The Efficient Markets Hypothesis

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The efficient markets hypothesis (EMH), popularly known as the Random Walk Theory, is the proposition that current stock prices fully reflect available information about the value of the firm, and there is no way to earn excess profits, (more than the market over all), by using this information. It deals with one of the most fundamental and exciting issues in finance – why prices change in security markets and how those changes take place. It has very important implications for investors as well as for financial managers. The first time the term "efficient market" was in a 1965 paper by E.F. Fama who said that in an efficient market, *on the average, competition will cause the full effects of new information on intrinsic values to be reflected "instantaneously" in actual prices.*

Many investors try to identify securities that are undervalued, and are expected to increase in value in the future, and particularly those that will increase more than others. Many investors, including investment managers, believe that they **can** select securities that will outperform the market. They use a variety of forecasting and valuation techniques to aid them in their investment decisions. Obviously, any edge that an investor possesses can be translated into substantial profits. If a manager of a mutual fund with $10 billion in assets can increase the fund's return, after transaction costs, by $1/10^{th}$ of 1 percent, this would result in a $10 million gain. The EMH asserts that none of

these techniques are effective (i.e., the advantage gained does not exceed the transaction and research costs incurred), and therefore no one can predictably outperform the market.

Arguably, no other theory in economics or finance generates more passionate discussion between its challengers and proponents. For example, noted Harvard financial economist Michael Jensen writes "there is no other proposition in economics which has more solid empirical evidence supporting it than the Efficient Market Hypothesis," while investment maven Peter Lynch claims "Efficient markets? That's a bunch of junk, crazy stuff" (Fortune, April 1995).[1]

The efficient markets hypothesis (EMH) suggests that profiting from predicting price movements is very difficult and unlikely. The main engine behind price changes is the arrival of new information. A market is said to be "efficient" if prices adjust quickly and, on average, without bias, to new information. As a result, the current prices of securities reflect all available information at any given point in time. Consequently, there is no reason to believe that prices are too high or too low. Security prices adjust before an investor has time to trade on and profit from a new a piece of information.

The key reason for the existence of an efficient market is the intense competition among investors to profit from any new information. The ability to identify over- and under-priced stocks is very valuable (it would allow investors to buy some stocks for less than their "true" value and sell others for more than they were worth). Consequently, many people spend a significant amount of time and resources in an effort to detect "mis-

priced" stocks. Naturally, as more and more analysts compete against each other in their effort to take advantage of over- and under-valued securities, the likelihood of being able to find and exploit such mis-priced securities becomes smaller and smaller. In equilibrium, only a relatively small number of analysts will be able to profit from the detection of mis-priced securities, mostly by chance. For the vast majority of investors, the information analysis payoff would likely not outweigh the transaction costs.

The most crucial implication of the EMH can be put in the form of a slogan: *Trust market prices!* At any point in time, prices of securities in efficient markets reflect all known information available to investors. There is no room for fooling investors, and as a result, all investments in efficient markets are *fairly priced,* i.e. on average investors get exactly what they pay for. Fair pricing of all securities does not mean that they will all perform similarly, or that even the likelihood of rising or falling in price is the same for all securities. According to capital markets theory, the expected return from a security is primarily a function of its risk. The price of the security reflects the present value of its expected future cash flows, which incorporates many factors such as volatility, liquidity, and risk of bankruptcy.

[1] M. Jensen, "Some Anomalous Evidence Regarding Market Efficiency," *Journal of Financial Economics* (June /Sept. 1978).

However, while prices are rationally based, changes in prices are expected to be random and unpredictable, because new information, by its very nature, is unpredictable. Therefore stock prices are said to follow a **random walk**.[2]

THREE VERSIONS OF THE EFFICIENT MARKETS HYPOTHESIS

The efficient markets hypothesis predicts that market prices should incorporate all available information at any point in time. There are, however, different *kinds* of information that influence security values. Consequently, financial researchers distinguish among three versions of the Efficient Markets Hypothesis, depending on what is meant by the term "all available information".

Weak Form Efficiency

The weak form of the efficienct markets hypothesis asserts that the current price fully incorporates information contained in the past history of prices *only*. That is, nobody can detect mis-priced securities and "beat" the market by analyzing past prices. The weak form of the hypothesis got its name for a reason – security prices are arguably the most public as well as the most easily available pieces of information. Thus, one should not be able to profit from using something that "everybody else knows". On the other hand, many financial analysts attempt to generate profits by studying exactly what this hypothesis asserts is of no value - past stock price series and trading volume data. This technique is called **technical analysis**.

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[2] Interestingly, in his book *A Random Walk Down Wall Street*, Burton Malkiel notes: "On Wall Street, the term 'random walk' is an obscenity. It is an epithet coined by the academic world and hurled insultingly at the professional soothsayers."

The empirical evidence for this form of market efficiency, and therefore against the value of technical analysis, is pretty strong and quite consistent. After taking into account transaction costs of analyzing and of trading securities it is very difficult to make money on publicly available information such as the past sequence of stock prices.

Semi-strong Form Efficiency

The semi-strong-form of market efficiency hypothesis suggests that the current price fully incorporates *all publicly available* information. Public information includes not only past prices, but also data reported in a company's financial statements (annual reports, income statements, filings for the Security and Exchange Commission, etc.), earnings and dividend announcements, announced merger plans, the financial situation of company's competitors, expectations regarding macroeconomic factors (such as inflation, unemployment), etc. In fact, the public information does not even have to be of a strictly financial nature. For example, for the analysis of pharmaceutical companies, the relevant public information may include the current (published) state of research in pain-relieving drugs.[3]

The assertion behind semi-strong market efficiency is still that one should not be able to profit using something that "everybody else knows" (the information *is* public). Nevertheless, this assumption is far stronger than that of weak-form efficiency. Semi-strong efficiency of markets requires the existence of market analysts who are not only financial economists able to comprehend implications of vast financial information, but

[3] One should not be surprised that investment companies analyzing many of the high-tech industries have started employing experts from many non-financial areas (such as medical doctors, pharmacists, biochemists, etc.) in order to be able to assess viability of projects undertaken by high-tech companies.

also macroeconomists, experts adept at understanding processes in product and input markets. Arguably, acquisition of such skills must take a lot of time and effort. In addition, the "public" information may be relatively difficult to gather and costly to process. It may not be sufficient to gain the information from, say, major newspapers and company-produced publications. One may have to follow wire reports, professional publications and databases, local papers, research journals etc. in order to gather all information necessary to effectively analyze securities.

As we will see later, financial researchers have found empirical evidence that is overwhelming consistent with the semi-strong form of the EMH.

Strong Form Efficiency

The strong form of market efficiency hypothesis states that the current price fully incorporates *all* existing information, both public and private (sometimes called inside information). The main difference between the semi-strong and strong efficiency hypotheses is that in the latter case, nobody should be able to systematically generate profits even if trading on information *not* publicly known at the time. In other words, the strong form of EMH states that a company's management (insiders) are not be able to systematically gain from inside information by buying company's shares ten minutes after they decided (but did not publicly announce) to pursue what they perceive to be a very profitable acquisition. Similarly, the members of the company's research department are not able to profit from the information about the new revolutionary discovery they completed half an hour ago. The rationale for strong-form market efficiency is that the market anticipates, in an unbiased manner, future developments and

therefore the stock price may have incorporated the information and evaluated in a much more objective and informative way than the insiders. Not surprisingly, though, empirical research in finance has found evidence that is inconsistent with the strong form of the EMH.

COMMON MISCONCEPTIONS ABOUT THE EMH

As was suggested in the introduction to this chapter, EMH has received a lot of attention since its inception. Despite its relative simplicity, this hypothesis has also generated a lot of controversy. After all, the EMH questions the ability of investors to consistently detect mis-priced securities. Not surprisingly, this implication does not sit very well with many financial analysts and active portfolio managers.

Arguably, in liquid markets with many participants, such as stock markets, prices should adjust quickly to new information in an unbiased manner.[4] However, much of the criticism leveled at the EMH is based on numerous misconceptions, incorrect interpretations, and myths about the theory of efficient markets. We present some of the most persistent "myths" about the EMH below.

Myth 1: *EMH claims that investors cannot outperform the market. Yet we can see that some of the successful analysts (such as George Soros, Warren Buffett, or Peter Lynch) are able to do exactly that. Therefore, EMH must be incorrect.*

[4] Less liquid markets, like art and real estate, may indeed not be as efficient.

EMH does not imply that investors are unable to outperform the market. We know that the constant arrival of information makes prices fluctuate. It is possible for an investor to "make a killing" if newly released information causes the price of the security the investor owns to substantially increase. What EMH does claim, though, is that one should not be expected to outperform the market predictably or consistently.

It should be noted, though, that **some** investors could outperform the market for a very long time by chance alone, even if markets are efficient. Imagine, for the sake of simplicity, that an investor who picks stocks "randomly" has a 50% chance of "beating the market". For such an investor, the chance of outperforming the market in each and every of the next ten years is then $(0.5)^{10}$, or about one-tenth of one percent. However, the chance that there will be *at least one investor* outperforming the market in each of the next 10 years sharply increases as the number of investors trying to do exactly that rises. In a group of 1,000 investors, the probability of finding one "ultimate winner" with a perfect 10-year record is 63%. With a group of 10,000 investors, the chance of seeing at least one who outperforms the market in every of next ten years is 99.99%, a virtual certainty. Each individual investor may have dismal odds of beating the market for the next 10 years. Yet the likelihood of, after the ten years, finding one very successful investor, even if he or she is investing purely randomly – is very high if there are a sufficiently large number of investors. This is the case with the state lottery, in which the probability of a *given* individual winning is virtually zero, but the probability that *someone* will win is very high. The existence of a handful of successful investors such as Messrs. Soros, Buffett, and Lynch is an expected outcome in a completely random

distribution of investors. [5] The theory would only be threatened if you could identify who those successful investors would be *prior to* their performance, rather than after the fact.

Myth 2*: EMH claims that financial analysis is pointless and investors who attempt to research security prices are wasting their time. "Throwing darts at the financial page will produce a portfolio that can be expected to do as well as any managed by professional security analysts".*[6] *Yet we tend to see that financial analysts are not "driven out of market", which means that their services are valuable. Therefore, EMH must be incorrect.*

There are two principal counter-arguments against the equivalency of "dart-throwing" and professional analysis strategies. First, investors generally have different "tastes" – some may, for example, prefer to put their money in high-risk "hi-tech" firm portfolios, while others may like less risky investment strategies. Optimal portfolios should provide the investor with the combination of return and risk that the investor finds desirable. A randomly chosen portfolio may not accomplish this goal. Second, and more importantly, financial analysis is far from pointless in efficient capital markets. The competition among investors who actively seek and analyze new information with the goal to identify and take advantage of mis-priced stocks is truly essential for the existence of efficient capital markets. In fact, one can say that financial analysis is actually the engine that enables incoming information to get quickly reflected into security prices.

[5] There may be other reasons why some investors can appear to be "long-term winners". Noted University of Chicago professor Merton Miller claims in the book *Investment Gurus* by P. Tanous(1997): "…in practice, it often comes down to not suffering a loss as big as the huge gain you made a while ago. Thus, a fellow like George Soros may be skating on thin ice. You see, he made a big killing and if he would now just do modest investments, he would never

So why don't all investors find it optimal to search for profits by performing financial analysis? The answer is simple – financial research is very costly. As we have already discussed, financial analysts have to be able to gather, process, and evaluate vast amounts of information about firms, industries, scientific achievements, the economy, etc. They have to invest a lot of time and effort in sophisticated analysis, as well as many resources into data gathering, purchases of computers, software.[7] In addition, analysts who frequently trade securities incur various transaction costs, including brokerage costs, bid-ask spread, and market impact costs (see chapter 21).

Therefore, any profits achieved by the analysts while trading on "mis-priced" securities must be reduced by the *costs of financial analysis*, as well as the *transaction costs* involved. For mutual funds and private investment managers these costs are passed on to investors as fees, loads, and reduced returns. There is some evidence that some professional investment managers are able to improve performance through their analyses. However, this may be by pure chance. In general, the advantage gained is not sufficient to outweigh the cost of their advice.

In equilibrium, there will be only as many financial analysts in the market as optimal to insure that, on average, the incurred costs are covered by the achieved gross trading

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lose it. He'd be a winner on balance over any time horizon. But if he insists on plunging again, he is just as likely to take a bigger loss. He may wind up giving it all back."

[6] B. Malkiel, *A random Walk Down Wall Street*.

[7] It should be noted that human capital is not cheap. *Wall Street Journal* frequently reports that the salaries of "star" financial analysts reach multi-million dollar values per year.

profits.[8] For the majority of other investors, the chasing of "mis-priced" stocks would indeed be pointless and they should stick with passive investment, such as with index mutual funds.[9]

***Myth 3**: EMH claims that new information is always fully reflected in market prices. Yet one can observe prices fluctuating (sometimes very dramatically) every day, hour, and minute. Therefore, EMH must be incorrect.*

The constant fluctuation of market prices can be viewed as an indication that markets *are* efficient. New information affecting the value of securities arrives constantly, causing continuous adjustment of prices to information updates. In fact, observing that prices *did not* change would be inconsistent with market efficiency, since we know that relevant information is arriving almost continuously.

***Myth 4:** EMH presumes that all investors have to be informed, skilled, and able to constantly analyze the flow of new information. Still, the majority of common investors are not trained financial experts. Therefore, EMH must be incorrect.*

This is an incorrect statement of the underlying assumptions needed for markets to be efficient. Not all investors have to be informed. In fact, market efficiency can be

[8] More precisely, one should expect that if the "market" for financial analysts is also efficient, the achieved profits should not only cover the incurred research and transaction costs, but also provide a "fair" (as opposed to "abnormal") return on those costs. Indeed, in that case, the profits achieved by star analysts such as George Soros or Peter Lynch can be considered a fair return on their substantial investment into their human capital.

achieved even if only a relatively small core of informed and skilled investors trade in the market, while the majority of investors never follow the securities they trade.

Evidence in favor of the efficient markets hypothesis

Since its introduction into the financial economics literature over almost 40 years ago, the efficient markets hypothesis has been examined extensively in numerous studies. The vast majority of this research indicates that stock markets are indeed efficient. In this section, we briefly discuss the evidence regarding the weak form, semi-strong form, and strong-form versions of the efficient markets hypothesis

The weak form of market efficiency

The random walk hypothesis implies that successive price movements should be independent. A number of studies have attempted to test this hypothesis by examining the correlation between the current return on a security and the return on the same security over a previous period. A positive serial correlation indicates that higher than average returns are likely to be followed by higher than average returns (i.e., a tendency for continuation), while a negative serial correlation indicates that higher than average returns are followed, on average, by lower than average returns (i.e., a tendency toward reversal). If the random walk hypothesis were true, we would expect zero correlation. Consistent with this theory, Fama (1965) found that the serial correlation coefficients for a sample of 30 Dow Jones Industrial stocks, even though statistically significant, were

[9] One more aspect of the impact of financial analysis on profits of investors should be stressed here. Some analysts perform research just to detect mispriced securities in order to achieve profits by passive investing into such securities (while waiting for the market to "correct the mispricing"). Still, many others (including star investors such as Warren Buffett) not only target the mispriced securities, but also get actively involved into value improvement of companies

too small to cover transaction costs of trading.[10] Subsequent studies have mostly found similar results, across other time periods and other countries.

Another strand of literature tests the weak form of market efficiency by examining the gains from technical analysis. While many early studies found technical analysis to be useless, recent evidence (e.g., by Brock, Lakonishok, and LeBaron (1992) finds evidence to the contrary. [11] They find that relatively simple technical trading rules would have been successful in predicting changes in the Dow Jones Industrial Average. However, subsequent research has found that the gains from these strategies are insufficient to cover their transaction costs. Consequently, the findings are consistent with weak-form market efficiency.

The Semi-strong Form

The semi-strong form of the EMH is perhaps the most controversial, and thus, has attracted the most attention. If a market is semi-strong form efficient, all publicly available information is reflected in the stock price. It implies that investors should not be able to profit consistently by trading on publicly available information.

Investment Managers

Many people suggest that mutual fund managers are skilled investors who are able to beat the market consistently. Unfortunately, the empirical evidence does not support this view. In one of the first studies of its kind, Michael Jensen found that over the period

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they own (for example, by firing incompetent managers). Since such investors actively create value, there is no need to assume that they should not generate any abnormal returns.

[10] E. F. Fama, "The Behavior of Stock-Market Prices," *Journal of Business (January, 1965).*

[11] W. Brock, J. Lakonishok, and B. LeBaron, "Simple technical trading rules and the stochastic properties of stock returns," Journal of Finance (December, 1992).

1955 to 1964 mutual funds achieved a risk-adjusted performance of approximately zero percent per year.[12] In other words, mutual fund managers exhibited no special stock picking ability. Furthermore, this return fell to –0.9% per year after taking into consideration commissions and expenses. More recently Burton Malkiel compared the performance of managed general portfolio funds to the performance of S&P 500 Index. During 1984-1994, the S&P 500 gained 281.65%, while the equity funds on average appreciated only by 214.80%.

Multiple studies have demonstrated that mutual funds, on average, do not exceed the return of the market index. This has been demonstrated in both large markets and smaller, supposedly "less-efficient" markets. Equally important to investors is whether or not they can identify some managers or mutual funds that can consistently beat the index. The findings show that a mutual fund's performance over the past 1, 3, 5 or 10 years is not predictive of its future performance.

There are some perverse findings. In July 1999, the *Wall Street Journal* reported a study comparing the performance of managed equity funds based on the fees they charge shareholders. One would expect that the higher fees would be charged by funds performing more substantial market research. The results showed that, when taking the fees into consideration, on average the low-fee funds tended to slightly outperform the high-fee funds. William Sharpe states: "The key issue is that past performance is a thin reed for how to predict future performance. Expense ratios and turnover are generally better predictors."

[12] M. Jensen, "Risks, the Pricing of Capital Assets and the Evaluation of Investment Portfolios," *Journal of Business*

Event Studies

If markets are efficient and security prices reflect all currently available information, new information should rapidly be converted into price changes. Let's look at an example. The research department of CJM Products, an agricultural research corporation, developed a new, revolutionary type of corn that can be grown in the desert. The selling of such a durable crop is potentially a very profitable activity.. Assume that on Monday, the price of one share of CJM's is $100, and that the estimated present value of the corn development project is $50 per share. What will happen on Tuesday morning when CJM announces the discovery of the new corn type?

If the market is efficient, the stock price would quickly adjust to this new information. The price would jump instantanously to $150 to fully reflect the effect of the new project announced by the company. The efficient capital market theory implies that market participants will react *immediately and in an unbiased manner*. That is, one can expect that the stock price should not *under-react* and trade below $150 nor *over-react* to the announcement and trade above $150 in a predictable manner. This situation is illustrated in figure 1. That way, no investor buying or selling shares after the announcement is made (say, on Tuesday morning) could be expected to make money based on the company's announcement – the CJM stock price would have already fully incorporated the impact of this information!

Many research studies have examined announcements similar to the one above, to determine whether the market reacts as predicted. Many types of events have been

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(April 1969).

studied, including mergers and acquisitions, seasoned equity offerings, spin-offs, dividend announcements, etc.. The evidence generally indicates that the market reacts quickly to these various corporate announcements - often in a matter of minutes. Thus, investors cannot expect to earn superior returns by trading on the announcement date.

In a widely cited study, Eugene Fama, Lawrence Fisher, Michael Jensen, and Richard Roll (hereafter FFJR) examined the stock price reaction around stock splits.[13] Conventional wisdom had long held that stock splits were good news for investors, because they were generally followed by dividend increases. FFJR found that stock splits were preceded, on average, by periods of strong performance, most likely because firms tend to split in good times. However, following the split, they observed no evidence of abnormal stock price performance. That is, investors would not be able to profit by purchasing the stock on the split date. This evidence is consistent with the efficient markets hypothesis.

There is overwhelming evidence in the financial literature suggesting that targets of takeover attempts gain significantly upon an announcement of the acquisition plan by the bidder. Figure 2 provides an example of average changes in stock prices of target companies around the announcement of takeover attempts.[14] Interestingly, there is a small upward drift in price prior to the announcement, indicating that some information leaked out. However, notice that after the announcement the stock price changes are, on average, close to zero (without any visible trend). This finding is consistent with efficient

[13] E. F. Fama, L. Fisher, M. Jensen, and R. Roll, "The Adjustment of Stock Prices to New Information," *International Economics Review* (February, 1969).

market hypothesis, since it suggests that the full effect of the information (about the announcement of takeover attempt and the potential implication of the takeover for the target's value) is incorporated immediately.

The Strong Form

Empirical tests of the strong-form version of the efficient markets hypothesis have typically focused on the profitability of insider trading. If the strong-form efficiency hypothesis is correct, then insiders should not be able to profit by trading on their privateinformation. Jaffe (1974) finds considerable evidence that insider trades are profitable.[15] A more recent paper by Rozeff and Zaman (1988) finds that insider profits, after deducting an assumed 2 percent transactions cost, are 3% per year.[16] Thus, it does not appear to be consistent with the strong-form of the EMH.

EVIDENCE AGAINST THE EFFICIENT MARKETS HYPOTHESIS

Although most empirical evidence supports the weak-form and semi-strong forms of the EMH, they have not received uniform acceptance. Many investment professionals still meet the EMH with a great deal of skepticism. For example, legendary portfolio manager Michael Price does not leave anybody guessing which side he is on: "…markets are not perfectly efficient. The academics are all wrong. 100% wrong. It's black and white." (taken from *Investment Gurus* by Peter Tanous) We will discuss some of the recent evidence against efficient markets.

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[14] A. Keown and Pinkerton J., "Merger announcements and insider trading activity," Journal of Finance, 36, Sept 1981.

[15] J. Jaffe, "Special Information and insider trading," *Journal of Business* (July, 1974).

[16] M. Rozeff and M. Zaman, "Market Efficiency and Insider Trading: New Evidence," *Journal of Business* (January, 1988).

Over-reaction and Under-reaction

The efficient markets hypothesis implies that investors react quickly and in an unbiased manner to new information. In two widely publicized studies, DeBondt and Thaler present contradictory evidence.[17] They find that stocks with low long-term past returns tend to have higher future returns and vice versa - stocks with high long-term past returns tend to have lower future returns (long-term reversals).

These findings received significant publicity in the popular press, which ran numerous headlines touting the benefits of these so-called contrarian strategies.[18] The results appear to be inconsistent with the EMH. However, they have not survived the test of time. Although the issues are complex, recent research indicates that the findings might be the result of methodological problems arising from the measurement of risk.[19] Once risk is measured correctly, the findings tend to disappear.

One of the most enduring anomalies documented in the finance literature is the empirical observation that stock prices appear to respond to earnings for about a year after they are announced. Prices of companies experiencing positive earnings surprises tend to drift upward, while prices of stocks experiencing negative earnings surprises tend to drift downward. This "post-earnings-announcement drift" was first noted by Ball and Brown in 1968 and has since been replicated by numerous studies over different time periods

[17] W. DeBondt and R. Thaler, "Does the Stock Market Overreact," *Journal of Finance* (July, 1985).
[18] For example, see B. Donelly, "Investors' Overreactions May Yield Opportunities in the Stock Market," *Wall Street Journal* (January 7, 1988).
[19] See E. F.Fama.and K. French, "Multifactor Explanations of Asset Pricing Anomalies," *Journal of Finance 51:55-84* (March, 1996).

and in different countries.[20] After more than thirty years of research, this anomaly has yet to be explained.

Another study reported that stocks with high returns over the past year tended to have high returns over the following three to six months (short-term momentum in stock prices). [21] This "momentum" effect is a fairly new anomaly and consequently significantly more research is needed on the topic. However, the effect is present in other countries and has persisted throughout the 1900s.

A variety of other anomalies have been reported. Some indicate market over-reaction to information, and others under-reaction. Some of these findings are simply related to chance: if you analyze the data enough, you will find some patterns. Dredging for anomalies is a rewarding occupation. Some apparent anomalies, such as the long-term reversals of DeBondt and Thaler, may be a by-product of rational (efficient) pricing. This is not evident until alternative explanations are examined by appropriate analysis.

Value versus growth

A number of investment professionals and academics argue that so called "value strategies" are able to outperform the market consistently. Typically, value strategies involve buying stocks that have low prices relative to their accounting "book" values, dividends, or historical prices. In a provocative study, Lakonishok, Schleifer, and Vishny find evidence that the difference in average returns between stocks with low

[20] Bernard V. and Thomas J.,' Evidence that stock prices do not fully reflect the implications of current earnings for future earnings,". Journal of Accounting and Economics 13, 305, 1990.
[21] Jegadeesh N and Titman S., 'Returns to buying winners and selling losers: implications for stock market efficiency," Journal of Finance 48:65-91, 1993.

price-to-book ratios ("value stocks") and stocks with high price-to-book ratios ("glamour stocks") was as high as 10 percent year.[22] Surprisingly, this return differential cannot be attributed to higher risk (as measured by volatility) - value stocks are typically no riskier than glamour stocks. Rather, the authors argue , market participants consistently overestimate the future growth rates of glamour stocks relative to value stocks. Consequently, these results may represent strong evidence against the EMH. It was also interesting that nearly the entire advantage of the value stocks occurred in January each year. However, current research indicates that the anomalous returns may be caused by a selection bias in a popular commercial database used by financial economists.[23]

Small Firm Effect

Rolf Banz uncovered another puzzling anomaly in 1981. He found that average returns on small stocks were too large to be justified by the Capital Asset Pricing Model, while the average returns on large stocks were too low. Subsequent research indicated that most of the difference in returns between small and large stocks occurred in the month of January. The results were particularly suprising because for years financial economists had accepted that systematic risk or Beta was the single variable for predicting returns. Current research indicates that this finding is not evidence of market inefficiency, but rather indicates a failure of the Capital Asset Pricing Model.[24]

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[22] J. Lakonishok, A. Shleifer, and R. Vishny, "Contrarian Investment, Extrapolation, and Risk," *Journal of Finance* (December, 1994).

[23] See, for example, S.P. Kothari, J. Shanken, and R. G. Sloan, "Another Look at the Cross-Section of Expected Stock Returns," *Journal of Finance* (March, 1995)

[24] See E. F. Fama and K. French, "The cross-section of expected stock returns," *Journal of Finance* (June, 1992)

MPLICATIONS OF MARKET EFFICIENCY FOR INVESTORS

Much of the existing evidence indicates that the stock market is highly efficient, and consequently, investors have little to gain from active management strategies. Such attempts to beat the market are not only fruitless, but they can reduce returns due to the costs incurred (management, transaction, tax, etc).

I Investors should follow a passive investment strategy, which makes no attempt to beat the market. This does not mean that there is no role for portfolio management. Returns can be optimized through diversification and asset allocation, and by minimization of investment costs and taxes. In addition, the portfolio manager must choose a portfolio that is geared toward the time horizon and risk profile of the investor. The appropriate mixture of securities may vary according to the age, goals, tax bracket, employment, and risk aversion of the investor.

CONCLUSIONS

The goal of all investors is to achieve the highest returns possible. Indeed, each year investment professionals publish numerous books touting ways to beat the market and earn millions of dollars in the process. Unfortunately for these so-called "investment gurus", these investment strategies fail to perform as predicted. The intense competition between investors creates an efficient market in which prices adjust rapidly to new information. Consequently, on average, investors receive a return that compensates them for the time value of money and the risks that they bear – nothing more and nothing

less. In other words, after taking risk and transaction costs into account, active security management is a losing proposition.

Although no theory is perfect, the overwhelming majority of empirical evidence supports the efficient market hypothesis. The vast majority of students of the market agree that the markets are highly efficient. The opponents of the efficient markets hypothesis point to some recent evidence suggesting that there is under- and over-reaction in security markets. However, it's important to note that these studies are controversial and generally have not survived the test of time. Ultimately, the efficient markets hypothesis continues to be the best description of price movements in securities markets

Suggested Reading

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