

Benjamin Graham and Risk

By Bruce Grantier¹

This is an article in a Brandes Institute series addressing the question, “What is risk?” This article was written by Brandes Institute Advisory Board member Bruce Grantier, CFA. He submitted a modified version of this article to the CFA Institute in response to its calls for comment on the proposal to amend the Asset Manager Code of Professional Conduct to include a requirement relating to risk management.

Beta is a more or less useful measure of past price fluctuations of common stocks. What bothers me is that authorities now equate the beta idea with the concept of risk. Price variability yes; risk no. Real investment risk is measured not by the percent that a stock may decline in price in relation to the general market in a given period, but by the danger of a loss of quality and earnings power through economic changes or deterioration in management. (Benjamin Graham, as cited in Montier, 2007)

INTRODUCTION

In this article, I review the modern portfolio theory (“MPT”) concept of risk and Benjamin Graham’s and other value investors’ concept of risk. I conclude with some comments on the differences in the two definitions.

This article draws on diverse sources, including:

- *The Intelligent Investor* by Benjamin Graham
- *Value Investing from Graham to Buffett and Beyond* by Bruce Greenwald et. al.
- *Capital Ideas* by Peter Bernstein
- *Behavioural Investing* by James Montier

This article makes reference to several key elements of MPT while exploring risk, including:

- Mean-variance analysis (“MVA”) – developed by Harry Markowitz in 1952
- Capital asset pricing model (“CAPM”) – pioneered by William Sharpe in 1964
- Efficient market hypothesis (“EMH”) – a result of Eugene Fama’s work in 1965

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Benjamin Graham and Risk

This article is not a challenge to MPT. There is already ample ongoing debate among very much more sophisticated commentators than myself, including the above-noted original authors, who acknowledge MPT's limitations and advocate broader perspectives.²

THE MPT CONCEPT OF RISK

THE THEORY

MVA combines risk and return to select portfolios which lie on an “efficient frontier.” Those portfolios on the frontier have the best combination of expected return per unit of risk at different levels of risk. The introduction of “portfolio variance” (Markowitz’s term for risk) as a partner with return is, according to Peter Bernstein (1992), “the most famous insight in the history of modern finance... (and) ...ultimately transformed the practice of investment management beyond recognition.”(p. 41)

William Sharpe subsequently and significantly advanced the MVA theories of risk, return, and efficient portfolios. Sharpe was working on a simplification idea with Markowitz as his thesis supervisor. While giving much credit to Markowitz’s ideas, Sharpe’s insight was that a single index, the market, represented the dominant source of variability of all efficient portfolios. The remaining stock-specific risk could be diversified away, leaving *beta* as the sole source of risk.

Beta, the market return coefficient in the Sharpe-Lintner-Treynor³ CAPM for pricing stocks (and other assets), represents sensitivity to market returns. CAPM contends that a stock’s volatility

² See for example:

“Market Efficiency: A Theoretical Distinction and So What?” Harry Markowitz, *Financial Analysts Journal (FAJ)*, Sept/Oct 2005. The author points out that CAPM, while elegant, clean and simple, and “a thing of beauty” is very sensitive to its assumptions, in particular; the unlimited, costless borrowing and lending assumptions. Markowitz is quick to note that his former student, William Sharpe, never claimed all the assumptions were realistic, just that they had to be invoked for the model to satisfy conditions of equilibrium. However, in today’s hedge fund-driven markets, Markowitz concludes “it is time to move on.”

Investors and Markets: Portfolio Choices, Asset Prices, and Investment Advice, William Sharpe, Princeton University Press, 2007. This book is about William Sharpe’s alternative to CAPM: a version of the state preference approach originally developed by Kenneth Arrow in the 1950’s. This theory does not depend on all the assumptions of CAPM but uses probabilities of return expectations which can change over time in future scenarios.

Sharpe, Fama and French all suggest that both CAPM and other models such as state preference theory should be taught in advanced finance courses.

³ From Peter Bernstein’s *Capital Ideas*: The three coincidentally were working on the same questions in the early 1960’s. Sharpe’s paper was published first (facilitated by Merton Miller). John Lintner (Harvard) and Jack Treynor (MIT) discussed their work with Sharpe, but for various reasons did not hit the same academic mainstream as Sharpe. Ironically, Sharpe’s paper was initially rejected by the *Journal of Finance* because its editor felt the assumption that all investors acted the same (i.e., everyone using Markowitz mean-variance optimization) was “preposterous.” Merton Miller interceded on behalf of Sharpe and eventually convinced the *Journal* to publish what soon became the single most-cited paper in finance.

Benjamin Graham and Risk

relative to the market is the only risk that matters, since, adjusted for market volatility (or systematic risk), the remaining volatility is specific to that stock and can be diversified away – and should be, by an investor seeking mean-variance efficient portfolios. *Alpha* is the return specific to the stock and is a residual compensating for the specific risk not explained by *beta*. As I shall discuss, higher *beta* stocks have higher volatility than the market (i.e., are riskier) and consequently should have higher returns over time.

Eugene Fama's EMH, the third element of MPT, was outlined in his doctoral thesis, published in 1965. While the term "efficient frontier" was Markowitz's creation, a similar phrase was adopted by Fama. In EMH, the term "efficient" refers to the minimal friction between new information entering the market and the outcome on market prices. Fama acknowledged that an efficient market is not necessarily a rational market; just that the adjustment to new information made it difficult to consistently outperform the market. In his 1965 paper, he tested three forms of the EMH:

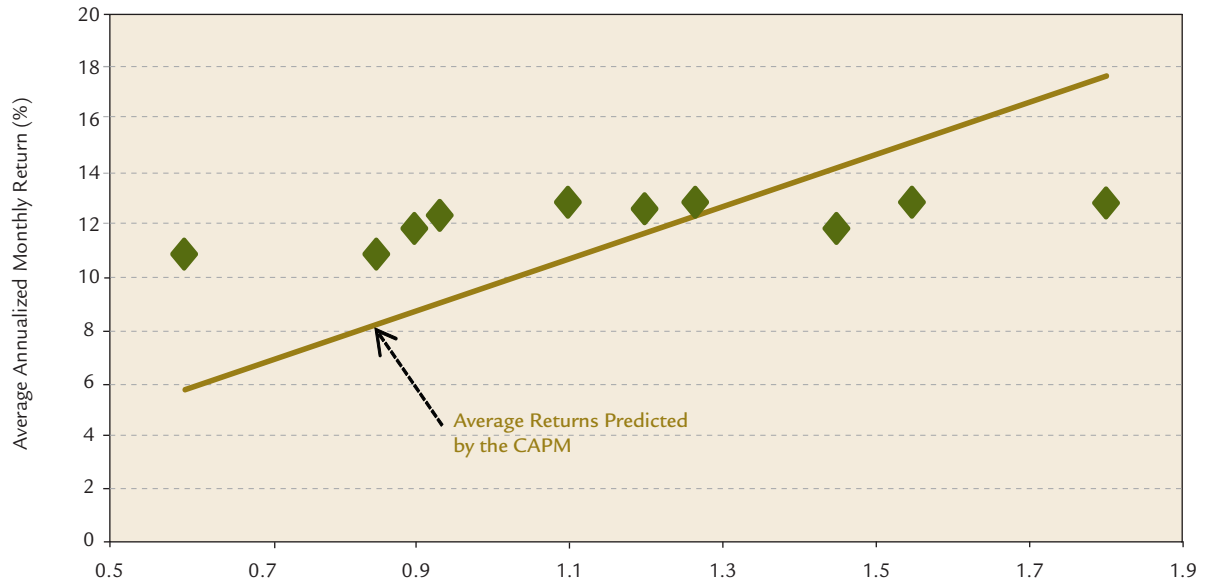
- Weak - Fama found quite convincingly that past prices provide no useful information regarding future prices.
- Semi-strong - Markets are efficient at adjusting to publicly available information.
- Strong - There is only limited evidence against the EMH that insiders and superior analysts can consistently profit from information. The EMH puts the cap-weighted market on the efficient frontier, making the argument for passive management.

THE EVIDENCE

The above (albeit brief) sets out the theory for *beta* as a measure of risk. Empirically, however, a body of research has emerged which challenges the theory. Value stocks (those with low Price/Earnings ratios (P/Es) and low Price/Book ratios (P/Bs)) were found to have lower *betas*, but have *higher historical* returns than growth stocks. This was contrary to the notion that returns go hand in hand with risk, which is at the heart of MPT. Such research emerged not long after Sharpe's paper in 1964 – with the first studies published in 1968... and they are still coming. An exhaustive study by Fama and French (2004) reviews this literature. Their study examined all New York Stock Exchange, American Stock Exchange, and NASDAQ listed stocks between 1929 and 2003. It found there was almost no relationship between returns and *beta*. Exhibit 1 is from this paper and is discussed by behavioural finance author, James Montier:

Benjamin Graham and Risk

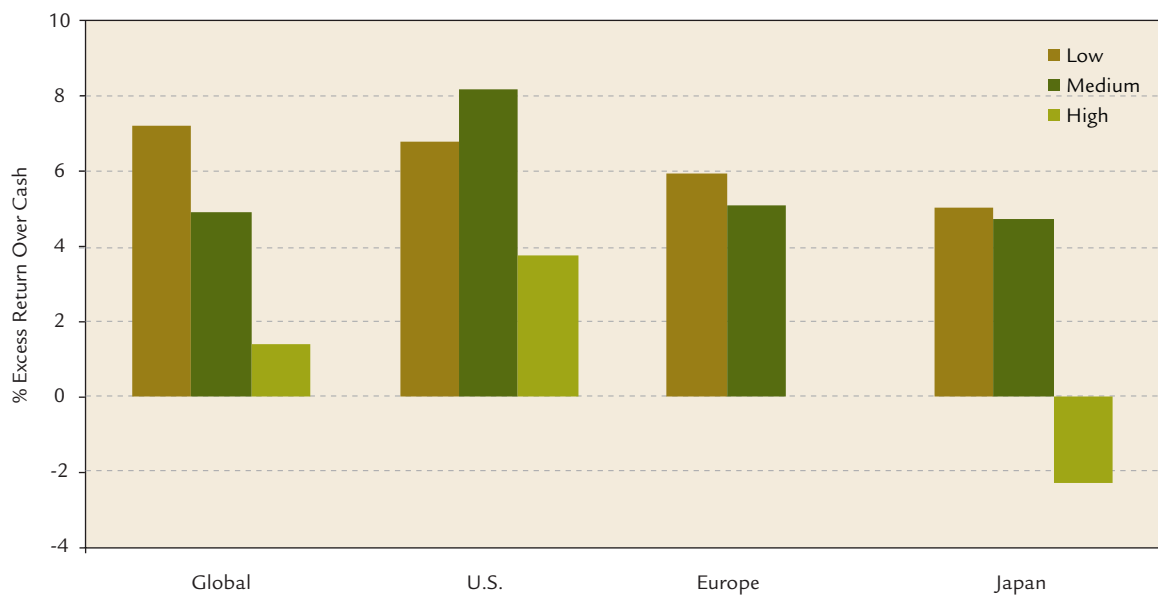
EXHIBIT 1– U.S. STOCK RETURNS AND BETA (1929-2003)



Source: Fama and French, as cited in Montier, 2007

Referencing the exhibit above, Montier (2007) said, “There is an overwhelming amount of evidence that CAPM simply does not work.... CAPM woefully underpredicts the returns to low beta stocks and massively overestimates the returns to high beta stocks.” (p. 428) Montier’s own research found the same low beta-high returns in Global, European, and Japanese markets, as shown in Exhibit 2:

EXHIBIT 2 – RISK AND RETURN: THE EVIDENCE (1986-2006)



Source: Biltz and Vilet, as cited in Montier, 2007

Benjamin Graham and Risk

VALUE INVESTORS' VIEWS ON BETA

In addition to Benjamin Graham's quote at the beginning of this piece, many other value investors have views on *beta*.

Warren Buffett writes in Berkshire Hathaway's 1993 *Annual Shareholder Letter*:

We define risk, using the dictionary terms, as "the possibility of loss or injury." Academics... like to define investment "risk" differently, averring that it is the relative volatility of a stock or portfolio of stocks... compared to a large universe of stocks. Employing databases and statistical skills, these academics compute with precision the "beta" of a stock... and then build ...investment and capital allocation theories around this calculation... for a single statistic to measure risk... For the owners of a business – and that's the way we think of shareholder, the academics' definition of risk is far off the mark.⁴

Charles Brandes writes in *Value Investing Today* (2004):

Volatility is measurable, uncertainty is not... defining volatility as risk (as MPT does) obscures the true definition of investment risk as the possibility of losing money. ...Beta is used primarily by those who are looking at the whole market (or large numbers of stocks within it) and who don't look in detail at the fundamentals of specific companies. As I have shown for value investors, this concept is irrelevant and downright dangerous at worst.⁵

THE ORIGINS OF MPT

To digress momentarily, Bernstein's *Capital Ideas*, provides insights into the mathematical/computer-based origins of mean-variance efficiency and CAPM.

Harry Markowitz worked at the Cowles Commission while earning his Ph.D. at the University of Chicago around 1950. The Director of Research there was Tjalling Koopmans, a 1975 Nobel Prize recipient for his development and application of linear programming (LP) to economic statistical modeling.⁶

Markowitz was searching for a dissertation topic and wanted to apply LP to investing. His thesis advisor was supportive and sent him to the library to read John Burr Williams' "The Theory of Investment Value" – mainly about applying dividend discount models to investing. After reading

⁴ Berkshire Hathaway 1993 *Annual Shareholder Letter*.

⁵ In his book *Value Investing Today*, Brandes attributes this quote to Malcolm Mitchell, the managing director of the Center for Investment Policy Studies.

⁶ LP is considered an operations research technique. It requires input variables and constraints and solves problems which have multiple outputs or solutions. A three-dimensional example of an LP output might be the set of points defining one surface of a cube. A two-dimensional example might be the set of points defining a side of a square. Markowitz' efficient frontier – a two-dimensional model – is not a linear but quadratic function. The mean-variance efficient frontier is wing-shaped due to the squaring of differences required in variance and covariance.

Benjamin Graham and Risk

Williams, it occurred to Markowitz that valuing a single stock was not sufficient, as most investors prefer a portfolio of securities. Portfolios involve how stocks move together – hence variance and covariance become relevant. LP cannot be done with one variable alone (that obvious one being return). At this point, Markowitz was one variable short of a thesis. Markowitz realized that volatility of returns should be the other variable and, in an afternoon in the library, he worked out the math. His mean-variance efficient frontier places volatility as an equal partner to return in portfolio selection, and subsequently volatility became accepted by many as the proxy for portfolio risk. Interestingly, one of his dissertation committee members (Milton Freedman), reflecting the highly original nature of the thesis, noted the subject was neither economics nor finance.

William Sharpe was a doctorate student at UCLA in 1960 in the field of economics, while also taking finance subjects. After some attempts at non-investment related dissertation topics, it was suggested by the dean (Fred Weston) that his supervisor could be Harry Markowitz (though not a faculty member at UCLA). Markowitz had just moved to Los Angeles to work for the RAND Corporation. Markowitz was continuing work on a simplified form of his mean-variance model in a genuine effort to address the concerns over the highly demanding computer capacity required to solve for mean-variance efficient portfolios. Weston knew Markowitz's work and believed Sharpe could handle the technicality and complexity. William Sharpe, in his own words, "was and still is a self-professed computer nut." Markowitz was glad to have Sharpe assist with this work. Markowitz's idea was to use a simplifying proxy for huge volume covariance calculations required in large portfolios. The technique Sharpe used – after testing various factors – was a single index, the market as a whole, since it best explained the variability of portfolios. Out of this came *alpha* and *beta* and CAPM. It should be noted that Markowitz and Sharpe were always highly complementary of each other. Sharpe stated, and it appears Markowitz agreed, that it was not possible to segregate their respective ideas.

Rapid advances in computer technology in the late 1950s meant the huge database accumulated by the Cowles Commission and available at the Centre for Research in Security Prices provided a wealth of opportunity for research in securities prices. Eugene Fama is quoted in *Capital Ideas* (1992) saying; "You could just pop the data in... we were like kids in a candy store."(p. 107)

In a way, MVA, CAPM, and EMH evolved from pursuits of mathematical and or computer applications. Of course, there is nothing wrong with that. Early research on the laser, for example, was intended to study molecular structures and never imagined today's enormous applications in communications, medicine, and electronics. In retrospect, however, the origins of MPT may derive more heavily from mathematical/computer constructs than perhaps the

Benjamin Graham and Risk

realities of humans as investors. As James Montier and other behaviouralists say, humans are not exactly efficient processors of information; they are inherently subject to a wide array of biases, all of which may greatly affect their investment decisions.⁷

THE BEHAVIOURAL ARGUMENTS

In *Behavioural Investing*, James Montier sets out extensively how behavioural traits affect investors. The book adds to the leading references in this field: Andrei Schleifer's *Inefficient Markets: An Introduction to Behavioural Finance* (Oxford, Oxford University Press, 2000), and Richard Thaler's (editor) *Advances in Behavioural Finance - Volumes I and II* (New York: Russell Sage Foundation, 1993 and 2005).

The book also provides clues to some of the current challenges facing behavioural finance as it relates to MPT:

- Whether the often observed “value premium” is due to risk (the EMH argument) or mispricing (the behaviouralists' argument).
- Why behavioural finance, despite its many observances of behavioural anomalies, lacks a “unified paradigm of asset-pricing.”

Montier provides a taxonomy of 22 different biases, stemming from four basic sources: self-deception, simplification, emotion, and social interaction. The most important of these are:

- Over optimism: people overestimate their ability (the classic: most people believe they are better-than-average)
- Overconfidence: people feel more confident, the more (often useless) information they accumulate
- Self-attribution: people credit their *skill* for good outcomes, blaming *bad luck* for bad outcomes
- Hindsight: the “Oh, I knew that!” syndrome, also called “success at correctly predicting the past”
- Anchoring: people grasp non-relevant information, often believing they are making better decisions
- Representativeness: people judge by appearance rather than likelihood
- Framing: people can give different answers depending on the same but differently framed questions
- Loss aversion: people typically give more weight to losses than to the corresponding gains.

These biases affect investment decisions, potentially leading to flawed decisions. Montier identifies a number of examples:

⁷ A review of *Behavioural Investing* by James Montier is available on the Brandes Institute website at www.brandes.com/Institute.

Benjamin Graham and Risk

- Enormous evidence shows investors are hopeless at forecasting, yet it is the heart of the investment process.
- Investors are obsessed with information, yet more information does not always lead to better decisions, just overconfidence.
- Meetings with company management are over-rated; management themselves are likely highly biased.
- Investors typically think they can outsmart everyone else.
- Investors are (increasingly) obsessed with short-term time horizons.
- People like good stories and often enhance them to suit their own biases, while ignoring the boring facts.
- The mind's default tendency is to believe; innate scepticism is rare, yet lack thereof is dangerous in investing.

Regarding the book's contribution to the theoretical issues facing behavioural finance, it appears reasonable to say:

- The book reports an overwhelming body of evidence that supports mispricing - not risk - as the cause for the value premium.
- The lack of a unified theory of asset pricing by the behaviouralists is understandable; the enormous complexity of the mind simply defies capsulation in a neat equation.

In *Neoclassical Finance*, Stephen Ross summarizes what appears to be the main challenge to behavioural finance from the efficient markets hypothesis. The EMH does not depend on average investor rationality to be valid – just sufficiently smart, well financed, and motivated investors. Indeed the EMH proponents agree with the behaviouralists that most people, most of the time, do “misbehave.” Ross notes that anomalous empirical observations within the market seem to have some or all of these characteristics:

- They are small
- They are statistically suspect
- They are fleeting
- They are not replicable.

In my opinion, the market's behaviour in 2007/2008 appeared to have none of these characteristics. The current market has been large, pervasive, and repeating and therefore does not conform to Ross' characteristics of a market anomaly.

In *Capital Ideas Evolving*, Peter Bernstein devotes the opening two chapters to this debate. As Bernstein points out, the irony of the behaviorists' numerous observations of anomalies is that they present the efficient market advocates with arbitrage opportunities – the outcome of which is... market efficiency.

Benjamin Graham and Risk

SOME LIMITATIONS OF BETA AS A RISK MEASURE

As noted, *betas* in practice do not conform to theory. Two recent papers by Fama and French present very good reasons why empirically observed betas differ from theory. The authors cite “migration” and “convergence” as causes of instability of betas.

“Migration” is the term Fama and French use to describe the movement of stocks between the factor categories: size (large cap and small cap) and style (value and growth). The paper measures the returns from migration of stocks (similar data to the 2004 study – all NYSE, ASE, NASDAQ stocks from 1927-2006). With respect to style migration, three factors contribute to the value premium (i.e., value stocks outperforming growth stocks):

- More value stocks surprised on the upside (a “plus” transition)
- More growth stocks surprised on the downside (a “minus” transition)
- Among value and growth stocks which did not migrate, value outperformed due to dividends.

“Convergence” is the term Fama and French used to describe the movement or reversion to a mean of P/B. One way to put this is that convergence is a cause of migration. The convergence paper and the migration paper provide evidence that betas change over time. The convergence paper differs though, in that it shows the anatomy or causes of the migration (using a very similar data set as the authors’ two other papers). The convergence paper attributes the value premium the dividend yield plus three capital factors:

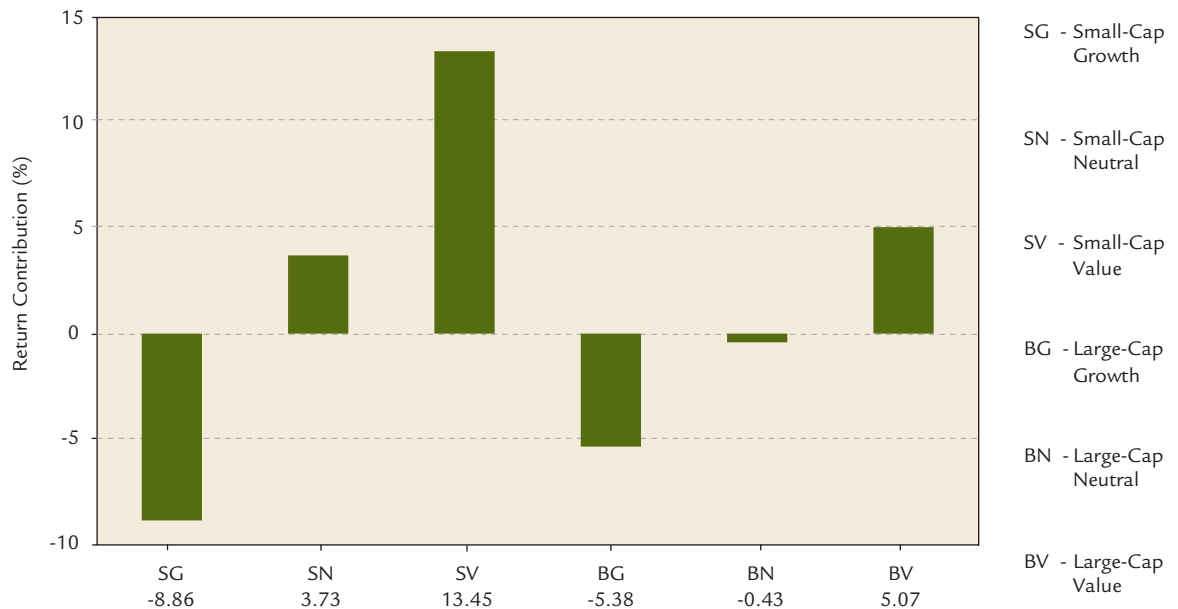
- Growth in book equity
- Convergence in P/B ratios
- Upward drift in P/B ratios.

The convergence paper found that from 1964 onward (prior to that there was no discernable difference) dividends contributed more to returns of value stocks than growth stocks and also more in large-cap stocks than small cap. Upward drift in P/B ratios is evident over the whole period, but is a relatively small contributor to returns, compared to growth in book value of equity and convergence of P/B ratios.

Exhibit 3 is from the convergence paper and shows the convergence factors by size and style category – they are seen to be positive in value, and negative in growth – and quite large in the case of small cap vs. large cap.

Benjamin Graham and Risk

EXHIBIT 3 – CONTRIBUTION OF P/B CONVERGENCE (1927-2006)



Source: Fama and French, 2007

Note: The above chart shows average percentage of capital gains attributed to the convergence of price-to-book ratios. Convergence is based on the divergence of book equity growth rates from capital gain returns.

Overall, the two papers present quite reasonable arguments as to why actual betas do not fit with theory – they are simply unstable over time. Low *beta* (value) stocks surprise investors on the upside and in the process move away from their status as value stocks. High *beta* (growth) stocks are more likely to disappoint and lose their luster as growth stocks.

BENJAMIN GRAHAM AND VALUE INVESTORS' CONCEPT OF RISK

The interesting thing about the value investor's definition of risk is that it is not a theory, nor an equation, but a common sense expression of how to avoid losing money. As Bernstein says in *Capital Ideas* (1992):

Ben Graham had devised a method for determining whether a stock is cheap or expensive. That method has stood many if not all the tests of time, but it is still not a theory. Graham told the investor what to do but said little about why his prescriptions would work. (p. 182)

Quite often Warren Buffett uses his investment in the Washington Post Company to explain risk. Buffett says in his postscript of *The Intelligent Investor* (2003):

Sometimes risk and reward are correlated in a positive fashion... the exact opposite is true in value investing. If you buy a dollar for 60 cents, it is riskier than if you buy a dollar for 40 cents, but the expectation for reward is greater in the latter case.

Benjamin Graham and Risk

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.'(p. 300)

In the value investors' definition of risk:

- There are no theoretical formulas or equations, only advice on how to value businesses.
- Few, if any assumptions, are necessary (CAPM has some 9-10 assumptions that are not very realistic).
- There is no reliance on higher mathematical or computer power. Columbia professor Bruce Greenwald says in *Value Investing*, you have to be able to add and divide, but not much more. Or as Warren Buffett has said, "If value investing required calculus, I would be poor."

Graham's *The Intelligent Investor* has been called (by Buffett and others) the best book ever written on investing. Buffett (2003), in the preface to *The Intelligent Investor*, recommends the two chapters in particular for their valuable advice: Chapter 8: "The Investor and Market Fluctuations", and Chapter 20: "Margin of Safety as the Central Concept of Investment." I quote Graham below.

THE INVESTOR AND MARKET FLUCTUATIONS

A serious investor is not likely to believe that the day-to-day or month-to-month fluctuations of the stock market make him richer or poorer... The holder of marketable securities actually has a double status, and with it the privilege of taking advantage of either at his choice. On the one hand his position is analogous to that of a minority shareholder or silent partner in a private business. Here his results are entirely dependent on the profits of the enterprise or a change in the underlying value of its assets. He would usually determine the value of such a private-business interest by calculating his share of the net worth as shown in the most recent balance sheet. On the other hand, the common-stock investor holds a piece of paper, an engraved stock certificate, which can be sold in a matter of minutes at a price which varies from moment to moment – when the market is open, that is -- and often is far removed from the balance sheet value. (p. 196-197)

If this sounds familiar, it is the preamble to Graham's well-known "Mr. Market" parable. In that, you are fellow owner of a private business with a benignly insane partner - Mr. Market. Every day Mr. Market quotes a price for your holding, offering to buy or sell your share, sometimes quite reasonably based on developments affecting the business, but sometimes at ridiculous prices, based on enthusiasm or fear. As Buffett (2003) asks, "If you are a prudent investor or a sensible businessman, will you let Mr. Market's daily communication determine your view of the value of (your) investment?" (p. 205)

THE MARGIN OF SAFETY (MOS)

Margin of safety is the difference between an estimate of a company's underlying, fundamental value and its stock price. Sometimes, the value of a business and its stock price will be in close proximity. At other times, there may be a considerable difference between the two measures.

Benjamin Graham and Risk

Graham (2003, p. 286) sums up the MOS chapter with the following statement and accompanying four business principles:

Investment is most intelligent when it is most businesslike... in accordance with accepted business principles if it is to have a chance of success:

First: Know what you are doing – know your business.

Second: Do not let anyone else run your business unless (1) you can supervise his performance with adequate care and comprehension, or (2) you have ... confidence in his integrity and ability.

Third: Do not enter upon an operation... unless a reliable calculation shows that it has a fair chance to yield a reasonable profit.

Fourth: Have the courage of your knowledge and experience. If you have formed a conclusion from the facts and if you know your judgement is sound, act on it – even though others may hesitate or differ.

COMMENTS ON THE DIFFERENCES IN THE TWO CONCEPTS OF RISK

MPT has quite a few limitations. As noted, the theory on beta simply does not hold up empirically. Fama and French's exhaustive study found that value stocks have had lower risk but higher returns than growth stocks -- a direct contradiction of MPT, and ironically, exactly what the value investors say. Fama and French went on to show that the low *betas* of value stocks and high *betas* of growth stocks converge as value stocks have tended to surprise on the upside and growth stocks have tended to surprise on the downside.

On the other hand, MPT has some useful attributes if one is willing to live with the limitations. An example of this, it seems, is trying to explain the concept of "portable alpha" without using the CAPM concepts of *alpha* and *beta*. As Alice Schroeder points out in *The Snowball: Warren Buffett and the Business of Life*, Benjamin Graham and Jerome Newman also offered a hedge fund in the 1930s alongside their long-only fund. MPT provides a useful framework to discuss separation of *alpha* and *beta*.

The recent comments of Harry Markowitz, William Sharpe, and Eugene Fama make a lot of sense. MPT is a useful (though not the only) theory that should be taught in finance courses. I would suggest that value investing should have equal billing to MPT in finance courses.

On the behavioural investment issues, the argument that behaviouralists have no unified theory of asset pricing should not be a persuasive criticism. As was pointed out, the mass of behavioural evidence of human bias leading to flawed decisions simply cannot be expressed in neat equations.

Benjamin Graham and Risk

A criticism of behavioural investments also seems to be that the anomalies are small, statistically suspect, fleeting, and not replicable. The value investor's answer to this is:

Warren Buffett, speaking in 1975, said he has seen no discernable trend towards value over the past 35 years. (Siegel, 2005)

More recently, Buffett was quoted in *Fortune* magazine (April 28, 2008), speaking of Berkshire's latest \$4 billion purchases in the auction-rate bond market:

Bids ranged from 6-11%, same bond, same time, same dealer.... wild things happen in the markets... and markets have not gotten more rational over the years.... they have become more followed.

Indeed, the market performance of 2007/2008 produced margins of safety, which value investors have not seen since the mid 1970s.

Overall, I would suggest that Benjamin Graham's definition of risk is the correct one and that of MPT is not. *Beta*, limitations and all, could be used as a measure of variability, but is not a good measure of risk.

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Benjamin Graham and Risk

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