



Pricing Fat Tails with Hindsight

Summary

- Due to recent experiences, many investors are increasingly sensitive to the greater possibility of extreme asset returns, often referred to as "fat tails."
- Protection against extreme outcomes, often in the form of long Treasury bonds, gold and options-based strategies, has become unprecedentedly expensive.
- However, we find it can be beneficial to run counter to the fashion of the day.
- In the following pages, we will explore ways to create a risk-controlled growth portfolio with minimal use of overpriced assets and strategies.
- Finally, in the age of emailing, instant messaging and texting, the author discusses the virtues of writing a letter.

After the Hurricane

Let's say a Category 5 hurricane has swept across Florida. Which corporate segment would immediately benefit? If you answered "insurance companies," you are correct. Ironically, these businesses do best when owners and renters have recently suffered the greatest destruction and policy-holders value protection against the next big one.

Now, let's assume the equivalent of a Category 5 hurricane has moved through the global financial markets. Which products would benefit? If you guessed "risk management strategies and assets that do well at the onset of the crises," you are again correct.

As investors, we are always on the lookout for mispriced assets and strategies. While most equity assets currently appear fairly valued, the overriding valuation theme is the dramatic uptick in assets and strategies that manage risk and in particular, extreme event risk.

The situation is partially attributable to the economic storms we are weathering and partially because extreme market events are more prevalent than standard models forecast. Investment cognoscenti often refer to the latter scenario as "fat tails." Let us explore why fat tails are unattractive.

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The Five Lives of an Experienced Investor

In theory, financial markets should be normal, meaning returns should be evenly distributed. Normal returns resemble a bell-shaped curve with a hump in the middle where the most common returns are found. Normal distributions at the outliers have “skinny” tails and a low probability of extremely high or low returns.

So, is this a realistic expectation? Yes and no. Annual stock-market return data is normally distributed with limited evidence of fat tails. Fat tails, which mostly take place on the downside, appear when extreme returns occur more often than predicted by the normal distribution curves.¹ If you encounter a stock market characterized by a fat tail return, it is unlikely to be enjoyable. Statistical types define fat tails as once-in-a-lifetime experiences. I have been in the investment business for 30 years, and according to this definition, I have exhausted about five lives by now.² Extreme outcomes are hardly once-in-a-lifetime experiences.

Fat tails, even if they occur over a very short period and reverse themselves within a year, can be dangerous and difficult to endure. This is particularly true if (a) you have a highly leveraged balance sheet and (b) there is a scarcity of risk-controlled strategies within your portfolio. In either situation, immediate cash-flow requirements could force you to liquidate assets at precisely the wrong time.

We have just gone through a period of fat tail returns and investors are sensitized to the possibility. The developed world is facing debt and growth problems unseen since the Great Depression. It is not surprising that popular risk management strategies have escalated in price. While there is a rationale for premium pricing on fat tail insurance, we believe it has reached unreasonable levels.

Let's review the pricing and valuation of risk-controlled strategies. In a nutshell, Treasury bonds are pricing in Japanese-style deflation, gold is pricing in hyperinflation, and the cost of equity portfolio protection reflects a perceived probability of a 40% price decline within one year.

The Great Deflation Hedge

The U.S. deficit has never been larger, and yet the Treasury is borrowing at some of the most attractive interest rates. What gives?

At some point during the second quarter, the economy began to slow. Private businesses finished replenishing their inventories, and the effects of stimulus programs began to unwind. Newspaper articles and strategy pieces argued the economy was about to enter a Japanese-style period of extended low growth and deflation. As anyone who has invested in Japan over the past two decades knows, government bonds are the only domestic assets to consistently perform. Despite Japan's bulging government debt-to-GDP ratios (over 200%), Japanese 10-year bonds yield only about 1% while 30-year bonds yield less than 2%.

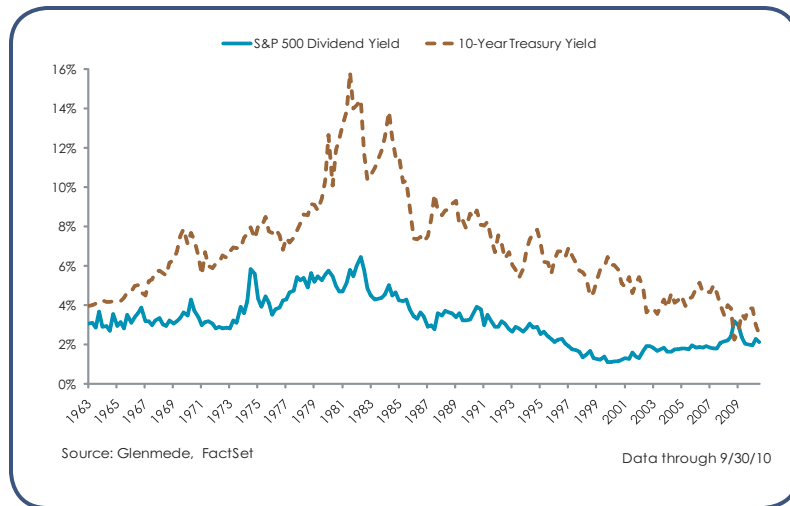
¹ The way to measure whether a distribution has fat tails is to calculate its kurtosis. This sounds like a skin disease. It is not. The kurtosis of a normal distribution is zero. The kurtosis of annual returns from 1926 to 2010 is -0.07 — statistically equivalent to a normal distribution. By contrast, the kurtosis of a distribution of returns is 9.16 for the 1990 to 2010 period. This is evidence of significant outliers or fat tails. We used the shorter time period to measure the daily returns due to data availability.

² Double Digit Interest Rates: 1981 to 1983, the Crash of 1987, the Emerging Market Crises: 1998, the Collapse of the Internet Bubble – 2000 to 2003, the Collapse of the Housing Bubble 2008.

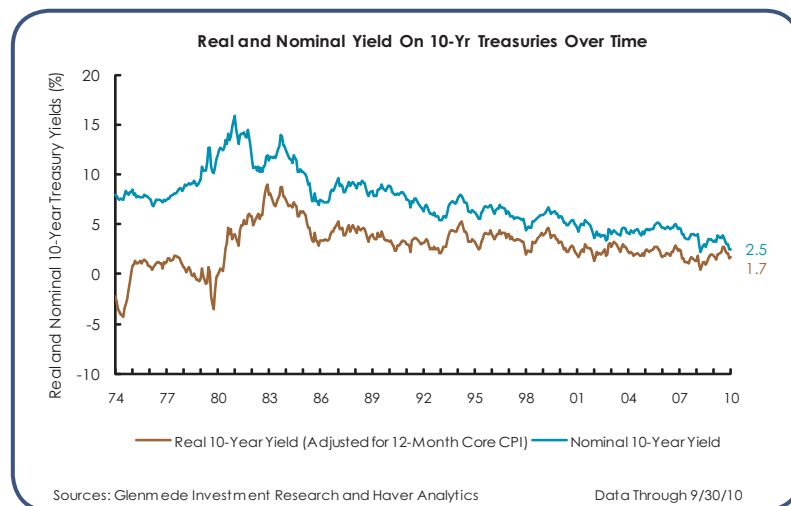
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There is some rationality to this. In an economy where prices are actually declining, the real yield on Japanese bonds may be 2-3%. Similarly, within the Japanese economy, corporate earnings are challenged by low growth. What could be a better safe haven than Japanese bonds?

The same could be said of U.S. Treasury bonds. This past summer, U.S. bond yields began to price in long-term Japanese-like inflation. Yields on 10-year Treasury bonds are currently so low that the dividend yield on S&P 500 stocks is now almost equal.



Given that inflation is expected to be 2% per year over the next 10 years,³ the real yield on Treasuries is now close to 0.6%, much below its historical average of 2.3% since 1880.



³ Implied 10-year inflation is the difference between the coupon yield on 10-year Treasuries and the coupon yield on 10-year inflation-protected securities. Inflation-protected securities provide a coupon yield plus inflation as measured by the U.S. Consumer Price Index (CPI). The difference in these coupon yields is the market's implied rate of inflation over the term of the securities (10 years).

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Are we in a bond bubble? Let's just say that bond yields fully reflect a zero inflation environment. However, bond yields should represent not just one economic scenario but also a probability-weighted average of different scenarios. Yet these levels do not seem to reflect the possibility of higher inflation as would be expected from too many rate cuts and the expansion of real yields.

This inherently singled-minded view of deflation strikes us as a mispricing.

The Great Inflation Hedge

If Japanese-style economic growth and deflation sit on one side of the spectrum of highly undesirable outcomes, the Federal Reserve flooding the market with money is on the other. Needless to say, countries that previously pursued this course suffered from rampant inflation.

What is the best protection against inflation and the destruction of the dollar? The obvious answer is gold. So, if low bond yields foreshadow a deflationary outcome, then gold must be really, really cheap. Correct? But that doesn't seem to be the case. I should, at this point, acknowledge that valuing commodities can be an elusive art.

Commodities, such as gold, should track inflation but not earn a risk premium; values should be in line with long-term inflation rates. Over long periods, gold and inflation should cycle one another, maintaining a symbiotic relationship. Yet, as shown in the graph below, there is a fairly big mismatch. For the two to come back together, we should see either inflation of over 90% or a substantial decline in the price of gold.

Gold Prices are High from a Historical Perspective



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Gold, having gotten well ahead of its fundamental value, is just further evidence of how risk-controlled assets and strategies are currently overvalued. Gold and Treasury bonds are indirect ways of controlling extreme portfolio risk. Options and derivative contracts provide more direct routes. But just how costly is buying this protection?

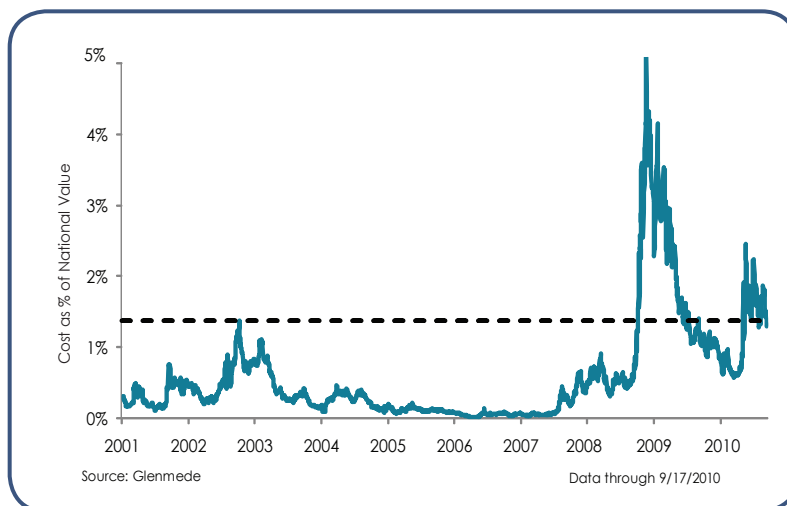
Buying Protection

It may be my imagination, but when you walk down Wall Street, you are liable to overhear the following: "It would be a real shame if something bad were to happen to your nice little portfolio." If, as most insist, Wall Street firms are in the "solutions business," it makes sense to incite buyers with language about needing to safeguard assets while also selling "protection." At various points, portfolio protection has been quite cheap and a good deal. In fact, if you read Michael Lewis' account of the sub-prime debacle, *The Big Short*, you know that the winning managers bought very cheap insurance on sub-prime debt prior to the meltdown.

However, since sub-prime's demise, the investment world has become attuned to the value of insuring against fat tails. Not surprisingly, the cost of this insurance has skyrocketed.

The chart below shows the cost over the past decade of equity portfolio insurance with a 60% floor or a 40% deductible. This insurance pays only after 40% of your portfolio is written down. If your portfolio is perfectly correlated to an S&P 500 index fund, you would get a dollar-for-dollar offset of your losses after the 40% write-down. Currently, the cost of this insurance is about 1.4% of the value of the portfolio.

Cost to Insure a 60% Floor (12 Months) on the S&P 500



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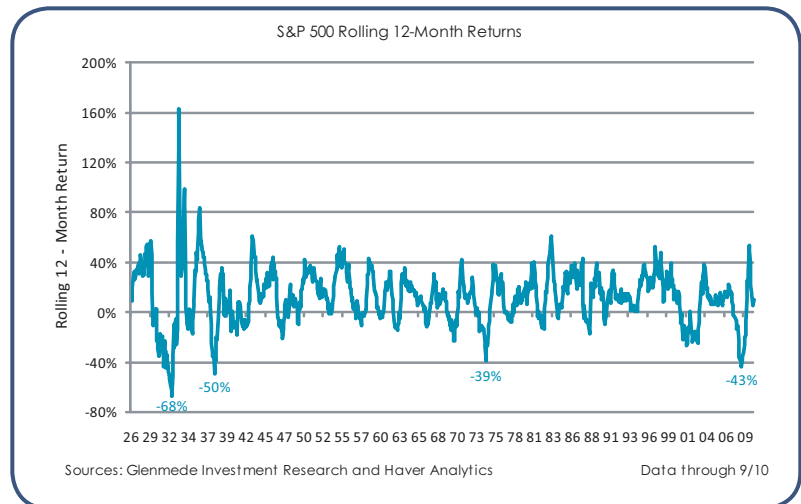
This may not sound expensive, but it is worth taking into account two factors. First, the current cost is higher than it was at any point during the Internet collapse. Second, a 40% decline is an extremely rare event. As shown in the chart below, if you examine each 12-month rolling period from 1926 to 2010, it happens about 1% of the time. An investor's ability to profit from this insurance depends not only on the occurrence of an extremely rare event, but also on placing the insurance at precisely the right time.⁴

So, what are we seeing? Strategies that protect against extreme events – inflation, deflation or outright market declines – are priced at a very large premium. How does this impact our perception about what is attractive and unattractive?

Valuation and Sentiment

Philosophically, as an investment firm, we like to invest where fear has created value. Investing is like shopping: It is preferable to buy during a sale. Investments tend to be discounted when sellers prematurely dump assets.

Conversely, the most attractive assets to sell are generally those that started off undervalued and were bid up to become priced like luxury goods. They are also the most likely to fall once the economic news swings a different direction and fashions change.



So, from this perspective, what stands out? Interestingly, there is not a particular asset class that shines brightly. On the sell side, however, it is clear there are a number of expensive assets and strategies. These strategies share a common attribute: Each is used to protect portfolios from extreme economic events.

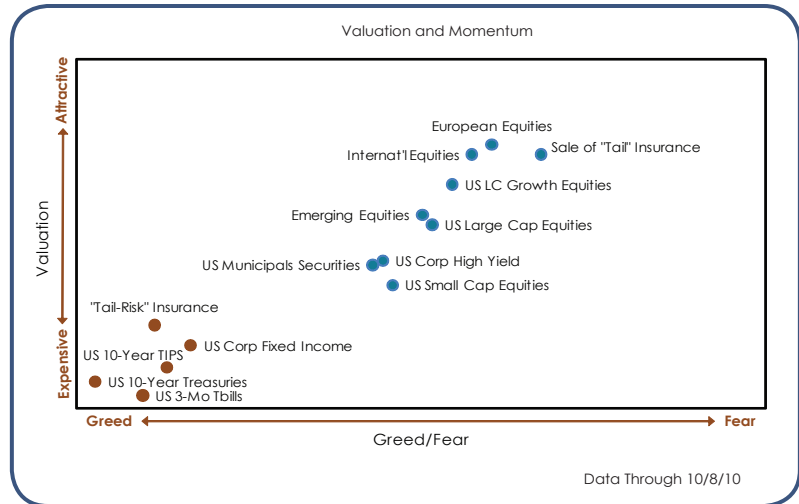
The chart on the next page shows our impressions of the valuation and sentiment indicators for major asset classes and strategies. Sentiment is the degree to which an asset's price reflects excessive optimism or pessimism, or greed and fear. When investors shun an asset due to a pessimistic outlook, the prevailing sentiment is fear. When an asset is valued based on an expectation of high returns continuing into the future without limit – such as Internet stocks in the late 90s – the prevailing sentiment is greed.

⁴ Protection strategies come with a time period. The example cited in the graph is for 12 months. If you buy a protection strategy for two sequential years with a 40% deductible and the market only falls by 20% within the 12- month window and then falls another 25% in the next twelve months, the strategy will not earn you any money.

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A highly attractively asset would land in the top right-hand corner. It is both cheap/undervalued and priced with a high level of fear. An unattractively priced asset would place in the lower left-hand corner. Its valuation shows it is expensive and priced with a level of greed.

Most equity strategies fall in the middle of the chart. Market sentiment for equity assets is balanced between fear and greed, being neither excessively cheap nor excessively expensive.



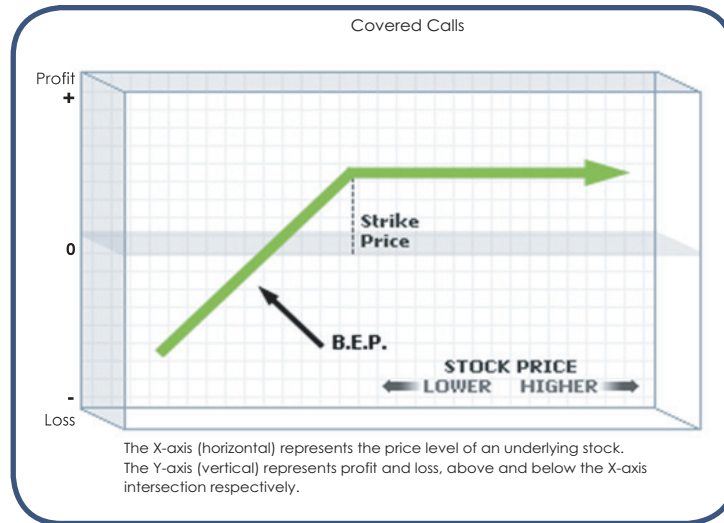
In contrast, most high-quality fixed-income assets show up in the lower left-hand corner. By our metrics, they are both expensive and priced with an excessive degree of optimism for future price appreciation. (Let me be clear, the optimism is based on the prospects for these assets and not the economy.)

Investing in the Current Environment

What would we do in this situation? We recommend the following:

1. **Lighten up on Treasuries and ultra-high-quality corporate bonds in favor of stocks.** High-quality municipal bonds are a challenge. The middle of the curve, intermediate maturity bonds, looks overpriced. Longer-term municipal bond pricing is more attractive, but it is very important to be selective. Budget problems at the state level have not yet crested. We believe the states will not only suffer from continued poor revenue growth, but will be the first to feel the federal austerity programs. Politicians will have difficulty cutting programs for which they are directly responsible. Instead, the more likely political outcome will be to cut aid to the states, which will subsequently cut aid to localities.
2. **With a lighter position in high-quality bonds, we recommend finding less-expensive risk control.** High-quality stocks with good balance sheets, rising dividend yields and high cash flows are better positioned to withstand market shocks and offer the potential for price appreciation in a slow-growth economy.
3. **Our secured option strategy, which shorts call options against an index of stocks, is also an appropriate risk-controlled strategy in this environment.** Here, the manager buys a stock index and sells call options, collecting a premium. In return for this premium, the investor relinquishes some of his upside. Still, the premium acts as a steady source of return or income, and cushions the portfolio from a downturn. As we have discussed throughout this paper, premiums are quite high right now. Historically, the BuyWrite Monthly Index (BXM), which replicates this strategy, has earned about the same as the S&P 500, with less risk.

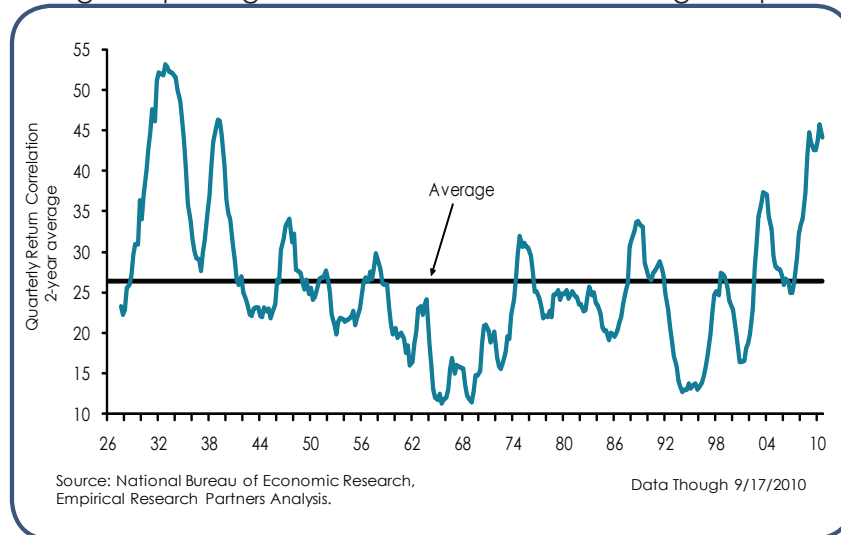
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Source: The Options Industry Council

4. **Global fixed income offers a more flexible approach that adjusts to market valuation levels.** The U.S. fixed income market may be overpriced, but that does not reflect global fixed-income markets. Global fixed-income managers have the freedom to fluidly move to the most undervalued markets and currencies. For investors looking for a place to hide from the dollar, this market serves as an alternative to gold.
5. **Equity managers who focus on stock picking are due to outperform.** The last 12-months saw an interesting phenomenon, one that tends to happen during macro events such as the 2008 subprime crises: a pickup in the correlation of returns between individual stocks. In a high-correlation market, stocks tend to be bought and sold with very little discrimination for individual company fundamentals.

Average Cap-Weighted Return Correlations of Large Cap Stocks



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Over the past 12 months, due to uncertainties in the long-term macro environment, the markets have been dominated by exchange-traded funds (ETFs), making it a rough environment for stock pickers. However, with this departure from a focus on fundamentals, the likely outcome is the mispricing of securities, thereby creating an opportunity for individual security selection. Following such a period, strategies that emphasize stock selection are now better positioned.

- 6. High-quality junk is still attractively priced relative to other fixed income assets.** High-yield bonds are one of the few places where it is possible to find an asset with high-income yields. This is a very desirable characteristic and one we suspect will lead to ongoing price appreciation. Given that high-yield bonds are not as extremely priced as directly following the subprime debacle, we like higher-rated (BB) high-yield credit. In a slow-growth environment, companies with very poor balance sheets and highly challenged business models may be unable to repay their debt, whereas high-quality companies with junk debt should be able to meet such obligations.
- 7. Invest in commodities instead of gold as an inflation hedge.** Theoretically, gold is overvalued and should be shorted. However, commodity prices follow maddeningly long trends. They can go from being very cheap to extremely cheap, and from very expensive to extremely expensive. Oil, as you may remember, reached more than \$130 a barrel before returning to the \$70-\$80 range. Keynes is attributed with saying "Markets can remain irrational longer than you can remain solvent." This sentiment is also applicable to gold prices. Given the value, we don't see a good justification for owning gold but we also would not short it. A better way to hedge against inflation is probably to buy a diversified basket of commodities. If the dollar is debased and becomes less valuable, commodities as a group will probably rise. Given that over time commodity prices and gold tend to move together, you could buy more commodities with not very much gold.

Letters to Clients

I was a prodigious writer when I first arrived at Glenmede. I produced a written commentary about once every week or two. Then reality and work set in, and after a year, I was down to once a month. For the last two years, my output has slowly dwindled to a quarterly client letter. Is this slower output a function of more job responsibilities or age-related sloth? Vanities aside, I feel neither answer really applies.

In the first place, we are fortunate Jason Pride joined us almost a year ago as our Chief Investment Strategist. He shares an increasing percentage of the writing duties and, importantly, he synthesizes our best thinking on the economy and investment strategy. He works alongside our other investment professionals to define a process that identifies assets and strategies that are both undervalued and timely.

Still, there is a second reason I am unable to write as frequently. Two years ago we dropped off our then ninth-grade daughter at a boarding school in Northern Massachusetts. The headmaster, a Philadelphia native and Penn Charter graduate, braced the first-year parents for the difficult process of separation. Once final goodbyes were exchanged, the parents were corralled into one last meeting where we were urged to resist the inclination to email, text or even access the web before driving through the school gates. And when we did arrive

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home, the headmaster recommended we follow an archaic and almost forgotten practice. He suggested we write our children a letter.

I remember how my grandfather sat in his study on Sunday afternoons to write his weekly letter to my uncle. My uncle was the son who lived in Europe and with whom my grandfather battled all through the teenage and non-college years. Without fail, my grandfather would adjourn to the small book-lined study and record the events of the week. Writing this letter was part of a weekly ritual that included early-morning communion, carefully washing his car with a chamois cloth and warm water, and eating a lunch of leftovers in the kitchen with my grandmother.

I have my own ritual. On Saturday morning I awake at the same time as during the week. I dress and feed the two greyhounds, Cowboy and Elbira. After breakfast and a quick run, Cowboy returns to his dog bed in our bedroom, and Elbira follows me into the office for a little company. This is when I type my daughter her weekly letter.

I have come to believe that writing a letter is the ideal way to communicate with teenage children. Trying to have a meaningful in-person conversation is usually a fruitless exercise. I know.

A letter has benefits for both parties. As the writer, I speak freely without disruption. I can pontificate on life-shaping events, lessons learned and subjects of interest. Were I to attempt this in person, I'd be met with eye-rolling impatience.

From my daughter's perspective, she only has to hear from me once a week. My voice arrives as a gift – a battered envelope in her mailbox. She can choose the time and place to break the seal and unleash her father's thoughts. When I go on too long, she can fold me up for later reading. And always, she knows that when she chooses to finish, it ends with "Love, Dad."

She has mentioned she is not the only one to receive an occasional letter from home, but that she is the only one to find accompanying economic charts. I am certain John and Abigail Adams would have done the same, if only they'd had access to Microsoft Word.

At many organizations, the management boasts that clients come first. And though I believe this to be true throughout our organization, in this particular case, it is not 100% true.

I look forward to writing you again, next quarter.

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