

**The Efficient Market in Doubt**

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### Overview

For years believers in the Efficient Market Hypothesis have gotten away with asserting that stock prices were random because they **instantaneously, and correctly, adjust to new information which, by definition, is random in appearance**. Meanwhile, the price at virtually all times was deemed to be the discounted present value of all future dividends over an infinite time horizon – risk adjusted or otherwise.

Thus, as Meir Statman has observed:

J. Williams (1938) illustrated the intrinsic value of a stock in his ...very serious book, *The Theory of Investment Value*... the intrinsic value of a stock is **the present value of its dividends** and rational investors care about no more than that.” In a rational stock market the price of a stock is always equal to its intrinsic value. **Fama noted that the intrinsic value of a stock can change across time because of new information**, but his examples of what constitutes information are telling. Each affects future dividends and their present value. The new information may involve such things as the success of a current research and development project, a change in management...[*Efficient Markets in Crisis*; *Journal Of Investment Management*, Vol. 9, No. 1, 2011]

Of late, however, so-called market efficiency has been downgraded by many to the simplistic notion that the market is efficient if investors, for the most part (with the exception of the likes of Warren Buffett, George Soros, Bill Miller, et. al. ) are consistently unable to beat the market after risk adjustment (which, itself, is still a rigorously debated concept).

### Introduction

In his timeless 1936 essay on the stock market, no less a genius than **John 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 in the same essay he asserts: “**investment based on genuine long-term expectation is so difficult today as to be scarcely practicable.**”

**Benjamin Graham** felt likewise regarding classic valuation theory based on the discounted present value of dividends and/or internal rate of return. Thus, according to Graham “There is a well established principle which states that the investment [and/or intrinsic] value of a common stock equals **the "present worth" of all its future dividends**. To apply this principle in practice would require dividend projections for, say, between 40 and 50 years. **We do not believe that estimates for so remote a future can be made with enough dependability to be really useful.**”

In addition **Milton Friedman** is on record as saying: “The **value** of every asset --

whether a **share of stock** or what not -- **is the discounted value of the future returns** that asset is expected to yield.”

While **Alan Greenspan** has cryptically noted “**The value ascribed to any asset is a discounted value** of future expected returns, **even if no market participant makes that calculation.**”

Meanwhile, **William Sharpe** has noted,

**The key idea behind the theory** [the Capital Asset Pricing Model] **is that of market efficiency...**definition is difficult, but **the idea is that...the price of a security will rarely diverge significantly for long from its intrinsic value defined as the certain present value of the uncertain future prospects** assessed by a clever, well informed analyst. Market efficiency only requires that currently available information **be properly reflected in price...**there is increasing agreement that **capital markets in the United States are highly (if not completely) efficient.** [William Sharpe; *Is Financial Analysis Useless*; 1978]

Furthermore,

If the price of a stock reflects everything that is known about the future, then the only thing that will cause a major change in the price will be new information, and new information by definition involves surprise... This leads to the notion that in an efficient market, a market in which prices reflect future prospects as they are now known, you should expect price behavior that is essentially random. This kind of an approach suggests that **the intrinsic value [or discounted present value]of a stock ought to follow a kind of random walk.** But it still begs the question since it doesn't specify what value is. To really know what you mean by saying price will equal value and value will follow a random walk, you have to have some notion as to what value is. What is the relationship between **present value** and future prospects, taking risk into account.? That was the task undertaken by the Capital Asset Pricing Model - a model of the relationship between risk and return in a market which is efficient, in which knowledge is widely available and incorporated efficiently into stock prices. [William Sharpe; 1979]

The aim of this paper is to shed light on the above points of view by examining the two classical models in finance for appraising common stocks; namely, the discounted present value and/or the internal rate of return. Based on the evidence presented, we conclude that these models are woefully lacking in their ability to appraise stocks “correctly.” Essentially this is because of their hyper-sensitivity to the underlying assumptions about future earnings growth rates, payout rates, discount rates, etc. required to make financial sense of the perpetual claim on a company’s future earnings ability that a share of common stock represents. **This is all spelled out in a separate 19 page article on the website, paradoxinvestments.com, entitled The Defined Future Earnings Model and the Riddle of Perpetual Claims.** This article,

- Uses a comprehensive model designed by the writer for Excel that examines the Discounted Present Value and/or the Internal Rate of Return of a stock from 12 different perspectives.
- Examines the accuracy of consensus annual earnings forecasts and consensus estimates of future long-term (five year) earnings growth rates. The study finds that stock prices are extremely sensitive to errors in these forecasts, while accuracy for the five year forecasts of earnings growth rates is virtually non-existent.
- After extensive practice with the model I concluded that the notion common stocks have, can, or will be correctly priced at their true “intrinsic values” defined as the (risk adjusted?) discounted present value of all future dividends over an “infinite horizon.” is a hoax.
- Indeed, one might go so far as to say that **the “discounted present value of an infinite dividend stream” actually drives or motivates less than 1/100<sup>th</sup> of one percent of all trading in securities on the New York Stock Exchange, The American Stock Exchange or NASDAQ.** Indeed it is for the very reason that investors have no firm sense of what the “intrinsic value” of a share of stock actually is that they are so obsessed by earnings estimate revisions and/or actual earnings announcements!

Meanwhile, there is no real need to assume that investors are irrational. Still, the behavior of stock prices makes a great deal more sense if one does. But of course that is not what Paul Samuelson had in mind when he wrote *Proof that Properly Anticipated Prices Fluctuate Randomly* in 1965. Thus, Samuelson provided a mathematical proof that properly anticipated security prices would fluctuate randomly around their intrinsic values. But he was also right when he stated in yet another paper, “...but of course, the weasel words ‘properly anticipated’ [using a discounted present value approach] provide the gasoline that drives the tautology to its conclusion.”

Thus, without offering any proof -- other than the empirical record itself -- it can also be asserted that *improperly assessed prices* (about uncertain claims on exponentially growing, perpetual, cash flows) can cause daily, weekly, monthly or quarterly changes in stock prices to approximate a random walk.

Moreover, since prices follow earnings like night follows day, random changes in short term earnings per share -- thoroughly documented by Litner and Glauber in *Higgledy Piggledy Growth*, 1962 -- provides strong support for the view that price changes will resemble a random walk. However it takes a considerable leap of faith to assert that these real world changes in price reflect “instantaneous adjustments” to the utopian ideal of a correct price (and/or the discounted present value of all future dividends over an infinite time horizon -- risk adjusted or otherwise).

Nor, parenthetically, is it very likely that a NYSE specialist would allow stocks for which he was responsible to go up or down in a straight line -- especially when nothing in the way of substantive "fundamental news" was occurring.

For an exhaustive review of the degree to which stock prices closely track revisions in consensus earnings estimates, and/or quarterly earnings surprises, please refer to the 19 page article on this website entitled, *Cycli-Graphs of Company Earnings and Stock Prices Illustrating Earnings Dominate Influence over Prices*, which

- Examines from a number of perspectives the extremely tight relationship that exists between changes in reported earnings and stock prices across stocks included in the S&P 500 index.
- Contains detailed data on the power of this relationships for the nine years. 2001-2009.
- Reviews both the absolute data and decile rankings to smoke out the closeness of fit between earnings changes and price changes.
- Includes dramatic graphs and tables depicting these relationships.
- Raises serious doubt about the efficient market hypothesis and the theoretical underpinnings of the CAPM given the glue-like relationship between reported EPS and changes in stock prices.
- The Efficient Market Hypothesis is tied inexorably to the concept of “intrinsic value” defined as the (risk adjusted?) discounted present value of all future dividends, presumably over an “infinite horizon.” In point of fact, nothing could be further from the truth!

In his original article, supporting the notion that stock prices ought to be expected to resemble a random walk, Samuelson further noted that:

Deductive analysis cannot determine whether the empirical properties of the stochastic model...come at all close to resembling the empirical determinants of today's real-world markets... [and later] The theorem is so general that I must confess to having oscillated over the years in my own mind between regarding it as trivially obvious (and almost trivially vacuous) and regarding it as remarkably sweeping. Such perhaps is the characteristic of basic results. [Nothing could be closer to the truth!]

### **Nobel laureate Paul Krugman on the Efficient Market Hypothesis and the CAPM**

By 1970 or so the study of financial markets seemed to have been taken over by Voltaire's Dr. Pangloss, who insisted that we live in the best of all possible worlds. Discussion of investor irrationality, of bubbles, of destructive speculation had virtually disappeared from academic discourse. The field was dominated by the “efficient-market hypothesis,” promulgated by **Eugene Fama of the University of Chicago, which claims that financial markets price assets precisely at their intrinsic worth** [discounted present value] given all publicly available information. (The price of a company's stock, for example, always accurately reflects the company's [discounted present] value given the information available on the company's earnings, its business prospects and so on.).....

**Finance economists rarely asked the seemingly obvious (though not easily answered) question of whether asset prices made sense given real-world fundamentals like earnings.** Instead, they asked only whether asset prices made sense given other asset prices. Larry Summers, now the top economic adviser in the Obama administration, once mocked finance professors with a parable about “ketchup economists” who “have shown that two quart bottles of ketchup invariably sell for exactly twice as much as one-quart bottles of ketchup,” and conclude from this that the ketchup market is perfectly efficient. [How Did Economists Get It So Wrong; *New York Times Magazine* (9-6-09)]

### Nobel laureate James Tobin on the CAPM

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.** [A Mean-Variance Approach to Fundamental Valuations *The Journal of Portfolio Management*; Fall 1984]

FORTUNE: Why do you now have doubts about the efficient market theory?

SHARPE: I've seen too many studies now where some phenomenon takes place, such as earnings being reported that are higher than predicted or insider trading reports showing that a bunch of insiders bought stock last month. After the information becomes public there seems to be a little warp. It's not gigantic and it doesn't always happen, but, on average, the stock moves 2% or so after the information becomes public. It ought to be zero if people are really paying attention and processing information efficiently. I still believe the market is highly efficient, but **I can no longer adhere to a hard line view that the market is hyper-efficient and never processes its information wrongly.**

Thus:

What does efficient market theory have to say about the market's recent gyrations, especially Monday's crash? "We're all totally perplexed," concedes William Sharpe...**"its pretty weird."** [William Sharpe; *The Wall Street Journal*; October 23, 1987]

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## Intrinsic Value on the Move

### STOCK PRICE VARIABILITY WITHIN THE DJIA

#### ONE-YEAR PRICE CHANGE FOR STOCKS IN THE DOW JONES INDUSTRIAL AVERAGE

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Ranked High-To-Low On Price Change

1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	AVERAGE
60	27	35	38	53	69	38	138	103	10	
30	15	27	36	52	37	21	88	68	4	42%
24	12	26	35	43	25	18	71	48	2	
22	11	21	35	42	24	12	70	48	0	
18	9	19	34	39	13	11	69	44	-1	
17	9	16	28	29	11	9	62	40	-3	
16	5	14	27	27	8	1	56	36	-5	
15	5	13	24	22	-5	-6	54	33	-5	
11	2	12	21	21	-9	-11	48	30	-6	
11	-2	11	20	20	-10	-12	42	25	-8	
8	-3	7	9	19	-12	-16	42	25	-8	
5	-5	7	9	19	-13	-23	40	23	-9	
5	-8	6	6	18	-17	-25	38	21	-11	
5	-13	5	5	17	-17	-25	37	21	-11	
4	-13	4	2	13	-17	-29	37	21	-11	
3	-13	3	1	9	-22	-31	34	19	-15	
0	-15	0	0	9	-22	-31	33	19	-15	
0	-17	-1	0	1	-23	-33	32	18	-16	
-2	-18	-3	0	1	-26	-37	32	17	-18	
-2	-21	-3	0	1	-31	-29	30	15	-19	
-3	-22	-3	-1	1	-32	-39	28	13	-20	
-4	-26	-4	-7	0	-33	-40	20	9	-27	
-4	-26	-5	-8	-1	-37	-41	19	9	-28	
-6	-29	-8	-9	-1	-41	-42	18	8	-34	
-8	-31	-8	-13	-5	-41	-42	17	7	-37	
-9	-33	-10	-16	-6	-43	-46	14	7	-37	
-9	-33	-10	-18	-10	-47	-47	13	5	-38	
-10	-36	-16	-19	-21	-47	-49	12	2	-41	
-17	-39	-18	-24	-23	-52	-54	9	1	-48	-27%
-19	-41	-20	-29	-31	-62	-60	8	-18	-48	

ABSOLUTE TOTAL FOR ALL ONE-YEAR PRICE CHANGES: 6,130%

TEN YEAR PRICE CHANGE FOR THE DJIA: -6%

*Handwritten mark*