

The Myth of Efficient Markets

Stock Market Theories is one of the most popular topics for debate amongst academicians and the Investing Community worldwide. Though there are various theories, by far the most widely taught/accepted one is the Efficient Market Hypothesis (EMH).

The basic propositions of the EMH are the following:

- Information is freely available to everyone and the Current Market Price reflects this information in a very objective and rational manner.
- Because all Securities are valued correctly, it will not be possible for anybody to make excess profits (more than the market overall). The only way to make excess returns is to take additional risks (risk being defined as relatively volatility of individual stocks vis-à-vis the Index). & by the very definition, the excess return is the reward for additional risk – and as with all risks, this excess return is not always guaranteed.
- Any Investor therefore cannot hope to make above-average Returns in the long run.

So what is the evidence in favor of the EMH?

- Eugene F. Fama proposed the EMH through his 1970 paper “Efficient Capital Markets”. Many academicians including Nobel Laurate Paul Samuelson, CNBC Anchor Larry Kudlow and a host of Investment Managers are also believers in the EMH.
- Most Business Schools in the US (Columbia Business School being a notable exception) teach the EMH – not only that, but even the existence of other theories are not discussed creating the perception that the EMH is the absolute truth.
- The strongest evidence for the EMH however comes from the track record of Investment Professionals themselves. More than 80% of the Fund managers worldwide underperform the Index they track in the long-term (10 years). Noted Harvard Financial Economist Michael Jensen says “there is no other proposition in economics which has more solid empirical evidence supporting it than the EMH”.

In the face of such compelling evidence why am I saying that the EMH is a Myth?

Because there is evidence of a group of Investors who have consistently outperformed the markets over long periods of time. However to conclusively prove that Markets are not Efficient in any form (EMH as proposed by Fama has been modified to suggest that there are varying degrees of Efficiencies – Weak, Semi-Strong & Strong. The arguments presented here is against all forms of EMH), the following three questions need to be answered:

1. Theoretical foundations of an alternate Hypothesis that suggests how people can obtain superior results.
2. Empirical evidence of a group that has outperformed the Markets using the above theory.
3. What are the mistakes in the theoretical underpinnings of the EMH? There also needs to be an explanation as to why the Performance track record of Investment Professionals is poor.

Warren Buffett in a 1984 debate commemorating the 50th Anniversary of the classic “Security Analysis” presented what I think is a irrefutable evidence addressing questions 1 & 2 (for the complete speech, please refer to SuperInvestors of Graham-and-Doddsville). His argument was essentially based on the fact that Graham-and-Dodd Investors are looking for a mismatch between the Intrinsic Worth of a corporation (as represented through it's Assets and projected cash flows) and Market Capitalization (as represented through the quoted market Price). He then goes onto present evidence of the track record of nine people/Funds (all of whom owed their intellectual origins to Graham and Dodd) who had comfortably outperformed the Index they were tracking over the several preceding decades.

Twenty Years later, the same people have continued to outperform (refer Appendix I for details). That should be sufficient proof that markets are not efficient --- and these people continue to swear by Graham – a proof that the theory holds good even beyond Wars, Oil Shocks, the “New Economy” syndrome and the likes.

The third question however is more difficult to answer -- If Markets are not efficient, then why do more than 80% of the Investing Professionals continue to Underperform?. This underperformance seems to be consistent with the EMH that it is not possible to outperform the markets over the long term.

What is wrong with the EMH?

The fundamental assumption of EMH is that of Perfect Information. & there are two flaws with this assumption:

- Information is certainly by-and-large free & perfect today – but not so in the 1970's when Eugene Fama postulated his theory. & I think it would be quite safe to state that Fama had not based his theory on any foresight of the information explosion that we have witnessed in the last decade.

- Even today, Information today is not 100% perfect. Joseph Stiglitz has shown that even small amounts of information imperfection could have effects that are profoundly different from a situation in which information is “Perfect”. So assuming that Market behavior in situations where information is not too imperfect would be similar to conditions in which Information is perfect is not valid.

However, let me give the benefit to EMH believers on the above issues. Not that I do not think of them as flaws, but I think there are far more important errors with the EMH. So even if I was to grant that Eugene Fama was an Oracle and also disregard the arguments of Stiglitz for all its merits, EMH still leaves a lot to be criticized.

The most critical flaw of the EMH lies in the subsequent logical deduction that people would use information to arrive at a Market Price in a rational manner. Even within the limits of rational behavior, people having the same information arrive at different conclusions based on their assumptions. & of course, this so called rational analysis is highly skewed by the rather illogical analysis of Investment Analysts trying to predict “How will Mr. Market interpret this new information?”.

Markets – Not Always Rational

- ***Speculative Bubbles:*** In his book “A Short History of Financial Euphoria” (1990), John Galbraith, lists a set of denominators common to speculative bubbles. He had derived these patterns as common elements of the previous Bubbles – & yet the dotcom years saw the same set of events repeating itself. Every one of those attributes that Galbraith had described was visibly in place – and yet, the irrationality of markets was never accepted – then or for that matter even now.

Galbraith further goes on to explain how reality would be ignored when he says “...In accepted free-enterprise attitudes and doctrine, the market is a neutral and accurate reflection of external influences; it is not supposed to be subject to an inherent and internal dynamic of error. This is the classical faith. So there is a need to find some cause for the crash, however farfetched that is external to the market itself... Markets in our culture are a Totem; to them can be ascribed no inherent aberrant tendency or fault”.

- ***Projecting the Future by Extrapolating the Past:*** Another situation of Irrational behavior happens when Investors extrapolate the past to predict the future while ignoring the conditions that caused the past behavior. The Pension Fund returns assumptions of firms like GE, GM, IBM point in this direction. All of them had assumptions of near 10% return in 2000

(when Government Bonds were returning just 5.4%), while they had a more conservative estimate of 6.0% in 1975 (when Government Bonds were returning 10.5%). They were just guided by the Equity returns over the preceding decade when they were making these assumptions.

Even within limits of rational behavior people would have different estimates of Intrinsic Value based on their assumptions. The physics-like precision attributed to Market prices, Risk etc. is just not correct. Some of the reasons that cause a variation are given below:

- ***Differential Expectations on Equity Returns***: The expectations of returns from Equity markets have a wide variance amongst the Investing community. Theoretically, returns from Equities should be defined as follows:

Equity Returns = Risk-Free Returns on Long-term (10-year) Bonds + Equity Risk Premium

Even going by the above equation, there are considerable differences as to what the Equity Risk Premium should be –

- The first argument is for a 5% Risk Premium based on observed excess returns (between Equities and Bonds) over the last 80 years.
- The second argument states that the Risk Premium should be about 2.4% as the observed excess returns over the last 80 years have been partly influenced by non-repeatable historical accidents (i.e falling long-term interest rates and the initial dividend yield) and after accounting for these factors the Prospective Risk Premium works out to 2.4%.
- Warren Buffett argues for a 0% Risk Premium in the context of the nature of Businesses that he buys into i.e. Consumer Monopolies (an argument that is very different from the 0% Risk Premium suggested in the context of Index returns by Jim Glassman of the “Dow 36,000” fame).

The above theoretical differences apart, it has also been noted that Investor expectations have been influenced heavily by the 13% nominal returns in the US markets over the last 20 years. Additionally we also know that the cost of funds available to Margin Investors is significantly higher than what would be determined by the above Risk Premium calculations.

What does this differential Expectation of Returns do? This significantly influences the Price at which a purchase of a Security could be considered “Rational”. So even with the same

information and rational outlooks, two Investors could have varying positions depending on their Expectation on Returns.

- **Differential Timeframes:** In my opinion this is the most important reason as to why even with the same available information, people come to different conclusions.
 - It has been shown that for a majority of the market participants, the holding timeframes range from a few days to a few weeks. These people are constantly looking out for new information (a lot of times this information could be entirely unrelated to the Valuation of a Security) and trying to evaluate its impact on the Price.
 - For the Grahamian Investors, the normal holding periods usually range from a few months to a few years with Warren Buffett representing the extreme scenario when he says that “My favourite holding period is forever”.

Therefore even with the same information and similar expectation of Interest rates, the Investor timeframes could play a significant difference in the outlook and behavior of Investors. The observation of Bob Rodriguez (2004), who had achieved 20-year annual returns of 17.6%, is very pertinent about this when he said, "I talk with some aggressive growth managers I know. I asked them when this thing (the tech meltdown) was blowing off, why didn't you get out of that crap. They said, 'Then we'd underperform relative to the market.' And if you underperform, I assume you'll get redeemed (in that shareholders redeem, or sell, their fund shares) right? They say, 'Right.' So let me get this straight: You own this crap, you get destroyed and you get redeemed anyway."

- **Valuations – an inexact Science:** Two people looking at the same company and the same information could come up with very different estimates of Intrinsic Value. To an extent, this is because of the above two reasons -- but even with similar outlook on expectation of equity returns and timeframes considered, valuations could differ. This is true even of Warren Buffett and Charlie Munger with Berkshire Hathaway being the company under consideration. There are a lot of subjective interpretations in such an exercise and so differences even to the extent of 10 or 20% is very natural. So attributing the continuous change in prices as a market mechanism of prices continuously adjusting to reflect intrinsic value is not correct. There is nothing like “a precise value” in the first place.

Why Most Investors underperform?

Before we begin this issue, I would like you to imagine a primary school in New York. In this school, they have a peculiar practice of fixing the passing-score as the average of all the students who take the examination. **In the normal scenario, one could then expect about 50% of the students to pass while the remaining 50% would fail.**

Now this school also has other peculiarities. The students pay their school fee (salaries of the Instructors, administrative costs, taxes to local Authorities etc.) in terms of Marks obtained in the examination. So each student has to part with a portion of the score they had obtained. The Dean of the school however happens to be a strict person and she refuses to recalculate the average and sticks to the original one (pre-fees average). What percentage of students would then pass the examination? While the percentage will most certainly be lower than the 50% obtained earlier, the amount of school fees vis-à-vis the average score would determine the pass percentage.

Assume now that the average student score is about 13 and the average fee to be about 4. So if a student has to pass, she should have scored more than 17. How many students would now pass the test? – **Without getting into score distributions, standard deviations and all that, it would be very logical to expect a significantly lower than 50% of the students in New York to pass the examination.**

How is this school experiment relevant?

Because that is what is exactly happening in the stock markets as well. Very similar to the average in the school examination, the Index is the benchmark for defining performance and an Investor with returns below the Index returns is deemed to have underperformed. The Index performance (i.e. the average pre-fee examination score) also represents the average of all market participants' performance while the various costs (a la school fees) involved in Investing tend to decrease the performance of the market participants without affecting the average.

The equivalent of the school fee in the Investing world is as given below:

- Transaction costs – this is the cost paid to the Stock exchanges, brokerage houses and banks for facilitating securities transaction & is estimated to be about 0.5-1.5% of the Assets Under Management (AUM).
- Management Fee – this is the fee and commission paid to Portfolio Managers, Distribution charges for Mutual Fund Sales etc. and would be about 2-3% of the AUM.

- Capital Gains Taxes – This is the tax paid to the Government on the basis of profits made through the securities transactions. This could be anywhere between 10% to 39.6% -- depending on Income Levels and the nature of Capital Gains i.e short-term or long-term. Assuming a 13% annualized return, one could then, on the average, expect this to be about 1-3% of the AUM.

With an average annual portfolio turnover of nearly 90% for the Mutual Funds, the combined effects of the above factors could easily be a 4% reduction in the Investing Gains made. So an Investor making 17% on a Gross basis (prior to transaction costs, management fees and taxes), will make 13% on a Net basis – just about enough to meet the average Index Returns. How many Investors can we expect to score more than 17% (before kicking in the various costs) when the average returns is just 13%? **Very much similar to the school, we would observe a number that is significantly lower than 50%.**

The reason for the underperformance then is the various Costs involved – it has nothing to do with Markets being Efficient or Inefficient. In a world where there are no transaction costs, management fee and Taxes, one could expect about 50% of the participants to outperform.

That brings us to a rather interesting Question – a hypothetical one, but a very important one nevertheless. If all Investors in the world become followers of Graham and Dodd, then would we have a better record as far as outperformance is concerned?

The answer, much to my disappointment, is “Absolutely Not”. Maybe a slightly better record, but there would continue to a significantly large percentage of Investors who underperform. & the slightly better overall track record would primarily stem from the Graham-and-Dodd style of investing that reduces transaction costs & taxes on account of lower portfolio turnover (the effect of the above costs on the Investment Portfolio of Berkshire Hathaway is estimated to be about 0.1%).

Therefore irrespective of the Investing philosophy the world believes in, there would continue to be significant underperformance by a large number of Investors -- about 50% before accounting for the costs and a much greater than 50% after. The reason is not that markets are Efficient. I would prefer to call it Statistics 101.

The only way then to increase this outperformance percentage is to lower the costs involved vis-à-vis the size of returns. If I may make a prognosis at this stage, it would be that the next few

decades would see an even greater degree of underperformance by the market participants. The reasons are straightforward – Given the levels of the markets today, one should expect a significantly lower than the 13% returns observed over the previous 20 years – maybe about a 4 to 6%, if I were to put a number. This return is assuming normal conditions of economic growth and macroeconomic stability. & if PE's contract – as they should if it is an objective indicator of outlook on interest rates and real earnings growth, we will probably get returns in the lower end of the 4-6% range or perhaps even below 4%. Imagine what reducing this Index return by about 4% on account of the various costs would do to the performance of Funds!!!.

Of course, if the EMH were to be around for the next 20 years, then the proponents would argue at that point in time that Markets become more efficient with the passage of time and so the degree of underperformance becomes closer towards 100%.

If significant underperformance is a statistical certainty, what then is the big deal with Graham?

That comes from the rather different perspective of Risk. The EMH Investors consider Risk to be relative volatility of individual securities vis-à-vis the Index. Grahamian Investors consider chances of a Permanent loss of capital as Risk. So while the record as far as outperformance may not be significantly different, chances that Grahamian Investors lose money on a permanent basis is very greatly reduced.

If significant underperformance is not a good indicator for Markets being Efficient, then what is?

A million dollar question. Here is my take on this issue:

To come out with an indicator to determine if Markets are Efficient, we first have to agree on what "Efficient" means. I will define Efficient as being "Reasonably" valued - pretty much in line with the EMH definition. However, the difference is in the implication of correct valuations. If a security or the Index is reasonably valued, then it implies that the long-term (10 years) returns will be in line with what is warranted by Risk Premium calculations – no more and no less. This is very different from the EMH implication of long-term outperformance of the Markets being an impossibility if securities are correctly valued.

In line with the above implications, I propose 5 levels of Market Efficiency definitions as below:

1. Depressed Valuations (Expected future Returns akin to Super Investors)

2. Undervalued (Expected future Returns in excess of what is warranted in Equities)
3. Efficient (Expected future Returns in line with the risks associated with Equities)
4. Overvalued (Expected future Returns lower than Efficient Returns but higher than Risk free Returns)
5. Irrational Exuberance (Expected future Returns Lower than the Risk free rate of return)

The above is a very subjective definition that could lead to different conclusions based on one's assumptions – a far cry from the mathematical precision of Beta, Underperformance etc. under EMH. But as Keynes once said “It is better to be approximately right than be precisely wrong”.

I should point out here that the Index being Efficient does not imply that all underlying securities are correctly priced as well. There will always be some companies/sectors that are overvalued and some that are undervalued. Just depends on the fancy of the market at any given point. All that an Index being Efficient implies is that an Investor who chooses an Index Fund is likely to get Returns that are expected out of equities over the long-term.

An obvious consequence of what I have said earlier, but well worth repeating is that all 5 of the above conditions would mean a significant underperformance by Market participants going into the future. We would witness the highest underperformance for the last condition and the least for the first condition.

There is however one caveat in extrapolating the school examination example to the stock market returns – the Index returns is not the simple Average, but the weighted average of the Returns and AUM of all the Investors (before the costs kick in). How does this affect my fundamental proposition?

My speculation is that it does not. On the contrary, it will concentrate outperformance to a few large Investors due to the compounding effect as well as attracting more clients due to successful track records. So, the ratio of outperformers to underperformers probably becomes even smaller than what would have happened otherwise.

Conclusions

I think the above arguments clearly establish that Markets are not efficient. Even so, there are always a few questions and it's worth answering them.

Argument	Response
<p>The EMH does not state that nobody will outperform the Market. All it states is that it will not be possible to predict as to who will outperform. So evidence that a few people have outperformed does not mean Markets are not efficient.</p> <p>An alternate form of the same argument is "Efficient Markets is like a Lottery – while it's certain that somebody will win, it's impossible to predict who will win"</p>	<p>The evidence presented has not been chosen from hindsight. Warren Buffett presented (in 1984) evidence of 9 Funds (not 9 chosen from hundreds or thousands of Investors he knew. These were the only 9 Grahamian Investors he knew of) and all 9 had outperformed the markets over the preceding several decades.</p> <p>Even granting that Warren Buffett might have been "partial" in choosing the elite 9, the 20 years since have yielded similar results to the one before the debate.</p>
<p>If Markets are not efficient, why do such a large number of Investment Professionals underperform?</p>	<p>Investing is essentially a zero-sum game -- In an Index that is representative of the underlying stocks, somebody has to underperform for somebody to overperform. This is just elementary mathematics – where scoring above the average is defined as a "pass (outperform)", it's most certain that a significant percentage will "fail (underperform)".</p> <p>On top of the above condition, if you subtract about 25% of everybody's scores while retaining the earlier average, it's obvious as to why a significant number underperform.</p> <p>In fact in almost any condition of life – marks in a school test, height of people in a group, Salary of employees in a company etc. one would find "significant underperformance" as long as the following two conditions are met.</p>

	<ol style="list-style-type: none"> 1. Underperformance is defined as being below the mathematical average. 2. Individual scores are reduced by about 25% while the average is unaffected by this. <p>Therefore significant underperformance in Investing has nothing to do with the markets being Efficient. In fact, even in an argument where Markets are inefficient, one would find a large number of Investors scoring below the Index performance – that just happens to be a pure and simple Statistical Phenomena.</p>
<p>What is the alternate theory that allows somebody to outperform? There are various theories like Growth Funds, Values, Mid Cap Funds etc. and none of them seem to have any predictability of Success.</p>	<p>While there are certainly a large number of alternate theories, I can't either confirm or deny the efficacy of these theories. In any case, it has been shown that significant underperformance is a statistical certainty irrespective of the Investing methodology. Expecting an Investing philosophy to ensure that all followers outperform is much like asking a Professor to ensure that all students score above the Average!!!</p> <p>However, Benjamin Graham & David Dodd have formulated the one theory that I know for certain allows Investors to earn "good" returns while reducing the chances of loss of capital. Sufficient and irrefutable evidence that this theory works has been provided.</p>
<p>\$100 Bills do not lie around for people to pick up.</p>	<p>I am not saying that they do. For every Investment proposition, there is a certain non-zero probability that the decision goes haywire. So in that sense there is no decision that has a 100% guarantee of being successful.</p> <p>However, a careful analysis of companies will lead to undervalued securities that have a high probability of giving meaningful returns to Investors.</p>

As concluding remarks, it is probably appropriate to quote the two most vocal opponents of EMH – Charlie Munger and Warren Buffett. Indeed, much of what has been written in this paper has been influenced by their thoughts and writings.

Charlie Munger in his vitriolic style says "...Now let's talk about efficient market theory, a wonderful economic doctrine that had a long vogue in spite of the experience of Berkshire Hathaway. In fact one of the economists who won -- he shared a Nobel Prize -- and as he looked at Berkshire Hathaway year after year, which people would throw in his face as saying maybe the market isn't quite as efficient as you think, he said, "Well, it's a two-sigma (of luck) event." And then he said we were a three-sigma event. And then he said we were a four-sigma event. And he finally got up to six sigmas -- better to add a sigma than change a theory, just because the evidence comes in differently. And, of course, when this share of a Nobel Prize went into money management himself, he sank like a stone.... "

Warren Buffett in his own folksy humour style makes the same point when he states "Ships will sail around the world but the Flat Earth Society will flourish. There will continue to be wide discrepancies between price and value in the marketplace, and those who read their Graham & Dodd will continue to prosper".

Frankly, I don't expect practicing Fund Managers (or for that matter Academicians) to give up on the EMH. In fact, from a very selfish standpoint, it suits, that a majority of the Investing community worldwide continues to believe in the EMH. After all as Buffett says ""What could be more advantageous in an intellectual contest -- whether it be chess, bridge, or stock selection -- than to have opponents who have been taught that thinking is a waste of energy?".

References:

- Warren E. Buffett, *SuperInvestors of Graham-and-Doddsville* (1984) – (<http://www.tilsonfunds.com/superinvestors.html>). A reprint of the article along with data is available in the book "The Intelligent Investor".
- R.D. Arnott and P.L. Bernstein, *What Risk Premium is Normal?* (2002) – (http://www.firstquadrant.com/PDFs/0202_What_Risk_Premium_Is_Normal.pdf)

Appendix

Given below is the performance track record during 1984-2000 of the SuperInvestors identified by Warren Buffett in his 1984 speech.

Person	Performance
Walter Schloss	18.8% from 1/1/84 to 12/31/01 before fee and 14.3% after compared to 13.9% for S&P 500. For 45 years ended 12/31/00, returned 15.7% vs. 11.2% for S&P.
Tweedy Browne	14.4% from 9/30/83 to 12/31/01 before fee and 12.6% after compared with 14.4% for S&P 500. For 43 years ended 12/31/01, returned 19.3% vs. 11.3% for S&P.
Sequoia Fund	16.6% from 1/1/84 to 3/31/02 after fee compared with 14.3% for S&P 500. For 31 years ended 3/31/02, returned 17% vs. 12.7% for S&P.
Warren Buffett & Charlie Munger	22.5% from 12/31/83 to 12/31/01. For 37 years ended 12/31/01, Book Value grew 22.6% vs. 11% for S&P.
Rick Guerin	Information Not Obtainable
Pacific Partners	
Perimeter Investments	
Washington Post, Master Trust	
FMC Pension Fund	

Source: <http://www.wealtheffect.com/stocks/b13.asp>

About the Author

Shanmuganathan N is the Director at Benchmark Advisory Services. Benchmark is a Consulting company that focuses on Megatrends that would shape the landscape of Commerce in the decades to come. Some key areas include Peak Oil, World Economic Outlook and Demographic Patterns.

Any criticisms or suggestions can be mailed to shan.sundaram@benchmarkconsulting.in

Epilogue

But isn't the introduction of alpha adjusted returns an acceptance that skill of an Investor determines the returns?

At some point, even the Academicians would have realized that the EMH is indefensible. But instead of jettisoning the theory, which would have the right thing to do (but would have made their previous 30-years of lecturing EMH appear, to put it mildly, conflicting), they made some tweaking in the form of this "alpha-adjustments" that would continue to allow them in indulging in their irrelevant mathematical jugglery.

I have shown here that the very foundations of EMH are faulty – to think that people behave rationally or that information is perfect and so stock prices are "correct" is nothing more than wishful thinking; No amount of tweaking of the Flat-Earth theory would lead you to the correct version; So the best way forward would be dump EMH and start from Graham.

Students incidentally do not have the historical baggage that Professors do and hence can make an objective judgment of this debate. I was greatly helped by the fact that I got a "C" in Security Analysis in my B-School days. Starting afresh made things a lot easier for me.

So do I think the Academicians would come around to accepting the absurdity of EMH?

To answer, I will quote Planck **"A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die and a new generation grows up that is familiar with it."**