Science Versus Reality on The New York Stock Exchange

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Introduction

There are two distinct points of view about how to address the problem of selecting investments and what the underlying processes are that drive the securities markets. One is scientific, the other judgmental. One entails mathematically driven risk engineering and optimal diversification while the other focuses on fundamental security analysis and judgment.

Thus modem portfolio theory (Markowitz) and the capital asset pricing model (Sharpe) sought to elevate the art of investing to a new level of scientific precision. However, it remains, one of the great enigmas of the investment profession that four of its greatest analysts-- Keynes, Graham, Markowitz and Sharpe --did not in the least agree on how investors do, or ought, to behave. As is well known, in 1990, Harry Markowitz and William Sharpe received the Nobel Prize in Economic Science. Concurrently both *The Wall Street Journal* and *The New York Times* published several articles commenting on these awards. One of these articles that appeared in the *The Wall Street Journal* contained the following observation that is of particular interest to us here:

> What a great day for financial economist!... the Nobel Prize finally acknowledges that the field of financial *economics is a genuine science*, in the same league with physics and mathematics.

Despite well earned praise for the newly acclaimed Nobel laureates from many quarters, there has always been a large “underground movement” on Wall Street that views the leading lights of capital market theory in the same way that Keynes described certain “mathematical economist” in his own day. Thus:

> Too large a proportion of recent "mathematical" economics are merely concoctions, as imprecise as the initial assumptions they rest on, which allow the author to lose sight of the complexities and interdependencies of the real world in a maze of pretentious and unhelpful symbols.
>
> John Keynes
> *Treatise on Probability* (1921)

Meanwhile, there can be no doubt that articles in the press concerning the 1990 Nobel Prize in economics mirrored popular perceptions about the insightful discoveries of modern capital market theory but did not comment on how controversial some of the analytical underpinnings and assumptions of this highly original work has always been and continues to be. In the remarks that follow we will explore some of the reasons this enormous gulf between theory and practice exists in the investment profession.

Thus, one of the classic debates on Wall Street has often been posed as follows: Is investing an art or a science? In many respects, this reduces to a perceived conflict between human nature (psychology and behavior) versus the notion of mathematically-driven investor rationality akin to lawful regularities in the physical sciences.

The core conflict between the two camps is related to the fact that events in the physical sciences can often be explained by *mathematical equations* that result in extremely accurate predictions whereas the greatest concern investors have is over the inaccuracy of their forecasts. And for those problems there are no clear-cut mathematical solutions. Stated a little differently,

it can be argued that since predictive accuracy in the stock market is so poor investors are prone to irrational behavior due to the impulse-driven and emotional consequences of hope, fear and greed.

Introduction to Keynes

John Maynard Keynes was not only an accomplished economist, mathematician and observer of human nature he was also a superb investor and portfolio manager. In his *General Theory of Employment Income and Money,* published in 1936, Keynes provided a description of investor behavior that many, including Nobel laureate James Tobin, consider one of the most incisive commentaries on the stock market ever written. If that assessment is correct, however, modern capital market theory (MCMT) is mistaken about many things.

Thus, MCMT embodies three critical paradigms: portfolio selection theory (Markowitz); the efficient market hypothesis (Fama) and the capital asset pricing model (Sharpe). The most renowned of these, CAPM, embraces MPT as well as EMH and implies that investors try to arrive at fundamental security valuations, as well as mean/variance estimates of return, in a "rational" analytical framework. Keynes, on the other hand, asserted that fundamentally "correct" stock valuations and prices are a pipe dream because investors simply cannot forecast the relevant (long-term) cash flows required for making such assessments. For example, in his timeless 1936 essay on the stock market, Keynes observed "….the market is subject to waves of optimistic and pessimistic sentiment which are unreasoning, and yet in a sense legitimate, where no solid basis exists for a reasonable calculation." Elsewhere he observes that, "investment based on genuine long-term expectation is so difficult today as to be scarcely practicable." Keyed essentially to these perceptions, Keynes went on to describe how investors respond to such a fuzzy state of affairs. That seminal essay, which appears on the following three pages, is followed by continuation of the current article.

John Maynard Keynes: The Stock Market and the Beauty Contest
From: The General Theory of Employment Interest and Money (1936)

As a result of the gradual increase in the proportion of the equity in the community's aggregate capital investment which is owned by persons who do not manage and have no special knowledge of the circumstances, either actual or prospective, of the business in question the element of real knowledge in the valuation of investments by those who own them or contemplate purchasing them has seriously declined.

Day-to-day fluctuations in the profits of existing investments, which are obviously of an ephemeral and non-significant character, tend to have an altogether excessive, and even absurd, influence on the market. It is said, for example, that the shares of American companies which manufacture ice tend to sell at a higher price in summer when their profits are seasonally high than in winter when no one wants ice. The recurrence of a bank holiday may raise the market valuation of the British railway system by several million pounds.

A conventional valuation which is established as the outcome of the mass psychology of a large number of ignorant individuals is liable to change violently as the result of a sudden fluctuation of opinion due to factors which do not really make much difference to the prospective yield, since there will be no strong roots of conviction to hold it steady. In abnormal times in particular, when the hypothesis of an indefinite continuance of the existing state of affairs is less plausible than usual, even though there are no express grounds to anticipate a definite change, the market will be subject to waves of optimistic and pessimistic sentiment, which are unreasoning and yet in a sense legitimate where no solid basis exists for a reasonable calculation.

But there is one feature in particular which deserves our attention. It might have been supposed that competition between expert professionals, possessing judgment and knowledge beyond that of the average private investor, would correct the vagaries of the ignorant individual left to himself. It happens, however, that the energies and skill of the professional investor and speculator are mainly occupied otherwise. For most of these persons are, in fact, largely concerned, not with making superior long-term forecasts of the probable yield of an investment over its whole life, but with foreseeing changes in the conventional basis of valuation a short time ahead of the general public. They are concerned, not with what an investment is really worth to a man who buys it "for keeps," but with what the market will value it at, under the influence of mass psychology, three months or a year hence. Moreover, this behavior is not the outcome of a wrong-headed propensity. It is an inevitable result of an investment market organized along the lines described. For it is not sensible to pay $25 for an investment, of which you believe the prospective yield to justify a value of $30, if you also believe that the market will value it at $20 three months hence.

DISTORTED INVESTMENT OBJECTIVES

Thus the professional investor is forced to concern himself with the anticipation of impending changes, in the news or in the atmosphere, of the kind by which experience shows that the mass psychology of the market is most influenced. This is the inevitable result of investment markets organized with a view to so-called "liquidity."... It forgets that there is no such thing as liquidity of investment for the community as a whole. The social object of skilled

investment should be to defeat the dark forces of time and ignorance which envelop our future. The actual, private object of the most skilled investment today is "to beat the gun," as the Americans so well express it, to outwit the crowd, and to pass the bad, or depreciating, half-crown to the other fellow.

This battle of wills to anticipate the basis of conventional valuation a few months hence, rather than the prospective yield of an investment over a long term of years, does not even require gulls amongst the public to feed the maws of the professional - it can be played by professionals amongst themselves. Nor is it necessary that anyone should keep his simple faith in the conventional basis of valuation having any genuine long-term validity. For it is, so to speak, a game of Snap, of Old Maid, of Musical Chairs - a pastime in which he is victor who says Snap neither too soon nor too late, who passes the Old Maid to his neighbor before the game is over, who secures a chair for himself when the music stops. These games can be played with zest and enjoyment, though all the players know that it is the Old Maid which is circulating, or that when the music stops some of the players will find themselves unseated.

Or, to change the metaphor slightly, professional investment may be likened to those newspaper competitions in which the competitors have to pick out the six prettiest faces from a hundred photographs, the prize being awarded to the competitor whose choice most nearly corresponds to the average preferences of the competitors as a whole; so that each competitor has to pick, not those faces which he himself finds prettiest, but those which he thinks likeliest to catch the fancy of the other competitors, all of whom are looking at the problem from the same point of view. It is not a case of choosing those which, to the best of one's judgment, are really the prettiest, nor even those which average opinion genuinely thinks the prettiest. We have reached the third degree where we devote our intelligence to anticipating what average opinion expects the average opinion to be. And there are some, I believe, who practice the fourth, fifth, and higher degrees.

If the reader interjects that there must surely be large profits to be gained from the other players in the long run by a skilled individual who unperturbed by the prevailing pastime, continues to purchase investments on the best genuine long-term expectations he can frame, he must be answered, first of all, that there are, indeed, such serious-minded individuals and that it makes a vast difference to an investment market whether or not they predominate in their influence over the game-players. But we must also add that there are several factors which jeopardize the predominance of such individuals in modern investment markets.

Investment based on genuine long-term expectation is so difficult today as to be scarcely practicable. He who attempts it must surely lead much more laborious days and run greater risks than he who tries to guess better than the crowd how the crowd will behave; and, given equal intelligence, he may make more disastrous mistakes.

CAN THE LONG-TERM INVESTOR SUCCEED?

There is no clear evidence from experience that the investment policy which is socially advantageous coincides with that which is most profitable. It needs more intelligence to defeat the forces of time and our ignorance of the future than to beat the gun. Moreover, life is not long enough - human nature desires quick results, there is a peculiar zest in making money quickly, and remoter gains are discounted by the average man at a very high rate...

Finally, it is the long-term investor, he who most promotes the public interest, who will in practice come in for most criticism... For it is in the essence of his behavior that he should be eccentric, unconventional, and rash in the eyes of average opinion. If he is successful, that will only confirm the general belief in his rashness; and if in the short-run he is unsuccessful, which is very likely; he will not receive much mercy. Worldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally.

In one of the greatest investment markets in the world, namely, New York, the influence of speculation (in the above sense) is enormous. Even outside the field of finance, Americans are apt to be unduly interested in discovering what average opinion believes average opinion to be; and this national weakness finds its nemesis in the stock market...This is only another way of saying that, when he purchases an investment, the American is attaching his hopes, not so much to its prospective yield as to a favorable change in the conventional basis of valuation, i.e., that he is, in the above sense, a speculator.

Speculators may do no harm as bubbles on a steady stream of enterprise. But the position is serious when enterprise becomes the bubble on a whirlpool of speculation. When the capital development of a country becomes a by-product of the activities of a casino, the job is likely to be ill-done.

SPONTANEOUS OPTIMISM

Even apart from the instability due to speculation, there is the instability due to the characteristic of human nature that a large proportion of our positive activities depends on a spontaneous optimism rather than on a mathematical expectation, whether moral or hedonistic or economic. Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as a result of animal spirits - of a spontaneous urge to action rather than inaction, and not as the outcome of a weighted average of quantitative benefits multiplied by quantitative probabilities.

Enterprise only pretends to itself to be...based on an exact calculation of benefits to come. Thus, if the animal spirits are dimmed and the spontaneous optimism falters, leaving us to depend on nothing but a mathematical expectation, enterprise will fade and die though fears of loss may have a basis no more reasonable than hopes of profit had before... Individual initiative will only be adequate when reasonable calculation is supplemented and supported by animal spirits, so that the thought of ultimate loss which often overtakes pioneers, as experience undoubtedly tells us and them, is put aside as a healthy man puts aside the expectation of death.

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Needless to say, Keynes' essay on the stock market speaks for itself and is highly regarded by "friend and foe" alike. Consider, for example, the following observations by Peter Bernstein (founder of *The Journal of Portfolio Management* and author of the widely acclaimed *Capital Ideas: The Improbable Origins of Modern Wall Street*) as well as the judgment of Yale economist and Nobel laureate, James Tobin. Thus:

> Liquid Markets facilitate investment but can create difficulties of their own...The most eloquent and enduring statement of that appears in Keynes's "General Theory"... Keynes makes the point so well that no further elaboration is necessary, but it is clear that he is the granddaddy of a rapidly growing literature on over- reaction and irrationality in the financial markets.
>
> Peter Bernstein (1991)

> Keynes characterized the market as a beauty contest...*The deep meaning of this metaphor is that investors forecast stock prices instead of company earnings. More precisely, today's price is a forecast of what investors expect tomorrow's price to be, rather than an estimate of the present value of future payment streams.* Keynes wrote all of this 50 years ago, and the leopards have not changed one of their spots...
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> Investors faced with the inherent uncertainty involved in estimating the present value of the future payments stream will inevitably look to shorter term price changes for the largest part of their return from equity ownership...Investors will therefore put more emphasis on new and easily understood information with immediate consequences than they will put on the less readily decipherable information with longer run consequences. This pattern of behavior seems to me to be such an inescapable feature of equity ownership that the evidence supporting the beauty contest and the overreaction effect should come as no surprise at all...
>
> Peter Bernstein (1985)

* * *

> I would certainly be the last person to assert that markets... generate fundamental valuations. The speculative content of market prices is all too apparent in their excessive volatility. *Keynes classic description of equity markets as casinos where assessments of long-term investment prospects are overwhelmed by frantic short term guesses about what average opinion will think average opinion will think -- and so on, to the nth degree -- rings as true today as when he wrote it.*
>
> Indeed, this is a decisive reason to be skeptical of the accepted capital asset pricing model as it is generally implemented. The empirical joint probability distributions of asset returns, inclusive of capital gains, contain so much speculative noise that the betas and other parameters estimated from them cannot be expected to continue to hold in the future. CAPM, it seems to me, is a "bootstrap" explanation of asset prices, wherein prices are supposed to be derived from movements in the very same prices.
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> James Tobin (1984)

Keynes as Portfolio Manager
During his 22 year career as portfolio manager of the King's College endowment fund (1924-46), Keynes achieved a 400% return while the United Kingdom Ordinary Share Index was flat. In a 1938 review of the fund, he outlined his investment philosophy as follows:

- Careful selection of a few types of investments having regard to their cheapness in relation to their probable actual and potential *intrinsic value* over a period of years ahead and in relation to alternative investments at the time.

- A steadfast holding of these in fairly large units through thick and thin, perhaps for several years until either they have fulfilled their promise or it is evident that they were purchased on a mistake.

- A balanced investment position, i.e., a variety of risks in spite of individual holdings being large, and if possible opposed risks.

On the topic of market timing, Keynes observed:

> We have not proved able to take much advantage of a general systematic movement out of and into ordinary shares as a whole at different phases of the trade cycle...Ag a result of these experiences I am clear that wholesale shifts are for various reasons impracticable and generally undesirable.

Returning to the principle of diversification he noted:

> I am convinced that the good results shown by King's are mainly due to the large proportion of its assets held in less than 50 favourite securities. To carry one's eggs in a great number of baskets, without having time to discover how many have holes in the bottom, is the surest way of increasing risk and loss.

In other words Keynes was saying that a certain amount of diversification makes good sense (its crazy not to) but don't overdo it.

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Keynes in Perspective
Clearly Keynes was an authentic genius and his insightful essay on the market has stood the test of time for over eighty years. Still, it is worth noting that Keynes wrote his essay on the market when he was 53, after years of practical experience as an investor. (Interestingly, early on in has career, Keynes had tried his hand trading in the currency markets and failed.)

Meanwhile, the two pioneers of modern capital market theory were inordinately gifted mathematicians who had little, if any, investment experience when they published their seminal works. Thus, Markowitz was 25 when his treatise on rational portfolio selection was published and Sharpe only 31 when he unveiled the capital asset pricing model incorporating the assumption that all investors were acting as Markowitz recommended. Thus, it is enough to make one pause when told the incomparably complex field of investments was thoroughly disentangled by two brilliant mathematicians/theorists with just a very few years of actual experience between them.

From this same point of view, moreover, it is no small paradox that the chief architect of modern portfolio theory (developed with the objective of outsmarting the market by customizing “efficient portfolios”) and the lead architect of the capital asset pricing model (that construed such an objective as quixotic) should share a Nobel Prize on the same day in recognition of the fact that both theories had become paradigms in the incredulous world of finance

Some Biographical Notes on Keynes

We’ll conclude with some interesting background information about Keynes that we collected over the years and filed away. The first group comes under the heading (which is most appropriate for our purposes here) of: *Keynes on Economics as Distinct from Science*. The second group of notes alludes to Keynes incomparable intellect as assessed by the noted philosopher Bertrand Russell. Thus:

> Professor Plank of Berlin, the famous originator of quantum theory, often remarked to me that in early life he had thought of studying economics, but had found it too difficult! Professor Plank could easily master the whole corpus of mathematical economics in a few days. He did not mean that! But the amalgam of logic and intuition and the wide knowledge of facts, most of which are not precise, which is required for economic interpretation in its highest form, is, quite truly, overwhelmingly difficult for those whose power consists mainly in the power to imagine and pursue to their furthermost points, the implications and prior conditions of comparatively simple facts, which are known with a high degree of precision.
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> J. M. Keynes
> Biography of Alfred Marshall

> I happen to sit next to Keynes at the High Table at King's college a day or two after Planck had made this [the above] observation...Lowes Dickenson was sitting opposite. "That's funny", he said, because Bertrand Russell once told me in early life he had thought of studying economics, but had found it too easy"!
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> R. F. Harrod
> Life of John Maynard Keynes

> Bertrand Russell had thought of turning from philosophy and mathematics to economics. But he decided, for reasons to be discussed, to stick to the former... Keynes answered the criticism of economists in an ingenious way. The reason why there were so few good economists was not that economics was especially difficult, but that a good economist had to be a mathematician, historian, philosopher.
> But no really first-class scholar would become an economist, for if first-class, he would have settled for mathematics or history or philosophy. A first-class economist was the combination, the rare combination, of three second rate talents. We may be sure that Lord Russell would have accepted, then and now, part of the diagnosis!
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> D. W. Brogan
> New York Times Magazine (1967)

Bertrand Russell on Keynes

> Maynard Keynes' intellect was the sharpest and clearest that I have ever known. When I argued with him, I felt that I took my life in my hands, and I seldom emerged without feeling something of a fool...
>
> Bertrand Russell (1951

Background on Russell

> Bertrand Russell will be numbered among the immortals... There is hardly a major theme in the foundations of logic and scientific method...that he did not illuminate...
>
> Sidney Hook (1984)

> The distinguished Oxford philosopher A.J. Ayer considers Russell to be, except possibly for Wittgenstein, the most influential philosopher of our time...He was, of course, famous as a political activist...but his place in history will be due to his brilliant and original work in philosophy and mathematical logic...
>
> James Rachels (1972)

> Russell, often called the greatest living philosopher and the greatest logician since Aristotle, ...is Britain's greatest citizen after Churchill... In collaboration with Whitehead, the "Principa Mathematica"...laid the foundations of the mathematical logic of this century. This work alone would insure for Russell undying fame as a great and original thinker...
>
> Charles Hussy (1962)

> When asked to write something about Bertrand Russell, my admiration and respect for that author at once induced me to say yes. I owe innumerable happy hours to the reading of Russell's works, something which I cannot say of any other contemporary scientific writer, with the exception of Thorstein Veblin. Soon, however, I discovered what a slippery field I had ventured upon, having, due to lack of experience, until now cautiously limited myself to the field of physics...
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> Albert Einstein (1944)