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Responses (Silly and Serious) to Recent Financial Market Volatility

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Given the magnitude of recent declines in the price of financial assets, commodities, and residential real estate, investors are coping with decisions about how to invest on a go forward basis. Our recent paper (appearing in our *Investment Quarterly* for Quarter 4, 2008] situates decision making within the context of investor ‘utility,’ where utility measures the investor’s aversion to declines in wealth as well as the investor’s satisfaction with gains in wealth. The essay demonstrates that there is no unique, universally correct, response to changes in wealth; rather, the response depends on the investor’s level of wealth and idiosyncratic risk tolerance.

The bad news is that prescriptive formulae applicable to all investors do not exist; the good news is that the recent downside volatility has forced investors to re-calibrate their investment policy to better match risk tolerance at their current wealth level. A more detailed exposition of these concepts is found on our website at www.schultzcollins.com under the “Current Topics” heading of “Static vs. Dynamic IPS.” A slightly revised version of this co-authored paper will appear in a forthcoming issue of *The Banking Law Journal*. Additionally, we refer investors seeking insight into suitable asset management strategies for portfolios making periodic distributions to the article, “[Managing Retirement Portfolio Withdrawals in Turbulent Times](#),” by Patrick Collins, published by *Wealth Strategies Journal*.

The objectives of this essay are (1) to evaluate some of the advice currently proffered to investors; and (2) to provide insight on important factors for prudent decision making. With regard to the first objective, with some tongue in cheek, we divide current advice into two subcategories: completely worthless; and, almost completely worthless. We hasten to add that the advice may not necessarily be *wrong*; rather, that it may not be *credible*. A trivial example is the stereotype of a stockbroker who advises clients according to the following guidelines – if a client has no current additional investible funds, the recommendation is to sell risky securities until the market has hit bottom; if a client has uninvested cash, the recommendation is to take advantage of this historic buying opportunity. To reiterate, although this advice may not be incorrect, it may reflect the broker’s personal business imperatives as much as it incorporates objective and well considered analysis. It is perversely amusing to find some mutual funds putting out communications about the wisdom of staying the course; security trading software vendors putting out communications about the wisdom of market timing; money managers touting the best sectors to be in now; advice magazines listing the 10 top ideas for 2009 (as sometimes advocated by their advertisers); hard asset salesmen recommending gold coins; and so forth. Perhaps the most perverse twist is the real estate gurus who, in 2007, were advising seminar attendees to mortgage their homes to buy investment real estate; and, in 2009, are telling seminar attendees to mortgage their homes to buy foreclosure bargains. The entrepreneurial spirit of W.C. Fields seems to be alive and well – “Is this a game of chance? Not the way I play it, no.”

We next consider an article appearing in a trade association publication. The author is an associate of a well-known asset management firm. He asserts the following:

1. Market declines are inevitable;
2. It is difficult to predict the ultimate magnitude of the current stock market decline;
3. There is a “sense of fear that magnifies perceptions of risk and causes stock prices to discount more than fundamentals would dictate;”
4. History can act as a guide for future actions.

His response to current market volatility is to note that during the period 1950 to the time of the article’s publication, the stock market (proxied by the S&P 500 stock index) has declined by 15% or more a total of twelve times. Bear markets exhibit an average downturn lasting about 12 months; bull markets exhibit periods of price increases averaging approximately 42 months. Further decomposition of the data indicates that bear markets that coincide with economic recessions last an average of 15 months. Following the 12 bear market periods, investors who stayed the course fully recovered losses over an average period of 14 months. The author concludes “patience during downturns will ultimately reward market investors.” [“Anatomy of a Recovery,” Stephen Savage, *Financial Planning* (September, 2008), pp. 147-149].

Although there is nothing wrong with the author’s data, there may be significant flaws in his logic. Not only are his conclusions based merely on historical “happenstance;” but he has fallen victim to the “flaw of averages.” Most readers are familiar with the “law of averages”—parameter values derived from random sampling of events with finite means and variance become more certain as the sample size increases. The law of averages, however, says nothing about any specific event. The probability of flipping heads from a fair coin does not increase if the last 10 coin flips were tails. There is nothing that says that any single event (market decline) will exhibit mean/variance values that reflect a long-term steady-state average.

Here is proof of the “flaw of averages” (where the “flaw” is to incorrectly apply the “law”). Imagine a drunk walking between the double yellow lines on a two-way road. Sometimes he will stumble to the left into oncoming traffic; and sometimes he will stumble to the right. On average, the value of the inebriated walk finds the drunk in a zone of “safety” – the cars will not hit him when he is between the yellow lines. The expected value of the journey is safety; the actual or ‘realized’ value of the journey is likely to be disability or death. Like the drunk, investors must live with actual results, not average results. The probability of a quick recovery does not increase as a result of rapid recoveries from past bear markets. This is the same error as the coin flip fallacy described above. During the Great Depression it took an investor 25 years to recover from an 89% decrease in the value of the Dow Jones Industrial Average.

Should investors adopt strategies designed to guarantee safety of principal – i.e., to maximize the likelihood of preserving a minimum, a “Max/Min” strategy? Should investors consider this an historic buying opportunity and pursue a “Max/Max” strategy? These issues are at the heart of the risk/return tradeoff. During particularly volatile markets investor views may tend to oscillate between two competing vectors: (1) further declines in portfolio values may permanently preclude the attainment of critical economic objectives (e.g., a threshold retirement standard of living); and, (2) the opportunity costs of forsaking long-term risky-asset returns may have the same effect. This is not a mere restatement of the trite “fear and greed” dynamic that the popular media likes to express; it is a sobering statement that the long-term investor must consider the risk/return tradeoff carefully, because the attempt to protect a portfolio from

downside volatility protects it also from the upside returns that may be required to fund future consumption goals. A “safe” portfolio that is unable to support the investors’ long-term standard of living may not be a prudent portfolio. Both the level of current wealth and the expected returns on current wealth are critical, because these variables determine the feasibility of future consumption.

But the above paragraph offers merely truisms. They are helpful to the extent that they clarify the context in which decisions are made; but, with one exception, they do not provide a solid basis for actually making a decision. The exception is the case where a minimum targeted income stream is required to fund subsistence consumption, where subsistence is defined subjectively according to each investor’s circumstances. Again, this is a truism (“don’t gamble with the rent money”), but it is worth mentioning because, in the wealth management context, it leads one towards actuarial solutions to financial problems. However, it is also important to state that, for investors holding current wealth substantially greater than is required to fund a threshold consumption level, there is no consensus opinion that segregating a large portion of their portfolio to “safe” investments – lacking the ability to generate future growth – is an optimal strategy. Indeed, many argue that investors will be better off with a well diversified portfolio. Such a portfolio provides an opportunity for total return that can address both future threshold consumption needs as well as future opportunities in the investment set – income and growth.

If Mr. Savage’s data mining of history is a poor process on which to base investment decisions, are there alternative analytical approaches that may be more prudent? Let’s return to his last two assumptions:

- There is a “sense of fear that magnifies perceptions of risk and causes stock prices to discount more than fundamentals would dictate;”
- History can act as a guide for future actions.

There is a further conceptual difficulty with these statements. The first statement implies that markets are irrational; the second that irrationality can be used as a guide, albeit imperfect, to decision making, because somehow asset prices will return to their “proper” valuations from their irrational wanderings. The second statement implies equilibrium: if equity markets tend towards a long-term equilibrium, then (all other things held equal) stocks are safe assets for long-term investors. But the first statement implies disequilibrium: if equity markets are truly irrational, then any discernible pattern is no more than an artifact of the data series and, therefore lacks predictive value. If such is the case, equity markets are not safe, variance may be “explosive,” the effects of economic shocks may be persistent, and only unscrupulous market manipulators and greedy financial intermediaries can emerge unscathed.

To have a credible viewpoint on the stock market, you must have a credible viewpoint on the concept of market equilibrium. It is not sufficient merely to assert the obvious empirical fact that stocks have historically yielded higher long term total returns than U.S. Treasury Bills, notes and bonds. When stocks underperform bonds, the magnitude of the cumulative potential losses may be larger for long-horizon investors. We refer you to the earlier statement that it took the Dow 25 years to recover its Depression-era losses. Conservative investors will not fall under the spell of the flaw of averages, but rather, will heavily weight the downside risk possibilities. As we assert in the Static vs. Dynamic essay located on our website, for some investors, the “growth optimal” or “maximum Sharpe Ratio” portfolio asset allocation gives way to the state-

preference portfolio allocation, where payoffs in recessionary environments are more valued than higher payoffs in prosperous times.

The above paragraph provides the first hint at how to get our arms around the concept of stock market equilibrium. Under a state-preference approach to asset pricing, the market represents the aggregate consumption preferences and utility of wealth (risk aversion) characteristics of the representative market participant (stock investor). If interest rates are low and investment opportunities are unattractive, the investor tilts towards precautionary savings (and, draws on wealth to support current consumption); if interest rates are higher and investment opportunities more attractive, the investor tilts towards deferring present consumption opportunities (and precautionary saving) in favor of investing to capture the possibility of even higher future consumption opportunities. The first environment tilts the investor towards savings, and towards consumption out of current wealth, making further deterioration in the stock market (i.e., in the investment opportunity set) possible; the second tilts the investor away from maximizing current consumption opportunities and towards investing. This is a “partial equilibrium” condition in which asset price levels are a function of consumption growth, expected asset returns, and the correlation between them. Prices change as the investment opportunity set becomes more or less attractive. So, by the same token, this is also a “partial disequilibrium” condition. Mr. Savage’s “popular-press” article characterized the “partial disequilibrium” condition inaccurately and inappropriately. Asset prices are constantly changing due to changes in real interest rates, risk premia (expected return on stocks minus expected return on risk-free bonds); volatility shocks (the volatility of volatility); and the complex feedback loops that exist among these factors.

The investor’s utility per unit of wealth also changes over time, and may require changes in a portfolio’s asset allocation. The change in investor utility is a function of the level of wealth (close to or far away from a critical threshold level), and on the covariance of asset returns with changes in wealth. If the economic climate never changed, then the portfolio asset allocation suitable for a short term investor would be suitable also for a long-term investor. However, as economic changes occur, the short-term investor may gravitate towards cash, and long-term investors may gravitate towards assets that exhibit payoffs that are negatively correlated with consumption growth opportunities. These are assets that, all else equal, will have relatively higher payoffs in poor economic environments in which consumption becomes difficult. This is one reason (i.e., inter-temporal consumption hedging) why investors want to include a bond position in their asset allocation. Bond returns tend to increase when interest rates decrease.

On a relative basis, some government guaranteed bonds have attractive payoffs in a recessionary economy. A portfolio of long-term bonds, however, would perform poorly in a stagflation recession. The safe asset for the short term investor is cash; the safe asset for a long-term investor is inflation adjusted treasury bonds. Cash is not a safe asset for a long-term investor because it must be constantly reinvested at uncertain future interest rates. Inter-temporal hedging demand motivates investors to own bonds rather than stocks.

So why would long-term investors want to own stocks? Because they have high *average* long-term returns. Is this important, or is it just another instance of the flaw of averages? Here is the argument for stocks as expressed by Wharton Professor Jeremy Siegel [[Stocks for the Long Run](#), McGraw-Hill (1994)]:

“It is widely known that stock returns, on average, exceed bonds in the long run. But it is little known that in the long run, the risks in stocks are *less than* those found in bonds

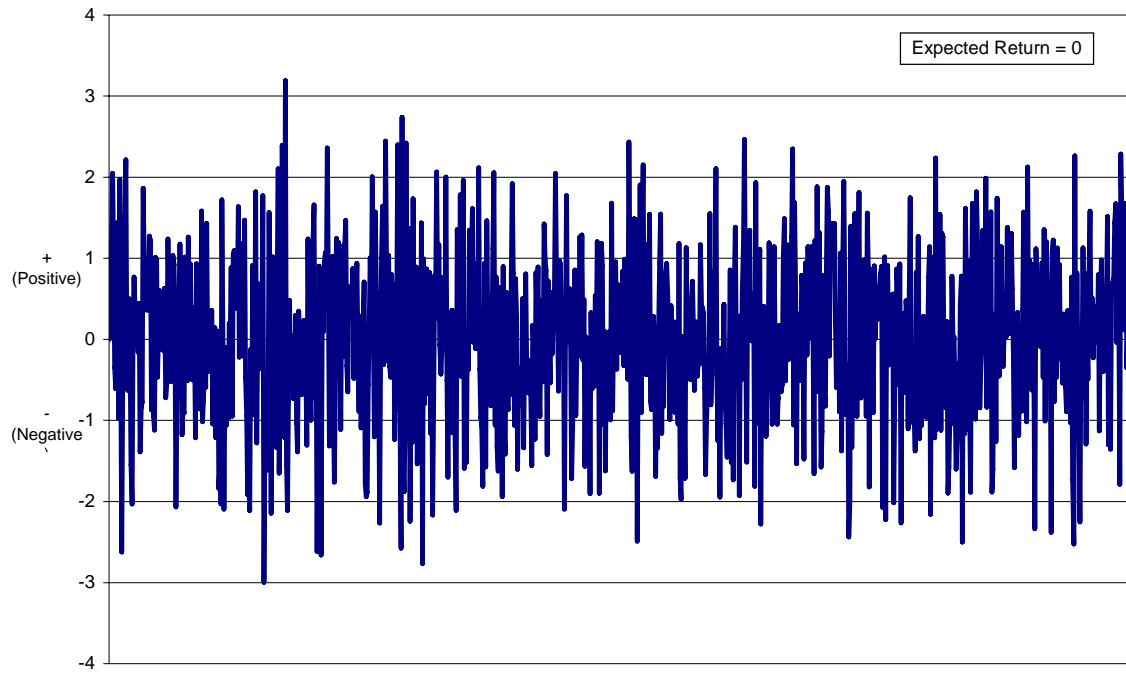
or even bills! ... Real stock returns are substantially more volatile than the returns of bonds and bills over short-term periods. But as the horizon increases, the range of stock returns narrows far more quickly than for fixed-income assets ... Stocks, in contrast to bonds or bills, have never offered investors a negative real holding period return yield over 20 years or more. Although it might appear riskier to hold stocks than bonds, precisely the opposite is true; the safest long-term investment has clearly been stocks, not bonds.”

“Ah-ha!” you say, “but this is merely the same historical data mining approach, albeit more elegant, as used by Mr. Savage. What makes Siegel’s claims any more credible?”

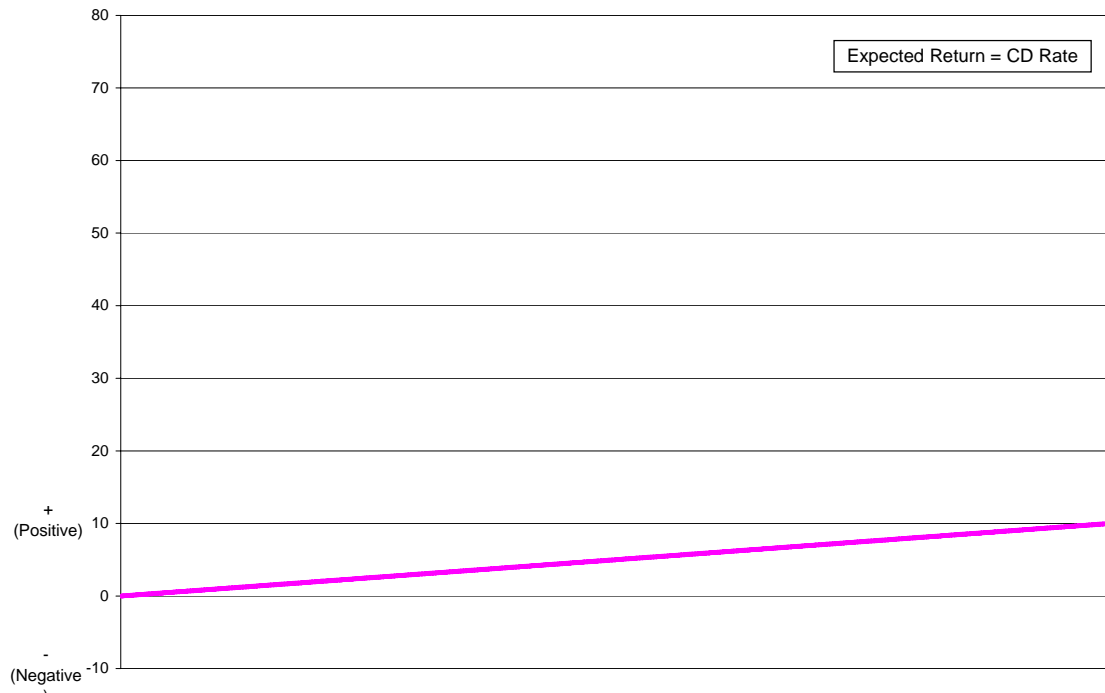
An array of econometric evidence suggests that Siegel’s claims may be correct. We define econometrics as the application of statistical techniques to problems in finance. In recent years econometrics has become increasingly important in the attempt to understand the characteristics of the underlying processes responsible for generating financial returns. Without becoming too abstruse, we assert that if econometric analysis demonstrates certain types of behaviors for returns of assets, then it is more likely than not that Siegel is on to something.

A key issue is whether stock market returns are pure “noise,” exhibiting no propensity to head off in any long-term direction; a “random walk,” in which case the return series will wander far away from its long-term mean and exhibit an equal propensity to produce long periods of profits and long periods of losses with little discernible likelihood for producing real long-term growth; a deterministic time series with no variance (like a long-term certificate of deposit); or a “drift and diffusion” process that has a long-term equilibrium drift coefficient (drift is the long-term steady state or equilibrium value that represents the true but unobservable long-term expected return) commingled with a possibly mean-reversionary diffusion process. The following charts depict the four types of return series:

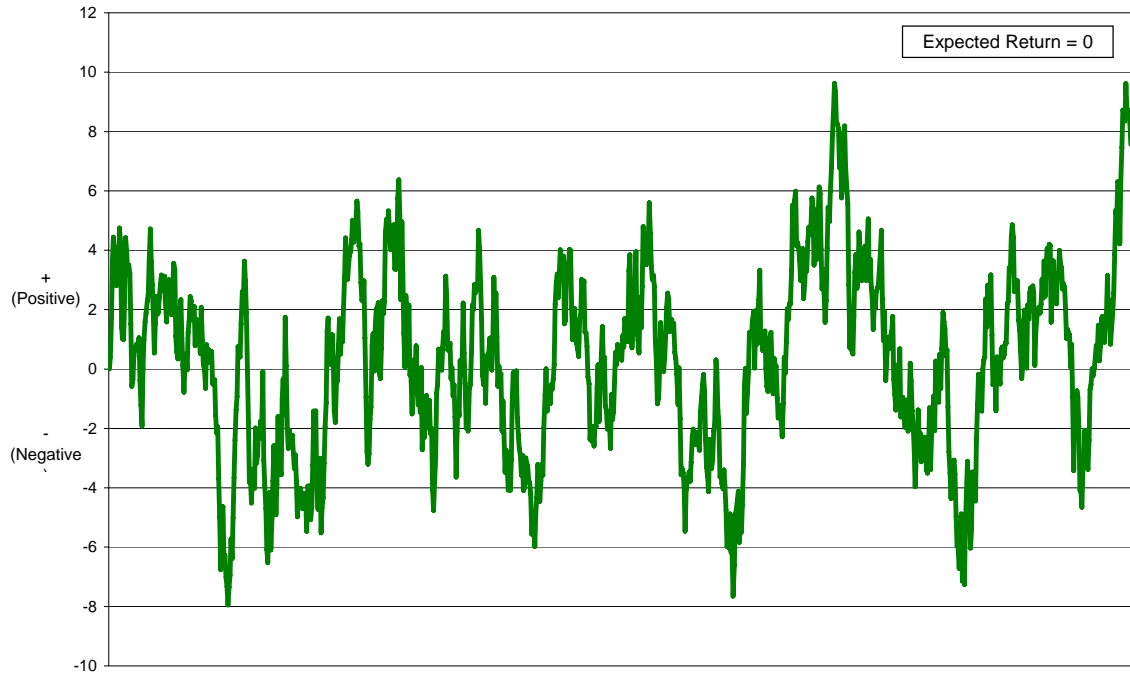
White Noise



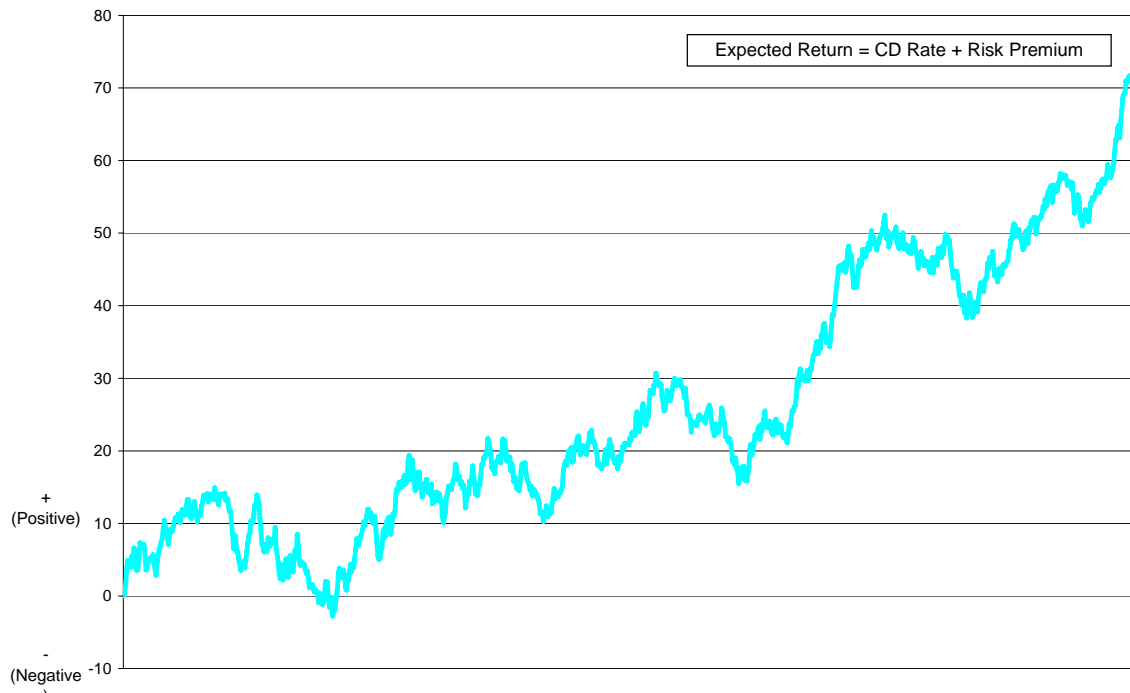
Deterministic



Random Walk



Drift & Diffusion



If the stock return process has a positive drift component combined with a diffusion process that, in the short term, generates either above-equilibrium returns or below-equilibrium returns, then two results follow:

1. Investors can expect to be compensated via a risk premium for tolerating the ups and downs; and,
2. The long-term compensation from holding stocks will be greater than the long-term compensation from holding bonds or cash.

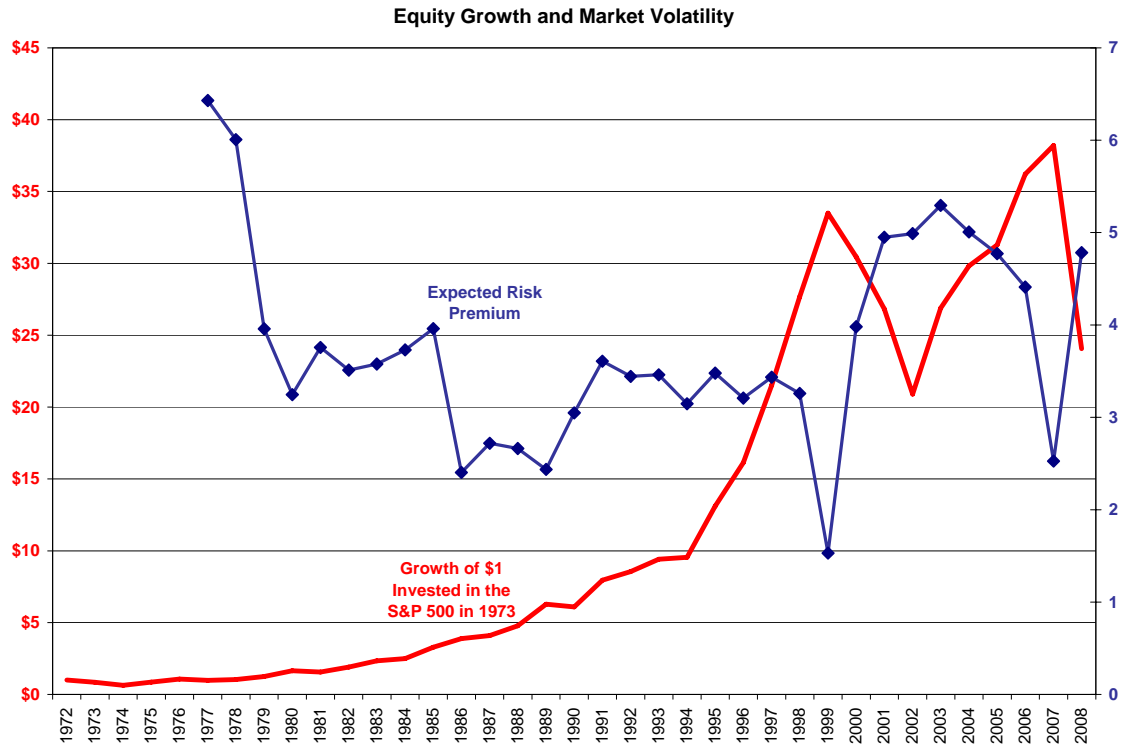
An *infinitely* risk averse investor will hold only the safe asset (cash if the planning horizon is short, inflation-adjusted bonds if it is long), and will not be attracted by the higher expected return potential of stock investments. Long-term investors with average utility of wealth (risk tolerance) and moderate to high consumption/wealth ratios will want to own both stocks and bonds, especially if the portfolio is distributing retirement income (cash flows create path dependencies that make the sequence of returns more important than the geometric average – another variation on the “flaw of averages”). Long-term investors focused on wealth accumulation will also have a positive demand to hold stocks, especially if stock returns are mean reverting. Mean reversion means that periods of high stock returns are likely to be followed by periods of lower returns. In today’s economic climate, a mean reversionary tendency suggests that unexpectedly low returns may be followed by unexpectedly high future returns. Is this an historic buying opportunity?

There is some econometric evidence that suggest that equity markets are mean reverting. The nature of the evidence is technical, but the main points include:

- Shocks to returns are not persistent (volatility decays);
- There is feedback from volatility to the expected risk premium. This feedback loop suggests a time-varying risk premium, where higher than expected returns are followed by lower than expected returns;
- Conditional variance (variance based on current market factors) of long-term stock returns differs from unconditional (historical) variance, in that it generates a convergence of stock returns towards their equilibrium. If conditional variance is lower than its historical mean they will converge from below; if higher, from above. Merely basing calculations on historical averages therefore provides an unrealistic picture of the mean reversionary tendencies of volatility; and,
- The volatility of stock returns is itself time varying, and tends to manifest in “clusters.” Periods of high volatility make future stock returns more uncertain, with the inevitable result that stock prices decrease; when such periods are followed by low volatility, stocks prices adjust upwards as the market becomes less uncertain.

Econometric analysis of volatility shocks indicates that proportional changes in volatility are negatively correlated with stock returns; that such proportional changes in volatility are greater in times of high volatility than they are in times of low volatility; and that volatility is mean reverting.

Consider, for example, the following chart that illustrates the volatility of the growth of one dollar and the expected (forward looking) risk premium during the period 1973 through 2008.



The red line represents the growth of \$1 invested in the S&P stock index during the applicable period, while the blue line represents the expected equity risk premium. The expected risk premium is the expected return in excess of the risk-free one-year T-Bill rate. It is always positive, because without the prospect of additional compensation for risk, no rational investor would commit funds to the market. The realization of the risk premium can, of course, be sharply negative when the S&P 500 underperforms the T-Bill.

The up and down movements in the red line are a visualization, albeit somewhat crude, of market volatility. When volatility is measured by the standard deviation of returns instead of by their rate of change, it is “unobservable,” in the sense that the value of the standard deviation statistic changes with the scale of the measurement period. Simply stated, for equity return series, daily volatility annualized generates a much different standard deviation value than monthly volatility annualized.

The calculation of the expected risk premium is a function of market volatility as measured by the standard deviation statistic. The ratio of volatility averaged over the previous five years to volatility averaged over the entire period is multiplied by the average risk premium for the entire period. Higher than average volatility during previous five-year periods tends to drive stock prices lower. But lower stock prices make higher expected future returns possible because, as the ratio of recent volatility to historical volatility reverts towards a value of one, investors are likely to return to a less uncertain market, and thus bid up prices.

Although this chart suggests that market timing is possible, we hasten to add that it is only a simplistic depiction of the concept that expected future returns in excess of the risk-free rate tend to increase following periods of downside price volatility, and decrease when volatility calms down. But no short-term stock trading rules can be extracted from this chart. There are

many studies on the subject of volatility forecasting and future expected stock returns, but little consensus on whether excess profits can be earned by investors after considering trading costs. Still, it is interesting to observe that, according to the admittedly oversimplified metric depicted in the chart, the recent decline in stock prices has dramatically increased future expected rewards from holding equity. Vanguard's John Bogle, for example, recently wrote that the U.S. stock market is currently priced to produce a 10.5% future return on stocks. [John C. Bogle & Rodney N. Sullivan, "Markets in Crisis," *Financial Analysts Journal* (January/February, 2009), p. 24.]

We finally return to the risk/reward tradeoff. Should investors return to the stock market? The answer depends on your beliefs about long-term equilibrium. If you believe that the expected risk premium is both constant and can be approximated by its long-term historical average, then long-term stock investors are likely to earn a substantial return above the risk-free rate. However, they earn this return purely as compensation for risk so that, on a risk-adjusted basis, they do not receive a free lunch. Practically, this means that investors cannot take much comfort in the fact that long-term stock ownership is safe solely because prices have historically rebounded from bear-market lows. As Paul Samuelson noted many years ago, the long run also increases the probability for realizations of financial catastrophes. Risk-averse investors holding these beliefs will not want to over weight their portfolios towards a 100% equity allocation. In the main, they will take on as much stock market risk in the long run as they are comfortable with in the short run. If, in the short run, the investor is unable to afford substantial portfolio declines, he will tilt towards bonds.

However, if you believe that stock returns are mean reversionary, stocks become a safer asset for long-term investors. Although they may diverge from their equilibrium return, generating either substantial gains or losses during any single period, they are pulled back towards the long-term mean. Additionally, if they mean-revert, it is foolish to extrapolate either recent high returns or low returns indefinitely into the future. Although, the long-term equilibrium value towards which the return tends may be more meager than the spectacular risk premium generated by stocks in the twentieth century, nevertheless, the expectation of a positive risk premium will cause rational long-term investors to shake off short-term portfolio declines in order to capture the higher average returns to equity. Bottom line – most investors with wealth levels in excess of those required to fund critical threshold liabilities will want to own equity. The extent of the demand to hold equity, however, depends both on investor risk tolerance and investor "learning" regarding the econometric characteristics of financial asset return series, for which history provides only a single sample. SCLC recognizes our obligation to help you work towards a coherent view of your risk tolerance and demand to hold stocks, and we look forward to discussing these topics with you in 2009.