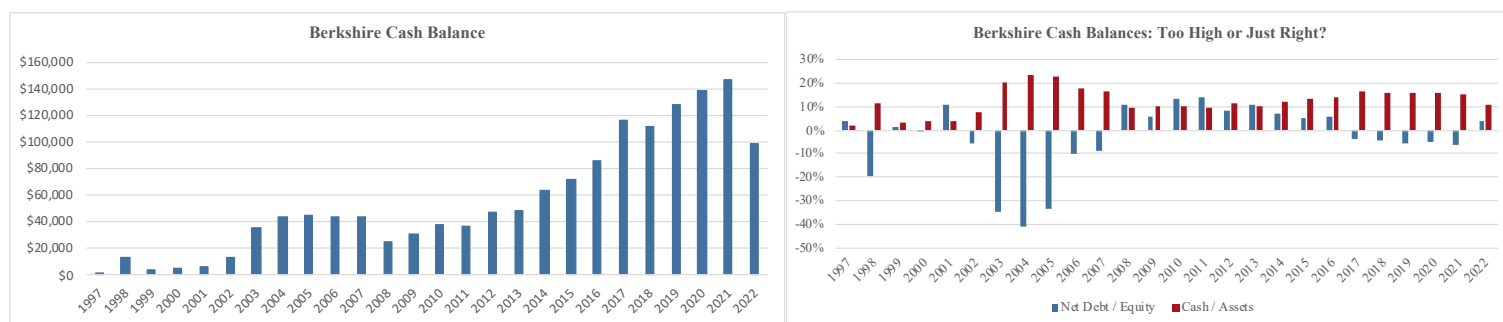
We make a generally material upward adjustment to Berkshire's reported profits that assumes much of Berkshire's cash will be put to good use, and reasonably soon. The adjustment added \$3.2 billion to 2021 adjusted GAAP earnings, a not insignificant 6.8% of \$46.9 billion in normalized earnings. The upward adjustment is earnings based only. It does not double count marketable securities or firm assets in a balance sheet analysis. The base assumption is that a portion of invested assets in cash are earning less than they will over time. Depending on whether higher-yielding investments are made and at what yields makes the adjustment worthy of critique, in whole or in part. The adjustment for 2022 falls to a measly \$154 million thanks to a sizable expenditure of cash and to rising yields earned on cash and T-bill balances.

Berkshire's cash position merits more media attention than it deserves – cash recently earning nearly nothing in U.S. Treasury bills but at this writing at yields approaching 5%. The cash balance will likely total roughly \$100 billion at year-end 2022, down from \$146.7 billion a year ago. See the earlier capital allocation discussion for a recap on where the money went.

At U.S. T-bill rates over 4.32% at year-end 2022, pre-tax interest is now more than \$4 billion versus a scant \$154 million in 2021, on a materially larger cash balance to boot. Interest rates on bills were 1.5% three years ago and 2.4% four years ago.

Berkshire states it will maintain cash on hand of \$30 billion as a permanent reserve. That leaves roughly \$70 billion for investment in longer duration assets. Our method also presumes the insurance operation will not allow cash to fall below one year's worth of insurance losses paid in cash, \$58 billion at today's level. \$60 billion cash in the insurance business dwarfs \$18.5 billion of fixed income. Combined the total is most likely roughly the minimum capital required to write \$74 billion annual premium. We are thus calling \$88 billion a more or less permanent cash reserve. We'll see if Berkshire is comfortable taking cash below that combined amount.

Below is an updated chart of Berkshire's cash position from 1997 through our 2022 estimate. Notice that cash tends to decline during years when stocks (good ones) are on sale.



Source: Berkshire Hathaway; Semper Augustus

The chart above takes the shape of a ski jump, causing anxiety among Berkshire watchers until management “finally” got around to spending the money in 2022. Cheers from the media. \$100 billion of what’s now diminished cash still sounds like a lot of money, but next to \$927 billion of total firm assets not so much.

Berkshire’s \$100 billion cash balance is within a normal range when measured against equity and assets since the General Re deal. Cash today is 11% of total firm assets, down from 15% a year ago. Cash as a percentage of total assets is in line with its 12% average since 1997. How about firmwide leverage? Berkshire maintains a net unleveraged but not too-cash-heavy capital structure. Net debt to equity at 4% exceeded cash for the first time since 2016.

It’s this historical perspective that allows doubt to creep into the method for assuming a higher return on much of the cash balance. The counterpoint is most of the debt on the consolidated balance sheet is held in the railroad and the energy businesses. The debt in in these groups is *not an obligation* of Berkshire – it’s standalone to the subsidiary and not hypothecated to the parent. It’s also geared at a proper level for those businesses. If you hold those two subsidiaries aside from consideration, then the rest of Berkshire is quite liquid and has room to invest a substantial portion of cash reserves.

Berkshire will undoubtedly invest a portion of its T-bill and cash balance in higher yielding assets. They may bag elephants, find more homes for capex, or repurchase more shares. The field of opportunity includes partial ownership of publicly traded companies (stocks), a control or shared equity interest in privately held businesses, or various iterations of higher yielding fixed-income or hybrid equity securities, such as warrant investments made since the financial crisis and most recently in Occidental Petroleum.

Progression of Berkshire Stock Portfolio as a Percent of Book Value and Assets

Year	Stocks	Cost Basis	Unrealized Gain/Loss	Realized Gain	Net Purchases	Net as % of Avg	Equity	Stocks as % of Equity	Total Assets	Stocks as % of Assets
1997	\$36,248	\$7,207	\$29,041	\$1,106	-\$1,302	-3.6%	\$31,455	115%	\$56,110	65%
1998	37,265	7,044	30,221	2,415	-2,823	-7.7%	57,403	65%	122,237	30%
1999	37,008	8,203	28,805	1,247	-691	-1.9%	57,761	64%	131,416	28%
2000	37,619	10,402	27,217	4,499	-2,725	-7.3%	61,742	61%	135,792	28%
2001	28,675	8,543	20,132	1,488	-2,806	-8.5%	57,950	49%	162,752	18%
2002	28,363	9,164	19,199	918	416	1.5%	64,037	44%	169,544	17%
2003	35,287	8,515	26,772	4,129	6,765	21.3%	77,596	45%	180,559	20%
2004	37,717	9,056	28,661	3,471	-578	-1.6%	85,900	44%	188,874	20%
2005	46,721	15,947	30,774	5,408	6,392	15.1%	91,484	51%	198,325	24%
2006	61,533	22,995	38,538	2,635	5,395	10.0%	108,419	57%	248,437	25%
2007	74,999	39,252	35,747	5,509	11,057	16.2%	120,733	62%	273,160	27%
2008	49,073	37,135	11,938	-7,461	3,300	5.3%	109,267	45%	267,399	18%
2009	59,034	34,646	24,388	787	-1,056	-2.0%	131,102	45%	297,119	20%
2010	61,513	33,733	27,780	2,346	-1,621	-2.7%	157,318	39%	372,229	17%
2011	76,991	48,209	28,782	-830	1,497	2.2%	164,850	47%	392,647	20%
2012	87,662	49,796	37,866	3,425	-712	-0.9%	187,647	47%	427,452	21%
2013	117,505	56,581	60,924	6,673	4,689	4.6%	220,959	53%	484,624	24%
2014	117,470	55,056	62,414	4,081	1,118	1.0%	239,239	49%	525,867	22%
2015	136,017	68,412	67,605	10,347	1,473	1.2%	254,619	53%	552,257	25%
2016	150,432	75,628	74,804	8,304	-11,596	-8.1%	282,070	53%	620,854	24%
2017	195,840	84,476	111,364	2,128	814	0.5%	348,296	56%	702,095	28%
2018	186,764	112,667	74,097	3,300	24,427	12.8%	348,703	54%	707,794	26%
2019	258,527	120,140	138,387	3,200	4,306	1.9%	424,791	61%	817,729	32%
2020	292,257	118,420	173,837	6,200	-8,595	-3.1%	443,164	66%	873,729	33%
2021	363,779	114,405	249,374	3,600	-7,401	-2.3%	506,199	72%	958,784	38%
2022	341,530	166,350	175,180	660	50,930	14.4%	473,005	72%	926,538	37%

Source: Berkshire Hathaway; Semper Augustus Calculations

Net purchases and realized gain for 2020 through September 30. All others through yearend.

Is it aggressive assuming a return that's not being earned currently? We don't think so. When Berkshire invested in Occidental preferreds at 8%, callable later at a premium (plus warrants), there was very little net yield pickup at the time versus our what was then 6.9% optionality premium to bills. The optionality premium shrinks as T-bill rates rise. If T-bills rise to 5%, the optionality premium shrinks to 2%. If bills yield 7% there is no optionality premium (and at 7% lots of things will have broken in the meantime). Similarly, when common stocks are purchased, Berkshire picks up the earnings yield, not counting whatever happens to the share price or future growth. Apple at 13x earnings is a 7.7% earnings yield. Of course, the annual gain on the Apple investment *far* exceeds both the earnings yield *and* the Semper opportunity cost yield. With more Apples the Semper 7%, or 5%, looks rather puny. Share repurchases are retired at Berkshire's earnings yield. The "income" picked up with the method breaks down if investable cash lingers permanently, a genuine risk if the two-decade range for cash to assets or net debt to equity are any barometer. In the grand scheme of things, we're talking about less than half of current cash balance genuinely investable at today's diminished cash level. At our conservative presumption that cash won't fall below \$30 billion *plus* one year of insurance losses paid as cash, merely \$12 billion remains available. That's 1.3% of total firm assets. One final thought: Today's U.S. Treasury yield curve is highly inverted. If longer-term yields rise from current levels, it wouldn't be surprising to see Berkshire increase fixed-income holdings in the insurance portfolio and reduce cash there.

Reduce Net Income to Reflect Higher Normalized Pension Expense

The pension adjustment methodology we've used for two decades was covered in past letters. Here we'll just overview the earnings adjustment for Berkshire in 2022. If you own or analyze companies with large legacy defined benefit plans, I encourage you to read our old letters. In a nutshell, we generally apply a 4% assumed rate of return on the fair value of pension assets versus Berkshire's 6.1% and run the difference as an annual expense through the income statement. We do the same by amortizing the collective \$172 million pension underfunded status over ten years, assuming a full funding over a decade. The \$172 million underfunded figure was at year-end 2021, a strong year for stocks and bonds. The liability a year earlier was \$2.5 billion. Given 2022's hammering of both stocks and bonds, the net funded status will be materially higher. The combination suggests Berkshire will commit an additional \$408 million pre-tax and \$322 million after-tax to its pension funds annually. These figures use 2021's published financials. This adjustment is immaterial enough that we don't try to figure out what 2022's plan will look like until the 10-K is released at month's end. Given the combined plans' 76% allocation to stocks and investment funds, the underfunded status is likely to again approach more than \$2 billion. It's hard to make headway because combined plan assets of \$18.6 billion distribute annual benefits of \$1 billion, requiring every inch of assumed return. Low interest rates combine with rich stock prices to make our very long-standing 4% assumed return conservatively realistic, even with a company such as Berkshire which regularly assumes both lower expected investment returns and allocates more to public equities than most.

Our method is *far* from actuarially correct but has proven reliable. What the method has done is kept us out of old businesses where the pension plan rivals the business in size and importance. It captures the huge one-off funding that takes place periodically, with the CFO suggesting analysts *ignore* the \$4 billion we just borrowed and "invested" in the pension. No, no, no. Rather, \$400 million ought to have been contributed annually for a decade. With nearly all plans failing to achieve their return assumptions for more than twenty years, it's been a useful tool. Overall, the pension situation improved for investors. The number of companies with defined benefit plans is lower and return assumptions have come down from approximately 9% to 6.5%. With some companies it's a big deal. When interest rates require a microscope to identify and stock markets are at levels consistent with historical secular peaks, the issue is worth considering for the investor in companies with materially large pension fund obligations.

Other Non-Recurring Adjustments

From time-to-time additional adjustments are necessary. Non-tax adjustments at year-end 2017 for the TCJA can be seen in the five-year summary table below. One adjustment irregularly occurs if the stock portfolio trades at a level we find dramatically overvalued or undervalued, where market value is adjusted with a discount or premium. This adjustment does not impact our earnings-based approach.

2020 required a non-cash adjustment reflecting a non-cash, non-tax-deductible write-down of \$10 billion in goodwill at Precision Castparts, plus another \$400 million *after-tax* charge against other intangibles. These “expenses” were properly dismissed as non-operating but cannot be ignored. The analyst cannot ignore the write-down and apply current and future profitability against a now lower equity balance, crediting the sinning management that overpaid for the assets requiring the charge. “Thou shalt not forget the price paid for an acquisition.” Fortunately, you’d have to look and keep looking for these charges at Berkshire over the 57 years present management has run the place. They don’t exist. Ignore the expense as non-cash, suggests the convincing CFO, but let me show you our return on equity, albeit written down. Lest you think the charges are immaterial, in 2020 write-offs and write-downs amounted to 23% of operating earnings, shrinking book value of the index by 2.9%. I highly recommend taking a meat cleaver to the 19.5% return on equity of the index. 2022 write-offs were at a much more modest 10.0% clip, typical during good times. When charges are low, get ready for coming recessions and the big-bath, kitchen-sink write-offs that come with them.

Final periodic adjustments, and here they do reflect earning power, are made if a business or group is under earning or over earning relative to normalized potential. For several years, BNSF and a handful of the manufacturing and industrial businesses were adjusted upward because current profitability was depressed. These subsidiaries improved back to a normalized steady state as of 2018 and again in 2021. The pandemic harmed many MSR businesses badly during 2020. A trade war and pandemic jointly worked against the railroad. Combining the modestly depressed profits with the more severely impacted earnings at MSR, we measured normalized GAAP adjusted after-tax profitability as depressed by \$2.9 billion. The need for markup was gone in 2021, with nearly all Berkshire operations in high gear. At - year-end 2022, only profitability at the railroad is modestly depressed. If the rail earns 14% normalized on equity, profits are perhaps \$600 million understated. I’m not marking overall profitability higher at the moment given the majority of Berkshire’s subsidiaries are performing exceedingly well. In places like GEICO, our underwriting normalization method allows for improvement we are likely to see in coming years.

The final adjustment under consideration to Berkshire’s GAAP financials (and beyond) is the degree to which improved profitability thanks to the TCJA tax changes will phase out, expire, and be competed away. We attempt to capture the decline in the benefit in our sum of the parts method for calculating Berkshire’s intrinsic value. To date, little loss from competition is apparent, at least in the aggregate.

Summary of GAAP Adjustments to Economic Earnings

After-Tax GAAP Adjustments to Economic Earnings: 2022 Expected (in billions)						
	2017	2018	2019	2020	2021	2022 (e)
Normalized Recurring GAAP Adjustment to Economic Earnings						
Add retained earnings of equity investees, taxed at 3% (1/7th of new 21% federal rate)	5.3	10.0	10.0	10.0	11.8	16.2
Add income for DTL's created with PP&E capex to reflect cash tax<GAAP tax	1.4	1.4	1.7	1.7	1.4	1.6
Add 90% of amortization charge for intangibles (was 80%)	0.9	0.9	0.9	1.1	1.1	1.1
Add optionality premium for near/intermediate investments with cash>(1-year insurance losses) + \$30 billion	2.7	2.3	3.8	5.5	3.2	0.2
Reduce net income to reflect higher normalized pension expense	-0.5	-0.5	-0.4	-0.4	-0.4	-0.3
Normalized Recurring GAAP Adjustment to Economic Earnings (before removing realized g/l)	\$ 9.9	\$ 14.1	\$ 16.0	\$ 17.9	\$ 17.1	\$ 18.7
Periodic or Irregular in Amount or One-Time Adjustments to GAAP Net Income						
Remove realized and unrealized gains/losses, including from derivative liabilities	-1.4	17.7	-57.4	-31.6	-62.0	52.4
Remove reported underwriting gain/loss	2.2	-1.6	-0.3	-0.7	-0.7	0.6
Add normalized 5% underwriting profit	2.1	2.2	2.4	2.6	2.7	3.2
Berkshire TCJA Adjustment one-time non-cash	-28.2					
Kraft Heinz TCJA Adjustment one-time non-cash	-1.7					
Write-down after-tax of PCC 2020 (\$10B goodwill and \$0.4B net intangibles)				10.4		
Total Periodic or Irregular in Amount or One-Time Adjustments to GAAP Net Income	\$ (27.0)	\$ 18.3	\$ (55.3)	\$ (19.3)	\$ (60.0)	\$ 56.3
GAAP Net Earnings (From Income Statement)	\$ 44.9	\$ 4.0	\$ 81.4	\$ 42.5	\$ 89.8	\$ -21.4
Total Adjustment (assumes no 4Q18 gain/loss on investments or irregular underwriting gain/loss)	\$ (17.2)	\$ 32.4	\$ (39.3)	\$ (1.4)	\$ (42.9)	\$ 75.0
Semper Adjusted Net Income; Economic Earnings ^{^*}	\$ 27.8	\$ 36.4	\$ 42.1	\$ 41.1	\$ 46.9	\$ 53.6

* Does not reflect degree to which subsidiary earnings or securities are under or over valued (roughly \$2.9 billion depressed in rail and industrial for 2020; modestly depressed in rail at 2022)

[^] May not sum due to rounding

Source: Semper Augustus; Berkshire Hathaway and Subsidiary SEC Filings

Annual adjustments are all over the map. Big movers are removing year-to-year gains and losses from investments and to a lesser degree short-term underwriting results, replacing each with logical normalization factors. Volatility in marketable securities and underwriting make analyzing the operations of Berkshire's reported results impossible. Assessing economic profitability requires an understanding of accounting strengths and weaknesses. Sometimes GAAP is CRAAP.

In total, the process eliminates the reported volatility that comes with owning a large portfolio of common stocks as well as the period-to-period swings in underwriting profitability among a diverse group of insurers. We capture the degree to which some intangibles do not decay in value; whether or when Berkshire will invest its cash reserves and into how much incremental earning power; the proper economic versus accounting treatment of insurance "float"; the difference between reported and cash taxes actually paid, now and prospectively. The process gets us to a durable appraisal of earning power.

Methods and granular estimates used in our process are open to debate. Berkshire is so diverse that the number of adjustments required in arriving at an understanding of durable earning power makes for quite an exercise. An equally important method for valuing Berkshire is through an analysis of its individual components, or at least large clusters of groups. A sum of the parts analysis reconciles closely with GAAP adjustments made to the rolled-up consolidated financial statements because adjustments made within the "parts" are also incorporated top down. Accounting adjustments applied to the whole also apply individually to the segments. The analyst can choose to modify assumptions used at each step, adopt some, or dismiss the method entirely. The GAAP adjusted approach reconciling against other methods used discerns what we believe is a conservative appraisal of Berkshire Hathaway's intrinsic value. Following the adjustments allows for a straightforward method of converting GAAP reported quarterly and annual figures to normalized.

It's important that our clients understand how we view measurement of earning power at what has been Semper's largest holding for more than two decades. Any concern that a public presentation of the approach would drive the stock up to fair value and make the shares unbuyable has been proven not a concern. Warren Buffett and Charlie Munger have long wondered at Berkshire's annual meeting why so few emulate a system that's worked so well for what's now nearly six decades. To the extent the shares trade with a sizable and persistent discount to a reasonable appraisal of intrinsic value suits us just fine. Price matters, but only if one appreciates value.

SUMMARY

Taggart: What do you want me to do, sir?

Hedley Lamarr: I want you to round up every vicious criminal and gunslinger in the west. Take this down.

[Taggart looks for a pen and paper while Hedley talks]

Hedley: I want rustlers, cut throats, murderers, bounty hunters, desperados, mugs, pugs, thugs, nitwits, halfwits, dimwits, vipers, snipers, con men, Indian agents, Mexican bandits, muggers, buggerers, bushwhackers, hornswagglers, horse thieves, bull dykes, train robbers, bank robbers, ass-kickers, shit-kickers, and Methodists!

Taggart: [finding pen and paper] Could you repeat that, sir?

Crazy, but that's how it goes. Who knew when going off the rails became the theme of the annual letter would Ozzy, Randy and Bob's lyrics contain such different yet profound meaning. So many years writing the letter. Sometimes they run together – the years that is. This one won't be forgotten anytime soon. Partly written at a makeshift workstation at my mom's bedside. Partly written in the hallway of a hospital emergency room. My wife, an unexpected patient for the past four days, laughed and snapped a photo of me at the new notebook keyboard from her hospital bed as I began this Summary. No need explaining why she laughed. Humor keeps us sane.

I've listened to preachers; I've listened to fools. How appropriate for the pulpit given to modern-day SPAC, ETF, crypto, ESG, China-shell and meme-stock promoters, fleecing the retail investor with little pushback from those who should know better. Reminds me of the vicious criminals and gunslingers in demand by Hedley Lamarr in the Mel Brooks' classic. While the irrationally exuberant jumped the track, pockets of rationality remained throughout the madness. Regulators are behind the curve in every mania. Financial television exists for ratings, not as a moral compass in protecting the little guy. Hats off to those who spotted the myriad abuses and took steps not only to avoid them but to point them out. Shame on those charged with investing other people's money who lack a proper risk filter. It's not too late in this cycle to figure it out. If you are the little guy, do your part to identify risk. The question is not whether to own stocks or bonds, for example. The question is to identify how you are likely to lose a big chunk of your money, and then figure out how to avoid doing so. On avoiding permanent losses of capital when bubbles pop, it is first essential to identify said bubbles. Sometimes you are the bubble. Never forget Rule Two. If the "professional" investor charged with managing money can't produce a solid rationale for owning a portfolio of stocks trading for more than 20x or 30x sales, hop the next train out of town.

We owe an enormous debt of gratitude to the best clients in the world for your decades of confidence, support, and trust. Many are you as much friends and colleagues as you are clients. Our approach to the preservation and growth of capital is undertaken as a profession and not as a business. We've always felt an obligation to share our thinking as clearly and thoroughly as possible. The annual letter is a big part of that. I'm thrilled at the number that read it in full, and others in part. We never intended for the letter to be a public document or widely read. The fact that so many of our clients find us only *after* reading the letter (or years of the letter) makes for wonderfully aligned relationships. Our clients are largely curious about investing. They are business owners and company executives. Many are sophisticated professional investors and others are experts in other areas of the capital markets. Others are professionals in fields totally unrelated to investing but share a common interest. I'm happy the letter has grown beyond the clients and a few friends in the profession. That it finds its way to college campuses and is read by younger investors with a passion for learning is extremely gratifying. Investors like Benjamin Graham and Warren Buffett did not need to dedicate so much time and energy to sharing and teaching, but they did. The teachers likewise owed debts of gratitude which they felt the responsibility to pass on. Not to mention that I learn a great deal as I write and teach. A win-win.

The portfolio is in terrific shape. At 9.5x earnings, less than half the multiple of the S&P 500, we enter 2023 at the *lowest* initial yearly valuation in firm history. The portfolio likewise trades for less than half

of the multiples to book value and sales, with far better balance sheets, outstanding managements, and excellent prospects to reinvest retained earnings. We are in good shape to hopefully match or exceed returns earned over the past 24 years. The energy and cyclical portions of the portfolio should reap continued rewards introduced by the law of unintended consequences. Price and rationality are our allies. In Berkshire, our largest holding, we own a diversified, durably predictable business earning above an unleveraged 10% return on equity trading at a wide discount to intrinsic value. Modest leverage (offset with matching cash), extremely conservative accounting and outstanding governance are rare qualities. To have them all in one place at today's price suggests reliably predictable returns for years. The stock will not be our highest performing investment, but it is the most knowable. As our base measure of opportunity cost, it remains a perfect hurdle.

A note of gratitude to two special gents for their editing help, Lincoln Minor and Frank Manzella. Neither are professional investors, but both have a great passion for investing. Lincoln works for the USDA but finds the time each year to painstakingly find not only boatloads of grammatical flaws but catches nuanced math errors and typos deep within detailed numerical tables. I'm quite certain when Lincoln shows up announcing he's from the government and he's here to help, help has arrived. Frank is a healthcare executive specializing in M&A. He's noted my occasional weakness with the passive voice versus active voice and offered editing assistance this year. When a Georgetown business and law Jesuit-educated friend offers help with proper voice and dangling participles, you take it. I can't thank both of you enough.

Hats off to the team at Semper. It's hard to believe we are 24 years into this. Time flies. The group is exceedingly talented and a pleasure to work with. While our charge is stewardship of your capital, I'd be surprised if you'd find a group of people with better rapport and who provide better customer service to clients. All are deeply committed to the task at hand. Shepherding your capital comes with enormous responsibility. We will never approach the mission with anything but our undivided care, focus and respect. We remain humbled by your confidence.

Huge thanks for the time so many of you devote to the letter each year. It's a labor of love. Your commitment to understanding the investment process at Semper and our approach to capital makes for easy and wonderful relationships. We look forward to catching up during the year.

I'm not sure dedicating an annual investment letter is a thing. I do want to say, in the spirit of my mom, don't let a day go by that you don't work on relationships with those closest to you. Let them know as often as you can how much you love them. I've always thought about which of my friends I'd want at my side if trapped in an alley with some bad actors and we had to fight our way out. Former teammate and lifelong great friend Jeff Goodell typically topped the list. A seriously tough center, Colonel Goodell retired recently from the USMC. 6'4", 295, a teddy bear in life but someone *never* to mess with when provoked. He's beating the hell out of cancer at present. But sorry, Jeffrey, you are now number two. Nobody protected me like Barb. Her children were her universe. Peace.

Christopher P. Bloomstran

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APPENDIX

Appendix A

Key Business Segment Information – Berkshire Hathaway 2022 Expected

Berkshire Hathaway Energy (92.0% owned)	
Revenues Total	\$26.5 B
Energy Operating Revenue	\$21.2 B
Real Estate Operating Revenue	\$5.5 B
Other Income (Loss)	\$-0.11 B
Pre-tax Income (Excludes gain/loss BYD and invest.)	\$2.9 B
Income Tax Expense (Benefit)	\$-1.8 B
Net Income (GAAP)	\$4.8 B
Non-Controlling Interests of BHE Subs	\$0.4 B
Net Earnings Attributable to BHE	\$4.4 B
Non-Controlling Interests	\$3.69 B
Preferred Stock Dividend to BRK	\$0.80 B
Net Earnings Attributable to BRK	\$3.9 B
Net Earnings Attributable to BRK (Adjusted for cash taxes)	\$4.7 B
Net Earnings Attributable to BHE (Adjusted for cash taxes)	\$5.6 B
Reported Tax Rate (Derived MD&A-not cash adjusted)	-40.0%
Cash Tax Rate (Deferred taxes exceed reported tax)	-47.0%
Goodwill (From BHE 10-Q, 10-K)	\$11.4 B
Deferred Tax Liability (Including \$1.7B for investments)	\$12.5 B
Amortization of Intangibles	\$0.275 B
Depreciation	\$4.090 B
Capital Expenditures (Mgt. Estimate)	\$7.1 B
BYD and Other NDC Trust Stocks; BYD \$6.868B)	\$4.3 B
BHE Equity (Including BYD, NDCs, Rabbi and Non-Control)	\$50.0 B
BHE Non-Controlling Interests (50% ETT, 50% Iroquois)	\$3.9 B
BHE Equity Net of BHE Non-Controlling Interests	\$46.1 B
BHE Equity Net of NCI and Net of BYD/Investments	\$42.4 B
BRK Non-Controlling Interests	\$3.68 B
BRK Equity in BHE	\$42.4 B
BRK Equity (Including \$3.5 B Investments Net of DTL)	\$45.9 B
BRK Equity (Excluding \$3.5 B Investments Net of DTL)	\$42.4 B
Total Assets (Including BYD and Investments)	\$132 B
Debt	\$47.9 B
Cash	\$2.7 B
Interest	\$2.182 B
After-Tax Interest	\$1.724 B
ROE GAAP w/ % DTL includes \$9.7 billion goodwill)	9.9%
ROE (Adjusted for cash taxes)	11.6%
ROC Net of Cash	8.4%
Estimated BHE Value (Gross of BRK NCI and With Investments)	\$88-93 B
Estimated BRK Value With BYD Net of Tax and NCI	\$81-86 B
Implied P/E	15-16

BNSF	
Revenues	\$25.8 B
EBIT	\$9.1 B
Pre-tax Income	\$8.0 B
Net Income (norm tax rate now 24.0%)	\$6.0 B
Net Income (cash tax adjusted)	\$6.8 B
Goodwill (BNSF SEC and STB filings)	\$14.9 B
Equity (estimated from STB and GAAP filings)	\$47.6 B
Total Assets	\$92.9 B
Debt (ex-lease)	\$21.9 B
Cash	\$1.9 B
Interest	\$1.025 B
After-Tax Interest	\$0.810 B
Deferred Tax Liability	\$15.2 B
Equities as an Investment (None now)	n/a
Depreciation and Amortization	\$2.5 B
Capital Expenditures	\$3.2 B
ROE GAAP Net Income	12.9%
ROE Adjusted for Cash Taxes	14.4%
ROC Net of Cash	11.3%
Estimated Value	\$117-137 B
Implied P/E (on net adjusted for cash taxes)	17-20

MSR Businesses + Finance & Financial Products	
Revenues	\$168.3 B
Pre-Tax Income	\$16.5 B
Pre-tax Margin	9.8%
Net Income at 23.4% assumed tax rate	\$12.7 B
Profit margin	7.5%
Goodwill (net of 2020 PCP \$10B write-down)	\$31.1 B
Other Intangibles (net of 2020 PCP \$600m write-down)	\$27.5 B
Total Assets (Identifiable + Intangibles)	\$181.5 B
Equity (Write-down 10.0 and 0.6 PCC 2020)	\$115.7 B
DTL (Unallocated estimate)	\$11.45 B
Depreciation of Tangible Assets	\$3.4 B
Capital Expenditures	\$3.7 B
Total Debt (allocated interest expense Ins & Other & Unallocated to Subs)	\$22.3 B
Cash (Offset to Debt; Balance to HoldCo)	\$22.3 B
Interest	\$0.357 B
After-Tax Interest	\$0.282 B
ROE (If equity 10.6B higher for PCP writedown: 8.8%)	11.0%
ROTE (excluding goodwill & other intangibles)	22.2%
ROC Net of Cash	11.2%
Estimated Value	\$228-241 B
Implied P/E	18-19

HoldCo	
KHC 26.5%; 325,635m shares (MV 13,260 2022; cash cost \$9.8 B)	\$12.902
KHC Market Value Adjustment	\$0.358
Additional KHC Deferred Tax Liability/Asset not on BS	-\$0.075
OXY 20.9% common; 194.350m shares (MV \$12.24B; cash cost \$ 11.180)	\$11.553
OXY Market Value Adjustment	\$0.687
Additional OXY Deferred Tax Liability/Asset not on BS	-\$0.144
Other Equity Method (PFI, Berkadia, ETT(in BHE)) from 4.0 roc	\$4.932
Itochu, Mitsubishi, Mitsui, Sumitomo, Marubeni) (\$12.4B in Insurance)	\$0.000
Diageo \$724M, IAG AU Sold, Taiwan Semi \$4.477 (In Insurance)	\$0.000
BHE Holdings (BYD \$3.496B; Rabbi Trusts/NDCs \$0.800B in BHE)	\$0.000
Cash (MSR cash assumed to offset MSR debt; Annual in HCO financials)	\$23.182
Cash Paid for Alleghany (Assumed from HoldCo not Insurance cash)	<u>-\$11.600</u>
TOTAL HOLDCO ASSETS	\$41.795
Debt (Interest Paid MSR 66.8% of MSR + Not segment allocated)	\$21.779
Additional HoldCo Deferred Tax Liability (All balance to MSR)	<u>\$1.000</u>
HoldCo Net Assets	\$19.016
KHC Eq Method Earnings (increase cost basis; (e) full 21% tax difference)	\$0.887
Divs KHC (Reduce basis of investment; full 21% tax)	-\$0.521
OXY Equity Method Earnings Normalize \$6B (increase cost basis; (e) full 21% tax	\$1.254
Divs OXY (Reduce basis of investment: \$0.82/share)	-\$0.159
Other Equity Method Earnings (\$683m 2019 increases basis)	\$0.984
Distributions Received Equity Method Earnings (Reduce basis; full 21% tax)	\$0.325
Interest Income; tax 21%	\$1.043
Retained Earnings of BYD and other BHE Stocks; Tax 7%	\$0.247
Retained Earnings of BYD; Owned in BHE but earnings not attributed to BHE	\$0.056
Optionality of holdco cash with \$30B permanent: \$4.8B @ 7% - 4%; tax 21%	\$0.144
Interest Expense (Not allocated to subs)	-\$0.355
Normalizing Net Pension Expense for GAAP Adjustment	-\$0.322
Net Investment Income Pre-Tax	\$3.6
Net Investment Income After-Tax	\$2.8
Estimated Value (Investments - HoldCo Debt)	\$19.016

Insurance Operations - Estimated at December 31, 2022			Insurance Investments (December 31, 2022 estimated)		
Premiums Earned with 4Q Alleghany (Excludes Retroactive Premiums Earned)	\$76.0 B		Equity Securities (Includes \$12.1B OXY Warrants)	\$313.5 B	
Statutory Surplus (Equity) \$237B 2020;	\$254.1 B		Fixed Income Securities	\$18.5 B	
Book Value GAAP (Reconciling to Subs; S/B lower than stat surplus; not accurate)	\$248.3 B		Cash (Assumed \$11.6 B Alleghany Buy funded by HoldCo - Could be Surplus Insurance Cash)	\$59.7 B	
			Other (\$0.850 BHE Pfd: Was 3.75, 1.45 paid 21, 800 paid 22; \$2B Seritage Term Loan)	\$3.35 B	
Float (\$147B '21; \$150B 9/30/22; FY Includes Y	\$163 B		Alleghany Y Investments (Presume \$2.9 B Stocks sold. Likely 70% eventually to Stocks)	\$20 B	
Losses Paid (Includes 4Q Y)	\$58 B		Total Investment Assets (326.1 Y/E 2019; 363.1 2020; 446.3 Y/E 2021)	\$415 B	
Expected After-Tax Underwriting Gain 2022:	-\$0.643 B		<u>Investment Income and Earnings (to reconcile)</u>		
Normalized Underwriting Margin: 5% Pre-tax (Ex Retro and PPA Amortization)	\$4.1 B		Dividends (Annualized at 12/31; Excludes OXY Pfd) Tax at 13.125% for less than 20% owned	\$5.2 B (1.74% div yield)	
Normalized Underwriting Net Profit	\$3.2 B		Retained Earnings of Common Stocks; Tax at 3%	<u>\$16.9 B (5.60% REY)</u>	
Capitalized Value from Underwriting ***	\$48.6 B		Total Earnings of Common Stocks	\$22.1 B (13.63 P/E; 7.34% EY)	
Goodwill (Includes \$3.1 B from Y; Other Intangibles immaterial)	\$17.9 B				
DTL (Investment Gain+Def Charges Reins-Unpaid Losses/LAE-Unearned Premiums)	\$38 B		Divs on OXY Preferred (Recently paid as cash)	\$0.800	
			Interest on Fixed Income and Cash; Tax at 21%	\$2.522 B	
Insurance Estimated Value					
Total Investment Assets (Includes \$20 B from Y)	\$415 B		Total Pre-Tax Earnings of Investments (\$17.3B 2019)	\$25.4 B	
Equity securities valuation premium/discount 15% 2021 (-19B 2019; -39B 2020)	\$0 B		Optionality of Cash > One-Year Losses Paid #	\$0.051 B	
Capitalized Value from Underwriting	\$49 B		Pre-tax Earnings with Optionality of Surplus Cash **	\$25.5 B	
Estimated Value	\$464 B		Paid and Hypothetical Taxes (11.0% blended; RE of stocks 3%)	\$1.8 B	
			Investment Net Income	\$23.7 B	

Appendix B – Capital Expenditures and Depreciation; Deferred-Tax Liabilities

CAPITAL EXPENDITURES AND DEPRECIATION; DEFERRED TAX LIABILITIES																				
(Dollars in millions)																				
Berkshire Total (All Operating Businesses)																				
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022 (E)	Total
Capital Expenditures	1,278	2,195	4,571	5,373	6,138	4,937	5,980	8,191	9,775	11,087	15,185	16,082	12,954	11,708	14,537	15,979	13,012	13,276	14,981	187,239
Depreciation	941	982	2,066	2,407	2,810	3,127	4,279	4,683	5,146	5,418	6,215	6,673	7,411	7,719	8,386	8,747	9,319	9,465	9,616	105,410
Difference	337	1,213	2,505	2,966	3,328	1,810	1,701	3,508	4,629	5,669	8,970	9,409	5,543	3,989	6,151	7,232	3,693	3,811	5,365	76,464
BHE																				
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022 (E)	Total
Capital Expenditures			2,423	3,513	3,936	3,413	2,593	2,684	3,380	4,307	6,555	5,876	5,090	4,571	6,241	7,364	6,765	6,611	7,100	82,422
Depreciation			949	1,157	1,128	1,246	1,262	1,333	1,440	1,577	2,177	2,451	2,560	2,548	2,830	2,947	3,376	3,584	4,090	36,655
Difference	-	-	1,474	2,356	2,808	2,167	1,331	1,351	1,940	2,730	4,378	3,425	2,530	2,023	3,411	4,417	3,389	3,027	3,010	42,757
BNSF																				
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022 (E)	Total
Capital Expenditures							1,829	3,325	3,548	3,918	5,243	5,651	3,819	3,256	3,116	3,608	3,063	2,910	3,220	46,506
Depreciation							1,221	1,480	1,573	1,655	1,804	1,932	2,079	2,304	1,890	2,350	2,423	2,406	2,466	25,583
Difference	-	-	-	-	-	-	608	1,845	1,975	2,263	3,439	3,719	1,740	952	1,226	1,258	640	504	754	20,169
BHE + BNSF																				
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022 (E)	Total
Capital Expenditures			2,423	3,513	3,936	3,413	4,422	6,009	6,928	8,225	11,798	11,527	8,909	7,827	9,357	10,972	9,828	9,521	10,320	128,928
Depreciation			949	1,157	1,128	1,246	2,483	2,813	3,013	3,232	3,981	4,383	4,639	4,852	4,720	5,297	5,799	5,990	6,556	62,238
Difference	-	-	1,474	2,356	2,808	2,167	1,939	3,196	3,915	4,993	7,817	7,144	4,270	2,975	4,637	5,675	4,029	3,531	3,764	62,926
DEFERRED TAX LIABILITIES *																				
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017 **	2018	2019	2020	2021	2022 (E)	
Investments	11,020	11,882	14,520	13,501	4,805	11,880	13,376	11,404	16,075	25,660	26,633	36,770	27,669	24,251	17,765	32,134	40,181	55,437	37,780	
Def Ch Reinsurance Assumed	955	828	687	1,395	1,373	1,385	1,334	1,449	1,392	1,526	2,721	2,798	2,876	3,226	2,970	2,890	2,613	2,234	2,200	
PP&E	1,201	1,202	4,775	4,890	7,004	8,135	24,746	28,414	29,715	32,409	34,618	36,770	39,345	26,671	28,279	29,388	30,203	31,323	32,400	
Goodwill and Intang												2,770	11,344	7,204	7,199	7,293	6,753	6,748	7,500	
Other	1,174	1,165	2,591	2,743	4,024	4,236	5,108	6,378	6,485	6,278	6,396	4,555	5,550	3,216	3,187	3,144	3,736	4,094	4,300	
Total	14,350	15,077	22,573	22,529	17,206	25,636	44,564	47,645	53,667	65,873	70,368	83,663	86,784	64,568	59,400	74,849	83,486	99,836	Annual Update	

Source: Semper Augustus

Appendix C – Cash and GAAP Tax Reconciliation

CASH TAXES AND GAAP TAXES																					
	Cumulative	2022 (e)	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005	2004	2003
Earnings Before Tax	544,606	-	27,235	111,686	55,693	102,696	4,001	23,838	33,667	34,946	28,105	22,236	15,314	19,051	11,552	7,574	20,161	16,778	12,791	10,936	12,020
GAAP Taxes **	136,961	-	6,531	20,879	12,440	20,904	-	321	6,603	9,240	10,532	7,935	8,951	6,924	4,568	5,607	3,538	1,978	4,159	3,569	3,805
Net Income *	407,645	-	20,704	90,807	43,253	81,792	4,322	17,153	24,427	24,412	20,170	19,845	15,312	10,746	13,494	8,441	4,994	13,213	11,015	8,528	8,151
Tax Rate	25.1%	-	24.0%	18.7%	22.3%	20.4%	-8.0%	28.0%	27.4%	30.1%	28.2%	31.1%	31.1%	29.8%	29.4%	30.6%	26.1%	32.7%	32.8%	32.5%	31.7%
Current Taxes	88,758	-	7,033	5,326	5,052	5,818	5,176	3,299	6,565	5,426	3,302	5,168	4,711	2,897	3,668	1,619	3,811	5,708	5,030	2,057	3,746
Deferred Taxes	48,203	-	13,564	15,553	7,388	15,086	-	5,497	3,386	2,675	5,106	4,633	3,783	2,213	1,671	1,939	1,919	1,833	886	475	177
Total Tax	136,961	-	6,531	20,879	12,440	20,904	-	321	6,685	9,240	10,532	7,935	8,951	6,924	4,568	5,607	3,538	1,978	4,159	3,569	3,805
Current as Percent of Total Tax	64.8%	-107.7%	25.5%	40.6%	27.8%	-1612.5%	49.3%	71.0%	51.5%	41.6%	57.7%	68.0%	63.4%	65.4%	45.8%	192.7%	86.6%	91.4%	49.5%	105.0%	87.9%
Deferred as Percent of Total Tax	35.2%	207.7%	74.5%	59.4%	72.2%	1712.5%	50.7%	29.0%	48.5%	58.4%	42.3%	32.0%	36.6%	34.6%	54.2%	-92.7%	13.4%	8.6%	50.5%	-5.0%	12.1%
Current Tax Rate	16.3%	-25.8%	4.8%	9.1%	5.7%	129.4%	13.8%	19.5%	15.5%	11.7%	17.9%	21.2%	18.9%	19.3%	14.0%	50.3%	28.3%	30.0%	16.1%	34.3%	27.8%
Deferred Tax Rate	8.9%	49.8%	13.9%	13.3%	14.7%	-137.4%	14.2%	7.9%	14.6%	16.5%	13.1%	10.0%	10.9%	10.2%	16.6%	-24.2%	4.4%	2.8%	16.4%	-1.6%	3.8%
Total Tax Rate	25.1%	24.0%	18.7%	22.3%	20.4%	-8.0%	28.0%	27.4%	30.1%	28.2%	31.1%	31.1%	29.8%	29.4%	30.6%	26.1%	32.7%	32.8%	32.5%	32.6%	31.7%

Source: Semper Augustus

Appendix D -- Reported Segment Profit by Berkshire's JV Partners

Year	Berkadia Net Income	Berkadia Distributions	Carrying amount of Equity and Loans	Year	ETT Net Income	Carrying amount of ETT Investment	
2009	\$20.8	\$0.0	\$240.0	2009		\$53.5	Project Completion date 2017. Estimated cost, \$3.1 billion (9.96% ROE)
2010	\$16.2	\$29.0	\$475.1	2010		\$110.3	
2011	\$29.0	\$23.6	\$193.5	2011		\$223.5	
2012	\$38.0	\$37.6	\$172.9	2012	\$41.0	\$353.7	Project Completion date 2022. Estimated cost, \$3.05 billion (9.96% ROE)
2013	\$84.7	\$69.0	\$182.6	2013	\$53.0	\$455.0	
2014	\$101.2	\$72.9	\$208.5	2014	\$84.7	\$527.0	
2015	\$78.1	\$89.6	\$191.0	2015	\$86.4	\$609.8	
2016	\$94.2	\$100.8	\$184.4	2016	\$97.4	\$725.5	
2017	\$93.8	\$67.4	\$210.6	2017	\$82.0	\$664.0	
2018	\$80.1	\$41.0	\$245.2	2018	\$62.0	\$666.0	
2019	\$88.2	\$65.1	\$268.9	2019	\$66.0	\$695.0	
2020	\$68.9	\$37.1	\$301.2	2020	\$68.0	\$732.0	
2021	\$130.6	\$58.0	\$373.4	2021	\$66.0	\$733.0	Estimated cost, \$3.9 billion (9.6% ROE)
2022	\$124.4	\$69.8	\$425.9				

Year	Iroquois Net Income	Iroquois Distributions	Carrying amount of Iroquois Investment	Year	Pilot Revenues	Equity Income	Carrying amount of Pilot Investment
2021	\$55.0	-\$140.0	\$392.0	2018	\$20,000.0	\$400.9	\$2,779.2
2022	\$77.0	\$232.0	\$237.0	2019	\$30,000.0	\$388.8	\$3,168.0
				2020		\$406.1	\$3,574.1
				2021	\$45,000.0	\$346.4	\$2,778.5

Appendix E – Nifty Fifty 1972-2022 Return Contribution with Corporate Actions

	Annualized Return	Return Contribution	Contribution to Dollar Return
Philip Morris Cos. Inc.	15.6%	2.31%	22.88%
Philip Morris International			
Altria			
PepsiCo Inc.	12.8%	0.70%	6.95%
Gillette Co.	12.4%	0.58%	5.71%
Procter and Gamble Co.			
Coty			
McDonald's Corp	12.2%	0.51%	5.10%
Eli Lilly and Co.	12.1%	0.51%	5.02%
Elanco			
Heublein Inc.	11.5%	0.38%	3.77%
Merck and Co. Inc.	11.3%	0.34%	3.42%
Organon			
Johnson and Johnson	11.1%	0.33%	3.23%
Texas Instruments Inc.	11.1%	0.32%	3.21%
Bristol-Meyers	11.1%	0.32%	3.19%
American Home Products	11.1%	0.32%	3.17%
Pfizer			
Zoetis			
Viatis			
Schering Corp.	11.1%	0.32%	3.15%
Merck			
Organon			
Coca-Cola Co.	10.9%	0.29%	2.89%
Procter and Gamble Co.	10.8%	0.29%	2.83%
COTY			
Pfizer Inc.	10.8%	0.28%	2.77%
Zoetis			
Viatis			
Lubrizol Corp.	10.8%	0.28%	2.74%
BRK/A			
Chesebrough Ponds Inc.	10.6%	0.26%	2.59%
Unilever			
American Express Co.	10.6%	0.26%	2.56%
Ameriprise Financial			
Squibb Corp.	10.5%	0.24%	2.39%
Int'l Telephone & Telegraph	8.9%	0.12%	1.19%
Starwood			
Marriott			
Hartford Financial			
ITT Corp			
Exelis			
Harris			
Xylem			
Anheuser-Busch Inc.	8.7%	0.11%	1.07%
Walt Disney Co.	8.7%	0.11%	1.05%
Louisiana Land and Exploration	8.5%	0.10%	0.97%
Burlington Resources			
ConocoPhillips			
Phillips 66			
American Hospital Supply Corp.	8.3%	0.09%	0.89%
Baxter Labs			

	Annualized Return	Return Contribution	Contribution to Dollar Return
Minnesota Mining & Manuf'g	8.3%	0.09%	0.87%
Neogen			
Dow Chemical Co.	8.3%	0.09%	0.86%
Dupont			
Corteva			
AMP Inc.	8.2%	0.08%	0.83%
Covidien			
Medtronic			
TE Connectivity			
Tyco International			
ADT			
Pentair			
Schlumberger Ltd.	7.6%	0.06%	0.63%
Transocean			
General Electric Co.	7.2%	0.05%	0.53%
Wabtec			
Baxter Labs	7.1%	0.05%	0.49%
Simplicity Patterns	7.0%	0.05%	0.48%
International Business Machines	7.0%	0.05%	0.48%
Kyndryl			
Joe Schlitz Brewing Company	6.9%	0.04%	0.44%
Int'l Flavors & Fragrances	6.8%	0.04%	0.44%
Upjohn Co.	6.6%	0.04%	0.38%
Pharmacia			
Pfizer			
Zoetis			
Viatis			
Halliburton and Co.	6.4%	0.04%	0.35%
KBR			
First National City Corp.	5.9%	0.03%	0.27%
Travelers			
Digital Equipment Corp.	4.0%	0.01%	0.10%
Compaq			
HP			
HPE			
Xerox Corp.	3.9%	0.01%	0.10%
Conduent			
Black and Decker Corp.	3.9%	0.01%	0.10%
Emery Air Freight Corp.	3.0%	0.01%	0.06%
XPO Logistics			
RXO			
Avon Products Inc.	-1.2%	0.00%	-0.01%
Natura			
Burroughs Co.	-7.4%	0.00%	-0.02%
Revlon Inc.	-100.0%	0.00%	-0.02%
JC Penney Inc.	-100.0%	0.00%	-0.02%
Sears Roebuck and Co.	-100.0%	0.00%	-0.02%
Eastman Kodak Co.	-100.0%	0.00%	-0.02%
Kresge (S. S.) Co.	-100.0%	0.00%	-0.02%
Sears Roebuck and Co.			
Polaroid Corp.	-100.0%	0.00%	-0.02%
MGIC Investment Corp.	-100.0%	0.00%	-0.02%
Portfolio	10.08%		10.08%

Appendix F – Nifty Fifty 1972-2022 Return of \$100 by Original Position with Corporate Actions

	Annualized Return	Beginning Dollars	Ending Dollars
Philip Morris Cos. Inc.	15.6%	100	
Philip Morris International			76,324
Altria			61,983
PepsiCo Inc.	12.8%	100	42,102
Gillette Co.	12.4%	100	
Procter and Gamble Co.			34,231
Coty			335
McDonald's Corp	12.2%	100	30,933
Eli Lilly and Co.	12.1%	100	30,211
Elanco			229
Heublein Inc.	11.5%	100	22,855
Merck and Co. Inc.	11.3%	100	20,352
Organon			408
Johnson and Johnson	11.1%	100	19,616
Texas Instruments Inc.	11.1%	100	19,509
Bristol-Meyers	11.1%	100	19,363
American Home Products	11.1%	100	
Pfizer			16,612
Zoetis			2,156
Viatis			466
Schering Corp.	11.1%	100	
Merck			18,778
Organon			376
Coca-Cola Co.	10.9%	100	17,542
Procter and Gamble Co.	10.8%	100	17,056
COTY			167
Pfizer Inc.	10.8%	100	15,559
Zoetis			559
Viatis			714
Lubrizol Corp.	10.8%	100	
BRK/A			16,626
Chesebrough Ponds Inc.	10.6%	100	
Unilever			15,740
American Express Co.	10.6%	100	11,084
Ameriprise Financial			4,460
Squibb Corp.	10.5%	100	14,529
Int'l Telephone & Telegraph Corp.	8.9%	100	
Starwood			
Marriott			3,211
Hartford Financial			739
ITT Corp			
Exelis			
Harris			2,654
Xylem			656
Anheuser-Busch Inc.	8.7%	100	6,572
Walt Disney Co.	8.7%	100	6,443
Louisiana Land and Exploration	8.5%	100	
Burlington Resources			
ConocoPhillips			3,949
Phillips 66			2,004
American Hospital Supply Corp.	8.3%	100	
Baxter Labs			5,479

	Annualized Return	Beginning Dollars	Ending Dollars
Minnesota Mining & Manuf'g	8.3%	100	5,199
Neogen			127
Dow Chemical Co.	8.3%	100	1,660
Dupont			1,914
Corteva			1,735
AMP Inc.	8.2%	100	
Covidien			
Medtronic			1,369
TE Connectivity			1,764
Tyco International			1,509
ADT			308
Pentair			172
Schlumberger Ltd.	7.6%	100	3,910
Transocean			23
General Electric Co.	7.2%	100	2,832
Wabtec			458
Baxter Labs	7.1%	100	3,047
Simplicity Patterns	7.0%	100	3,000
International Business Machines	7.0%	100	2,966
Kyndryl			34
Joe Schlitz Brewing Company	6.9%	100	2,766
Int'l Flavors & Fragrances	6.8%	100	2,731
Upjohn Co.	6.6%	100	
Pharmacia			
Pfizer			2,207
Zoetis			80
Viatis			98
Halliburton and Co.	6.4%	100	1,804
KBR			397
First National City Corp.	5.9%	100	526
Travelers			1,234
Digital Equipment Corp.	4.0%	100	
Compaq			
HP			384
HPE			316
Xerox Corp.	3.9%	100	560
Conduent			126
Black and Decker Corp.	3.9%	100	680
Emery Air Freight Corp.	3.0%	100	
XPO Logistics			292
RXO			154
Avon Products Inc.	-1.2%	100	
Natura			54
Burroughs Co.	-7.4%	100	2
Revlon Inc.	-100.0%	100	0
JC Penney Inc.	-100.0%	100	0
Sears Roebuck and Co.	-100.0%	100	0
Eastman Kodak Co.	-100.0%	100	0
Kresge (S. S.) Co.	-100.0%	100	
Sears Roebuck and Co.			0
Polaroid Corp.	-100.0%	100	0
MGIC Investment Corp.	-100.0%	100	0
Portfolio	10.08%	5,000	609,020

Appendix G – Nifty Fifty 1972-2022 Method and Corporate Action Detail

Nifty Fifty Corporate Actions

Philip Morris Cos Inc.: Altria (Philip Morris USA) spun off Philip Morris International on March 25th, 2008. post-spin, PMI had a value of ~\$130 billion compared to ~\$85 billion for Altria.

Pfizer Inc.: Pfizer IPO'd 20% of its Zoetis business in 2013 and then spun out the remaining 80% later that year. The spin-off stub was valued at \$12 billion compared to the remaining market cap of \$197 billion for Pfizer. Pfizer spun out its \$12 billion Upjohn business and combined it with Mylan to form Viatris on November 16th, 2020.

Bristol-Meyers: In 1989, Bristol-Myers and Squibb merged and became Bristol-Myers Squibb.

Procter and Gamble Co.: Procter and Gamble bought Gillette on April 10th, 2005 for \$54 per share in P&G shares which represented an 18% premium at the day the deal was announced. Procter and Gamble completed the spinoff of their \$11.5 billion P&G Specialty Beauty Brands segment under the name Coty on October 4th, 2016.

Merck: Merck spun out its \$7.5 billion Women's Health segment into Organon on June 3rd, 2016.

General Electric: GE spun out Wabtec on February 25th, 2019. Wabtec was valued at \$11 billion following the transaction.

Schering: Merck bought Schering for \$41 billion on November 3rd, 2009.

Eli Lilly and Co.: Eli Lilly spun out Animal Health business under the name Elanco on March 11, 2019. Post-spin Elanco had a value of ~\$7.5 billion.

American Home Products: Changed its name to Wyeth on March 11th, 2002. Wyeth was purchased by Pfizer on October 14th, 2009, for \$68 billion in cash and shares.

Revlon Inc.: Filed for Chapter 11 on June 16th, 2022.

Chesebrough Ponds Inc.: Chesebrough Ponds was acquired by Unilever in 1987 for \$3.1 billion.

First National City Corp.: Citigroup spun out Travelers Companies in August 2002 at a valuation of ~\$8 billion.

American Express Co.: American Express spun out Ameriprise Financial on September 30th, 2005 at a value of ~\$9 billion.

Dow Chemical Inc.: Dow and DuPont merged on 8/31/2017. Dow and DuPont merged in 2017 to form DowDuPont. DowDuPont split on April 1st, 2019 to form Dow Chemical Corteva and DuPont de Nemours. These companies were valued at \$33 billion, \$50 billion and \$20 billion respectively.

American Hospital Supply Corp.: Merged with Baxter Labs in 1985.

Upjohn Co.: Upjohn merged with Pharmacia in 1995. Pharmacia merged with Pfizer on April 16, 2003.

AMP: AMP was acquired by Tyco International on April 5th, 2015 for \$12.2 billion. Tyco spun out its healthcare business in July 2007 under the name of Covidien on July 5th, 2007. Upon the spinoff, Covidien had a market value of ~\$20 billion. Covidien was acquired by Medtronic for \$43 billion on January 26th, 2015. Tyco spun out its electronics business as Tyco electronics, later renamed TE Connectivity in July 2007. This business was worth ~\$18 billion post-spin. After spinning off the healthcare and electronics business in July 2007, the surviving company was worth \$22 billion. On October 1, 2012 Tyco International spun out ADT at a \$6.6 billion valuation. ADT was later acquired by Apollo Global for ~\$7 billion on March 30th, 2016. Tyco International spun out their flow control business on October 1, 2012 and immediately merged it with Pentair.

Minnesota Mining and Manufacturing: In December 2021, 3M merged its food testing and animal health businesses with Neogen. The 3M assets were valued at \$3.2 billion.

International Telephone and Telegraph Corp.: In 1995, ITT split into 3 companies, ITT Corp. (\$7 billion), ITT Hartford (\$6 billion, Hartford Financial) and ITT Industries (\$3 billion, later changed to ITT Corp.). ITT Corp merged with Starwood in 1997. Starwood was acquired by Marriott in September 2016 for \$13 billion. Renamed ITT Corp. in July 2006. In 2011, ITT Industries spun out their defense business, Exelis which was valued at \$3.2 billion. Exelis was later acquired by Harris in May 2015 for \$4.8 billion. In 2011, ITT Industries spun out their water business which was renamed Xylem.

International Business Machines: IBM spun out Kyndryl on November 4th, 2021 at a \$4 billion valuation.

Xerox: Xerox spun out Conduent in January of 2017 at a \$3 billion valuation.

Haliburton: Haliburton spun out KBR in February of 2007 at a \$4 billion valuation.

Lubrizol: Lubrizol was acquired by Berkshire Hathaway for \$9.7 billion in December 2011.

Digital Equipment Corp.: Compaq acquired Digital Equipment Corp. in a \$9.6 billion deal in January 1998. HP acquired Compaq in a \$25 billion deal in May 2002. HP spun out its enterprise business under the name Hewlett Packard Enterprise in September 2017. Post-spin, the stub was worth \$25 billion.

Avon Products Inc.: Avon was acquired by Natura in January 2020 for \$2 billion.

Louisiana Land and Exploration Co.: Burlington Resources buys Louisiana Land and Exploration for \$2.44 billion in July 1997. ConocoPhillips buys Burlington Resources for \$36 billion in August 2006. ConocoPhillips spun out their refining business as Phillips 66 in May of 2012 at a \$20 billion valuation.

Kresge (S. S.) Co.: Sears Roebuck acquired Kmart to form Sears Holding Company in March 2005 in an \$11 billion deal.

Burroughs Co.: Burroughs acquired Sperry for \$5 billion to form Unisys in September 1986.

Polaroid Corp.: Polaroid went through Chapter 11 in 2001.

Emery Air Freight Corp.: Consolidated Freightways buys Emery in 1989 for \$230 million. Emery subsidiary was shut down in 2001. Consolidated Freight was renamed CNF Transportation which was again renamed to Con-Way. Con-Way was acquired by XPO Logistics for \$3 billion in September 2015. XRO spun out of XPO Logistics in November 2022 at a \$2.5 billion valuation.

MGIC Investment Corp.: Bankrupt in 1985.

Deriving a total return for a basket of fifty companies from fifty years ago is no easy task. Mergers, spinoffs, splits, take privates, must all be properly accounted for. The methodology used here in

calculating returns for the Nifty Fifty over 50 years improved on some flaws used by Siegel in his 1998 article. Both presumed reinvestment of dividends back into the company having paid the dividend.

Using Siegel's returns from 12/31/1972 to 8/31/1998, we constructed an equal weighted portfolio in 1972 and ran it to 1998. Ending weights for each holding then became beginning portfolio weights for the subsequent time period, 8/31/1998 to 12/31/2022. A total return was calculated for each position over the subsequent timeframe and a weighted average return was calculated for each and for the portfolio. Like Siegel, when a company went through a merger, a position in the surviving company was retained and the performance of that surviving company was used for the period following the deal. The same methodology was applied for spinoffs – the existing company and the spinoff company were reweighted relative to the market cap at which they traded following the spin. It is not clear how Siegel handled spinoffs. For buyout deals where there was no surviving publicly traded company, the Semper method reinvested the capital at the average annual rate of return earned by the remaining Nifty Fifty portfolio for the relevant duration of the period 8/31/1998 to 12/31/2022. This contrasts with Siegel's methodology of reinvesting buyout proceeds in the S&P 500. The Semper method reflects the return an investor would earn owning the Nifty Fifty over this time period which presumably was the goal of Siegel's study and paper.

Appendix H – Price-to-Sales Class Return Outliers

In the 30+ group, 2021 and 2022 were outlier years where five stocks from five different classes grew to such size to propel positive returns for their respective classes in years when most high price-to-sales stocks declined precipitously.

>30x Sales

2000 Class: Gilead started 2021 and 2022 at a weight of 63% and 64% respectively as one of the remaining 15 names in a class that started with 85 constituents. The stock was up 29% in 2021 and 24% in 2022.

2001 Class: United Therapeutics started 2021 and 2022 at a weight of 43% and 62% respectively as one of the remaining 19 names in a class that started with 76 constituents. The stock was up 42% in 2021 and 29% in 2022.

2003 Class: Began 2022 with only 4 remaining names from the original 17 constituents. Alexion and Regeneron had a disproportionate effect on the returns for 2021 and 2022. Alexion started 2021 at 57% of the portfolio and the stock was up 17% after being acquired by AstraZeneca in July of that year. Regeneron started 2021 and 2022 at 33% and 83% of the portfolio respectively. The stock was up 31% and 14% in those years.

2007 Class: Dexcom began 2021 at 52% of the portfolio as one of the remaining 18 names from the original 36 constituents. The stock was up 45% for the year.

2009 Class: Blackstone began 2021 at 35% and of the portfolio as one of the remaining 10 names from the original 17 constituents. The stock was up 107% that year.

In the 20+ group, 2021 and 2022 were similarly outlier years where three stocks from two different classes drove returns for their respective classes.

>20x Sales

2003 Class: Alexion and Regeneron were also in the 20+ class. Alexion made up 49% in 2021 and Regeneron made up 29% and 63% for 2021 and 2022 respectively.

2013 Class: Tesla drove the bus for 2020-2022. Its weight within the class was 28%, 72% and 85% for 2020, 2021 and 2022 respectively. The stock performed exceptionally well for the first two years, up 743% and 50% respectively. No, that return in 2020 is not a typo. 2022 was a different story altogether with the stock being down 57.7%.

Appendix I – Semper Augustus Investments Group Historical Returns

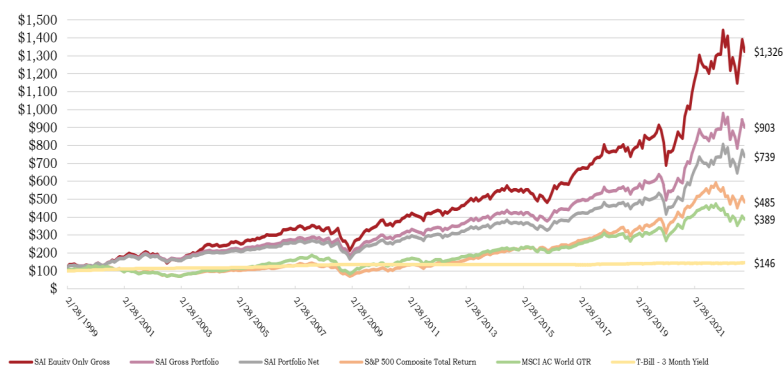
Fundamental Intrinsic Value Equity Composite Performance

Year End	Gross of Fees	Net of Fees	Gross of Fees Equities Only*	Net of Fees Equities Only*	MSCI All Country World Index	S&P 500
1999**	29.9%	28.8%	29.1%	28.1%	27.5%	19.9%
2000	26.8%	25.6%	30.7%	29.5%	-14.0%	-9.1%
2001	20.8%	19.7%	23.1%	22.0%	-15.9%	-11.9%
2002	-15.5%	-16.2%	-22.0%	-22.7%	-19.0%	-22.1%
2003	21.8%	20.8%	38.2%	37.1%	34.6%	28.7%
2004	9.2%	8.4%	16.3%	15.5%	15.8%	10.9%
2005	6.2%	5.4%	7.4%	6.6%	11.4%	4.9%
2006	14.2%	13.3%	18.4%	17.5%	21.5%	15.8%
2007	3.8%	3.0%	3.1%	2.3%	12.2%	5.5%
2008	-20.3%	-21.5%	-21.6%	-22.7%	-41.9%	-37.0%
2009	22.0%	20.8%	27.9%	26.7%	35.4%	26.5%
2010	12.8%	11.6%	14.4%	13.2%	13.2%	15.1%
2011	6.9%	6.1%	7.1%	6.3%	-6.9%	2.1%
2012	6.5%	5.7%	6.8%	6.0%	16.8%	16.0%
2013	15.5%	14.6%	17.3%	16.4%	23.4%	32.4%
2014	4.6%	3.8%	5.2%	4.4%	4.7%	13.7%
2015	-8.7%	-9.4%	-10.3%	-11.0%	-1.8%	1.4%
2016	22.1%	21.2%	27.7%	26.8%	8.5%	12.0%
2017	13.5%	12.6%	18.0%	17.1%	24.6%	21.8%
2018	-1.3%	-2.1%	-1.4%	-2.1%	-8.9%	-4.4%
2019	20.4%	19.5%	23.6%	22.7%	27.3%	31.5%
2020	11.2%	10.4%	11.9%	11.1%	16.8%	18.4%
2021	24.9%	24.0%	27.3%	26.4%	19.0%	28.7%
2022	1.9%	1.0%	2.1%	1.2%	-18.0%	-18.1%

	Gross of Fees	Net of Fees	Gross of Fees Equities	Net of Fees Equities Only*	MSCI All Country World	S&P 500
Cumulative Since	802.7%	639.3%	1226.0%	985.9%	289.2%	385.2%
Annualized Since Inception**	9.7%	8.8%	11.5%	10.5%	5.9%	6.9%

* This is supplemental information

** Inception Date 2/28/1999. # Firm Assets at 12/31/2022 is \$477 million, at 12/31/2021 was \$390 million and at 12/31/2020 was \$305 million.



Firm Overview:

Semper Augustus Investments Group, LLC claims compliance with the Global Investment Performance Standards (GIPS®). For the purpose of complying with GIPS, SAI defines itself as Semper Augustus Investments Group, LLC, an independently registered investment adviser. For purposes of determining firm assets under management, SAI includes all discretionary and non-discretionary assets as well as all fee paying and non-fee paying.

Composite Description:

The Semper Augustus Fundamental Intrinsic Value Equity consists of portfolios managed for Semper Augustus' clients according to the firm's published investment philosophy. Semper Augustus employs a fundamental value investment strategy, identifying companies earning free cash returns in excess of a realistic estimate of the firm's cost of capital. Our firm defines risk as a permanent loss of capital, not as volatility around some mean. Portfolios have generally contained fewer than 30 holdings and are often concentrated in a small handful of businesses with high business quality and share prices at a significant discount to conservative appraisals of intrinsic business value. These dual margins of safety are crucial to the investment process, and lend themselves to generally long holding periods and low portfolio turnover. During periods of high volatility, turnover can be opportunistically higher. Investments are made across all market capitalizations, in both domestic and globally headquartered businesses. Our firm makes international investments in businesses domiciled in industrialized countries where the rule of law is strong and accounting standards are high. We are benchmark agnostic. Industry weightings are not a consideration. The composite includes the income and performance derived from various option-writing strategies in some client accounts. Allocations to cash are a byproduct of the investment process and not a permanent allocation. To be included in the composite, accounts must meet certain thresholds of equity securities purchased by SAI. This method generally excludes accounts that are managed as "balanced" accounts and client accounts that have not met the required threshold for inclusion. Cash and equivalents have been significant holdings at times.

Index Return Information:

The MSCI ACWI returns are gross of any fees required to replicate the index and are also pre-tax. The index is theoretically passive (unmanaged) but in reality, replication requires trading costs and some management fees. Fundamental Intrinsic Value Equity may differ materially from the index as the Fundamental Intrinsic Value Equity owns concentrated positions and the MSCI ACWI has a bias towards large cap stocks. Fundamental Intrinsic Value Equity has included varying investments in small, mid and large cap stocks in addition to investments in cash and short-duration fixed income securities. The MSCI ACWI is broadly used as an investment benchmark. The MSCI ACWI index is the benchmark for Fundamental Intrinsic Value Equity.

The S&P 500 returns are gross of any fees required to replicate the index and are also pre-tax. The index is theoretically passive (unmanaged) but in reality, replication requires trading costs and some management fees. The Fundamental Intrinsic Value Equity may differ materially from the index as the Fundamental Intrinsic Value Equity owns concentrated positions and the S&P 500 has a bias towards large cap stocks and holds only U.S. domiciled companies. Fundamental Intrinsic Value Equity has included varying investments in small, mid and large cap stocks, both foreign and domestic, in addition to investments in cash and fixed income securities. The S&P 500 is broadly used as an investment benchmark and is presented in this document to provide a clear measure of how the strategy did against the general stock market.

Composite Return Details:

Supervised assets are defined as assets acquired by SAI in client accounts based on the discretion granted in client agreements. This process involves the establishment of a model security and the dates whereby the security is held. For securities received into an account prior to or after the model period; directed purchases by a client; or corporate actions arising from non-model securities; these securities have been excluded from the supervised assets. SAI must have initiated the trade or the security was a model security when transferred into an account for its performance to be included in the composite.

Returns are presented both gross of management fee and net of management fees and performance fees and include the reinvestment of all income. The composite was created on March 1, 2018. The U.S. Dollar is the currency used to express performance.

Returns are presented net of all commissions and any margin interest expense incurred in the management of portfolio accounts. Composite management fees have been calculated as if the fees were charged each month based at the actual client contract rate on the month-end composite assets for each client. For family and employee accounts that do not pay a management fee, a fee of 1.25% was included in the composite management fees during the period when the accounts were included in the composite. Actual returns will be reduced by investment advisory fees and any other expenses that may be incurred in the management of the portfolio accounts. The collection of fees produces a compounding effect on the total rate of return net of management fees.

Gross of Fees Equities Only: Represents the actual performance of all equity securities included in the composite, including reinvested dividends. It is a pure equity only return and does not have any cash equivalents or fixed income securities included. Net of Fees Equity Only: Represents Gross of Fees Equities Only reduced by Composite management fees consistent with the net fee adjustment detailed above where Composite management fees have been calculated as if the fees were charged each month based at the actual client contract rate on the month-end composite assets for each client. For family and employee accounts that do not pay a management fee, a fee of 1.25% was included in the composite management fees during the period when the accounts were included in the composite.

Actual returns will be reduced by investment advisory fees and other expenses that may be incurred in the management of the account. The collection of fees produces a compounding effect on the total rate of return net of management fees. As an example, the effect of investment management fees on the total value of a client's portfolio assuming (a) quarterly fee assessment, (b) \$1,000,000 investment, (c) portfolio return of 8% a year, and (d) 1.00% annual investment advisory fee would be \$10,416 in the first year, and cumulative effects of \$59,816 over five years and \$143,430 over ten years. The annual composite dispersion presented is an asset-weighted standard deviation. To obtain a GIPS Composite Report and/or the firm's list of composite descriptions, please contact Chad Christensen at csc@semperaugustus.com. GIPS® is a registered trademark of CFA Institute. CFA Institute does not endorse or promote this organization, nor does it warrant the accuracy or quality of the content contained herein.

Past performance is not indicative of future results.

COMPOSITE PERFORMANCE: COMPOUND ANNUAL GROWTH RATES (CAGR)
FROM INCEPTION AND LOOKING BACK TO INCEPTION

Year		Gross Portfolio	Gross Portfolio CAGR from 2022	Gross Portfolio CAGR from 1999	Portfolio Net	Portfolio Net CAGR from 2022	Portfolio Net CAGR from 1999	Equities Only Gross	Equities Only Gross CAGR from 2022	Equities Only Gross CAGR from 1999	Equities Only Net	Equities Only Net CAGR from 2022	Equities Only Net CAGR from 1999	MSCI AC World GTR	MSCI AC World GTR CAGR from 2022	MSCI AC World GTR CAGR from 1999	S&P 500 Composite Total Return	S&P 500 CAGR from 2022	S&P 500 CAGR from 1999
1999*	<i>24yr</i>	29.9%	9.7%	29.9%	28.8%	8.8%	28.8%	29.1%	11.5%	29.1%	28.1%	10.5%	28.1%	27.5%	5.9%	27.5%	19.9%	6.9%	19.9%
2000	<i>23yr</i>	26.7%	8.8%	31.2%	25.6%	7.9%	30.0%	30.7%	10.7%	33.1%	29.5%	9.7%	31.8%	-13.9%	5.0%	5.2%	-9.1%	6.3%	4.8%
2001	<i>22yr</i>	20.8%	8.0%	27.5%	19.7%	7.2%	26.3%	23.1%	9.8%	29.4%	22.0%	8.9%	28.2%	-15.9%	5.9%	-2.8%	-11.9%	7.0%	-1.4%
2002	<i>21yr</i>	-15.5%	7.5%	14.5%	-16.2%	6.6%	13.5%	-22.0%	9.2%	13.4%	-22.7%	8.3%	12.4%	-19.0%	7.1%	-7.3%	-22.1%	8.0%	-7.3%
2003	<i>20yr</i>	21.8%	8.8%	16.0%	20.8%	7.9%	14.9%	38.2%	11.1%	18.2%	37.1%	10.2%	17.1%	34.6%	8.6%	0.1%	28.7%	9.8%	-0.8%
2004	<i>19yr</i>	9.2%	8.1%	14.8%	8.4%	7.2%	13.8%	16.3%	9.8%	17.9%	15.5%	8.9%	16.8%	15.8%	7.4%	2.7%	10.9%	8.9%	1.1%
2005	<i>18yr</i>	6.2%	8.1%	13.5%	5.4%	7.2%	12.5%	7.4%	9.5%	16.3%	6.6%	8.6%	15.3%	11.4%	6.9%	3.9%	4.9%	8.8%	1.7%
2006	<i>17yr</i>	14.2%	8.2%	13.6%	13.3%	7.3%	12.6%	18.4%	9.6%	16.5%	17.5%	8.7%	15.5%	21.5%	6.7%	6.0%	15.8%	9.0%	3.4%
2007	<i>16yr</i>	3.8%	7.8%	12.4%	3.0%	6.9%	11.5%	3.1%	9.1%	14.9%	2.3%	8.1%	14.0%	12.2%	5.8%	6.7%	5.5%	8.6%	3.6%
2008	<i>15yr</i>	-20.3%	8.1%	8.6%	-21.5%	7.2%	7.6%	-21.6%	9.5%	10.5%	-22.7%	8.5%	9.6%	-41.8%	5.4%	0.3%	-37.0%	8.8%	-1.5%
2009	<i>14yr</i>	22.0%	10.5%	9.7%	20.8%	9.6%	8.8%	27.9%	12.1%	12.0%	26.7%	11.2%	11.0%	35.4%	10.0%	3.1%	26.5%	13.1%	0.8%
2010	<i>13yr</i>	12.8%	9.6%	10.0%	11.6%	8.8%	9.0%	14.4%	11.0%	12.2%	13.2%	10.1%	11.2%	13.2%	8.2%	3.9%	15.1%	12.2%	1.9%
2011	<i>12yr</i>	6.9%	9.3%	9.8%	6.1%	8.5%	8.8%	7.1%	10.7%	11.8%	6.3%	9.9%	10.8%	-6.9%	7.8%	3.0%	2.1%	11.9%	1.9%
2012	<i>11yr</i>	6.5%	9.6%	9.5%	5.7%	8.7%	8.5%	6.8%	11.0%	11.5%	6.0%	10.2%	10.5%	16.8%	9.3%	4.0%	16.0%	12.9%	2.9%
2013	<i>10yr</i>	15.5%	9.9%	9.9%	14.6%	9.1%	8.9%	17.3%	11.4%	11.8%	16.4%	10.6%	10.9%	23.4%	8.5%	5.2%	32.4%	12.6%	4.7%
2014	<i>9yr</i>	4.6%	9.3%	9.6%	3.8%	8.5%	8.6%	5.2%	10.8%	11.4%	4.4%	10.0%	10.4%	4.7%	7.0%	5.2%	13.7%	10.6%	5.2%
2015	<i>8yr</i>	-8.7%	9.9%	8.4%	-9.4%	9.1%	7.4%	-10.3%	11.5%	10.0%	-11.0%	10.7%	9.0%	-1.8%	7.3%	4.7%	1.4%	10.2%	5.0%
2016	<i>7yr</i>	22.1%	12.8%	9.1%	21.2%	12.0%	8.2%	27.7%	15.1%	10.9%	26.8%	14.2%	10.0%	8.5%	8.7%	4.9%	12.0%	11.5%	5.4%
2017	<i>6yr</i>	13.4%	11.4%	9.3%	12.6%	10.5%	8.4%	18.0%	13.1%	11.3%	17.1%	12.2%	10.3%	24.6%	8.7%	5.9%	21.8%	11.4%	6.2%
2018	<i>5yr</i>	-1.3%	10.9%	8.8%	-2.1%	10.1%	7.8%	-1.4%	12.1%	10.6%	-2.1%	11.3%	9.7%	-8.9%	5.8%	5.1%	-4.4%	9.4%	5.6%
2019	<i>4yr</i>	20.4%	14.2%	9.3%	19.5%	13.4%	8.4%	23.6%	15.8%	11.2%	22.7%	14.9%	10.3%	27.3%	9.8%	6.1%	31.5%	13.2%	6.7%
2020	<i>3yr</i>	11.2%	12.3%	9.4%	10.4%	11.4%	8.5%	11.9%	13.3%	11.2%	11.1%	12.4%	10.3%	16.8%	4.5%	6.5%	18.4%	7.7%	7.2%
2021	<i>2yr</i>	24.9%	12.8%	10.0%	24.0%	11.9%	9.1%	27.3%	14.0%	11.9%	26.4%	13.1%	11.0%	19.0%	-1.2%	7.1%	28.7%	2.7%	8.1%
2022	<i>1yr</i>	1.9%	1.9%	9.7%	1.0%	1.0%	8.8%	2.1%	2.1%	11.5%	1.2%	1.2%	10.5%	-18.0%	-18.0%	5.9%	-18.1%	-18.1%	6.9%

* Inception Date 2/28/1999.

SEC-registered investment advisory firms are now required to disclose 1-, 5- and 10-year returns, or the time period since performance composite or portfolio inception, if shorter. The new rule seeks to prevent “advertisers” from cherry-picking time periods that make returns appear more favorable. As short- and intermediate-term returns change frequently due to beginning and endpoint sensitivity, we have chosen to disclose *all* yearly intervals from the current 1-year return all the way back to inception. Intra-year periods will likewise be shown annually back to inception. Better, in our opinion, to provide more data than less. We are augmenting the mandated disclosure with the full data set – not to confuse – but if we must provide a few defined numbers, to the extent anybody uses them in decision making, we want you to have the information we’d want if our roles were reversed. The yearly return intervals are *italicized and shaded in blue*.