DISTILLATE CAPITAL

RATIONAL INDEX DESIGN

Risk: Fundamentals Over Price Volatility

Summary

- Long-term investors should consider an investment's risk as based on its underlying fundamentals and valuation, rather than its short-term price volatility.
- Rationally defining risk from a long-term perspective enables us to try to mitigate it and moderate the heavy impact of drawdowns on compounded, real world returns.
- Our differentiated view of risk helps to reveal investment opportunities that investors who are overly focused on near-term price fluctuations may be missing.

For Long-Term Investors, Risk is Not as Simple as Short-Term Price Volatility

Risk is an obvious key consideration in the attractiveness of any investment. In its most basic form, the expected return on any investment is a function of its price in relation to the expected future cash flows that the investment will generate. The riskiness of an investment then relates to how likely those cash flows are to actually materialize and what happens to the investment's value if they do not. This is true of stocks, bonds, real estate, or any other asset class.

In real estate, where prices are not constantly quoted, an investor would not likely think that a building was low risk just because it was not priced on a daily basis and the price had not changed in several months. Instead, he or she would evaluate its risk by looking at the building's ability to generate future cash flows based on its location and attractiveness to tenants, the ability to raise rents in the future as a result of local market conditions, the price paid in relation to those cash flows, the degree to which the building is leveraged, and likely a host of other factors.

Why should the same logic not apply to equities? For long-term investors, should not the consideration of long-term fundamentals, valuation, and indebtedness outweigh the degree to which stock prices fluctuate in the short-term? Yet many investment professionals use definitions of risk that focus solely on such measures of stock price movements. We believe many of those measures are of little use to long-term investors and that using short-term stock price volatility as a measure of risk is a mistake that leaves open an opportunity for those with longer time horizons. As Warren Buffett wrote in his 2014 letter to shareholders,

> "...volatility is almost universally used as a proxy for risk. Though this pedagogic assumption makes for easy teaching, it is dead wrong: Volatility is *far* from synonymous with risk. Popular formulas that equate the two terms lead students, investors and CEOs astray."[1]

These are powerful words than run counter to the way most investors think about risk.

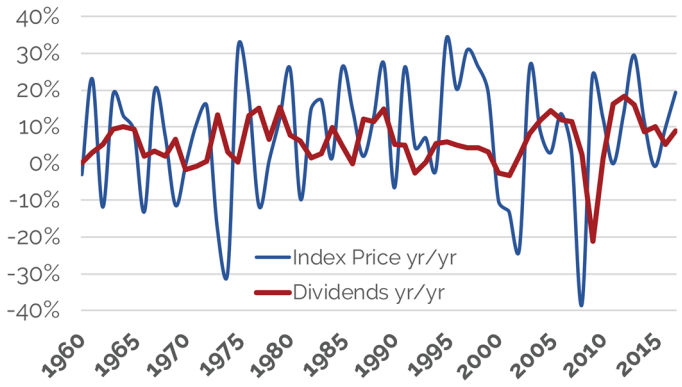
Fundamentals Are Critical in Measuring Risk

In theory, price volatility is used as a proxy for risk because short-term price moves fully capture all of the fundamental and market risks of an investment. Leaving aside the assumption that prices are perfectly efficient despite the significant body of work in behavioral economic research that suggests otherwise, this implies that stock price volatility should reflect the fundamental volatility of an underlying company's ongoing operations and cash generating abilities. In theory, it would follow that stock prices should then be more stable than the cash flows they are supposed to discount since investors should look through temporary near-term disruptions in setting prices that reflect much longer-term expectations.

This supposition was the premise of a 1980 paper by Nobel Prize-winning behavioral economist Robert Shiller.[2] Contrary to the expectation that prices should be more stable than the underlying fundamentals they are supposed to reflect, Shiller found that prices are actually far more volatile than the dividends they should be discounting on a long-term basis. This is evident in a comparison of year-over-year changes in S&P 500 dividends and prices **(See Figure 1)**. This result caused Shiller to write in a 1984 paper that the assumption that price moves are entirely rational and perfectly reflect risk "represents one of the most remarkable errors in the history of economic thought."[3] Yet the use of price volatility as a proxy for risk still permeates most portfolio management and risk awareness systems used by professional money managers.

The S&P 500 Index price is significantly more volatile than the underlying fundamentals it is supposed to reflect.

Figure 1: S&P 500 Index Price vs. Dividends

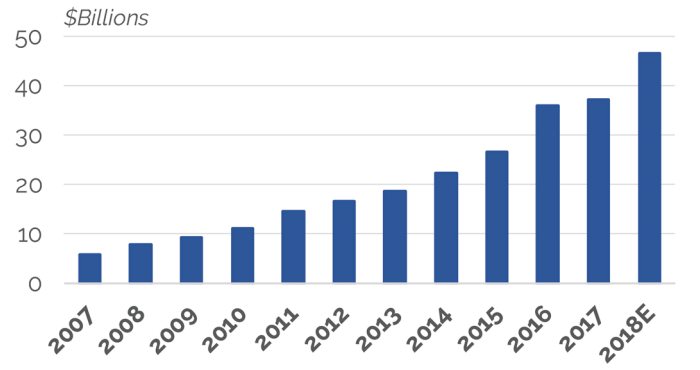


Source: Aswath Damodaran data

[1] Berkshire Hathaway Annual Letter to Shareholders 2014
[2] Shiller "Do Stock Prices Move Too Much to Be Justified by Subsequent Changes in Dividends" 1980
[3] Shiller "Stock Prices and Social Dynamics" 1984

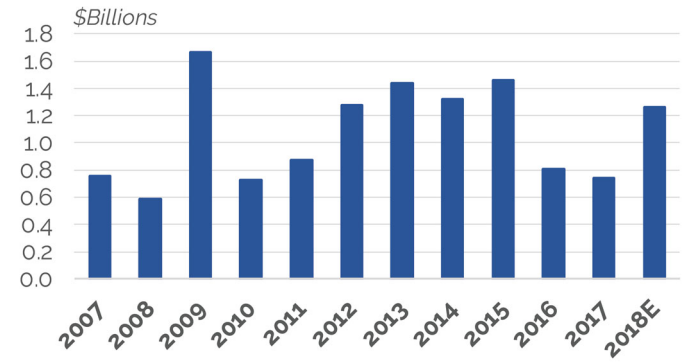
Alphabet's cash flows are substantially more stable than NiSource's.

Figure 2: Alphabet's Operating Cash Flow



Source: FactSet, data as of October 2018

Figure 3: NiSource's Operating Cash Flow



Source: FactSet, data as of October 2018

There certainly are instances where an anticipated sale or an impending need for funds will cause nearer-term share price volatility to be a consideration. In those instances, the realization that stock prices can move dramatically should push investors to assets with greater short-term price stability. But for most investors, the appropriate time horizon is long. Buffett aptly states in his 2014 letter to shareholders that most investors should have a multi-decade horizon. For those investors, utilizing short-term price volatility rather than some assessment of longer-term fundamentals presents a significant mismatch and likely a substantial cost in foregone total returns.

Following Shiller's work, since prices are more volatile than the underlying fundamentals they are intended to represent, we think it makes sense to look directly at those fundamentals to measure risk. Going back to the bedrock of present value mathematics, as the value of any asset is the present value of the cash that it will produce, the riskiness of an investment then depends on the reliability of that cash, as well as the potential impact on price if it falls short of expectations. In that context, for long-term investors, long-term fundamental stability and leverage are more important measures of risk than short-term price volatility.

To set out a real-world example, in comparing Alphabet, the parent of Google, with NiSource, the regulated utility, fundamentals tell a very different story than relative price volatility. Alphabet has a significantly more stable cash flow profile than does NiSource **(See Figures 2 and 3)**. In addition, **Figure 4** shows that Alphabet enjoys a net cash position on its balance sheet compared to NiSource's substantial debt burden. A debt load of that level leaves little room for error and has the ability to massively amplify the impact of a negative change in expected cash flow.

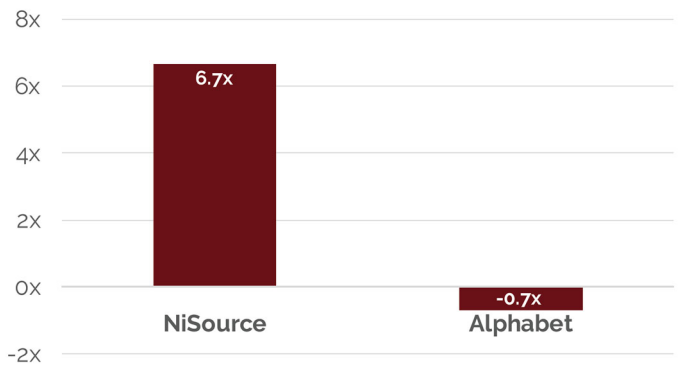
Alphabet's very stable cash flow and net cash position leave us with the view that it is a much higher quality, safer, and more desirable investment than NiSource. But despite these seemingly superior fundamental attributes, Alphabet's stock exhibits much greater short-term share price volatility. This means that on the standard metric of beta, which is based on the stock price volatility of each company compared to the overall market, Alphabet would be considered riskier with a beta of 1.4 versus NiSource's comparable figure of just 0.20, according to FactSet data as of October 2018.

The conclusion that Alphabet is significantly riskier than NiSource is not one that makes fundamental sense to us. Instead, we think it highlights the dangers of relying on short-term price movements to measure risk, as Buffett described.

Lastly, while the example we laid out uses standard measures of cash flow and leverage, we think that a more thorough assessment of risk along these lines should make necessary adjustments to such metrics to address potential accounting distortions or issues like off-balance sheet debt that does not get included in traditional measures.

NiSource has substantially more leverage than Alphabet.

Figure 4: NiSource vs. Alphabet Net Debt/EBITDA



Source: FactSet, data as of October 2018

Valuation is a Critical Component in Assessing Risk

While we think fundamental stability and leverage are indicators of quality and key components in the consideration of risk, we do not think they are adequate measures on their own. Instead, we think price paid, or valuation, has to be considered in conjunction with fundamental stability and quality. A high-quality investment that has stable cash flows and little leverage, for example, may be very risky if the price paid is too high. At the same time, valuation alone is an inadequate measure as an apparently inexpensive investment may prove to be very risky if the cash flows upon which the valuation is based fail to materialize and significant leverage amplifies the shortfall. We therefore think that it is the combination of quality and valuation that determines risk for long-term investors.

Instead of incorporating valuation, traditional measures of risk often act counterintuitively and indicate that an investment is riskier as it gets less expensive. Warren Buffett noted this irrationality in his 2003 letter when he wrote:

> "The Washington Post Company in 1973 was selling for $80 million in the market. At that time...the assets were worth $400 million, probably more. Now if the stock had declined even further to a price that made the valuation $40 million instead of $80 million, its beta would have been greater. And to people who think beta measures risk, the cheaper price would have made it look riskier. This is truly 'Alice in Wonderland.'"[4]

We completely agree and have seen the same effect many times since this extreme example in 1973.

Consider Microsoft. During the recent financial crisis, the share price of Microsoft dropped from a peak of $37 to a low of $15 **(See Figure 5)**. Alongside this price drop, Microsoft's price volatility surged **(See Figure 6)**. But since Microsoft's fundamentals remained relatively healthy, a substantial portion of the price decline was due to valuation compression rather than a large erosion in its underlying ability to generate profits. Consequently, valuation as measured by the stock's ratio of enterprise value to earnings before interest taxation and depreciation (EV/EBITDA), plunged from 15x to around 4.5x at the trough **(See Figure 7)**.

On the basis of price volatility then, Microsoft would have been considered a safer investment at almost $40 per share and an EV/EBITDA multiple of 15x than it was near $15 per share in 2009 at an EV/EBITDA multiple of 4.5x! This despite a stable cash generation profile and little debt. Similar to Buffett's Washington Post example, we think this makes little sense.

Using stock price volatility as a measure of risk, Microsoft was considered safer at a price of nearly $40 and an EV/EBITDA multiple of 15x in 2007 than it was at a price of $15 and an EV/EBITDA multiple of 4.5x in 2009.

Figure 5: Microsoft Stock Price

Source: FactSet

Figure 6: Microsoft Rolling One Year Stock Price Volatility

Source: FactSet

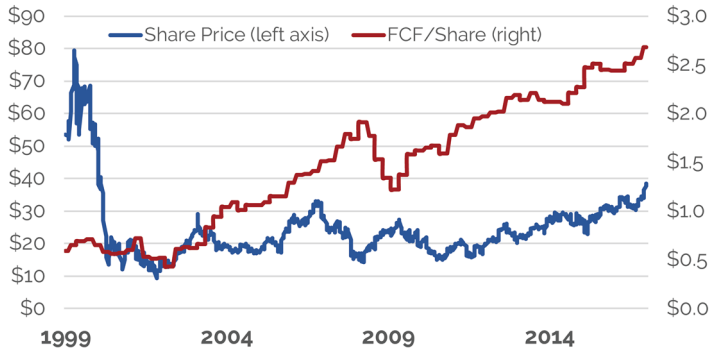
Figure 7: Microsoft EV/EBITDA Valuation Multiple

Source: FactSet, trailing 12M EBITDA estimates

4 Buffett "The Superinvestors of Graham-and-Doddsville" 1984

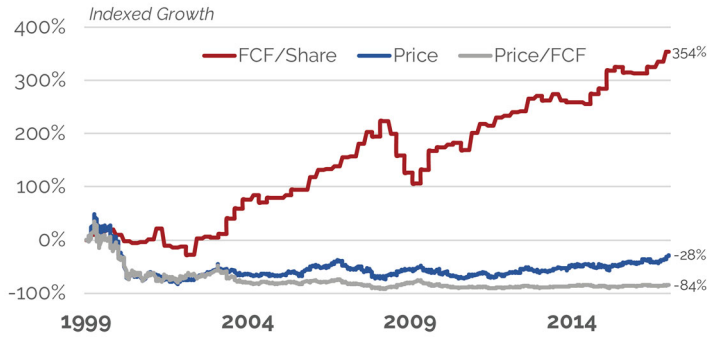
Cisco's stock price has done poorly since 2000 despite enormous growth in free cash flow per share because the starting price paid was so high.

Figure 8: Cicso's Stock Price vs. Free Cash Flow Per Share



Source: FactSet, free cash flow is trailing 12M data

Figure 9: Cisco's Stock Price, Free Cash Flow Per Share and Free Cash Multiple Indexed to 0%



Source: FactSet, free cash flow is trailing 12M data

Cisco provides another example of the importance of incorporating valuation into the consideration of risk. In 2000, Cisco's stock price was approximately $80 per share on a split-adjusted basis and its free cash flow per share was around $0.60 per share. Since then, Cisco's free cash flow per share has more than quadrupled while the stock price is down over 40% **(See Figure 8)**. By indexing Cisco's free cash flow per share, its stock price, and its free cash flow multiple in **Figure 9**, we can see that although the free cash flow increased 354%, the stock price fell over the period by 28% due to the massive 84% decline in the stock price multiple of free cash flow. Despite the enormous free cash flow growth since 2000, the stock did very poorly because the initial price paid was so exorbitant.

Paying too high a price for a stock, like with Cisco in 2000, can thus be tremendously risky even if the underlying fundamentals are strong. On the flip side, being disciplined on valuation can provide an investor with some protection against valuation compression as well as fundamental erosion. This is the principle behind what Ben Graham, the father of value investing, referred to as "margin of safety."

The Low Beta Anomaly and the Impact of Drawdowns

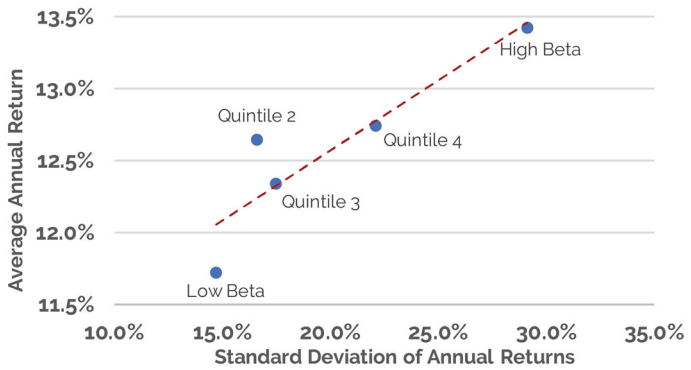
Low beta as an investment concept has garnered a lot of attention and investment dollars in recent years. One reason for this is the high level of anxiety about geopolitical turmoil, political discord, negative interest rates, high levels of global debt, trade disputes, and a host of other issues. The other reason is increased awareness of the "low beta anomaly," in which lower beta (lower risk) stocks actually produce higher long-term returns.

The fundamental premise of using relative price volatility, or beta, to measure risk is that there should be a positive relationship between risk and return. Using the Ken French data set back to 1964, there is indeed a positive relationship between the standard deviation of annual returns (the common proxy for risk) and average annual returns. Using five different groups of stocks based on beta, the lowest beta (least risky) stocks have a lower standard deviation of returns, but also a lower average return. The highest beta (most risky) quintile, by contrast, has the largest standard deviation of annual returns, but also the highest average return **(See Figure 10)**.

But this seemingly tight relationship between risk and return breaks down if returns are looked at on a compounded basis as an investor would actually experience them. As any investor who has experienced a large price decline knows all too well, average returns and compounded returns can be drastically different. For example, an investment that alternates between annual returns of -50% and +60% would have a simple average return of 5%. In reality, the investor experiencing those results would lose two-thirds of their starting principal investment over ten years, and 90% over 20 years because of compounding.

There is a nice relationship between average annual returns and the volatility of returns by quintile of beta.

Figure 10: Average Return vs. Volatility by Beta



Source: Dartmouth Tuck Ken French Data Library

But when returns are looked at on a compounded basis, as they are experienced in real life, large drawdowns in the highest beta group cause it to have the worst returns.

Figure 11: Cumulative Return by Beta

Source: Dartmouth Tuck Ken French Data Library

When returns are looked at on a compounded rather than average basis, large price declines have enormous consequences. As a result, the same example of returns stratified by their starting betas is dramatically different using compounded return figures. Despite having the highest average return, the top quintile of stocks by beta (highest risk) produce the worst compounded return due to the impact of large price declines **(See Figure 11)**. The second highest beta group, quintile 4, has the second worst compounded return, while the second quintile by beta ends up doing the best.

Overall, the compounded returns by quintile of beta are nearly the total reverse of the average returns shown previously because of the enormous impact of price declines. This raises the obvious question of why investors continue to rely on beta to measure risk when actual results are nearly the complete opposite of what the theory suggests. This long-term outperformance of lower beta stock groups, which is known as the "low beta anomaly," highlights the importance of avoiding large declines for long-term investors.

The "low beta anomaly" thus highlights how limiting price drawdowns can significantly enhance long-term compounded returns. While this is an extremely desirable characteristic of an investment, we do not think looking at beta is the best way to capture this opportunity. For starters, volatilities can change quickly and something that was low beta may suddenly become high beta. Even more important is the risk of paying too much. The price paid matters no matter how low the beta. Given the flight into low-beta strategies and the increase in valuations for low-beta stocks, we think this is particularly relevant at present.

To Minimize Risk, It Must Be Properly Measured

Instead of using beta or volatility to try to limit risk and minimize drawdowns to support long-term compounded returns, we utilize a combination of measures of fundamental stability, leverage, and valuation. We think this provides a more comprehensive and more durable evaluation of risk. By using a different, and we think more rational measure of risk, we are also able to identify attractive investment opportunities that others may have overlooked by relying too much on traditional price-driven measures.

Focusing on risk as a function of quality and value enables us to exploit behavioral biases. Many investors, professional and otherwise, are drawn to stocks with lottery-like characteristics. Research has shown that highly levered turnaround situations typically thought of as value opportunities, or stocks with enticing growth stories and high valuation multiples, can become systematically overpriced by investors who are excited at the prospect of large near-term gains. By forgoing these overpriced lottery-like stocks and using our risk methodology to avoid large underperformers, we invest in typically less exciting stocks that have a favorable skew of more modest outperformance. Our paper on behavioral biases digs deeper into how this is incorporated into our methodology.

Lastly, our process is designed to buy high quality companies where the long-term fundamentals are healthy but where fear-based selling in the short-term may have created an opportunity. We think picking up high quality companies at attractive prices also helps us limit our exposure to the negative tail of the distribution curve of returns, while increasing our odds of having a disproportionate share of good performers.

Final Word

Many investors take on substantial long-term risk by focusing too much on trying to minimize near-term price volatility. Warren Buffett, who we admit to quoting quite often, defined risk this way in his 2017 letter, "Investing is an activity in which consumption today is foregone in an attempt to allow greater consumption at a later date. 'Risk' is the possibility that this objective won't be attained." Buffett then went on to write, "It is a terrible mistake for investors with long-term horizons—among them, pension funds, college endowments and savings-minded individuals—to measure their investment 'risk' by their portfolio's ratio of bonds to stocks. Often, high-grade bonds in an investment portfolio increase its risk." In this light, while it is a strange situation for there to be $7.5 trillion of negative yielding bonds around the world as of the beginning of 2018, it is even stranger for investors to think of them as a low-risk investment. A guaranteed loss of your money over the longer-term seems pretty risky indeed.