



SYMPATHY FOR THE DOG

CHALLENGING DOGMA, DEATH OF THE PROFIT
MARGIN, AND A *(BRIEF)* BERKSHIRE REDUX

2016 LETTER TO CLIENTS

February 12, 2017

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2016 LETTER TO CLIENTS

SYMPATHY FOR THE DOG

CHALLENGING DOGMA, DEATH OF THE PROFIT MARGIN, AND A (BRIEF) BERKSHIRE REDUX

*Please allow me to introduce myself; I'm a man of wealth and taste
I've been around for a long, long year; Stole many a man's soul and faith
And I was 'round when Jesus Christ had his moment of doubt and pain
Made damn sure that Pilate washed his hands and sealed his fate*

*Pleased to meet you; Hope you guess my name
But what's puzzling you is the nature of my game*

*I stuck around St. Petersburg when I saw it was a time for a change
Killed the Tsar and his ministers, Anastasia screamed in vain
I rode a tank, held a general's rank
When the blitzkrieg raged and the bodies stank*

*Pleased to meet you; Hope you guess my name
Ah, what's puzzling you is the nature of my game*

*I watched with glee while your kings and queens
Fought for ten decades for the gods they made
I shouted out, "Who killed the Kennedys?"
When after all it was you and me*

*Let me please introduce myself; I'm a man of wealth and taste
And I laid traps for troubadours who get killed before they reached Bombay*

*Pleased to meet you; Hope you guessed my name
But what's puzzling you is the nature of my game
Pleased to meet you; Hope you guessed my name
But what's confusing you is just the nature of my game*

*Just as every cop is a criminal and all the sinners saints
As heads is tails just call me Lucifer
Cause I'm in need of some restraint; So if you meet me
Have some courtesy; Have some sympathy, and some taste
Use all your well-learned politesse, or I'll lay your soul to waste*

*Pleased to meet you; Hope you guessed my name
But what's puzzling you is the nature of my game – Jagger/Richards*

Can you *guess the name* of the protagonist? Many of you would conclude it's the new occupant of 1600 Pennsylvania Avenue. Some of the verses fit rather well...For others of you, that would have been your guess *prior* to November 8. Our country has been profoundly divided many times in its history, but we have never observed firsthand such hatred and contempt as today. Of course, the lyrics belong to the Rolling Stones' Sympathy for the Devil. It seemed a fitting lead.

Last year's letter borrowed its title and the first verse and chorus from Prince's anthem, Party Like It's Nineteen Ninety-Nine. Sadly, Prince is once again, and will forever be, The Artist Formerly Known As.

Some observed our timing was forebodingly coincidental. The title and lyrics fit the day as we drew parallels with the market craziness in both 1999 and 2015.

Much of the insanity persisted through 2016, though market breadth vastly improved, and a rising tide lifted the market to all-time highs. Many of the great branded consumer franchises fetch prices rivaling those seen in 1998, the peak of the “new” Nifty Fifty. On insanity, 2016 closed at a political crossroads, with the country divided and many in a manic stupor. Shakespeare would have had a field day if he were alive. However it evolves, we expect the next four years to be jam-packed with entertainment. Tragedy or comedy? Find a safe space, pull up an armchair and behold the tale.

While we sincerely doubt any preternatural correlation with our writing about Prince and his untimely demise last year, we played it safe regardless by awarding this year’s theme to the Stones, because everyone knows they’re going to live forever, especially Keith Richards, the co-author of *Sympathy, the epic lead guitar and occasional lead vocalist*. With a dedicated effort, I finally finished Keith’s memoir, *Life*, last year. It was written with James Fox in 2010, and occupied a place among the stack on the nightstand for four years. It’s an incredibly incoherent but interesting history, especially for a lifelong Stones fan. Keith’s remaining brain cells allow him to recount wandering stories while Fox interprets. I found you could only read a few pages and then had to decompress and set it aside for a few days, or weeks, but couldn’t help but come back at times.

This year’s letter begins with a contrast of the things in investing that are within our control and those that are outside our control. We are no more geniuses today for portfolio returns north of 20% last year than we are dolts in years when our portfolio declines in price or underperforms the market. We can control two critical inputs – the *quality* of the businesses we invest in and the *quantity* of earnings our businesses produce. By controlling these two essential aspects, satisfactory returns should follow over the long haul. We have no control over stock prices over short periods of time. The stock prices of our businesses will ultimately reflect the earning power of the underlying businesses, thus correlating to things we control. Time is the arbiter of investment outcomes, success comes by controlling the important inputs.

From there, the letter delves into a rare “aha” moment in which a previously sacrosanct investment truth is dispelled. Letting go of long-held biases and convictions, particularly those shared by others, is difficult. After much thinking, **we now conclude that profit margins mean reverting to a historically observable range is now an irrelevant concept because the amount of capital required to produce a dollar of revenues has grown.** In this case, capital is not capital expenditures, but the combination of equity and debt employed in the business. If a range exists for profit margins, it is now higher than conventionally believed. Many won’t agree (I do) with our conclusion. To support the hypothesis, we compare two companies side by side on a common size basis to demonstrate what really matters in investing, and it’s not the profit margin.

We then wade back into the swamp with a *brief* follow-up to last year’s dive into Berkshire Hathaway. We’ll answer a couple questions raised in response to the letter, then go off the reservation with a persnickety diatribe about some Berkshire intrinsic value numbers moving around in last year’s Chairman’s letter. Finally, we conclude with a current intrinsic value estimate for Berkshire and an updated ten-year expected return for the shares. An appendix, with updated tables, supports our Berkshire valuation methodologies.

MONEY DOG

Amazon Claus came early last year, he came often, too, delivering Phil Knight's recently released memoir, *Shoe Dog*, on Christmas Eve. The book proved a wonderful holiday read. Unlike the Keith Richards memoir, which took four years to work through, I read Mr. Knight's over two nights.

Nike is widely known as one of the world's largest athletic apparel companies, but it's much more than that. It is an icon, one of the world's great consumer brands, and Mr. Knight's memoir is a wonderful accounting of the firm's founding and its pre-IPO years. For the investment crowd, the story is a great example of the value of growth. I hadn't known that Phil Knight was a public accountant for many years, including many of the years when he first founded and led the business, then known as Blue Ribbon Sports. If Phil Knight did anything well, and most of what he did was great, it was understanding the exponential growing demand for what he was selling and his push to meet that demand at nearly all costs. Most accounting-oriented investors would have passed early on, given the debt used to finance exponentially growing inventories. Many of his bankers shortsightedly did.

There are great lessons from the book – hire and surround yourself with the best talent whenever you find it, control your distribution, ensure product quality, and perhaps most importantly – have enormous fun along the way – make sure your work is also your play. In the memoir, Mr. Knight reveals that “shoe dogs” are those whose entire lives and passions are consumed by shoes. Phil Knight lived, breathed, ate and drank Nike, and it is obvious he loved every minute of the game. He was and is the consummate Shoe Dog.

The holidays are a reflective time, and while reading Mr. Knight's memoir, it dawned on me that investment managers are dogs, too. Phil Knight became the top shoe dog. Investment managers are, well, just, dogs. But if an absolute passion for the shoe business earned its most devout the moniker shoe dog, then why not “money dog” for those consumed by the discipline of value investing!

In 2015, when our investment returns were down, despite the median stock in the major indices being way down, we were regardless in the doghouse. Bad dog! You lost money. Your largest position cratered 12.5%. Shame. We get it, nobody likes to open a statement and see a shrinking balance. However, rising prices don't affirm that the process is working, and falling prices don't confirm the process is broken. You are neither right nor wrong because the market agrees with you in the short run. Last year's letter was penned to approvingly show our “owners” we weren't bad at all, that dogs can control only what they can control. We argued that as investors we can't control or predict stock prices in the short-term, that it's the underlying earning power of the business that matters, and that, we *can* control.

2016 was an attaboy year from the start. Throughout the year, despite a drag from an increasing stockpile of cash from realized gains that are now more than 20% of assets, our performance roughly doubled the 11.96% return posted by the S&P 500.

Time passes, and Semper Augustus is now in its 19th year, and I am now navigating my second quarter century as a professional money manager. Believe me, although we try to remind everyone that we can't control prices, when prices decline, we have to remind *ourselves* of that as well. There is nothing to test your conviction in a business or investment like a declining price. Rising prices confirm an investment thesis (in some cases prematurely). Rapidly rising prices can bring the opportunity to reduce or eliminate position sizes when the after-tax proceeds can eventually be invested in lower price, higher earning situations. We always strive to control two variables – business quality and price. Time to get back out on the hunt!

INTRINSIC VALUE UPDATE – THE CASE FOR ACTIVE MANAGEMENT

The 2000 Report Usefully Projected the Long-Range Result

Last year's letter walked through the history of an intrinsic value report we have run since March 2000, used to contrast the valuation and expected return of our portfolio with that of the S&P 500. Sixteen years on, the report demonstrates its utility.

The first Intrinsic Value report run on March 31, 2000 suggested we should earn our earnings yield of 6.4% per year, plus another 2% to 3% per-year as the discount on our portfolio holding at the time accreted upward to our appraisal of intrinsic value for each holding. Our stocks earned 8.6% per year since the running of the report through year-end 2016. By contrast, the index had an earnings yield of 2.5% at March 31, 2000, and needed to fall roughly 60% to attain our appraisal of fair value. As such, the earnings yield of 2.5% was the base case expectation for the annual return of the index for a long, long time, and a case could be made for the index spending substantial time in negative territory. Since March of 2000, the index returned 4.4% annually, and has yet to work off much of the excessive valuation that existed 17 years ago. By our math, the index still needs to fall somewhere between 33% and 50% to reach fair value.

The 2015 and Current Vintage Reports

At last year's writing, our Semper Augustus stock portfolio traded for 12.1 times normalized earnings, which gave us an earnings yield of 8.2%. If our businesses produce profits consistent with our analysis, then the earnings yield effectively becomes our base expected return over a ten to fifteen-year horizon. Additionally, our stocks traded at 80% of intrinsic value, which allowed for 25% upside to fair value as the discount accretes over time. At 80% of intrinsic, we'd expect to earn an additional 2-3% per year in addition to the earnings yield. Adding these together, our long-range expected annual return from year-end 2015 was about 10.2 to 11.2% (about 2-3% above the earnings yield – not meant to imply precision that doesn't exist).

Our stocks generated a total return of 27.6% in 2016. You would naturally assume that most of the discount to intrinsic value which valued our stocks at 80 cents on the dollar would have been "used up" by last year's gain. By simple math, our stocks should now be closer to 95% of intrinsic value, and the expected annual return would mostly consist of the current earnings yield. So, where are we today?

Our stocks are trading at year-end 2016 at a higher, but still cheap, 13.5 multiple to normalized earnings, giving us a 7.4% earnings yield, which becomes our new base case return expectation for a ten to fifteen-year horizon. Importantly, our stocks still trade at a sizable discount to intrinsic value of 82% of value, giving us 22% upside should the gap close.

How can we still have a healthy discount to intrinsic value? A portion of the long range expected return did erode thanks to the outsized return for the year. Adding a similar 2-3% per year accretion of the discount, our long-range expected annualized return is now logically a bit lower, 9.4-10.4% versus 10.2-11.2% as calculated last year. We therefore shaved 0.8%, or 80 basis points, from the expected long-term annual expected return. The shave is largely due to the expansion in the portfolio's P/E from 12.1 times to 13.5 times, effectively accounting for 11.5% of last year's gain. But where did the rest of the gain come from, and why is the portfolio still similarly undervalued?

The answer, cover your ears academicians and passive investors, is thanks to *active* management. During the year, we eliminated five portfolio positions entirely and materially trimmed several others as their individual discounts to intrinsic value closed. We reduced Exxon Mobil from 12% to a mid-single digit weight at prices within 10% of all-time highs, a testament to the quality of Exxon but also thanks to its inclusion as a huge constituent in many passively managed portfolios. (Some will remember the wizards at Standard and Poor's kicking internationally headquartered global businesses with U.S. listings out of the index in 2002. Bye-bye Royal Dutch (and Shell). When energy specific passive index products became the rage, Exxon is disproportionately represented thanks to its U.S. domicile. With huge flows to energy specific "products", Exxon's shares receive a lift, regardless of fundamentals.) We also cut Mercury General and Washington Federal, two businesses we have held since the late 1990's, way back in the post-election euphoria, which pushed many financial shares to full valuation. We have opportunistically trimmed and added to positions like Mercury and Wash Fed over the years at favorable prices. Microsoft and PepsiCo are now completely gone from the portfolio, both eliminated largely for price reasons. Our history with Microsoft is a happy one, having written in January 2000 that shareholders would lose money for fifteen years, to buying it 70% off its high, to trimming it, to adding to it, to trimming it, and now to eliminating it. Actively managing around ever-changing appraisals in a significant number of holdings over the years has added lots of value and lots of dollars to our returns.

In addition to portfolio trims and sales, we also added to several already existing positions and initiated new positions in two businesses at valuations far lower than the positions we trimmed or sold.

The S&P 500 trades for more than 22 times trailing earnings, at an earnings yield somewhere between 3.1% and 4.5%, depending on the earnings number you use. We tend to the conservative, but regardless, assume our stocks can again perhaps double the return of the market over a sufficiently long horizon. It's the beauty of active management, particularly in the value style, which is grounded in price and quality.

On Cash and Intrinsic Value

We were net sellers in 2016, and portfolio cash will drag against investment results, at least during periods when equity returns exceed cash yields. Last year, a rising cash balance was a drag on performance by the percentage of cash held. A rough 20% cash position cost about 6% of return, shaving returns to 21% on average. When we calculate expected returns combining earnings yields with the expected closing of the discount to intrinsic value, we exclude returns from cash in the calculation. Depending on how quickly we put today's cash to work, and how fully invested we remain over time will dictate the difference between equity results and portfolio results. When we value Berkshire Hathaway, we assume an optionality premium for a portion of their cash holdings, which assumes Berkshire will at some point, sooner rather than later, put their cash to work at some earnings yield. We think about our cash the same way.

Clients should always be curious as to plans for cash. We do not like having lots of cash lying around, but we also preach patience. We are fans of buying low, which requires low prices. Sometimes we sit and wait for more attractive entry points, despite the existence of current portfolio positions right now at undervalued prices. If we go down this path now, however, we'll never get to the next section of the letter, which is an exciting story about the death of a heretofore investment truism and what matters in investing.

DEATH OF THE PROFIT MARGIN – A NEW PERMANENTLY HIGH PLATEAU

The “laws of economics” have characterized the after-tax profit margin as a value that reverts to its historical mean over time. We argue not that the profit margin is what’s important in investing, but rather that changes in the amount of incremental capital required to produce a dollar of profits, and the return on that incremental capital, is far more important.

Much of the investment world fixates on profit margins. Are they low? Are they high? Are they just right? Do they mean revert? When will they mean revert? What are they telling us about valuations? How do they interact with P/E multiples? We killed a forest of trees writing about this question in earlier client letters.

The profit margin simply measures how many dollars of profit are created for each dollar of sales. It is the same as return on sales: $\text{After-tax profit} / \text{revenues} = \text{profit margin}$.

Hold the Pickles, Hold the Lettuce - Profits Your Way

Profits are calculated three different ways. Conventionally, Standard & Poor’s calculates two types of profits, “operating” earnings and “as reported” earnings. Operating earnings measure income from product (goods and services) and exclude corporate (M&A, financing, layoffs) and other unusual or non-recurring items. As reported earnings measure income from continuing operations, and are also known as GAAP (Generally Accepted Accounting Principles) earnings. GAAP profits are *after* write-offs and write-downs.

Pro forma earnings are a third variety, largely favored by managements and stock promoters. Managements have incentives, often related to their compensation, to make profits and profit margins look as healthy as possible. Shock of shocks. Many, therefore, insist on calculating profits using pro forma earnings, which excludes all kinds of expenses such as non-recurring or non-cash expenses like share based compensation. This is misleading. When managements provide pro forma earnings or cash flow calculations as supplemental to their GAAP profits, they are almost always *higher* than their GAAP earnings. Pro forma is the equivalent of saying if you don't count the 3 touchdowns the other team scored when our star linebacker was hurt, and you count our touchdowns that were called back for holding and the illegal block in the back, we won the game 14-0 on a pro forma basis. Please ignore our 21-0 defeat on the scoreboard.

At Semper, we begin with GAAP earnings and make any number of adjustments, both upward and downward, to adjust for a more economic, cash driven reality. The adjustments we make are in no way made to flatter results, we have no incentive to do that. We are trying to properly measure economic profitability and also properly measure the amount of capital employed in a business. Some of our methods produce earnings calculations that are materially different than under GAAP. Sometimes you find businesses where economic profitability is far in excess of convention, and other times you find businesses where reported profits are well in excess of what can be economically expected to be earned over time. Here is a table providing a general comparison among the methodologies:

| | Operating | As Reported (GAAP) | Pro Forma (B.S.) | Semper Augustus |
|--|-----------|-------------------------------------|----------------------------------|---|
| Income From Product (Goods & Services) | √ | √ | √ | √ |
| Write-Offs and Write-Downs | √ | χ Primary difference with operating | χ | √ Mostly included - spread over time as normalized |
| Pension Expense | √ | √ | Often excluded as one-off charge | √ Included as <i>materially</i> greater expense than GAAP |
| Amortization of Intangibles | √ | √ | Sometimes excluded | Exclude those that don't lose economic value |
| Mergers & Acquisition expenses | √ | χ | χ | Depends; Included when M&A is ongoing |
| Financing Expenses | √ | √ | χ | √ |
| Layoff Charges | √ | √ | χ | √ |
| Option Grant and Share Based Expense | √ | √ | χ | √ Can be a larger expense than under GAAP |
| Realized Capital Gains and Losses | √ | √ | χ | χ Generally exclude. May normalize by smoothing |
| Look-through earnings of investees | χ | χ | χ | √ Retained earnings of non-consolidated/equity method |
| Pension Gains | √ | √ | √ | χ Never economically a gain to the business |
| Restructuring charges from Ongoing Ops | √ | χ Generally included with w/o w/d | χ | √ Generally economic in nature |
| Litigation Settlements and Proceeds | √ | √ | χ | Depends; Included if recurring; Excl if one time |
| Discontinued Operations | √ | √ | χ | Depends on timing and method of discontinuance |

√ Included χ Excluded

We make other business or industry specific modifications beyond those listed in the table. For example, some companies use depreciation schedules against fixed assets that are different from peer companies. At times, we will modify depreciation to more properly reflect economic reality. Discerning normalized economic profitability is one of our key roles as investors, and we think it's a huge competitive advantage. We could dedicate an entire book to interpreting financial statements. But let's get back to profit margins.

Profit Margin Dogma

Conventional wisdom holds that profit margins, regardless of the type of earnings used, are both range-bound and mean reverting. It's a notion we long accepted as gospel. Over time, our thinking evolved. They say successful organisms are adaptable. Operating profit margins here at year-end 2016 may perhaps break 2014's third quarter all-time quarterly record high 10.1%, following two years of an earnings recession led by lower oil prices and a strong dollar. Once, we would have claimed that if profit margins are at an all-time high, they will be shortly mean reverting down to within a more normal historic range. Our tune has changed, however, and we now believe that profit margins shouldn't necessarily have the same mean reverting aspects as assumed in years past. There's a case to be made that they perhaps *should* be at all-time highs.

What better time to declare that profits may now have reached an Irving Fisheresque "permanently high plateau" than with margins approaching all-time highs! But the conclusion that profit margins are, and perhaps should be, higher than in years past comes with a critical caveat. We also now conclude that

aggregate margins relative to historic levels isn't so important when establishing a value estimate for the broad market. There are good reasons that margins are higher and that a new and higher range is appropriate to assume. But first, the historical argument.

Investing luminaries Warren Buffett and Jeremy Grantham, among many others, have ardently argued the point that margins were range-bound and mean reverting – hugely important in that margins and the price paid for margins combine to drive stock prices (read our January 4, 2002 client letter, Headwinds and Tailwinds). In a November 22, 1999 article written for Fortune Magazine with Carol Loomis, Mr. Buffett suggested after-tax corporate profits should be range bound between a historically observable 3% and 6% “normalcy” band. At the time of the article, margins were closing in on 2000's nosebleed level of 7.4%, only once previously exceeded by 1929's 8.9%, Mr. Buffett wrote:

You know, someone once told me that New York has more lawyers than people. I think that's the same fellow who thinks profits will become larger than GDP. When you begin to expect the growth of a component factor to forever outpace that of the aggregate, you get into certain mathematical problems. In my opinion, you have to be wildly optimistic to believe that corporate profits as a percent of GDP can, for any sustained period, hold much above 6%. One thing keeping the percentage down will be competition, which is alive and well. In addition, there's a public-policy point: If corporate investors, in aggregate, are going to eat an ever-growing portion of the American economic pie, some other group will have to settle for a smaller portion. That would justifiably raise political problems--and in my view a major reslicing of the pie just isn't going to happen.

We have long argued that both labor and capital spending have suffered at the expense of corporate profits. Over time, profit margins would at some point decline as high returns attracted competition and workers and capex take back more of the economic pie. This is the Schumpeterian premise of creative destruction and the capital cycle. In our 2002 letter, we attributed rising margins to:

- Declining interest rates
- A shifting tax burden to households
- Declining labor costs
- Shifting healthcare and retirement costs to the worker
- Falling commodity prices
- Declining depreciation expense as R&D replaced capex
- Increasing capital gains
- Lower insurance costs
- Aggressive accounting

Add to the list the degree to which domestic businesses conduct substantial business abroad, which is often conducted at higher margins and taxed at lower rates. An argument that margins would revert downward would involve any combination of these factors heading in the other direction.

Offsetting some of the full-on mean reversion argument, however, an allowance for a modest and permanent upward adjustment is warranted because of the growing contribution to the economy from capital-lite industries, particularly information technology and medicine. Research and Development has replaced capital expenditure for a sizable and growing swath of the economy. R&D is expensed through the income statement in the period in which it is incurred, whereas capex resides on the balance sheet, with subsequent depreciation of the asset expensed through the income statement over time. Both industries produce far higher profit margins than the classical industrial economy, and as their contribution has grown, so has their contribution to aggregate profit margins. Thus, a slight upward shift in profits over time can be explained.

That caveat aside, we wouldn't bet that capital expenditures will ever return to historically high levels, despite the fiscal rhetoric of the day. Debt levels are clearly too high, evidenced by a dearth of suitable investment projects (companies repurchase shares instead with profits and borrowed capital). Labor, certainly, has long suffered, but in what industries can their share of the profit pie justifiably march higher? The replacement of human labor can be argued to be the curse of productivity-driven profitability. Productivity, increasing output per hour worked sounds great, until the same productivity prices labor out of work, which it has for most the manufacturing jobs lost in the US in the last three decades. Interestingly, only 20% of those jobs have been lost to outsourcing; the majority (80%) have been lost to automation and technology. Perhaps Henry Ford was right, and that labor can only suffer at the expense of capital for so long. Mr. Ford understood the logic of paying his employees very well, reasoning that if they weren't well-paid, then they could not afford his cars...

We could write on and on about the mean reverting aspect of profits, but it's not profit margins that count in investing. Understanding where profit margins can sustainably change, for better or worse is important. But the return on capital, without a doubt, is the most important thing in investing (other than the return *of* capital, naturally). As capital intensity changes, the significance of an arbitrary historic range for profit margins fades away.

...the return on capital, without a doubt, is the most important thing in investing (other than the return *of* capital, naturally). As capital intensity changes, the significance of an arbitrary historic range for profit margins fades away.

When Mr. Buffett wrote, "you have to be wildly optimistic to believe that corporate profits as a percent of GDP can, for any sustained period, hold much above 6%," he wasn't emphasizing the most important factor in investing. The profit margin represents earnings as a percentage of sales, the return on sales. The measure excludes how much capital is required to produce a dollar of sales. *It's earnings as a percentage of invested capital, not sales, that counts.* In my investing lifetime, despite seeing a decline in capital expenditures as a percentage of sales, the dollars of capital required to produce a dollar of sales have risen. This fact reduces the importance of the profit margin, and though profit margins are higher now than ever, most businesses are in fact lousy because returns on capital are mediocre at best. Don't confuse capital here with capital expenditures. Capital is the combination of debt and equity used to finance business, and it is against the dollars invested, not the revenues created by, that returns are properly measured.

Capital is the combination of debt and equity used to finance business, and it is against the dollars invested, not the revenues created by, that returns are properly measured.

If profit margins weren't at all-time highs, given the amount of capital invested to produce a dollar of sales, returns on capital would be below already low levels. If margins were at Mr. Buffett's 6% upper band, return on capital for the market would be less than 4%. Even in a world of low interest rates, a 4% return is a capital destroyer. When calculating profitability on an economic basis, instead of ignoring real costs by relying on the fantasy of operating or pro forma methodology, most companies already *are* capital destroyers, even at seemingly adequate returns on capital.

What's Behind Door Number 1?

Let's walk through a comparison of two hypothetical businesses I used with some MBA students that I had the privilege of meeting with last year. We'll present them on a common-size basis to make comparison easy. Each business generates revenues of \$100. Company A produces \$1 in pre-tax profit and \$0.65 after taxes. Company B earns \$13.50 pre-tax and \$9.00 net of tax. Which is the better business?

| | Company A | Company B |
|---------------------------------|-----------|-----------|
| Sales | \$100.00 | \$100.00 |
| Pre-tax Profit | \$1.00 | \$13.50 |
| After-tax Profit | \$0.65 | \$9.00 |
| Profit margin (profit/sales) | 0.65% | 9.0% |

If you answered company B, you would be in the vast majority. It should be obvious that a 9% profit margin is better than a sub 1% profit margin, right? If you went against the crowd and answered company A, you were a true contrarian. Alas, neither A nor B is not the correct answer. The question was a set-up. The only plausible answer is that you weren't given enough information. So, what valuable information are you missing?

An investor in any asset should be most interested in how much money they can make on the amount of their investment. Investing is all about return on invested capital, and this truth is far too often lost in the shuffle, particularly for investors in the stock market. Let's assume Company A has a book value (equity) of \$6.50 versus Company B's \$70.00 in book value. (New information is presented in italics.) Now, which is the better business?

| | Company A | Company B |
|---------------------------------|---------------|----------------|
| Sales | \$100.00 | \$100.00 |
| Pre-tax Profit | \$1.00 | \$13.50 |
| After-tax Profit | \$0.65 | \$9.00 |
| Profit margin (profit/sales) | 0.65% | 9.0% |
| <i>Book Value (Equity)</i> | <i>\$6.50</i> | <i>\$70.00</i> |
| <i>Return on Equity (ROE)</i> | <i>10.0%</i> | <i>12.9%</i> |

You would be among the crowd if you again sided with Company B, for a 12.9% return on equity clearly trumps a 10.0% return, and you have far more profit per dollar of sales as a "cushion". It would be hard to fault your logic. But here again, you still lack sufficient information to make an intelligent investment decision as to which is the better businesses.

When you think about ownership of a business, you are dealing with the equity of the business. Equity, also called book value, represents ownership. It can be calculated as all the assets of the business minus all of its liabilities. If you start a business with your own capital and with no partners, you own 100% of the equity of the business. Sometimes (often/too often) the equity capital of a business is augmented by borrowing money to make further investments in the business, or simply to operate the business. If you own a business and want to expand, but need additional capital to do so, and if you don't want to raise money by selling some ownership to a new equity partner, you can borrow money to increase the capital base.

Increasing the capital increases the amount of assets that a business can control. In the case of Company A, let's assume the small \$6.50 in equity is sufficient to run the business and it operates with no debt. Hence, equity represents the entire capital of Company A. Company B, on the other hand, uses an amount of debt that is considered by many to be reasonable and operates with \$90 in debt, but keeps \$16 on hand in cash for a rainy day. Company A keeps no cash on hand. Now we have essential balance sheet information, operating margin, and can calculate both return on equity and return on capital.

| | | Company A | Company B |
|--|--------------------------|-------------------------------|-------------------------------------|
| Sales | | \$100.00 | \$100.00 |
| <i>Earnings Before Interest and Tax (EBIT)</i> | | <i>\$1.00</i> | <i>\$16.50</i> |
| <i>Interest Paid</i> | | <i>0</i> | <i>(\$3.00)</i> |
| Pre-tax Profit | | \$1.00 | \$13.50 |
| After-tax Profit | | \$0.65 | \$9.00 |
| Profit margin | After-tax Profit/Sales | 0.65% | 9.0% |
| <i>Debt</i> | | <i>\$0.00 (also \$0 cash)</i> | <i>\$90.00 (gross of \$16 cash)</i> |
| Book Value (Equity) | | \$6.50 | \$70.00 |
| <i>Total Capital</i> | <i>(Debt+Equity)</i> | <i>\$6.50</i> | <i>\$160.00</i> |
| <i>EBIT/Total Capital</i> | | <i>15.4%</i> | <i>10.3%</i> |
| Return on Equity NI/Equity | | 10.0% | 12.9% |
| <i>Return on Capital</i> | <i>NI/Capital</i> | <i>10.0%</i> | <i>5.6%</i> |
| <i>ROC (net of cash)</i> | <i>NI/(Capital-Cash)</i> | <i>10.0%</i> | <i>6.3%</i> |

The answers in the room no longer skew heavily to Company B as being the better business. Which is the better business? Now that we have far more information, it's debatable. Fans of B would most certainly posit that its 12.9% return on equity continues to trump A's lower 10.0% return. B's fans may further argue that by employing leverage we are most certainly producing more output than we could unlevered, and that our \$16.50 in earnings before paying \$3.00 interest produces a healthy 16.5% EBIT margin and

an also fine 10.3% return on total capital before interest and tax, plenty to cover both often overlooked expenses. But drilling down to an after-tax return on capital, B's return drops to 5.6% (6.3% excluding cash) where A's original 10.0% return on equity remains unchanged and the return on capital is equal to the return on equity. Lots and lots of business owners and professional investors would prefer Company B to Company A given the substantially higher margins and return on equity. But the jury should still be out. We're still missing one too often overlooked data point in assessing the relative attractiveness of an investment.

To make an investment in company A or B, you must have one other mission-critical nugget of information, the one that puts the *value* in value investing. In our January 1, 2000 client letter, we predicted Microsoft shareholders would lose money for the next fifteen years. Why? The price made no sense. You were paying \$620 billion for a business doing only \$20 billion in sales. It was a great business, but it was wildly expensive. You needed to know ***THE PRICE!***

| | | Company A | Company B |
|---|---|------------------------|---------------------------|
| Sales | | \$100.00 | \$100.00 |
| Earnings Before Interest and Tax (EBIT) | | \$1.00 | \$16.50 |
| Interest Paid | | 0 | (\$3.00) |
| Pre-tax Profit | | \$1.00 | \$13.50 |
| After-tax Profit (NI) | | \$0.65 | \$9.00 |
| Profit margin | After-tax Profit/Sales | 0.65% | 9.0% |
| Debt | | \$0.00 (also \$0 cash) | \$90 (gross of \$16 cash) |
| Book Value (Equity) | | \$6.50 | \$70.00 |
| Total Capital | Debt+Equity | \$6.50 | \$90.00 |
| EBIT/Total Capital | | 15.4% | 10.3% |
| Return on Equity | NI/Equity | 10.0% | 12.9% |
| Return on Capital | NI/Capital | 10.0% | 5.6% |
| ROC (net of cash) | NI/(Capital-Cash) | 10.0% | 6.3% |
| <i>PRICE (Market Value)</i> | | <i>\$6.50</i> | <i>\$200</i> |
| <i>Price/Book Value</i> | <i>Price/Equity</i> | <i>1.00x</i> | <i>2.85x</i> |
| <i>Price/Sales</i> | | <i>0.065x</i> | <i>2.00x</i> |
| <i>Price/Earnings (P/E)</i> | <i>Price/NI</i> | <i>10.0x</i> | <i>22.2x</i> |
| <i>Enterprise Value/EBIT</i> | | <i>6.5x</i> | <i>16.6x</i> |
| | <i>[Market Value + (Debt – Cash)] / EBIT</i> | | |

Voilà. We have something to go on. At this point in the demonstration, when asked to choose, the A's unanimously have it among the MBA's. You are likely waving your hand in the air as well! Now that we know the *price*, using the key fundamental measure of price to earnings, A's 10.0x is flat out cheap relative to B's 22.2x. Company A trades for one times book value and for a fraction of sales. Of course, we know nothing about the growth prospects of each business, whether earnings are temporarily depressed or high, or of the durability of their respective businesses. But A seemingly combines high quality and a low price, two key elements for a margin of safety. Company A gives us an unleveraged and very acceptable return on equity of 10.0%, where B utilizes an uncomfortable (to us at least) debt structure to goose its return on equity to 12.9%. Because we get A at book value, our return on equity as an investor is identical to that of the business. In the case of B, because the price paid is 2.85 times its book value, the adjusted return on equity to the investor drops from 12.9% to 4.5%. B becomes un-investable in our world because its return on capital is too low, its leverage is too high, and it is selling at a sky-high price (unless the growth prospects are unusually high and sustainable).

By now, you may have guessed *the nature of my game*. There must exist true identities of each company. I'm confident that several of our value-oriented analyst contemporaries may have a great guess as to which business Company B is. A isn't as straightforward, but a decent generalist would certainly narrow its industry to a small handful. Both are presented as a bit of a gambit, and so help illustrate some key investment points and principles. Company A could certainly be a business experiencing aberrantly low profits due to an economic contraction or whose reported profits are presented net of unusual write-offs or write-downs. Neither are the case, however.

Let's get on with it. As Mel Hall would have said, "Carol, show us what's behind Door Number 1!" Company A is a common size presentation of the McLane Company, the wholesale food and non-food distributor wholly owned internally by Berkshire Hathaway. Berkshire bought the business for \$1.5 billion from Wal-Mart in 2003, which had owned it for the prior 13 years. Some of you may have guessed Company A was a retailer, perhaps even a grocer or distributor, given the very low margin structure. But as mentioned earlier, it's not the margins that count as much as the amount of capital required to produce sales and margins. Despite his commentary about mean reversion, Mr. Buffett has never been fooled by profit margins. He has long highlighted return on unleveraged net tangible assets as one of his favorite metrics in his Chairman's letter each year.

As a wholesale distributor, McLane operates on huge volumes and high inventory turns, coupled with tiny operating and profit margins. The business generates about \$50 billion in annual sales, a huge number, but only operates on a pre-tax margin of about 1%. If the business required a dollar in capital for each dollar in sales, it would be a terrible business. Fortunately, that's not the case. The company probably does around 15 dollars in sales for each dollar of capital employed.

Our hypothetical price for Company A represents the actual 6.5 times pre-tax income that Berkshire paid Wal-Mart for the entire business in 2003, giving Berkshire an initial pre-tax return on capital of 15.3% and an after-tax return of 10%. Since the acquisition, McLane has made several bolt-on acquisitions, entered alcoholic beverage distribution, and made major investments in warehouse space and technological infrastructure. Sales in the thirteen years under Berkshire's ownership grew from \$23 billion to today's approximately \$50 billion. We can't tell from Berkshire's SEC filings the extent to which profits were retained within McLane over the period of its ownership, but we believe it's been the majority and that a doubling of sales probably required close to a doubling of capital. We presume margins and returns on invested capital have stayed at about their 2003 level, which may not be attractive to many Wall Street pundits, but are most certainly to us. If Berkshire has indeed earned an unlevered high single-digit return over time, and that the business maintained profitability while reinvesting all

earnings, then it has been a most excellent investment. We'd argue the business is worth far more than the price presented in the example and far more than the multiple Berkshire paid Wal-Mart.

We include summary financials for McLane and a discussion of its returns on equity and capital in Appendix A of the letter. The financials are presented back to 2003, the year of Berkshire's purchase. The data are pulled from the segment footnote in Berkshire's annual reports. GAAP accounting requires a segment breakout for McLane thanks only to its large revenues within Berkshire. By any other measure, it would be "immaterial" and lumped together with the other service businesses in the MSR group per the Chairman's letter and in the "Insurance and Other" segment in the GAAP financial statements. How sad to lose your identity... The presentation hammers home the point that return on incremental capital deployed is more important than the return on current capital. That McLane has presumably been able to retain its earnings and maintain, and even to grow its returns, is a testament to good management and a good business. It's when returns on capital turn down in the face of competition or obsolescence that management decision making becomes even more important.

You may scoff at being presented a business as an investment that the everyday investor can't make. That's fair. McLane was chosen to demonstrate that profit margins as a stand-alone data point are meaningless. How often have you heard or read that one business or industry is better than another because it has higher margins? The ability to *improve* margins can be important. It's return on equity and return on capital (for leveraged enterprises) that drive the bus, however, and a business with tiny margins can be a great investment if it requires little capital relative to sales and can be purchased at a reasonable price. Berkshire, it turns out, got a great price for McLane. We'll soon elaborate on the big picture concept of business capital outstripping sales, but first, to lead into that idea, "Carol, please show us what's behind Door Number 2!"

Company B is not a company at all! Rather, it's a common size summary of the S&P 500 aggregated as if it were a business. As Emeril would say, Bam! You can buy it today myriad ways. You can get it as a low-cost index fund or ETF. Unfortunately, too often investors get it as a high-cost, pseudo active fund from those afraid to deviate from its hard to beat historical performance. Regardless how you get it, Company B is what you get. Substitute our hypothetical \$100 in revenues for approximately \$9.9 trillion, plug in that same multiplier, and you get the aggregated dollar values for the index.

From our perch, the index appears extremely overvalued, and has for quite a while. Paying 22.2 times earnings (that aren't depressed) gets you an earnings yield of 4.5%. You can reconcile that using simple mathematical dexterity with price-to-book and price-to-sales relationships. The S&P has a return on equity of 12.9%, but because you are paying 2.85 times book value, which is the same as equity, your adjusted return on equity as the shareholder drops down to the same 4.5% you get as the earnings yield. Easy. From a price-to-sales standpoint, two times sales happens to set an all-time high multiple for the index, slightly exceeding the 2000 peak. The index's profit margin of 9%, considering you are paying twice sales, also shaves down from 9% to, you guessed it, the same 4.5% earnings yield and shareholder adjusted return on equity. Easy peasy. Returns (the same as saying earnings) on sales, equity and capital are essential to understand and properly measure. But only when adjusting those measures for the price paid do you come to what you, the investor, are expected to receive. By adjusting the premium to each by the relative price paid, the netted-down return to the shareholder must be the same. Math is fun.

When the return on capital is significantly smaller than the return on equity, sirens should be going off. At 6.3% versus 12.9%, the return on capital, net of cash, qualifies as significantly smaller. The difference between the two represents the degree to which debt is used in the capital structure. If the return on capital is acceptably north of the cost of capital, then its difference with return on equity may be due to equity being understated. But if the return on capital is low or below the cost of capital, you may have a problem. A 6.3% return on net capital is perilously low relative to a conservative cost of capital estimate.

If equity (book value) is severely understated, either because assets are carried at historic cost or due to write-offs and write-downs, then you would get a high return on equity due to GAAP book value understating economic book value. When this is the case then a sizable differential between return on capital and equity may be justified. But it is the combination of a big difference between the returns with an absolute low return on capital that merits further digging.

Our comparison of Companies A and B leaves out much more information that an investor would want to have. Understanding ongoing capital requirements of each business relative to any depreciation of fixed assets, working capital use and requirements, prospects for incremental capital investment, trends or unusual changes or cyclical forces that would skew reported sales or margins, and the degree to which asset values and equity as reported differ from economic reality or replacement values are all important to good analysis. A quantitative overview also leaves out a determination of the quality of management. Are managements' incentives aligned with shareholders? What is their approach to capital allocation and investment? The comparison was simply a broad-brush overview which we hope was informative.

We won't belabor the market overvaluation point. Suffice it to say by most conventional measures, the market appears very rich, even when considering the absolute low level of interest rates. If you own the index, you own the numbers illustrated by Company B. The example of using the S&P 500 as Company B helps illustrate the theme of this letter. Over the years, by reading Value Line tear sheets each week, and ultimately by analyzing lots of companies in different industries over an investment career, I've noticed that the capital required to produce a dollar of sales has marched steadily upward for many companies, particularly since the market peak in 2000. The result is a diminution of the importance of the absolute level of profit margins.

The Climb of Capital and the Descent of Returns

The climb of capital relative to sales belies Mr. Buffett's assertion that profit margins shouldn't last long above 6%. A 6% after-tax profit margin makes sense if it takes roughly a dollar of capital to produce a dollar of sales. There, capital and sales are numerically equal and the profit margin would also equal the return on capital. If the capital requirement jumped to, say, two dollars to produce the same one dollar of sales, whatever the profit margin was at the time would now be half of the return on capital. *If this sentence isn't intuitively obvious, it's worth re-reading it.* When you are investing in a business, you need to understand how much capital is required to produce a dollar of sales and at what return on capital. It is the Holy Grail of investing. If it now requires far more than a dollar of capital to produce a dollar of sales, then Mr. Buffett's premise is no longer valid and any normal range for profit margins would shift permanently higher. The range shifts higher because it would now be required to incent marginal capital deployment.

Our work concludes that it now takes a far larger amount of equity and capital to produce a dollar of sales. It now takes more than \$2 of retained earnings to produce a dollar of sales, where it only took about a dollar prior to the 2000 bubble peak. Retained earnings measure the amount of profit not distributed as dividends but retained and invested in a company. We also believe that equity (book values) are seriously understated, which to the Pollyanna's among us is a bullish thing because price-to-books mustn't be as high. What it really means is that if book values more closely approximated economic reality, then seemingly high ROE's are really much lower. Low enough in fact to conclude that **most companies that trade publicly are wealth destroyers.**

We would argue that a business that earns less than its properly measured cost of capital over time is effectively a money-losing, wealth-destroying operation. Absent new capital, a wealth destroying company will ultimately fail. To illustrate the wealth destruction, if a business earns a seemingly healthy

9% profit margin, but only earns a 6.3% return on net capital, and if the cost of capital for the business is higher than 6.3%, then the business is a dud. Well, that's the modern state of affairs, and it's what you get with the S&P 500. Some would say that in a world of zero or very low interest rates, a 6.3% return on capital is acceptable. OK. Some would also say that increasing the debt component of the capital structure when debt costs are, say, 3% pre-tax, and accordingly shrinking the equity component by repurchasing shares in the open market at a 4.5% earnings yield, adjusted ROE yield and adjusted profit margin yield makes for an accretive arbitrage. OK as well. But there isn't much room for error at an initial 6.3% return on capital, and surely an increase in leverage increases the risk of an operation.

When properly accounting for earnings by adjusting for aggressive defined benefit accounting, by adjusting for write-offs and write-downs over time, and by ignoring many of the pro forma presentations of profits that ignore ongoing true cash or economic expenses, then a more conservatively calculated return on capital might become a somewhat lesser 3.9%. Who knows what the proper cost of equity actually is? We think it has a lot to do with opportunity cost. Incorporating a "beta" input in determining the cost is sheer madness, but don't get me started... Measuring the debt cost of capital is straightforward, identifiable by the interest rate paid on borrowings. But even there, a firm that concentrates its borrowings at short maturities may indeed be lowering their interest burden, but how much additional risk is introduced by borrowing short and investing in long-duration assets or investments, including in company stock? While the debt component of firm capital is larger than the equity component (for the index), there does remain an equity component.

A business owner has title to the equity of a firm. The current price of the equity piece is the market cap for a publicly traded business. Equity and market cap are not the same thing. Market cap is the quoted price today. How much do you need to earn on your investments in common stocks per year to be happy and sated? We'd guess a number considerably north of today's interest rates. Academics can give you the equity cost with precision. We are more ballparky here, but we set the number high enough to give us a margin of safety and, accordingly, let us sleep at night. Perhaps in a world of low or no interest rates it's not 10%, but it's certainly higher than the modern yield on a ten or thirty-year loan to Uncle Sam.

Standard & Poor's has some wonderfully useful quarterly data for their S&P 500 index on their website. They have sales and book value per-share figures back to December 31 1999, capital expenditure per-share back to December 2010, and per share figures for operating and reported earnings, plus index price and thus P/E's back to March 31, 1988. The index divisor is also provided back to 1988, which is a proxy for shares outstanding. Having the divisor available makes calculating index per share data easily convertible to dollars. Having raw data is nirvana for geeks, just as raw eggs are for Rocky Balboa.

Below are some data points comparing figures for the index at December 31, 1999 and September 30, 2016. We selected the end of 1999 for two reasons. One, Standard & Poor's quarterly data for these series are only completely available on their website only as far back as this date. Two, the date very closely marks the peak of the stock market and economic cycle. Peak to peak measures are useful over time and eliminate many distortions caused by endpoint or selective period sensitivity. Whether we are at a peak today remains to be seen. Our bet is we may be close. Below are index per-share data points from S&P, mixed with GDP data from the St. Louis Federal Reserve. We calculate the cumulative growth rate and the annualized rate for each data set:

| | Price | Sales | Operating Earnings | As Reported Earnings | Dividends | Book Value Per Share | Divisor | GDP Nominal | GDP Per Capita | Real GDP Per Capita | Total Credit Market Debt |
|--------------|----------|----------|--------------------|----------------------|-----------|----------------------|---------|-------------|----------------|---------------------|--------------------------|
| 12/31/99 | 1,469.25 | 745.70 | 51.68 | 48.17 | 16.69 | 290.68 | 8381.82 | \$9.9 t | \$44,492 | \$43,919 | \$26.7 t |
| 9/30/16 | 2168.27 | 1,138.43 | 101.42 | 89.09 | 45.03 | 779.61 | 8643.59 | \$18.7 t | \$57,300 | \$51,331 | \$65.3 t |
| % Change | 47.6% | 52.7% | 96.3% | 84.5% | 169.8% | 168.2% | 3.1% | 88.1% | 28.8% | 16.9% | 143.9% |
| %Change/Year | 2.4% | 2.7% | 4.4% | 4.0% | 6.5% | 6.5% | 0.2% | 4.1% | 1.6% | 0.9% | 5.9% |

You can see from the annual growth rates over time that the nearly 16-year period has been nothing to write home about for investors or for those dependent on economic growth. The 2.4% annual change in the price of the index coupled with a 2% average dividend yield produced a less than stellar 4.4% annual total return. Operating and reported earnings clipped along at a higher rate than stock prices and sales, which means P/E ratios contracted from their late-1999 bubble highs. Dividends compounded faster than earnings, which means payout ratios increased.

The highest compounders were book value per-share and dividend growth, matching each other at 6.5% per year, which is interesting and unusual. It makes sense to us that book values compounded at such a high clip thanks to mergers done at very high multiples to book value, which creates higher asset and equity values via the creation of goodwill. Book value would normally grow in line with the amount of profits that are retained each year, but with profits growing at a smaller clip that only explains a portion of book value growth. More recently, the amount of share repurchases at elevated levels to book value serves to dampen book values. The combination of factors is most influenced by deals done north of book (and perhaps north of rational prices).

It's always useful to compare growth in stock market yardsticks to growth in economic measures. Nominal GDP clipped along at a modest 4.1% annual rate over the period, but when adjusted for population and inflation barely advanced at 0.9% per year. Note that nominal GDP nearly doubled over the period, growing by \$9 trillion. It is disconcerting to see the advance in debt levels over the period. Total debts outstanding, which were already large at 269% of GDP in 1999, swelled by \$38.5 trillion to 350% of GDP, growing at 5.9% per year. It thus took more than \$4 in new debt to grow output by \$1. Much of the recent run-up in leverage is in government debt, which is used to finance deficit spending, little of which goes to increasing economic output. Much of the increase in leverage is for transfer payments that are not at all accretive to the economy. In fact, much is regressive.

Let's now drill down to the important measures regarding the S&P 500. Our work with the index data concludes that it took \$2.20 in retained earnings to grow sales by \$1, and when considering an expansion in non-financial debt, takes even more capital to produce an incremental dollar of revenues. **When companies retain earnings, an investor should expect to realize at least an incremental dollar in share price growth for each dollar of profit reinvested in the business.** Unfortunately, that hasn't been the case for investors in the index. It took \$1.23 in retained earnings to produce \$1 of market value, which suggests a destruction of investor capital. To support our conclusions, the aggregated data over the 15 ³/₄ years produced some eye-opening results:

| | |
|---|-----------------|
| Cumulative operating earnings: | \$1,306.40 |
| Cumulative reported earnings: | <u>1,115.95</u> |
| Difference (totals write-offs/write-downs): | (190.45) |

| | |
|--------------------------|---------------|
| Book value @ 12/31/1999: | \$290.68 |
| Book value @ 9/30/2016: | <u>779.61</u> |
| Gain in book value: | +488.93 |

The first thing that should jump off the page is the extraordinary, to us at least, difference between operating and reported profits.

The \$190.45 difference between the two equals a staggering 14.6% difference on average per year for the 15 ³/₄ years. We then calculated the difference per-year back to 1988 thinking that charges may be higher more recently. The longer-term average comes to the identical 14.6% per year on average. So much for that theory. Scanning the quarterly data, it's easy to observe that during periods of expansion and good times, write-offs and write-downs are typically on the low side, often at a low single-digit percentage. But when economic times get tough, during and in the wake of contractions, charges swell and have approached 70% of earnings in some years. Using big charges when profits are already under duress is famously known as "big bath" accounting. There have been quarters when write-offs exceed operating earnings! When it's already bad, who cares about more bad news? Just layer it on and tell your investors to chalk it all up as one-off...

We have a methodology for dealing with charges over time at Semper Augustus, one that tries to approximate economic reality. Suffice it to say, we believe a small amount of charges are legitimate and economically real. Most write-offs and write-downs are used to shrink asset and equity balances, which thus prospectively serves to make returns on equity and on assets appear healthier. In almost all cases, managements admonish their investors to ignore them as one-time events and non-operating. To that we say B.S. If you pay a fancy price in an acquisition, or overpay developing assets, and the future profits aren't high enough to produce adequate returns on invested capital, then charges invariably follow. Writing down goodwill and tangible assets as one-time expenses allows the investor to "forget" the amount that was actually spent. Once an asset is written down, under accounting conventions it generally can't be written back up, thus you get a lower asset and equity number to calculate future returns against, boosting reported results. If you are interested in how we deal with the subject, please check out our client letters from 2003 and 2004. (Yes, sadly, this is what we do for fun.)

For fun, we calculated what book values would look like if no write-offs or write-downs had taken place over the period. The exercise isn't so farcical when you consider that managements and Wall Street analysts rather you use operating earnings, or even better, use pro forma operating earnings, when capitalizing profits to get your fair stock price. In fact, they encourage you to use "expected" profits, even though all the historical data sets for P/E's and earnings use *trailing* earnings. The flip side of that is that managers and analysts like to have their cake and eat it too. While they want you to use operating earnings, *before* write-offs and write-downs, they are more than happy to tell you how profitable their business is when using GAAP book values, which are, of course, *after* write-offs and write-downs.

While they want you to use operating earnings, *before* write-offs and write-downs, they are more than happy to tell you how profitable their business is when using GAAP book values, which are, of course, *after* write-offs and write-downs.

Holding everything else constant (hold your wallet tight when you hear this), the most generic progression for calculating the change in shareholders' equity, or book value, is straightforward. Let's use the data as an example.

Beginning book value
+ Net income
- Dividends paid
= Ending book value

Of course, there are other moving parts to the calculation such as share issuance or repurchase and new capital invested, but remember we are keeping this simple and holding all else constant...

Using our aggregated numbers for the index:

| | |
|-------------------------------------|-----------------|
| Beginning book value at 12/31/1999: | \$290.68 |
| + Cumulative operating earnings: | 1,306.40 |
| - Cumulative Dividends: | <u>(446.49)</u> |
| = Ending book value: | 1,150.59 |

| | |
|---------------------------|-----------------|
| Actual ending book value: | <u>\$779.61</u> |
| Difference: | 370.91 |

Why would our easy to calculate hypothetical ending book value of \$1,150.59 be so much higher than the actual GAAP book value as calculated? The easiest answer is that \$190.45 disappeared via the write-offs and write-downs we are "instructed" to ignore as one time, despite their dragging 14.6% every year on average from operating results. What happened to the other \$180.46? We would argue the difference largely represents the degree to which share repurchases are being made at substantial premiums to book value. A much smaller shrink would have been due to what had been the customary writing down of goodwill until the implementation of FAS 142 in 2002, which ended the required amortization of goodwill under GAAP. Our data set only begins at the outset of 2000, so there only would have been two years of goodwill amortization.

A sharp-eyed reader would note in the earlier table that the divisor for the index, which is effectively the shares outstanding, *rose* by 3.1% during the period. Companies were, on average, slight issuers of stock, not net repurchasers. So, wouldn't the book value have risen? Nope. The history of when companies issue new stock and retire stock is fascinating and is a folly in bad timing and reflective of poor capital management. The record shows that companies are forced to raise new capital when under duress. The financial sector during the financial crisis is a case in point. At times like these, capital is raised at much closer prices to book value. These are often the best times to be buying shares as an investor (think banks during the financial crisis).

Fast forward to when companies are in the market for their shares, as they have been in a big way during the past handful of years. Now, businesses are buying back shares at such prodigious rates that, when coupled with dividends, exceed annual earnings. To finance the difference, they have been net borrowers in the debt market, layering on an increasing debt component to the capital structure. Today's purchases are being made at huge premiums, with the index now trading at 2.85 times its book value. The huge premium serves to shrink calculated equity and book value. It's a remarkable thing when overlaying the actual 6.5% *growth* in book value per share as calculated earlier.

We think managements today are wasting capital and increasing business risk by buying shares at inflated prices. The CEO's and CFO's guilty of this will tell you they are arbitraging the cost of capital. NO! An

arbitrage should be *riskless*. Leveraging the balance sheet by borrowing at 3% to invest at 4% is folly. The margin of safety erodes, and when trouble appears, a too-leveraged balance sheet can pose problems.

Capital allocation is one of the most important tasks charged to CEO's and CFO's, and too many don't do it well. A handful of capital levers are at the disposal of managements. All require an understanding of the intrinsic value of business, theirs and others'. A firm grip on how to measure return on invested capital is essential. Among the options at the disposal of management for capital allocation are:

- Capital spending in the business – Capex and R&D
- Pay / increase dividends or reduce / suspend dividends
- Pay down debt or take on new/additional debt, including shifting terms
- Make acquisitions using company stock, with cash, with debt, or with a combination
- Repurchase shares in the open market
- Issue shares / new capital
- Increase executive compensation (favored by many)

What if Write-offs and Write-downs were Disallowed?

What would be the effect of adding write-offs and write-downs back to book value and using \$1,150.59 instead of \$779.61 per GAAP? Return on equity would be lower. Here we would use operating earnings because they are before charges. Thus, \$101.42 in trailing twelve-month 2016 operating earnings to 9/30/2016 divided by \$1,150.59 in adjusted book value gives us an 8.8% ROE, where the same calculation using actual book value of \$779.61 produces an artificially high ROE of 13.0%. Reality in our eyes is closer to the 8.8% than to the 13.0%. Of course, the price-to-book value would also be lower, at a more modest 1.88 times. By now you should know the drill. As shareholders, you aren't even getting the lower 8.8% return because you are paying an 88% premium to that return, which lowers your shareholder adjusted return down to 4.7%.

Moving right along in the mathematical tedium, let's look at the cumulative benefit that accrued to shareholders from retained earnings (the profits that not distributed through dividends but rather reinvested by management into the business to grow sales and profits) since 1999. Let's start with sales.

| | |
|--------------------------------|-----------------|
| Sales per-share at 12/31/1999: | \$745.70 |
| Sales per-share at 9/30/2016: | <u>1,138.43</u> |
| Difference: | +392.73 |

The \$392.73 growth in sales per-share was 52.6%, or 2.7% per year. Because we are told to use operating earnings instead of reported, operating earnings minus dividends would equate to retained earnings:

| | |
|--------------------------------|-----------------|
| Cumulative operating earnings: | \$1,306.40 |
| - Cumulative Dividends: | <u>(446.49)</u> |
| = Retained Earnings: | \$859.91 |

You can now see that it took \$859.91 in retained earnings to grow sales by only \$392.73. Said another way, index constituents retained \$2.19 in earnings and only grew sales by one dollar. If we had instead used reported earnings, we would have seen a lower \$669.46 retained as equity, which would mean it took \$1.70 in retained earnings to grow sales by a buck. I can remember when it took about a dollar in capital to produce a dollar of sales, but that was back in the day when companies used capital for productive use, not by playing games with trying to manufacture growth in earnings per share and the

related executive compensation that goes with it. **It's now true that business is far more capital intensive, but not intensive in ways that capital is spent on increasing production. The intensity comes from swapping equity for debt, thinking shareholders are benefitted from "giving back".** May we live in interesting times.

So, why is it important to determine that it took \$2.19 in retained earnings to produce one dollar in new sales? Back to profit margins. If at a point it took a dollar of capital to produce a dollar of sales, then the profit margin would have equaled the return on capital. Now that it takes more than \$2 in incremental capital to produce a dollar of sales, then the currently elevated level of profit margins has no reason to be bound by some historic range. The profit margin range needs to be higher given the capital required to grow the top line and output. A 10% profit margin is reduced down to a 4.5% return on capital when allowing for the increased capital involved.

It is worth noting here that using the S&P 500 as a proxy for the stock market can create confusion, believe me, as our new Commander-In-Chief is wont to say. Although the index does capture about 80% of the value of the broad domestic stock market, it includes financials, the inclusion of which presents complexities for the analyst.

De-Risking the Banks Masks Growing Leverage Everywhere Else

Many pundits have argued that corporate debt levels are extremely low and healthy. They point to serious deleveraging for the S&P 500 since the 2007 peak. However, when financials are removed from the index, a different picture emerges. Debt levels among non-financial companies have moved in the other direction. When excluding the financials from the index, valuations are much higher than appears because the financials are much cheaper on a price to earnings and price to book value basis. Financials, banks in particular, deleveraged by raising capital through share issue during the crisis and through retained earnings since then. If the market is expensive, it's even more so sans financial companies.

Financial companies employ prodigious amounts of leverage relative to their equity capital, thus controlling far larger pools of assets than they would or could as conventional businesses. They are spread businesses. Analyzing companies in the financial sector (and utilities for that matter) requires a different set of analytical methodologies. The financial sector today makes up 14.6% of the value of the S&P 500. It commanded a very high 23% in 2007 prior to the financial crisis (fittingly named), and then saw its weight plummet to 11% during the crisis. Plummet is correct – the weight dropped during a period that saw the index lose nearly 70% of its value! A red flag should go up anytime a sector sees its valuation grow to north of 20% of broad market cap (energy in the early 1980's; technology in the late 1990's – keep an eye on the FANG-led tech sector again...).

Leverage employed by financials is disproportionately high relative to businesses in any other sector, and smaller changes in financial sector leverage can mask or distort larger changes in non-financial debt. This outsized influence on aggregate debt levels was compounded from the mid-1990's through the financial peak in 2007-08, when not only were financials the largest component of the index at a peak of 23%, but they also were significantly more leveraged. From 1997 to 2008, financials controlled between \$13 and \$15 in assets for each dollar of equity in their businesses. Wall Street investment banks and the Freddie/Fannie tandem were much, much higher.

Today, because they nearly imploded the entire global economy during the crisis, dragging the industrial economy with them toward Hades, subsequent financial reforms have produced higher capital requirements. Now, the financials as a group are less levered, controlling \$9-10 in assets for each dollar of equity employed. Here at Semper, we are generally fans of a lower regulatory burden, but in the case of

the very large players in the banking system, requiring lower leverage and increasing capital requirements has been a good thing.

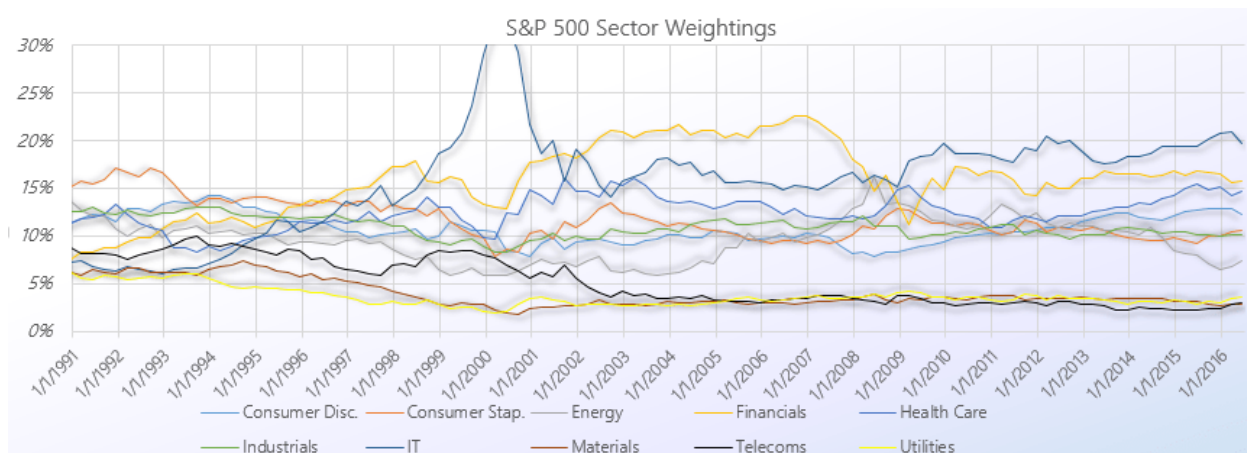
The effect of lower leverage ratios for the financial sector, coupled with their now smaller index sector weighting, has produced a declining total leverage ratio for the entire index. The decline is masking an increase in debt levels among the non-financial sectors, which make up more than 85% of the balance of the index.

Between 1997 and 2008, the same period reviewed above, total debt as a percent of equity for the S&P 500 ranged between 180% and 230%. In other words, the debt component was about double the equity component. When book value per share of \$290.68 in 1999, debt per share was roughly double that. In dollar terms, book value was about \$2.4 trillion with debt at roughly \$4.8 trillion. Total capital excluding cash was thus \$7.2 trillion. Of course, stock prices were then off the charts, with the S&P 500 market cap at a whopping \$12 trillion, which was a record twice sales and a ridiculous 31 times trailing and peak earnings (by our more conservative scrubbing of earnings, the market traded at 40 times). With operating earnings at \$400 billion, the return on equity was then 16.75%, but return on capital was a far more muted 5.6% due to leverage at more than twice equity.

Today, total debt to total equity has declined to about 120%, where the index has a book value of \$779.61 per share and debt of about \$925 per share. In dollar terms, book value is \$6.7 trillion and debt totals about \$8 trillion. The cash balance is a much publicized and ballyhooed \$1.5 trillion. Return on equity is 12.9% and return on capital is 5.6%, coincidentally the same as in late 1999, though valuations are lower now. Importantly, the decline in financial sector debt, post-crisis, is masking a leveraging of non-financial corporate debt. Debt as a percentage of EBIT and EBITDA has been screeching higher since 2011, and is now higher than at any time since 2002. In healthcare, for example, debt to EBITDA has swelled from 1.0 times to 2.5 times. Even in conservative, blue-chip consumer staples, the measure has grown from 1.5 times to nearly 2.5 times. Telecom is also significantly higher, as is energy, despite much restructuring over the last two years.

In a search for financial industry weighting in the index over time, we came across some interesting S&P 500 composition information produced by a group called Sibilis research:

*When S&P 500 index was created in **March 1957**, the index consisted of **425 industrials, 60 utilities and 15 railroad companies**. In 1976, the structure was changed to **400 industrial, 40 utility, 40 financial and 20 transportation corporations**. So quite surprisingly, there were no financial service corporations part of S&P 500 before the year 1976. In 1988, Standard & Poor's finally removed the 400-40-40-20 system and since then the index committee was more free to select index constituents. But sector balance is still an important factor when selecting the companies to the index. In 2005, S&P Dow Jones changed their methodology for all US indexes to float adjusted market cap weighted index. This means that instead of full market cap, the weight of a company is adjusted based on a [public float factor](#) (IWF). This had big effect on some large companies like Wal-Mart with a lot of shares not tradable in public and the change also affected the sector weightings.*



Summarizing Death of the Profit Margins

- The classic argument that profit margins are mean reverting with an upper band of 6% is no longer applicable. Perhaps it's the return on capital that's mean reverting? Ah...
- We now conclude that profit margins mean reverting to a historically observable range is now an irrelevant concept because the amount of capital required to produce a dollar of revenues has grown.
- If a range exists, it is likely now permanently higher.
- Profit margins *should* be higher than historically to compensate for increased capital to produce a dollar of sales.
- Low interest rates do explain some of the increase in margins. With debt nearly equal to revenues (90% as large), each 1% increase in pre-tax interest costs would depress pre-tax profit margins by almost the same 1%. On an after-tax basis, if the interest burden were to rise to 6% from 3%, we'd see a reduction in profit margins from 9% to 7.25%.
- It now takes increased capital, between equity and debt, to grow sales by one dollar, making the return on capital as calculated now much smaller than the profit margin, where historically they were more proximate to each other.

All of this may have been a long-winded way of concluding that returns on capital are too low. Managements have failed by pulling the wrong levers at the wrong times. Shares are issued in the teeth of a crisis when they are cheap because business needs new capital to stay alive. They are repurchased during good times when prices are expensive and returns are low. At extremes, capital is destroyed. Utilizing debt now because interest rates are low to repurchase inflated shares is folly. Risk increases but won't be apparent until the next downturn. Low interest rates are a byproduct of too much debt. Managements won't invest in the next capital project because they either don't believe it exists at adequate returns or they know it doesn't. With profits do they increase dividends? They have. Dividend payouts are higher than they have been in decades. Do they pay down debt? No, because in their minds they should be borrowing to lock in low interest costs. With the proceeds of debt issuance, in addition to repurchasing shares they make acquisitions at high prices. Why? There is little organic growth in a world awash in debt. Retained earnings aren't invested in growth capex or R&D so you are not seeing growing output (which takes capital to produce). The incremental returns on most of the capital management levers are low return levers today. It all adds up to a declining return on capital.

Titans of business think that because they have an aggregate 12.9% return on equity that they can replicate that return with incremental investment. They can't. Instead of borrowing at 3% to buy back shares at 4%, why not find an incremental project or acquisition that can yield a decent return? Increase a line of production at 8% return? Buy a business at a 7% return that has prospects for incremental capital deployment at good returns? Alternatively, continue to increase payouts to shareholders with dividends and let them allocate capital? Or allow cash to accumulate with hopes of deploying it at more favorable returns than exist today? Unfortunately, most higher returning alternatives require patience. If you are a 63-year old CEO with an expected two-year tenure, the last thing you have is patience. Get the stock up, get your options in the money, and ride away into the sunset. Today's low return on capital is the direct result of terrible C-Suite decision making.

So how does the situation resolve itself? What happens next? Schumpeter happens. We will eventually have a cleansing of the system of highly leveraged, low-returning businesses. Businesses that don't earn their cost of capital eventually disappear. When the decks are clear, a better, higher-returning set of levers will present themselves. In the meantime, there are fortunately good businesses that do pull the right levers, understand intrinsic value and the importance of return on capital. We own a portfolio of them. Berkshire Hathaway is certainly one of them.

BERKSHIRE HATHAWAY REDUX – BACK TO THE SWAMP

Last year's letter devoted a not brief dissertation to a deep dive analysis of Berkshire. When my friend, Joe Koster, asked if he could post the letter on his outstanding Value Investing World blog, he insisted the letter would go "viral". I laughingly agreed, believing only a small handful of value investors, and an even smaller coterie of serious Berkshire analysts, might actually read it. Well, between downloads from the link on our website to the letter finding its way beyond the blog to several additional value sites, the thing did go viral, having been downloaded by thousands of readers. The response to the letter was unexpected and gratifying, but also more than a bit unsettling that so many out there closely follow the company. Crowds make "Intelligent Investor" groupies uncomfortable. Many thanks to the countless students of Berkshire who reached out with messages and calls. Thanks, also, to Kate Welling, who interviewed me shortly after Berkshire's annual was released last year regarding our reaction to the unusual presentation of the two intrinsic value yardsticks in the Chairman's letter. As Managing Editor, Kate "invented" Barron's Roundtable during her more than 20 years at the magazine, where her investigative financial journalism and manager interviews were unrivaled. Now a solo act, her eponymous Welling on Wall Street bi-weekly interviews remain the best in the business and are well worth the price of admission.

Several questions came in last year regarding the analysis of Berkshire. Without killing more trees, I thought an attempt at consolidating and briefly answering some of the more common and thought-provoking of the questions would be useful. I also thought it would be interesting to briefly walk through the ways in which Berkshire's two yardsticks of intrinsic value were changed last year and their impact on analysis of the company. We'll follow up with an up-to-date estimate for our calculation of intrinsic value, without repeating in detail the methodologies covered in our letter last year. The letter, and several others from the archive, are now on our website. The interview with Kate is there as well.

Thoughts on Questions Raised About Berkshire

Why don't you reduce your calculation of intrinsic value by the float of the insurance business, because float is a liability?

Of all the questions raised in emails and calls last year, next to succession, this was by far the most common, and is also one of the most common misunderstandings about the economics of Berkshire's operations, particularly in insurance. The question centers on the accounting treatment of insurance float, while the answer addresses two issues.

First, while the accounting definition of float and its calculation result in a net liability on the books, the diversified nature of Berkshire's insurance operations, their long-tailed nature based on lines written, and the degree to which the insurance companies are, in aggregate, seriously overcapitalized, combine to allow Berkshire's insurance float to have an equity-like character, despite its existence on the balance sheet as a net accounting liability.

The second answer to the question incorporates our methodologies used to value the business. Those who measure the earning power of the business to derive intrinsic value, but then back off an accounting liability because they believe float is a liability, are conflating valuation methodologies, effectively mixing apples and oranges. The subtraction of some value representing the portion of float as a liability is done with a balance sheet or book value analysis. Doing so when assessing earning power necessarily understates the ongoing earning power of the business. There is no dispute on our end that float, on a net basis, is indeed a liability. Loss reserves will absolutely be paid over time. We wrote last year:

It would be a sin to suggest a GAAP liability isn't really a liability... We're not saying loss reserves and deferred taxes aren't liabilities. They absolutely are. The question is when will they be paid and at what cost.

Consider the economics of Berkshire's insurance operations. We derive intrinsic value by adding the total of the insurance investments in marketable securities to a capitalized value of our estimate of the insurers' normalized underwriting profitability. We don't envision an environment whereby Berkshire would be forced to liquidate big portions of its insurance investments to pay losses. They have stated an intent to keep \$20 billion in cash on hand at all times, and we think this number is derived as an approximation of a bit less than one year's worth of insurance losses paid in a typical year. Berkshire will pay out more than \$20 billion per year in insurance losses, but the amount going out the door will almost certainly be replaced with new premiums coming in. Our discussion last year of float having equity-like characteristics emphasizes our thinking on this:

Berkshire is unique in its five-decade long history of investment success. Its assembly of insurers consistently underwrite profitably over the long haul, producing float at a negative cost. They are willing to walk away from business at times when they estimate premiums are inadequate to cover future losses and current expenses. Most importantly, Berkshire's float has proven durable and will likely continue to do so for decades to come. The benefit of conservatively profitable underwriting is a translation to a permanence of float that it brings to the insurer. As long as future losses don't greatly exceed upfront estimates, and as long as operational cost is kept low, the accounting treatment of float as a net liability becomes inaccurate. As long as float balances grow through ongoing profitable underwriting, or at least don't shrink rapidly, float can really be economically treated as equity. From a balance sheet perspective, the net liability for losses is really equity, because the investment assets it supports will never technically be repaid. Berkshire refers to float as more of a revolving fund. Outside of Berkshire, most insurance companies don't emphasize to shareholders or policyholders how much float they have on hand, in part because their float doesn't support the same mix of invested assets. If underwriting margins are negative enough, or if losses develop negatively, float in most cases really is a liability.

For the accounting oriented, float represents components from the liability side of the balance sheet offset by smaller components from the asset side. Liabilities included in float are the total of loss reserves, loss adjustment reserves, life, annuity and unpaid health benefit liabilities, and unearned premiums. From the asset side, deferred prepaid acquisition costs, deferred commissions to brokers and agents, unearned premium reserves, and prepaid taxes offset the liabilities. For reinsurers it also includes reserves held under reinsurance assumed offset by charges against assumed reinsurance. Float is simply money held today that insurers have the use of that is going out the door tomorrow. The sum total of these items is a net balance sheet liability. In Berkshire's case, because we believe float is durable and comes at a long-term negative or free cost thanks to conservative underwriting, the fact that we realistically have permanent use of the invested assets, the value of Berkshire's insurance companies is really derived from gains and income from the investments, enhanced by the present value of the amount of underwriting profits we expect the insurers to earn over time.

Our belief in the durability of, and in the ability of Berkshire to grow its insurance float balances over time, allows us to include the full value of Berkshire's insurance company investments in marketable securities as a reasonable approximation of the value of the combined insurers. To this we indicated we add a bit of value for the sustainability of underwriting profitability. At times, we will adjust the value of the investments upward or downward to the extent they are under or overvalued. In a nutshell, however, we determine Berkshire's float balances are more equity-like than liability-like. Even as a net liability, as long as sustained underwriting margins are at least breakeven, the float comes with zero or negative cost. Compared to a liability like debt, it has a completely different economic characteristic at a company like Berkshire.

Whether you agree with our premise or not regarding the equity-like economic character of Berkshire's float balances, our second point in answering the question makes the point mostly irrelevant. Our preferred methodology in valuing Berkshire is as a sum-of-the-parts, involving an estimate the *earning power* of each of the business segments. In working through the earning power of the insurance operations, we drill down to the sustained earning power of the investments in marketable securities, and also the earning power from the underwriting side of the insurers. On the former, we have at times significantly reduced our appraisal of the stock market holding of Berkshire, and in late 2008 and early 2009 made upward revisions to reflect the degree they were undervalued. We further award some value for the optionality of Berkshire's large cash balances in insurance operations in excess of the \$20 billion permanently set aside.

With respect to valuing the underwriting profitability of Berkshire, we assume that the businesses will underwrite at better than breakeven over time. We have used a normalized 5% underwriting margin for as long as we have been shareholders. If the environment changed and we believed Berkshire would run off its insurance book, or large parts of the book, and that losses would develop unfavorably, then we would adjust downward the earning power of the insurers. If that were the case, Berkshire itself would likely reduce its allocation to longer duration assets like common stocks. This allocation shift would be captured in our analysis of earning power.

Those who argue that subtracting from an earnings-derived estimation of intrinsic value an amount representing a balance sheet calculation of float erroneously offset an estimate of income statement earnings power by a balance sheet liability. The earnings power calculation already includes an estimate of the *cost of the liability*. It's effectively a double count of the liability. A proper balance sheet analysis, which we perform essentially to reconcile the earning power of the asset value of the firm, estimates market values for each asset and market values for each liability. Break-up values are useful calculations, but care must be taken to not conflate balance sheet analysis with earning power analysis.

Berkshire has said that depreciation in railroads is understated and therefore reported profits aren't as high as they seem. Does this fact offset the tax and free cash advantage you calculate deriving from the degree to which capex in the rail and energy businesses exceeds depreciation?

We couldn't agree more that depreciation is understated at railroads and utilities, and therefore maintenance capital expenditures are a larger component of what appears to be growth capex. At the outset of the Burlington acquisition by Berkshire we were critical of the economics and the price paid. Rails and utilities have very long-lived assets that do need to be replaced over time. Inflation makes the replacement of an asset today higher in today's devalued dollars than it would have been at its original placement in service. The older the asset, be it track at a railroad or a boiler at a utility, the lower the amount of depreciation relative to current replacement cost. Further, the older and the larger the installed base of fixed assets, the lower the depreciation expense and the artificially higher the reported profit. For this, capital expenditures at railroads and even utilities have far exceeded depreciation charges at least as long as I have been an analyst. That said, the economics of both industries are better today thanks to the way allowed returns are calculated and awarded by the regulators. As assets are replaced at today's higher current cost, they are allowed higher returns on a larger rate base.

In last year's letter, we noted that for the rails, the Surface Transportation Board changed their regulatory methodology for calculating allowable return on invested capital by incorporating a capital asset pricing model (CAPM) for Class 1 rails in 2008. Real revenues per ton-mile began expanding in 2004, further augmented by fuel surcharges exceeding the underlying cost of fuel. In terms of ratemaking, the use of CAPM, combined with a more traditional discounted cash flow model, allowed for the capture of higher than historically allowed regulated returns, which has offset somewhat the fact that much of the

depreciation charge is still against an old asset base. As the rails replace their asset base, and all the while rationalize their assets, they are getting higher returns on the newly allowed assets. Furthermore, lower inflation in recent years has kept the cost of replacing fixed assets closer to their historic cost. High inflation rates in the 1970's and early 1980's had a profoundly different impact on the cost of asset replacement relative to depreciation. These factors, coupled with the allowed use of accelerated depreciation for the tax books, produce a very real free cash advantage today that didn't exist in the past. Berkshire's cash taxes paid are far below those reported in the income statement. The benefit will revert away over time as lower depreciation for taxes increases cash taxes paid, but as long as the rail and the utilities have economically viable allowed investments to make, the benefit to Berkshire is large and offsets the classic case of reported profits being too high due to inflation causing maintenance capex to exceed depreciation charges. Said another way, though maintenance capex does exceed depreciation by a wide margin, it is being spent at attractive allowed returns on capital. We can't calculate with precision the degree to which the benefit from lower than reported cash tax rates is mitigated from maintenance capex exceeding depreciation. At the end of the day, we think Berkshire has a home for retained earnings and for incremental capital investment within both regulated industries at decent to good returns.

Moving the Goalposts

We were surprised when last year's Berkshire Chairman's letter apparently changed methodologies when calculating the two yardsticks of intrinsic value supplied for many years. In particular, both yardsticks, one for earnings per-share excluding investment gains and insurance underwriting, the other for marketable securities per-share, were effectively restated for the prior year 2014 with little or no disclosure about the change itself and what prompted the change. Berkshire then made some statements about historical methods to produce the numbers that weren't accurate.

We discussed our reaction to the changes in the interview with Kate. Our reaction, which we elaborate on briefly here (and in-depth in the Appendix), may fairly be called persnickety (thanks, Rob). Perhaps by discussing the issue we are kicking a dead horse. Berkshire deserves credit for going above and beyond to provide analysts with information that allows for a rational understanding of the business. Without the supplemental data, investors would be left with Berkshire's GAAP reported financials. As with many businesses, GAAP figures are only a starting point to good analysis. In Berkshire's case, GAAP earnings are meaningless and often mask the economic earning power of the business. At the end of the day, however, we're borderline perfectionists, and though the information supplied is appreciated, we can't help but take issue when we think a reasonable explanation of the changes should have accompanied the changes. While we'd like to see a clarification as to how the thinking evolved inside Berkshire as to the presentation of the yardsticks, the changes alone don't at all alter our thinking about the company, our satisfaction with management and our confidence in their abilities as stewards of capital.

For the detailed diatribe, jump now to Appendix D, "Down the Rabbit Hole We Go..."



If you went away, welcome back from Wonderland. You could probably use a bite of mushroom. With some thought and analysis, we believe we understand what changed and where the goalposts were moved. But what we don't know, continuing with the football analogy, is what rules we are playing by. Are we playing American rules or are we playing Canadian rules with a 110-yard field, 20-yard end zones and multiple receivers in motion and toward the line of scrimmage? Or are we playing Australian rules football on an oval with no passing and required bouncing of the ball? Perhaps we are too strong here. The reality is, though it wasn't impossible to estimate where the changes to Berkshire's two measures of intrinsic value were modified, it wasn't apparent to the general shareholder that they had even been changed.

The intrinsic value yardstick numbers have become a regular feature in the Chairman's letter and are now integral to valuing the business. Effectively restating both numbers for a previous year may make sense, but doing so should come with more disclosure than of the year-over-year growth rate in each, and absolutely should have stated that the previous year's figures were no longer the baseline for measuring change. We'll presume as oversights that forgetting that underwriting profits had actually been included in previous years, and that shareholders had been told that investments from the finance and financial products segment were excluded. We had sent a letter to Berkshire last year with questions about our observations. It will be interesting to see how the intrinsic yardsticks are presented this year.

Our expectation for the pre-tax earnings yardstick for 2016 is \$12,532 per A share *excluding* underwriting earnings. Our estimate is probably slightly higher than what Berkshire will report without underwriting due to some of the adjustments we make to Berkshire's GAAP financials. Berkshire's number will also include underwriting results for the year. For the first nine months of 2016 Berkshire reported \$1.267 billion in pre-tax underwriting profit, which is roughly \$771 per share. Add to that any fourth quarter underwriting gain or loss and you will have Berkshire's per-share profit for operations excluding investment gains or losses. Our method instead adds a normalized 5% pre-tax underwriting profit capitalized at 10 times to the operating earnings number, which is done separately as part of the overall intrinsic value estimate.

We presume Berkshire will again, for the second year, include all cash held in the MSR, Rail and Energy and Finance businesses, as well as marketable securities in the Finance segment in its yardstick for marketable securities per-share. If they do, then we expect to see about \$161,385 per-share, equal to \$265.3 billion, in this year's Chairman's letter. Our method, which doesn't count the cash in the non-insurance segments (but now includes \$2.4 billion in securities in the Finance segment as surplus capital), is now about \$35 billion lower than what Berkshire will report.

In the grand scheme of things, Berkshire's management deserves wide latitude. The yardsticks of value are provided as a tool to help shareholders understand where and how value is created at the conglomerate. They are only supplemental information separate from the audited financials. Have they become integral to the annual report? We think they have. But Berkshire's accounting over the years is as fine as any company we have analyzed. You don't find cycles of massive write-offs or write-downs. Contrast that with the 14.6% bled annually on average by the members of the S&P 500 over time. While we'd like to see a clarification as to how the thinking evolved inside Berkshire as to the presentation of the yardsticks, the changes alone sway not a bit our thinking about the company, our satisfaction with management and our confidence in its ongoing operational success. We will tweak our methods to compensate for the changes, and nod to the new presentation as perhaps more reflective of where intrinsic value is now derived.

Berkshire Hathaway: Ten-Year Expected Return

Berkshire Hathaway's shares gained 23.4% in 2016, an attaboy performance for sure to most owners. The price gain far outpaced both the gain in book value per-share and the gain in intrinsic value per-share, which we estimate grew by 9.5% and 10.0%, respectively. The S&P 500 logged a total return of 11.96%. As our largest holding, the gain in Berkshire strongly contributed to the gain at Semper this year, though Berkshire lagged our overall equity return of 27.6% excluding cash balances. Our rising cash position dragged overall returns into the low 20's.

Berkshire's strong price gain in excess of both its growth in underlying earning power and intrinsic value took a small bite out of future expected gains. This should make sense. The good news is Berkshire was so undervalued going into 2016 that plenty of upside to fair value remains, coupled with our expectation that book value and intrinsic value can compound at close to 10% per annum. In fact, intrinsic value should grow modestly faster than reported book value. Here's an update demonstrating expected returns over the next decade at various multiples to normalized earning power which is shown compounding annually at 8% and at 10%. We include both our 10-year projections from last year and this year to illustrate how future expected returns were impacted by the 23.4% gain in 2016.

Last year's table (with final result added in blue):

| | 2014 | 2015 | (e)2016 If Flat/down No Change Down 10% | Final 2016 23.40% | | 10- Year: 2025 8% ROE and growth | | | | | 10 Year: 2025 10% ROE and growth | | | |
|----------------------|---------|---------|--|----------------------|-----------|----------------------------------|---------|---------|----------|--|----------------------------------|---------|----------|----------|
| | | | | | | 13x | 15x | 18x | 20x | | 13x | 15x | 18x | 20x |
| Market Cap | \$371 B | \$325 B | \$325 B | \$292.5 B | \$401.2 B | \$702 b | \$810 b | \$972 b | \$1080 b | | \$845 b | \$975 b | \$1170 b | \$1300 b |
| Net Income | \$23 B | \$25 B | \$27.5 B | \$27.5 B | \$27.5 B | \$54 b | \$54 b | \$54 b | \$54 b | | \$65 b | \$65 b | \$65 b | \$65 b |
| P/E | 16.1x | 13.0x | 11.8x | 10.6x | 14.6x | 13x | 15x | 18x | 20x | | 13x | 15x | 18x | 20x |
| Earnings Yield | 6.2% | 7.7% | 8.5% | 9.4% | 6.90% | 7.7% | 6.7% | 5.60% | 5.0% | | 7.7% | 6.7% | 5.60% | 5.0% |
| Price Change | | | | | | 116% | 147% | 199% | 229% | | 160% | 200% | 260% | 300% |
| Annual Gain Per Year | | -12.5% | 0% | -10% | 23.40% | 8.0% | 9.5% | 11.6% | 12.7% | | 10.0% | 11.6% | 13.7% | 14.9% |

This year's table with net income compounded from 2016's \$27.5 billion, and with 2017 shown as though Berkshire trades at intrinsic value at the end of 2017:

| | 2014 | 2015 | Final 2016 23.40% | (e) 2017 At Int Val | | 10- Year: 2026 8% ROE and growth | | | | | 10- Year: 2026 10% ROE and growth | | | |
|----------------------|---------|---------|----------------------|------------------------|--|----------------------------------|---------|----------|----------|--|-----------------------------------|----------|----------|----------|
| | | | | | | 13x | 15x | 18x | 20x | | 13x | 15x | 18x | 20x |
| Market Cap | \$371 B | \$325 B | \$401.2 B | \$544.5 B | | \$754 b | \$870 b | \$1044 b | \$1160 b | | \$930 b | \$1073 b | \$1287 b | \$1430 b |
| Net Income | \$23 B | \$25 B | \$27.5 B | \$30.25 B | | \$58 b | \$58 b | \$58 b | \$58 b | | \$71.5 b | \$71.5 b | \$71.5 b | \$71.5 b |
| P/E | 16.1x | 13.0x | 14.6x | 18x | | 13x | 15x | 18x | 20x | | 13x | 15x | 18x | 20x |
| Earnings Yield | 6.2% | 7.7% | 6.90% | 5.6% | | 7.7% | 6.7% | 5.60% | 5.0% | | 7.7% | 6.7% | 5.60% | 5.0% |
| Price Change | | | | | | 87% | 117% | 160% | 189% | | 132% | 167% | 221% | 256% |
| Annual Gain Per Year | | -12.5% | 23.4% | 35.7% | | 6.7% | 8.1% | 10.0% | 11.2% | | 8.8% | 10.3% | 12.4% | 13.6% |

The tables compare last year's 10-year expected outcome for 2025 based on 2015 year-end market cap and earnings with the 10-year projected outcomes for 2026 using 2016 data. We illustrate return on equity and earnings growth using two growth rates, at 8% and 10%. Four P/E multiples are applied against future earnings. Our normalized intrinsic value estimate falls at 18 times normalized earnings, which is

used against our calculation of normalized earnings. The 18 multiple approximates the combination of our intrinsic value estimates derived from our multiple valuation methodologies.

In the bottom table, the green (e) 2017 column shows Berkshire trading at year-end 2017 at its intrinsic value projection. This is not a forecast that Berkshire shares will gain 35.7% this year. It illustrates the upside combining the current discount to intrinsic value with growth in earnings at 10%, matching our long-range return on equity estimate for the business.

Moving to the right of the bottom table, we show growth at a range in return on equity and earnings growth (they should be the same at Berkshire due to no dividend paid to shareholders) of 8% to 10% over ten years.

Because of last year's strong stock gain, at 10% prospective earnings growth, the annualized return expectation drops from 13.7% per year using last year's projection to 12.4% per year this year. In other words, last year's 23.4% return outpaced an underlying growth in intrinsic value of 10% by enough to shave the long-range expected return with the stock at 18 times earnings by 1.3% per year. The takeaway should be that despite a now lower long-range return assumption, the expected return is still extremely attractive. We presume the S&P 500, by contrast, may compound at a much lower 3-5% per year from today's lofty valuation.

Berkshire Hathaway Intrinsic Value Update

Instead of repeating a discussion of the methodologies we use to value Berkshire, we instead have included updated tables in an appendix to this year's letter. Data points are updated with our expectations for year-end 2016 financial information, which will be released in the Berkshire annual filings at the end of this month.

We use multiple approaches to value Berkshire, all of which are used to reconcile to each other. With an investment in any business or asset, you are buying the discounted free cash that an asset produces for its owner(s) from today throughout its lifetime. Estimating future profits in the case of any business is very difficult. With all of Berkshire's moving parts and businesses under its umbrella, most believe estimating its future would be an effort in futility. Rather, because of its myriad earnings streams across a wide array of industries, the quality of its assets, its limited use of leverage, the high quality of management and their ethical approach, and an increasing investment in predictable and in many cases regulated industries, we assign a high degree of confidence to our estimate of Berkshire's earning power.

Estimating earning power is a critical step to successful investing. As we said in the beginning of this letter, while we can't control stock prices in the short or even intermediate terms, we focus on the two things we can control – the quality of the businesses we own and the quantity of earnings they produce. The latter is done with a focus on price paid for an investment and price's impact on future returns. For that, our Sum of the Parts approach and GAAP Adjusted Financials approach are our preferred methodologies for estimating intrinsic value at Berkshire. Both methods interrelate and both drill down to assessing the earning power of the business. We use a price-to-book value approach and a return on equity analysis as reconciliation tools for our earning power estimates.

2016 Year-End Intrinsic Value by Methodology

Below is a summary of our current intrinsic value appraisal for Berkshire using our four primary methodologies. Supporting data and tables can be found in Appendix B and Appendix C.

| | Market Capitalization | Price Per A Share | Price Per B Share |
|--|-----------------------|-------------------|-------------------|
| Two-Pronged Approach (ours) | \$508 billion | \$309,166 | \$206 |
| Sum of the Parts Basis | 520 billion | 314,534 | 210 |
| GAAP Adjusted Financials | 514 billion | 312,709 | 208 |
| Simple Price to GAAP Book Value | 487 billion | 296,471 | 198 |

Sum of the Parts and GAAP Adjusted Financials are our most reliable methodologies, valuing Berkshire at about \$517 billion, which equates to roughly \$314,000 per A share and \$210 per B share. A simple equal weighted average of our four approaches yields a slightly lower \$507 billion, reflecting the Two-Pronged approach and Simple Price to Book slightly understating fair value at present. Our Two-Pronged Approach uses our estimate of what Berkshire will report as operating earnings for the current year and doesn't normalize for the degree to which the railroad and a handful of industrial businesses are currently earning below potential. Our Simple Price to GAAP Book Value places intrinsic value at 1.75 times book. The multiple to book value should slightly increase over time as intrinsic value compounds somewhat faster than book value.

At \$244,121 per A share and \$162.98 per B, Berkshire's year-end 2016 market cap was \$401.2 billion. On \$27.5 billion in normalized net income, Berkshire trades for 14.6 times trailing earnings, which equates to a 6.9% earnings yield. Our appraisal values the shares at 78% of intrinsic value, affording accretion of 28.2% over some period of time should that gap close. Coupling a sustainable 10% ROE, which derives from expected 10% growth in equity and in earnings, with a move to fair value over time, should produce a very healthy expected return. Ten-years out, if the shares trade at a more normalized 18 times economic earnings, we will have earned a healthy 12.4% annual return, 3.2 times our money over a decade. Should the discount close this year we get 35.7%, but that's not a forecast.

The Simple Price to GAAP Book Value approach provides an investor a very easy tool to estimate fair value. The trick is determining what is the proper multiple to apply to book value. Our estimate of the proper multiple has expanded over our 17 years as shareholders. As the non-insurance operations within Berkshire grew in proportion within the company, to the extent that the insurers are now worth less than half of the value of Berkshire, in our opinion, book value has become less reliable and now understates intrinsic value by a wide margin. A 1.75 multiple to book has worked recently, but is probably now even modestly low. Berkshire has many subsidiaries and assets carried at historic cost whose current replacement values are far above book cost.

We have two tables in the appendix which work together. The table titled Net Income Basis shows our estimate for pre-tax and after-tax income for each segment, with BH Energy separately stated from BNSF. These estimates are used in the derivation of values for the Sum of the Parts presentation. Estimates for each subsidiary are supported by the separate breakout labeled "Key Business Info". The earnings estimates for each are capitalized at different multiples, based on our appraisal and analysis of each. Income for the Net Income Basis presentation involves an estimate for the earnings derived from the marketable securities held in the insurance operations. To these investment earnings we include the

retained earnings of the common stock investees. We also assume that cash held in the insurance operation in excess of one year's normalized losses paid will eventually be invested in producing assets. Here we add an optionality premium to reflect this. At present, we estimate Berkshire has roughly \$40 billion in cash held at year-end in the insurance operation. The company announced it had purchased a net \$12 billion in stocks after the November presidential election.

For the Two-Pronged Approach, which uses the Berkshire provided estimates for pre-tax earnings and for marketable securities per-share, we will adjust the Berkshire supplied numbers as such:

- For pre-tax per-share earnings, we will now remove underwriting profits from the calculation (as we did from 1995 to 1999 when they were also included). Instead, we will do what we have always done. We assume Berkshire's combined insurance operations will underwrite at a sustainable normalized 5% underwriting margin. We then capitalize the pre-tax 5% number at a 10x multiple. Underwriting profitability should be less volatile at Berkshire given the diversified nature of lines written and a shrinking exposure to super-catastrophe risks. However, they will still be volatile enough year-to-year, including positive and negative reserve development to affect the operating profits of the non-insurance operations. We'd rather smooth the insurance results and instead have a better idea of whether the operating profits within the rest of Berkshire are at normal levels or are aberrantly depressed or elevated. Presently, earnings at BNSF and in several of the industrial business within the MSR group are depressed. We'll see how Berkshire chooses to present the earnings in future if they suffer a badly adverse period for insurance underwriting.
- For marketable securities per-share, we will remove cash from the asset total for the MSR, Rail and Energy, and Finance and Financial products segments. We will leave investments in equities, fixed-income, preferreds and warrants within the Finance and Financial Product segment in the total, effectively considering them surplus capital not required in the spread lending operations. Of note: The Finance and Financial Services segment, spread leasing businesses, show \$12.7 billion cash that largely offsets \$15.5 billion in notes payable. We'd like to know why both balances exist (question for analysts or reporters in Omaha?). **By removing cash from the non-insurance subsidiaries, the balance of marketable securities is a good proxy for the value of the insurance operations.** To this we add or subtract the conservatively capitalized value for normalized underwriting and, at times when the stock portfolio of the insurers is materially under or overvalued, will adjust accordingly. We made downward adjustments in the late 1990's and upward adjustments in late 2008 and early 2009.

We've fielded several questions about which Berkshire earnings number we adjust. Our GAAP Adjusted Financials approach removes realized gains and losses, including from derivative liabilities, from the GAAP reported earnings number that Berkshire will report in its annual report. To this we add approximately \$7.5 billion at today's run rate for the modifications we make to GAAP earnings to reflect economic earning power. Our approach will:

- Add an estimate for the retained earnings of Berkshire's investees in common stocks, hypothetically taxed at the rate at which corporations pay income taxes on dividends earned.
- Include a slightly smaller upward adjustment for the creation of deferred taxes though capital spending and the tax use of accelerated depreciation in the rail and energy businesses as the capex spend rate is lower for 2016 than for 2015. We will adjust accordingly here. There continues to be a material benefit for the use of accelerated depreciation and its impact on cash taxes spent versus the GAAP calculation of taxes.
- Increase economic earnings by a larger amount due to the 2016 inclusion of Precision Castparts. The balance of intangibles being amortized with no economic decay is now much larger. 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. Gross intangibles are \$42.5 billion at September 30 versus \$15.5 billion at the beginning of the year. Accumulated amortization is only \$6.8 billion. Thus \$35.7 billion of intangibles are now being amortized, though assets like trademarks, customer relationships and customer lists lose very little, if any, economic value over time.

- Reduce income by an additional \$100 million per year to \$700 million to reflect the addition of Precision Castparts' \$2.3 billion (defined benefit plan assets) to Berkshire's \$12.8 billion in other pension plan assets. The Precision plan was underfunded by \$387 billion at the time of acquisition, which increases the Berkshire plan's underfunded status to about \$2.8 billion. We assume investment returns of 4% per year, not Berkshire's assumed 6.5% (lowered from 6.7% in 2015), on what now is about \$15 billion in plan assets, and assume underfunding to PBO will be funded over 10 years. Ours is far from a GAAP or actuarial treatment, but is a decent economic approximation of cash flows being used to fund pension obligations beyond actuarial assumptions. This is pretty much a rounding error at Berkshire. At businesses with materially large defined plans, most assume much higher and unrealistic return assumptions than Berkshire. Maybe next year we'll dig back into the work we do on pension math. We calculate that defined benefit plans economically cost the 346 businesses in the S&P 500 that have them about \$10 per share, or \$90 billion in earnings per year that never flows through the operating income statement.
- Include an optionality premium to reflect higher investment earnings for near-term and intermediate-term investments to be made with cash balances north of one year's worth of insurance losses. We currently assume \$20 billion in cash balances will be invested over the near and intermediate terms. Our calculation uses the current earnings yield of the equity portfolio, now at 7.9%. Taxes are applied based on an expected blend of investments to be made in common stocks (at 10.5%) or in wholly-owned subsidiaries (35%). Rates vary based on domicile of the investments made.
- The previous five adjustments can be considered generally recurring in nature and the dollar amounts won't change much year to year. A critical final (or initial) adjustment to GAAP earnings is to strip out realized gains and losses per period, including gains and losses on derivative liabilities. These are non-recurring in nature and in many cases, are only taxable under GAAP and not on the tax/cash books.
- Make a further adjustment reflecting the degree to which any businesses within Berkshire are under or over-earning relative to normalized potential, and also mark up or down the stock portfolio for any material deviation from reasonable fair value.

Reconciling GAAP earnings to economically real earnings at Berkshire is a case study in accounting. Putting all the adjustments to GAAP together, Berkshire has an additional approximate \$7.5 billion in "hidden" after-tax annual economic earning power on a sustainable basis that doesn't appear in the reported financials, after stripping out realized gains and losses. We would add a further \$1 billion to after-tax earnings today to reflect our belief that BNSF and a handful of industrial businesses within the MSR group are under-earning. Management doesn't go out of their way to tout this with pro forma presentations of earnings excluding "bad stuff", as is most common throughout the balance of publicly traded companies.

We hope the inclusion of our thoughts on analyzing Berkshire and the inclusion of the information in the appendix is helpful to those interested in digging deep into the company. Additionally, as our largest holding by far, you as clients deserve our perspective on our analysis of the company. Much of the work we do in the analysis of Berkshire, or on any of the businesses we own, is based on assumptions and are open to debate. We're trying to get the moving parts and the valuation roughly right. Mr. Buffett is famous for quoting Keynes, who said, "It is better to be approximately right than precisely wrong".

Calculating whether the hidden earning power within Berkshire is \$5 billion, \$7.5 billion or \$10 billion is less important than knowing that it's a materially large *positive* number, and that it exists and produces more than \$100 billion in intrinsic value that you wouldn't recognize if you took reported GAAP profits at face value. GAAP (or IFRS for international businesses) financials are a great starting point in the analysis of any business. Only by working to understand the economics of any investment can a rational investment be made. GAAP numbers don't always provide enough information to get you there.

Despite the 23.4% advance in the price of Berkshire's shares last year, they remain considerably undervalued. If Berkshire can earn between 8% and 10% on equity for the next decade, and if the shares trade at our approximation of intrinsic value, we will have earned between 10% and 12.4% per year from year-end 2016. Repeating from the Summary in last year's client letter,

An investment in Berkshire Hathaway today will not provide us returns that mimic those of the past 51 years, or from the 1974 bear market low. Gone is the ability to compound capital at 20% a year. But there are other things you don't get as well. You don't get a business facing obsolescence and declining growth prospects. You don't get a company with aggressive accounting practices that is focused on short-term results. You won't find material write-downs or write-offs or spin-offs of underperforming subsidiaries. They simply aren't there. You don't get a business that abuses its shareholders by overcompensating its officers and directors, or that dilutes shareholder value by issuing vast numbers of options and restricted shares, or that repurchases shares at exorbitant prices that harm shareholders in the name of returning money to them.

We remain very comfortable with our large position in Berkshire and appreciate the opportunity to share our thoughts on the company with you. At an expected long-range annual return of 10.0% to 12.4%, Berkshire's place in our portfolio should bear fruit for many years to come.

A SIDEBAR ON INTEREST RATES – DON'T MESS WITH JANET

Interest rates and the prospect for inflation are topics du jour. Despite knowing that predicting changes in interest rates is a fool's endeavor, we thought we'd offer our two cents.

You don't tug on Superman's cape, spit into the wind, pull the mask off the old Lone Ranger, and you don't mess with interest rates by raising them much when on-balance sheet debt levels are 350% of GDP. Working down debt levels is deflationary. You do raise interest rates when a significant portion of your on-balance sheet liabilities are externally held by foreign lenders and those foreign lenders are putting their loans back to you instead of rolling their investments. Higher interest rates are an attempt to entice rolling versus putting.

There is lots of talk about fiscally stimulative policy these days – lowering tax rates and increasing infrastructure spending. Hence, the world is preparing for a return of inflation, which central banks have been trying to engineer for a decade (or three in the case of Japan). One form of inflation comes when governments wielding printing presses can't roll their debt and are having it put back to them. Trump fiscal policy is a red herring. The real story is foreign lenders no longer willing to hold as much US paper. When this kind of inflation genie is let out of the bottle, it's not the kind that comes with demand exceeding supply for goods and services. Rather, it's the hyper kind, where working down debt levels is no longer deflationary. Our guess would be that central bankers try to raise interest rates in a series of fits and starts, gaining little traction with any sustained increases. We can't afford the interest. The only case to be made for sustained higher rates is if they are forced to raise rates to defend currencies. If we go down that path, then all our lives will change markedly and it won't be fun. We'll keep an eye open.

SUMMARY

It was widely pointed out last year that not many investment managers write 70-page client letters to clients. We're optimistic that the feedback was complimentary, but as a precaution we took a class last year on shrinking verbosity. The page number below confirms progress, yes? Kidding aside, if you spent your valuable time wading through the letter we appreciate it. Your interest in understanding our thinking is important to us. Our revelation that a growing combination of debt and equity capital is distorting conventional business economics produced an "aha" moment, and we were interested in attempting to explain it.

Wisdom involves challenging your beliefs, particularly those held dear. We challenge dogma to learn and to grow, whether it be in the form of long-held beliefs in profit margins, adjusting earnings to match economic reality, reevaluating each investment as new data comes in, or even in Mr. Buffett with his shifting yardsticks of intrinsic value. Perhaps old dogs can learn new tricks.

We look forward to any thoughts or comments on the letter, positive or negative. The explanation of today's high level of after-tax profit margins should necessarily direct focus to what matters in investing – returns on equity, capital, and incremental capital invested, and the *price* of that equity and capital. With the proceeds from growing corporate leverage not going to new investment, but instead used in financial engineering, returns on capital are trending down and are very thin, leaving little margin of safety for hard times.

Our portfolio today is built to withstand hard times, and to compound business value across all times. The portfolio is comprised of businesses of exceptional quality, with managements we trust and admire. That our high-quality holdings trade at 13.5 times normalized earnings, a 7.4% normalized earnings yield and at 82% of intrinsic value is remarkable in the current inflated environment. More important than the multiple to earnings or the discount to intrinsic value, our businesses collectively earn about 10.4% on equity and 9.3% on net capital (7.6% if cash is not netted against debt), and many of our businesses have the capacity to put large amounts of money to work in high return investments. The proximity of our return on equity and return on capital indicates a dearth of leverage across the portfolio. The price of our holdings relative to only modestly leveraged earnings, equity and capital is significantly lower than for the S&P 500 and its highly-leveraged, expensive constituents. We are fortunate to have relative and absolute advantages today nearly as great as at any time. The portfolio is well-positioned to generate favorable returns for many years, and the risk we take is very low.

We hope to earn the moniker money dogs one day. We love the hunt for value. But the personal relationships developed over the years are as important to us as anything. As always, we welcome your comments and feedback. We appreciate the confidence and trust you place in Semper Augustus.

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APPENDIX

Appendix A

McLane Financial Information (Company A)

| McLane Financial Information - dollars in millions | | | | | | | | | | | | | |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | 2015 | 2014 | 2013 | 2012 | 2011 | 2010 | 2009 | 2008 | 2007 | 2006 | 2005 | 2004 | 2003 |
| Revenues | 48,223 | 46,640 | 45,930 | 37,437 | 33,279 | 32,687 | 31,207 | 29,852 | 28,079 | 25,693 | 24,074 | 23,373 | 13,743 |
| EBIT | 502 | 435 | 486 | 403 | 370 | 369 | 344 | 276 | 232 | 229 | 217 | 228 | 150 |
| EBIT Margin | 1.04% | 0.93% | 1.06% | 1.08% | 1.11% | 1.13% | 1.10% | 0.92% | 0.83% | 0.89% | 0.90% | 0.98% | 1.09% |
| Interest | 13 | 14 | 12 | 12 | | | | | | | | | |
| Interest / EBIT | 2.59% | 3.22% | 2.47% | | | | | | | | | | |
| Taxes | 195 | 169 | 178 | | | | | | | | | | |
| Taxes / EBIT | 38.84% | 38.85% | 36.63% | | | | | | | | | | |
| Net Profit (EBIT - interest and taxes) * | 294 | 252 | 296 | 262 | 241 | 240 | 224 | 179 | 151 | 149 | 141 | 148 | 98 |
| Net Profit Margin | 0.61% | 0.54% | 0.64% | | | | | | | | | | |
| Capital Expenditures | 338 | 241 | 225 | 225 | 188 | 166 | 172 | 180 | 175 | 193 | 125 | 136 | 51 |
| Cap Ex / EBIT | 67.33% | 55.40% | 46.30% | 55.83% | 50.81% | 44.99% | 50.00% | 65.22% | 75.43% | 84.28% | 57.60% | 59.65% | 34.00% |
| Depreciation | 161 | 159 | 159 | 149 | 129 | 129 | 120 | 109 | 100 | 94 | 96 | 107 | 59 |
| Goodwill | 656 | 657 | 701 | 705 | 155 | 155 | 155 | 154 | 149 | 158 | 158 | 158 | 145 |
| Identifiable Assets | 5,871 | 5,419 | 5,209 | 5,090 | 4,107 | 4,018 | 3,505 | 3,505 | 3,477 | 2,986 | 2,803 | 2,349 | 2,243 |
| Book Value (Equity) ** | 4,174 | 3,880 | 3,628 | 3,332 | 3,070 | 2,829 | 2,589 | 2,366 | 2,186 | 2,036 | 1,887 | 1,746 | 1,598 |
| Return on Equity | 7.04% | 6.50% | 8.16% | 7.86% | 7.83% | 8.48% | 8.64% | 7.58% | 6.90% | 7.31% | 7.48% | 8.49% | 6.10% |
| Debt (assumed 20x interest new in '12) | 260 | 280 | 240 | 240 | | | | | | | | | |
| Return on Capital | 6.63% | 6.06% | 7.65% | 7.33% | | | | | | | | | |
| Return on Assets (EBIT / Ident. Assets) | 8.55% | 8.03% | 9.33% | 7.92% | 9.01% | 9.18% | 9.81% | 7.87% | 6.67% | 7.67% | 7.74% | 9.71% | 6.69% |
| Cap Ex - Depreciation | 177 | 82 | 66 | 76 | 59 | 37 | 52 | 71 | 75 | 99 | 29 | 29 | -8 |
| Goodwill / Identifiable Assets | 11.17% | 12.12% | 13.46% | 13.85% | 3.77% | 3.86% | 4.42% | 4.39% | 4.29% | 5.29% | 5.64% | 6.73% | 6.46% |
| Depreciation / (Ident. Assets - GW) | 2.74% | 2.93% | 3.05% | 2.93% | 3.14% | 3.21% | 3.42% | 3.11% | 2.88% | 3.15% | 3.42% | 4.56% | 2.63% |
| Cumulative Cap Ex | 2415 | | | | | | | | | | | | |
| Cumulative Depreciation | 1571 | | | | | | | | | | | | |
| Cumulative Cap Ex - Depreciation | 844 | | | | | | | | | | | | |
| Cumulative EBIT | 4241 | | | | | | | | | | | | |
| Cum Net Profit (assume 65% of EBIT) | 2757 | | | | | | | | | | | | |
| Increase in Identifiable Assets | 3628 | | | | | | | | | | | | |
| Increase in Goodwill Balance | 511 | | | | | | | | | | | | |
| * assumed at 65% of EBIT 2003-2012 | | | | | | | | | | | | | |
| ** Assumed Begin BV + NI each year | | | | | | | | | | | | | |

McLane merits segment status in Berkshire's footnotes to the annual thanks only to a large top line revenue. The balance of its financials is immaterial to the whole, but because it appears in the segment footnote, a handful of financial data are reported each year, and we can put together some summary data. We aren't provided the amount of capital in the business so you have to do a little thinking about the business. Reported each year since the mid-2003 acquisition are:

- Revenues
- EBIT
- Interest Paid (reported since 2013)
- Taxes Paid (reported since 2013)
- Capital Expenditures
- Depreciation
- Goodwill
- Identifiable Assets

You don't get information for the equity or capital employed in the business. To measure the profitability of McLane (properly on equity and capital and not on sales...) we make the following assumptions:

- Assume the increase in revenues from approximately \$23 billion to \$50 billion at the current run rate has been financed with a proportionate amount of capital.
- Assume cumulative net earnings have totaled about \$2.8 billion (requires an estimate for taxes paid).
- Assume a tax rate of 35% from 2003 to 2012 because we don't have tax data for those years.
- Assume McLane retained all earnings and paid no upstream dividends to Berkshire, then the equity of the business will have grown from the \$1.5 billion beginning equity (which included \$145 million in Goodwill) to \$4.2 billion.
- Assume no debt existed at the close of the 2003 acquisition – we only have interest paid data from 2013 on.
- Assume \$260 million in debt is now outstanding. \$13 million was paid as interest in 2005, so we assume debt outstanding is 20 times that amount (5% interest rate), and has probably been in place since 2012 when an acquisition pushed the goodwill balance from \$155 million to \$705 million and identifiable assets from \$4.1 billion to \$5.1 billion.

Using our assumptions, McLane would have a current book value of \$4.2 billion and total capital of \$4.4 billion. Cumulative capital expenditures have just about equaled net income, and also exceeded cumulative depreciation charges by \$844 million. If these figures are correct then you can see in the spreadsheet that McLane's return on equity has consistently ranged between 6.5% and 8.5%. For years when the business didn't have debt the return on capital would equal the return on equity. With very modest leverage now employed, McLane's return on capital was 6.6% in 2015. It is clear that Berkshire has been able to deploy increasing capital adequately and at decent returns.

If we consider that some profits may have been distributed upstream to Berkshire as dividends, then the retained earnings and the equity balance at McLane would be lower than assumed. Identifiable assets have increased by \$3.6 billion, which is in excess of our presumed cumulative profit (retained earnings) of \$2.4 billion by \$1.2 billion. Thus, pre-tax return on identifiable assets has improved by roughly 2% per year to a mid-8% return lately from the early years of Berkshire's ownership of the business.

If McLane indeed distributed some income and the capital base is lower than we assume, naturally calculated returns on equity and capital would be even higher. If the book value of McLane is closer to \$3 billion, then returns would be 10%. At an extreme, if McLane had distributed all profits as dividends to Berkshire, today's capital would be the original \$1.5 billion in equity plus approximately \$260 million in debt (assuming no cash in the business), and the return on capital would be 16.7%. We don't believe this is the case. Our base case assumption of a larger capital balance is used to apply the most conservative sets of parameters for analysis.

Regardless of how much capital is actually employed in the business (we'd love the data as curious analysts), the conclusion to be drawn is that McLane is but one of *many* subsidiaries within Berkshire that can deploy increasing capital investments at satisfactory returns on invested capital.

If we were to see declining returns, then an option for managements at that point may be to run the business in more of a steady state. If competition were driving returns steadily downward, then management would need to determine an appropriate course of action. Using return on capital and equity is most important way to properly measure investment decision making. The management focused on profit margins and growth in revenues instead of returns on equity and capital, is using the wrong measurement tools.

Appendix B

Key Business Segment Information – Berkshire Hathaway 2016 Expected

| | | | |
|--|--------------------------|---|---------------------------|
| Key Business Information | | | |
| 2016 (Estimated) | | | |
| Berkshire Hathaway Energy (89.9% owned) | | MSR Businesses | |
| Revenues | \$18.4 B | Revenues | \$120 B |
| EBIT | \$3.6 B | Pre-tax Income | \$9.1 B |
| Pre-tax Income | \$3.2 B | Net Income (Lubrizol, Marmon, IMC modestly depressed) | \$6.0 B |
| Net Income (reported) | \$2.5B | Profit margin | 5.00% |
| Net Income (adjusted for cash taxes) | \$2.9 B | Working Capital (\$ 16 billion cash) | \$21 B |
| Earnings Applicable to Berkshire | \$2.6 B | Total Debt | \$15.5 B |
| Equity (estimated) | \$56 B | Equity (estimate w/ PCP and Duracell) | \$90 billion |
| ROE (includes \$9.6 billion goodwill) | 4.6% | ROE (incl. estimated goodwill & intang of \$69 billion) | 6.7% |
| ROE (excluding goodwill) | 5.6% | ROE (excluding goodwill & other intangibles) | 28.6% |
| Estimated Value | \$40-45 B | Estimated Value | \$120-130 B |
| Implied P/E | 15 | Implied P/E | 20 |
| BNSF | | Finance and Financial Products | |
| Revenues | \$20.2 B | Equity* | \$21.5 B |
| EBIT | \$6.8 B | EBT w/ \$400M derivative amort | \$2.6 B |
| Pre-tax Income | \$5.7 B | Net Income w/ derivate amort | \$1.8 B |
| Net Income (as reported) | \$3.5 B | Normal Average ROE | 8.5% |
| Net Income (adjusted for cash taxes) | \$4.4 B (5.2 normalized) | Estimated Value | \$27-32 B |
| Equity (estimated from STB and GAAP filings) | \$42 B | Implied P/E | 15 |
| ROE (includes \$14.8 billion goodwill) | 10.5% | *12.7 B cash and \$15.5 B notes payable both high and mostly offset) | |
| ROE (per STB annual R-1)* | 8.5% | | |
| Estimated Value | \$73-83 B | | |
| Implied P/E (on net adjusted for cash taxes) | 18 trail (14 normalized) | | |
| * Excludes goodwill and most debt | | | |
| Insurance Operations | | Insurance Investments (December 31, 2016 estimated) | |
| Premiums Earned (\$41 Billion in 2014 and 2015) | \$45 B | Equity Securities (Excluding Kraft Heinz Equity) | \$120 B |
| Statutory Surplus (Equity) 129 B '14, 124 B '15) | \$129 B | Fixed Income Securities | \$24 B |
| Book Value (GAAP Estimated) 2014 Value 151 B '15 | \$155 B | Preferreds, Warrants | \$15.4 B |
| Float (\$84 Billion 2014, \$88 B 2015) | \$92 B | Investment in Kraft Heinz | \$28.4 B |
| Losses Paid (2014 22.7 B; 2015 24.5 B) | \$26 B | Cash | <u>\$40.5B</u> |
| Normalized Underwriting Margin: 5% Pre-tax | \$2.25 B | Total Investment Assets | \$228.3 B |
| Normalized Underwriting Net Profit | \$1.5 B | Investment Income and Earnings (to reconcile) | |
| Capitalized Value from Underwriting | \$22 B | Dividends (annualized at 12/31 estimated) | \$4.0 B (3.3% div yield) |
| | | Retained Earnings of Common Stocks | <u>\$5.2 B</u> |
| | | Total Earnings of Common Stocks | \$9.2 B (13 P/E; 7.7% ey) |
| | | | |
| Insurance Estimated Value | | Interest and Divs on Preferreds (annualized at 12/1/16) | \$900 M |
| Total Investment Assets | \$225 B | | |
| Capitalized Value from Underwriting | \$22 B | Kraft Heinz Preferred Dividend | \$0 M |
| Estimated Value | \$247 B | Kraft Dividends and Equity Method Earnings | \$1.3B |
| | | | |
| | | Total Kraft Heinz Earnings * | \$1.3 B |
| | | | |
| | | Total Pre-Tax Earnings of Investments | \$11.4 B |
| | | Optionality of Cash > One-Year Losses Paid | \$1.6 B |
| | | Pre-tax Earnings with Optionality of Surplus Cash ** | \$13.0 B |
| | | Paid and Hypothetical Taxes | \$1.7 B |
| | | Investment Net Income | \$11.3 B |
| | | | |
| | | * Kraft Heinz will be accounted for under the equity method | |
| | | and may not be held as an insurance company asset; preferred called in 2016 | |
| | | ** Dividends assumed taxed at 10.5%; retained earnings presumed as dividends and taxed at 10.5% | |
| | | Preferreds at 35%; Fixed-income at assumed blended rate of 25% based on issuer type | |

Appendix C - Tables

Methodologies and Support for Calculating Intrinsic Value for Berkshire Hathaway

| Income Statement GAAP Adjustments to Economic Earnings | | | |
|--|-----------------------|--|--|
| Add retained earnings of equity investees, taxed at 10.5% | \$5.0 billion | est for '16; 5.2 B rate for '17 | |
| Add income for DTL's created with PP&E capex to reflect cash tax<GAAP tax | 1.3 billion | capex lower in '16 | |
| Add 80% of amortization charge for intangibles | 750 million | added pcip intanbibles, was \$600 m/yr | |
| Add optionality premium for near/intermediate investments with cash>1-year insurance losses | 1.2 billion | 20 B @ 7.9% taxed at blended 25% | |
| Reduce net income to reflect higher normalized pension expense | (700 million) | Added PCP pension '16 | |
| Normalized Annual GAAP Adjustment to Economic Earnings (before removing realized g/l) | \$7.55 billion | "Normalized annual GAAP to Economic | |
| Remove realized gains/losses, including derivative liabilities | (5.7 billion) | at 9/30/16 | |
| Change for 2016 assuming no 4Q realized gain/loss on investments | \$1.85 billion | | |

| Sum of the Parts Basis - 2016 expected | | | Net Income Basis - 2016 expected # | | | |
|--|-----------------------|-----------|--|---------------------|-----------------------|------------|
| | | | | Pre-tax | After-tax | |
| BH Energy | \$40-45 B | | BH Energy | \$3.2B | \$2.6 B | |
| BNSF | 73-83 | | BNSF | 5.7 | 4.4 | depressed |
| MSR Businesses | 120-130 | | MSR Businesses | 9.1 | 6.0 | Modest dec |
| Finance Businesses | 27-32 | | Finance Businesses | 2.6 | 1.8 | |
| | 260-290 | | | 20.6 | 14.8 | |
| Insurance Underwriting | 22 | | Capitalized underwriting | 2.3 | 1.5 | |
| | 282-302 | | | 22.9 | 16.3 | |
| Investment Portfolio | 228 | | Investment Income | 13.0 | 11.3 | ** |
| | | | | \$35.9B | \$27.6 B | * |
| Total | \$510-530 B | | Investment Portfolio value derived through investment income | | | |
| | | | P/E: | Multiple to pre-tax | Multiple to after-tax | |
| Total per A share | \$310,237 - \$322,400 | | | 10x \$359 B | 13x \$358B | |
| Total per B share | \$207 - \$215 | | | 11.5x 413 | 15x 414 | |
| | | 2016 gain | | 14x 503 | 18x 496 | |
| Current Market Cap | \$401 billion | 23.40% | | 16x 574 | 20x 552 | |
| 2015 y/e market cap | \$325 billion | | * Implies an aggregate cash tax rate of 23.1%, not 35% | | | |
| Market Cap to Fair Value | 78%% | was 69% | # Earnings are GAAP adjusted by Semper Augustus | | | |
| | | | ** Included optionality premium on cash > \$20 billion | | | |
| | | | and all earnings on Kraft Heinz assumed for all of 2016 | | | |

| 2016 Est Intrinsic Value at Normalized 18x earnings on TTM and Norm | | | | |
|---|---------------------|---|---------------|--|
| Earnings | Intrinsic Value P/E | | IV Market Cap | |
| \$27.6 billion | 18 | = | \$497 billion | |
| \$28.6 billion * | 18 | = | \$514 billion | |
| * normalizes earnings at BNSF and industrial MSR businesses | | | | |

| | | | | | | Two-Pronged Basis# (dollars in millions) | | | | | | |
|----------|------------------|---------|---------|---------|------------|---|------------|--------------|--------|----------------------------|----------|---------|
| | Per-Share | | | | | Per-Share | | | | | | |
| | Pre-Tax Earnings | | | | Investment | Per-Share Investments + everything else | | | | Market Cap Intrinsic Value | | |
| | 10x | 12x | 13.5x | | plus 10x | plus 12x | plus 13.5x | shares out M | at 10x | at 12x | at 13.5x | |
| 2005 | 2,441 | 24,410 | 29,292 | 32,954 | 74,129 | 98,539 | 103,421 | 107,083 | 1.541 | 151,849 | 159,372 | 165,014 |
| 2006 | 3,625 | 36,250 | 43,500 | 48,938 | 80,636 | 116,886 | 124,136 | 129,574 | 1.543 | 180,355 | 191,542 | 199,932 |
| 2007 | 4,093 | 40,930 | 49,116 | 55,256 | 90,343 | 131,273 | 139,459 | 145,599 | 1.548 | 203,211 | 215,883 | 225,386 |
| 2008 | 3,921 | 39,210 | 47,052 | 52,934 | 77,793 | 117,003 | 124,845 | 130,727 | 1.549 | 181,238 | 193,385 | 202,495 |
| 2009 | 2,250 | 22,500 | 27,000 | 30,375 | 90,885 | 113,385 | 117,885 | 121,260 | 1.552 | 175,974 | 182,958 | 188,196 |
| 2010 | 5,926 | 59,260 | 71,112 | 80,002 | 94,730 | 153,990 | 165,842 | 174,732 | 1.648 | 253,776 | 273,308 | 287,958 |
| 2011 | 6,990 | 69,900 | 83,880 | 94,365 | 98,366 | 168,266 | 182,246 | 192,731 | 1.651 | 277,807 | 300,888 | 318,199 |
| 2012 | 8,085 | 80,850 | 97,020 | 109,148 | 113,786 | 194,636 | 210,806 | 222,934 | 1.643 | 319,787 | 346,354 | 366,280 |
| 2013 | 9,116 | 91,160 | 109,392 | 123,066 | 129,253 | 220,413 | 238,645 | 252,319 | 1.644 | 362,359 | 392,332 | 414,812 |
| 2014 | 10,847 | 108,470 | 130,164 | 146,435 | 140,123 | 248,593 | 270,287 | 286,558 | 1.643 | 408,438 | 444,082 | 470,814 |
| *2015(e) | 11,562 | 115,620 | 138,744 | 156,087 | 136,918 | 252,538 | 275,662 | 293,005 | 1.643 | 414,920 | 452,913 | 481,407 |
| **2015A | 11,186 | 111,860 | 134,232 | 151,011 | 159,794 | 271,654 | 294,026 | 310,805 | 1.643 | 446,328 | 483,085 | 510,653 |
| *2016(e) | 12,532 | 125,320 | 150,384 | 169,182 | 140,154 | 265,474 | 290,538 | 309,336 | 1.643 | 436,174 | 477,354 | 508,239 |
| 2016new | 12,532 | 125,320 | 150,384 | 169,182 | 161,385 | 286,705 | 311,769 | 330,567 | 1.643 | 471,056 | 512,236 | 543,122 |

*Per-share earnings for 2015 and 2016 are Semper Augustus estimates from our sum of the parts analysis (\$20.6 billion for 2016) and higher than presented by Berkshire

*Per-share investments are also estimates by SAI

Two-Pronged basis intrinsic value excludes capitalized value for ongoing insurance underwriting profitability, \$2.25 billion currently valued at \$22.5 billion, or \$13,688 per-share

**Berkshire changed the methodology for calculating both earnings and investments per-share. See "Moving the Goalposts". Semper estimates use our traditional methods.

** 2016(e) is our Semper Augustus estimate. We continue to exclude underwriting profits and normalize at 5%, capitalizing at 10x pre-tax

** (2016)e Our Semper estimate continues to exclude cash from MSR, Rail and Energy and Finance businesses. We now include, as does Berkshire, warrants, preferreds, equities and fixed from finance.

2016 (new) is the new Berkshire methodology including cash from MSR, Rail and Energy and Finance businesses

| 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. BVPS |
| 1994 | 11,875 | | 11,875 | 14,250 | 20,781 | 23,750 | | 20,800 | 15,150 | | |
| 1995 | 14,025 | 12,950 | 14,025 | 16,830 | 24,544 | 28,050 | | 30,600 | 20,250 | 236% | 156% |
| 1996 | 19,011 | 16,518 | 19,011 | 22,813 | 33,269 | 38,022 | | 38,000 | 31,000 | 230% | 188% |
| 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 | 134,973 | 124,594 | 134,973 | 161,968 | 236,203 | 269,946 | | 178,900 | 136,850 | 144% | 110% |
| 2014 | 146,186 | 140,580 | 146,186 | 175,423 | 255,826 | 292,372 | | 229,374 | 163,039 | 163% | 116% |
| 2015(A) | 155,501 | 150,844 | 155,501 | 186,601 | 272,127 | 311,002 | | 227,500 | 190,007 | 151% | 126% |
| 2016(e) | 169,412 | 162,457 | 171,000 | 203,294 | 296,471 | 338,824 | | 249,711 | 187,001 | 154% | 115% |
| 2017(e) | 186,350 | 177,881 | 188,100 | 223,620 | 326,113 | 372,700 | | ? | ? | ? | ? |

* Berkshire authorizes share repurchases below 1.2 times BVPS

1.6437 million shares outstanding at 2016; \$296,471 per share equals market cap of \$487 billion at 1.75x BVPS at 2016

Appendix D – Down the Rabbit Hole We Go

Moving the Goalposts at Berkshire – What Changed and How it was Presented

Last year's write-up of Berkshire covered in detail the different methodologies we employ in appraising intrinsic value for the firm. The first method discussed, which comes with two data points provided annually by Berkshire, is a Two-Pronged Approach. It so happens that we first began researching Berkshire at the time the business created the "B" share class of stock via their 1996 public offering. Our earliest analysis consisted of researching the annual reports from 1993-1995 as well as the offering prospectus for the share offering. Berkshire included a table in the 1995 annual report with two columns. The first showed marketable securities owned per-share at ten-year intervals. The second listed pre-tax per-share operating earnings for all Berkshire subsidiaries excluding dividends, interest and realized capital gains and losses from the marketable securities.

| Year | Marketable Securities Per Share | Pre-tax Earnings Per Share Excluding All Income from Investments |
|---------------------------------|------------------------------------|--|
| ---- | ----- | ----- |
| 1965 | \$ 4 | \$ 4.08 |
| 1975 | 159 | (6.48) |
| 1985 | 2,443 | 18.86 |
| 1995 | 22,088 | 258.20 |
| Yearly Growth Rate: 1965-95.... | 33.4% | 14.7% |

It was apparent that management was providing the two data points at ten-year intervals to help shareholders objectively understand the economics of the business and how they viewed valuation. The inclusion of these two columns of data, highlighting marketable securities per-share and pre-tax earnings per-share, excluding all income from investments, provided a simple back of the envelope tool for valuing Berkshire. It also highlighted the degree to which investments in marketable securities had contributed to value creation over time. The two data points for investments and pre-tax earnings were subsequently included in the four following years 1996-1999, were omitted in the following five from 2000-2004, and found their way permanently back beginning with the 2005 annual.

The depth of our understanding of Berkshire has evolved over the years. We bought shares for the first time in February 2000. The position quickly became our largest through growth and subsequent well-timed purchases. As our Berkshire acumen developed, our estimates of the two data points have become very accurate each year in advance of their update in the annual Chairman's letter. Last year, having taken the time to write-up our analysis of Berkshire, we expected to be as precisely correct as possible. Imagine the surprise then when the two yardsticks supplied for year-end 2015 wound up being *far different* than we expected. Whoa! I mean, we had just told the world what those numbers would be. In both cases, each yardstick was higher than we expected. Way higher. What had we missed? We'd done this every year since first buying the stock, even in the five years when the two numbers weren't supplied (more on this shortly). We'd always been close to spot on. Here, we were wrong. So naturally we dug in. Other than one mentioned change regarding underwriting results in the Chairman's letter, the answers, particularly for marketable securities per-share, weren't immediately obvious. It became immediately clear that the two data points that had been *previously* provided by Berkshire for 2014 had been changed, and were changed with little to no explanation.

Before we expand on what changed, let's review the two quantitative intrinsic value data points as they appeared in Berkshire's 2014 Chairman's letter:

Here is an update of the two quantitative factors: In 2014 our per-share investments increased 8.4% to \$140,123, and our earnings from businesses other than insurance and investments increased 19% to \$10,847 per share.

Besides occasionally updating the multi-year data points as they appeared in the 1995 annual, in most years the two data points are generally presented along with their year-over-year growth rate. We never presumed that Berkshire would ever restate the previous year's numbers. Reconciling the two numbers for 2014 with the 8.4% and 19% growth rates presented yields \$129,253 for per-share investments and \$9,116 for per-share earnings, precisely the numbers that appeared in the 2013 annual. No issue there.

When we wrote our letter last year, we expected Berkshire to report something very close to \$136,918 for per-share investments and \$11,562 for per-share earnings. Instead, the two yardstick values were presented in the Chairman's letter as:

Here is an update of the two quantitative factors: In 2015 our per-share cash and investments increased 8.3% to \$159,794 (with our Kraft Heinz shares stated at market value), and earnings from our many businesses – *including insurance underwriting income* – increased 2.1% to \$12,304 per share. We exclude in the second factor the dividends and interest from the investments we hold because including them would produce a double-counting of value. In arriving at our earnings figure, we deduct all corporate overhead, interest, depreciation, amortization and minority interests. Income taxes, though, are not deducted. That is, the earnings are pre-tax.

I used the italics in the paragraph above because we are for the first time including insurance underwriting income in business earnings. We did not do that when we initially introduced Berkshire's two quantitative pillars of valuation because our insurance results were then heavily influenced by catastrophe coverages. If the wind didn't blow and the earth didn't shake, we made large profits. But a mega-catastrophe would produce red ink. In order to be conservative then in stating our business earnings, we consistently assumed that underwriting would break even over time and ignored any of its gains or losses in our annual calculation of the second factor of value.

Today, our insurance results are likely to be more stable than was the case a decade or two ago because we have deemphasized catastrophe coverages and greatly expanded our bread-and-butter lines of business. Last year, our underwriting income contributed \$1,118 per share to the \$12,304 per share of earnings referenced in the second paragraph of this section. Over the past decade, annual underwriting income has averaged \$1,434 per share, and we anticipate being profitable in most years. You should recognize, however, that underwriting in any given year could well be unprofitable, perhaps substantially so.

Our estimate for marketable securities of \$136,918 missed the reported amount of \$159,794 per-share by \$22,876 per share. In dollar terms, we were low by more than \$37 billion! For earnings per-share our miss was more modest. We had estimated \$11,562 for 2015 and were under the reported \$12,304 by \$742 per-share, lower in dollars by \$1.224 billion. The 2015 letter referenced that underwriting earnings were included for the first time. While we knew that not to be the case (more on that in a bit), it reasoned that their inclusion probably accounted for our "miss". We further suspected that in readying for the impending closure of the acquisition of Precision Castparts, cash balances must be now included in the marketable securities tally that hadn't been previously included. But the analyst in us needed to dig deeper to reconcile what specifically had changed in the reporting of both numbers.

The first easy test was to reconcile the growth rates indicated for 2015 back to 2014's reported numbers. Remarkably, the growth rates for both data points don't reconcile the reported numbers to each other. If

per-share investments had grown at the stated 8.3% rate, then 2014's investments would have been \$147,548 per share. But in fact, from the 2014 annual report, the number was presented as the previously mentioned \$140,123. With that simple calculation and revelation, I just stared at the calculator. Then I re-read the Chairman's letter for each year. No explanation. How could the numbers presented for 2014 and 2015 not reconcile with the growth rate presented, and particularly with no disclosure that both of 2014's yardstick values had changed? It was a stunning finding.

The next step was to reconcile the earnings per-share figures between the years, which would now require an adjustment for the inclusion of underwriting results in each year. 2015's \$12,304 per-share, grown by 2.1%, would make 2014's earnings \$12,050, as opposed to the \$10,847 actually presented that year. Because 2015's figure now included the stated \$1,118 in pre-tax underwriting profit, increasing 2014's \$10,847 by \$1,204 in underwriting earnings would make the numbers tie out. Except pre-tax underwriting earnings in 2014 weren't \$1,204 per share. From the 2014 annual report, pre-tax underwriting earnings that year were \$2.668 billion, which on a per-share basis was \$1,624 per-share, a \$690 million dollar difference than what had been reported. We suspected the difference could have been explained through year-to-year insurance loss development, but in reviewing the 2015 10-K, that didn't explain the difference. Loss reserves developed favorably.

In both cases, trying to reconcile the reported yardstick figures for 2014 and 2015 couldn't be done using the growth rates supplied. Even when adjusting for the new inclusion of underwriting profit in the earnings figures, the numbers simply didn't make sense using the methods we had been using for years. 2014's numbers were now different than those that had been reported. Coupled with a lack of disclosure as to which, if any, marketable securities were now being included, we were thoroughly dismayed. Time to keep digging.

Below is a spreadsheet which helps to clarify the moving parts across the two years. We include in the first column the numbers as actually reported and show the underlying reconciliation. In the second column, you will see where we believe methodologies changed, as suggested by the growth rates not allowing the data to tie out. We'll discuss those, and then elaborate on issues at large regarding when various changes had taken place and what had been previously been said about the methods over time.

Continued on next page

**Marketable Securities 2014 to 2015 -
Presented in Dollars (millions)**

| | 2014 Reported | 2014 Inferred Restated (8.3% '14 to '15) | 2015 Reported | growth y/y | |
|---|--------------------------|---|----------------------|-------------------|------------------------|
| | 230,285 | 242,448 | 262,571 | 8.3% | |
| Insurance and Other | | | | | |
| Cash and cash equivalents | 57,974 | 57,974 | 61,181 | | |
| Fixed Maturity Securities | 27,397 | 27,397 | 25,988 | | |
| Equity Securities # | 115,529 | 115,529 | 110,212 | (4.6%) | total return (2.7%) |
| Other (Warrants, Preferreds WWY,DOW,BAC,RBI) | 16,346 | 16,346 | 15,998 | | |
| Investments in Heinz/Kraft Heinz (Fair Mkt Value)* | 11,660 | 11,660 | 32,042 | | |
| Minus Cash From MSR * | <u>-5,765</u> | <u>-5,765</u> | <u>-6,807</u> | | |
| Subtotal Insurance and Other (no MSR cash) | 223,141 | 223,141 | 238,614 | | |
| Finance and Financial Products | | | | | |
| Other (Warrants, Preferreds WWY,DOW,BAC,RBI) ** | 5,978 | 5,978 | 5,719 | | |
| Investments in equity and fixed income securities ** | <u>1,299</u> | <u>1,299</u> | <u>411</u> | | |
| | 7,277 | 7,277 | 6,130 | | |
| ORIGINAL TOTAL | 230,418 | 230,418 | 244,744 | 6.2% | |
| Plus | | | | | |
| Cash from MSR | | 5,765 | 6,807 | | |
| Cash from Railroad, Utilities and Energy | | 3,001 | 3,437 | | |
| Cash from Finance and Financial Products | | <u>2,294</u> | <u>7,112</u> | | |
| | | 11,060 | 17,356 | | |
| Reconciled Total ^ | | 241,478 | 262,100 | 8.5% | |

2014 per-share investments:

\$140,123 equals \$230.285 billion

2014 RESTATED/INFERRED investments: \$147,548

per share equals \$242.448 billion

2015 per-share investments: **\$159,794 per share**

equals \$\$262.571 billion

* Investments in Heinz and Kraft Heinz not at balance sheet value (cost) but fair value from fair value table; MSR cash from Chairman's Letter

** Assets from Finance and Financial Products stated as excluded in 1999 and 2005 Chairman's Letter

Growth y/y excludes dividends, net purchases and time weighting, Ballpark estimate of total return loss of \$3.1 billion, 2.7%

^ Reconciled totals are off (low) by \$970 million for 2014 and by \$471 million for 2005.

Number of shares in denominator or other assets?

Pre-Tax Earnings Now Include Underwriting Gain - Presented in Dollars Per-Share and Per-Share

| Pre-tax Earnings (Without Investment Income) - PER-SHARE | | | | | Growth y/y |
|---|--------------------------|---|---|----------------------|-----------------------|
| | 2014 Reported | 2014 Inferred Restated (2.1% '14 to '15) | 2014 Using \$2.668 billion / 1,624 per share | 2015 Reported | |
| Pre-tax earnings (without investment income) | 10,847 | 10,847 | 10,847 | 11,186 | |
| Underwriting Gain | | 1,204 | 1,624 | 1,118 | |
| Pre-tax earnings (with underwriting gain) | | 12,051 | 12,471 | 12,304 | |
| <u>Growth rates year/year</u> | | | | | |
| Original presentation (no investment income; no underwriting) | 10,847 | | | 11,186 | 3.1% |
| Inferred Restated with underwriting | | 12,051 | | 12,304 | 2.1% |
| Using \$2.668 billion / 1,624 per share underwriting for 2014 | | | 12,471 | 12,304 | (1.3%) |
| | | | | | |
| Pre-tax Earnings Per-Share (Without Investment Income) - In DOLLARS (Millions) | | | | | |
| | 2014 Reported | 2014 Inferred Restated (2.1% '14 to '15) | 2014 Using \$2.668 billion / 1,624 per share | 2015 Reported | |
| Pre-tax earnings (without investment income) | 17,827 | 17,827 | 17,824 | 18,381 | |
| Underwriting Gain | | 1,978 | 2,668 | 1,837 | |
| Pre-tax earnings (with underwriting gain) | | 19,805 | 20,492 | 20,218 | |
| <u>Growth rates year/year</u> | | | | | |
| Original presentation (no investment income; no underwriting) | 17,827 | | | 18,381 | 3.1% |
| Inferred Restated with underwriting | | 19,805 | | 20,218 | 2.1% |
| Using \$2.668 billion / 1,624 per share underwriting for 2014 | | | 20,492 | 20,218 | (1.3%) |

Let's begin with where we believe the methodology for including marketable securities must have changed. Considering that we knew the value of the investments at September 30, 2015 and that we track each portfolio holding daily, the only plausible way we could have been so low was for Berkshire to have net purchased a huge amount of investments in the fourth quarter of 2015 with cash that didn't already exist in the security tally (with proceeds from a bank line of credit that wouldn't have been disclosed during the quarter). At September 30, 2015, Berkshire had acquired \$8.3 billion in equities, net of sales, including a \$5.3 billion addition to their Kraft Heinz position. By year-end, net equity acquisitions for the

year had declined to \$6.7 billion for the year. Purchases, sales and maturities of fixed maturity securities washed for the year, which means Berkshire was a net seller of about \$1.6 billion in the fourth quarter of 2015. So, that wasn't it.

There are several issues to deal with. First, we have long assumed that the figure presented for per-share marketable securities included only securities in the insurance companies. We value the insurance operations as the fair value of the invested securities, plus or minus any amount by which deem the securities to be materially under or overvalued. We also have long included a capitalized value for an assumed 5% long-term sustainable underwriting margin. In the Berkshire annual report, the insurance operations are consolidated with "Other", which is mostly the Manufacturing, Service and Retail operations, plus some smaller holding company operations. Other than cash, these non-insurance businesses don't carry investments in fixed income securities or equities, and we have taken care to remove the cash within the segment from the aggregated cash balance for "Insurance and Other". For 2014 that cash amount for MSR cash was \$5.765 billion. You can find this number in the 2014 Reported column in our table. In that column, that Marketable Securities include Cash, Fixed Maturity Securities, Equity Securities, Other (warrants, preferreds of Wrigley, Dow, Bank of America and Restaurant Brands) plus the fair market value of investments in Heinz and ultimately Kraft Heinz. Adding together those investment securities for 2014, which excludes the MSR cash, totals \$223.141 billion. To arrive at the reported figure for 2014, \$7.277 billion in warrants, preferreds and equity and fixed securities needed to be included in the total.

That's a lot of wind simply to show where the marketable securities were held. The problem is, Berkshire stated in both the 1999 and 2005 Chairman's letter that, "assets held in finance operations are not included in the marketable securities figure." Yet it appears they are included from this segment in 2014 and 2015.

Moving on to the marketable securities figure for 2015, you can see in the third column that to arrive at the total marketable securities of \$159,794, the dollar total with 1.65 million shares outstanding would be \$262.571 billion. To identify enough securities to reach this total requires not only including \$6.130 billion investments in the Finance and Financial Products segment but also picking up all the \$17.356 billion in cash from the MSR, Railroad, Utilities and Energy, and Finance and Financial Products operations.

If our table is correct, then Berkshire is now including marketable securities from other operations of the business that had previously been not included. Doing so seems to contradict earlier statements about what had been included in the calculation.

On one hand, we completely understand the logic. Berkshire was rounding up cash to complete its acquisition of Precision. Further, discussions we have had with several CEO's and managers of Berkshire subsidiary companies confirms that cash was traditionally left in the field for use in operations by the subsidiaries. There was no master sweep operation in place. If Berkshire is now operationally going to more efficiently manage and invest cash and working capital across its vast empire, then logic prevails. From an analysts' perspective, if that is the case, where should the cash be properly assigned when valuing the separate parts of Berkshire? Will the MSR businesses now be operating with modest net debt? If so, we would slightly decrease the multiple we'd be willing to pay for that piece of the company. Further, no longer is it reasonable to assume that the value of the marketable securities is a good proxy for the value of the insurance operations. This may have been a Semper Augustus assumption that others, including Berkshire, may not have made historically. We can still make the assumption, but would have to back out non-insurance company cash and longer duration assets included in the yardstick figure but held in non-insurance segments.

Let's now address a few additional thoughts regarding the "new" presentation of operating earnings per-share. We had estimated \$11,562 for earnings per-share for 2015 and were low of the reported \$12,304 by \$742 per-share, lower in dollars by about \$1.224 billion. The answer to the difference here was mostly evidenced by the inclusion of underwriting profits. We still can't reconcile 2014's inferred (by growth rate) larger earning figure though. The number is too low by \$420 per-share, and we'd like to understand what had changed from 2014 to 2015 to modify the previously reported number for 2014. In fact, when presenting year-over-year results both in the Chairman's letter and in the footnotes to the annual report, the 2014 pre-tax figure was unchanged. How then did the number change when presenting the intrinsic value yardstick figure?

From a disclosure standpoint, the 2015 Chairman's letter states:

I used the italics in the paragraph above because we are for the first time (emphasis added) including insurance underwriting income in business earnings. We did not do that when we initially introduced Berkshire's two quantitative pillars of valuation (emphasis added) because our insurance results were then heavily influenced by catastrophe coverages.

The fact is, Berkshire actually did just that. 2015 was *not* the first time they included insurance underwriting income in business earnings. When the two-prong yardsticks first appeared in 1995, they very much included underwriting earnings. They were included for all five years 1995-1999. We can only speculate why the yardsticks were omitted from the 2000-2004 reports, but it's interesting that underwriting profitability turned seriously negative immediately at the time of the General Re acquisition in 1998. In fact, the underwriting results were so bad that the overall pre-tax operating earnings yardstick figures were reported as negative in 1998 and 1999. It's hard to capitalize losses. When we first bought our shares in 2000, the 1999 annual hadn't yet been released, but we already had assumed that Berkshire's aggregate insurance operations would underwrite at 5% on a long-term sustained basis. When the yardsticks failed to appear, we didn't blanch at their omission, simply concluding that it never made sense to include them together in the first place. Underwriting results are too volatile over time and over cycles. Even with a lessened reliance on catastrophe coverage, we presume there will again come a year, or years, when Berkshire suffers underwriting losses, and may regret the reintroduction of that portion of earnings in the operating earnings yardstick. Of course, as insurance overall shrinks in relevance within Berkshire, perhaps it won't much affect the total number.