

SECURITIES MARKET EFFICIENCY RECONSIDERED

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This paper reviews the claims of information efficiency with respect to share markets. Financial Economics theory has it that share markets are efficient, and hence the Efficient Markets Hypothesis (EMH). This mighty edifice rests partly on the discredited foundations of Technical Analysis and Fundamental Analysis. Advocates of EMH point out that attempts by Technical and Fundamental analysts to predict future share prices and earn excess or abnormal profits have proved futile. They claim that the very efficiency of securities markets makes it impossible for Technical and Fundamental Analysis to be viable practices. Such claims of efficiency have in turn been disputed. Critics observe that markets are a process and by their very nature can never be efficient in the sense that EMH holds them out to be. On this reasoning EMH is no more than an assertion of a mathematical possibility and is not a real life phenomenon. Nor does EMH explain how markets become efficient.

This paper contends that the emphasis on efficiency (even if this be so) without explanation of the process which generates efficiency is flawed. In asserting so, this view rejects the notion of an equilibrium state which EMH inevitably holds out. To conjure a state of equilibrium is flawed because of the state of 'partial ignorance'¹ confronting all participants in dynamic markets. Partial ignorance emphasises the element of uncertainty with respect to the future. In addition, there is also the problem of unexploited existing opportunities - of opportunities staring at one's face but not taken advantage of.² Finally, this paper contends that the role played by price is a limited one in the sense that it is merely the starting point for decision making. The investors' concern, it is argued, is not what a particular price is but what it is likely to be at the next point in time.

Throughout this paper heavy reliance is placed on the views of the Austrian School that information markets are continually in process and never in a static state.³ These views provide deep insights as to why markets are competitive and become, but never are, perfectly efficient. This view sees the market process as an engine of discovery where meaningful information is the product not of 'merely plugging in values of variables in an otherwise unchanged learning function'⁴ but is the product of changes in the learning functions themselves. The market process here is both the source and manifestation of change, where change itself is the product of individual expectations in the face of uncertainty of events, of actions and expectations of other participants, and inevitable guesswork or likely guesswork of other participants. The emphasis, therefore, is on the dynamic but essentially subjectivist character of individual decision making.⁵

The paper is divided into six parts. Part I deals with the most common methods used to arrive at share values, the Efficient Markets Hypothesis (EMH), and Modern Portfolio Theory (MPT); Part II with Dynamic Time and Uncertainty; Part III with Efficiency and The Role of Price; Part IV with the evidence with respect to Securities' Market Efficiency; Part V with the role of Entrepreneurship in Price Formulation; and Part VI offers some Concluding Thoughts.

PART I

SECURITIES VALUATION AND MARKET

EFFICIENCY

Analysts generally approach share selection in two ways: Technical (or Chart) analysis, and Fundamental analysis. Both methods recognize continuous movements in share prices. But unlike Fundamental analysis, Technical analysis attempts to predict future share prices by reference to past share price movement patterns. Technical analysts believe that history repeats itself. They are guided by two underlying principles: (1) that all information about earnings, dividends and future performance of a company is not automatically reflected in the company's past share prices, and (2) that it may be reflected with delay, ie a stock that is rising tends to keep on rising, while a stock at rest tends to remain at rest. Technical analysts see their task as being able to foresee that next step in this pattern formation with the aid of what has gone before. While extreme adherents of this practice place exclusive reliance on past share prices, more moderate adherents seek confirmation of their predictions by reference to Fundamental analysis.

Technical analysis has been subjected to severe criticism. It is pointed out that such prophetic patterns as are discussed are often dependent upon the scale of the chart, eg whether measured in terms of weeks, days or parts of days, or upon months or years. Trends and patterns which appear significant with respect to the former disappear in relation to the latter. The comparison could also be made with respect to events, eg, a period following economic depression. A second difficulty is to determine when precisely the trend will set in. The more quickly a person acts in response to signals the more likely he is to make the wrong decision. A third is to predict the ultimate pattern the price line will delineate. The most powerful argument, however, is provided by the random walk theory. According to the latter, share price movements are completely unrelated to the past performance of a share and react only to new information. Yet Chart analysis continues to be practiced. Investors find in it a useful source of information of the past performance of a

company and its shares, as an indicator to its future potential. Fundamental analysts find it particularly useful for this very reason.

By contrast Fundamental analysis asserts that market prices are a random process. Expected price changes are independent of past price changes as are distributions of rates of returns. The essential task is to determine whether a given security is underpriced or overpriced in relation to an intrinsic price arrived at by reference to a variety of factors. The value so arrived at is obviously subjective and is constantly revised in the face of new information. In pursuing their objective of predicting share values, Fundamental analysts make use of set, yet flexible, formulas. The flexibility lies in the matters taken into account in arriving at a result for the set factors. Three set factors are commonly taken into account in valuing a corporation's share. These are (1) required return from the investment, (2) anticipated dividend payouts, and (3) anticipated share price at the end of the year. The flexible factors taken into account include in respect of: (1) *the required return*, the element of risk common to all stock generally (non-diversifiable risk) and the relationship of the particular stock to other stock in a portfolio (representing diversifiable risk); (2) *anticipated dividend payments*, detailed examination of the corporation's past performance, an assessment of its current position and an estimation of its future prospects from such sources as past practices of the corporation, disclosed information in its accounts and from other required disclosure provisions under the Corporations Acts and the Stock Exchange requirements; (3) *anticipated share price* wherein factors such as the state of the economy and industry factors peculiar to the corporation, are taken into account.⁶ This third factor is often subsumed in the first and second.

EMH rejects both Technical and Fundamental Analysis and for that matter any other method of earning abnormal profits. Instead, it asserts that share markets are informationally efficient and consequently, share price movements are unpredictable.⁷ EMH has its origins in the work of Louis Bachelier. Analysing the French commodities' market in 1900, Bachelier found the market's contract prices to be unbiased estimates of future prices and consequently, neutral towards both buyers and sellers. Changes in commodity prices were the result of new information (positive or negative) the emergence of which was random. Prices, therefore, take on a random walk over a period of time - a feature discovered to be true of stock markets too.

There are several definitions of information efficiency.⁸ The earliest was by Graham Dodd and Cottle⁹ who viewed efficiency in terms of discovering deviations from an inherent or 'intrinsic' value. 'Intrinsic' value was measured by reference to a variety of factors.¹⁰ Share valuation was thus a process inviting the skill of the analyst. The subsequent definition by Fama¹¹ moves away from this notion of 'intrinsic' value altogether. According to Fama a securities market is efficient 'if security prices "fully reflect" the information available'.¹² The focus thus is on

actions in the marketplace alone without reference to a benchmark. There are several problems with such a definition. One is its inherent circularity, efficiency being dependent on available information. Put another way, a market is considered to be efficient because that is how efficiency is defined. A more recent definition is by Beaver,¹³ according to which a 'market is efficient with respect to some specified information system, if and only if security prices act as if everyone knows the signals from the information system'.¹⁴ The focus on 'some specified information' as distinct from 'the information available' does not relieve the definition of circularity. However, the second half of the definition, unlike Fama's definition, focuses on a world of heterogeneous beliefs and information rather than homogeneous beliefs and information. Thus unlike Fama's definition, Beaver's definition is not equilibrium based. However, the underlying assumption is one of objectivity. Beaver's definition is open to criticism from another direction. As Foster shows, it will in some circumstances be impossible for prices to act 'as if everyone knows the information'.¹⁵

Following Fama¹⁶, three forms of the hypothesis have been recognized, viz, weak, semi strong and strong. The weak form holds that past security prices are of no value in predicting future prices since current security prices fully reflect all the information upheld by the historical sequence of prices and returns on investments. The semi strong version holds that since securities prices fully reflect all generally available public information, investors cannot profit from acting on such information. For example, once a piece of information is in *The Wall Street Journal*, it is too late to use it to earn superior returns.¹⁷ The strong form holds that even investors with non-public information cannot earn superior investments results. Non-public information includes insider information and proprietary conclusions developed from public data by professional investment managers. Implications of the hypothesis in total are: (1) Resort to Technical Analysis is worthless since securities prices reflect more than the information available in past prices (ie, market prices reflect all publicly available information); and (2) resort to Fundamental Analysis is of no help either since prices reflect information in excess of what is publicly available (ie, reflect insider and proprietary information). Market price alone is appropriate, the argument goes.

It is not possible to test the efficient market hypothesis directly as one needs to know the market's anticipated net operational cash flows and anticipated required rates of return for all future periods together with information relevant to security prices and the way such information is reflected in prices. Tests have, therefore, been designed based on available information and available statistical techniques. Tests of market efficiency commonly used are joint tests of (1) the efficiency with which information is processed (whether asset prices 'fully reflect' all available information), and (2) the descriptive validity of a chosen asset pricing model (whether the estimated function or model of market equilibrium is

correctly specified).¹⁸ Thus rejection can be due to an inefficient market, a misspecified model, or both.¹⁹

The model of market equilibrium provides the benchmark for determining whether supernormal profits can be earned by exploiting the information.²⁰ Different models of equilibrium require different tests though variants of the two-parameter Capital Asset Pricing model of Sharpe (1964)-Lintner (1965) are most frequently used. Predecessors of the latter were the random walk model and the market model. The term Modern Portfolio Theory (MPT) is used to group all of these models under one common head.²¹ Researchers using the random walk model in the original form tested the joint hypothesis that the market is efficient and that the expected return on any asset is constant through time. If the joint hypothesis is true, then the equilibrium expected return on any asset is constant through time. If the joint hypothesis is true, then the equilibrium expected return equals the constant regardless of what other information is known. Fama, in his 1965 study, found this to be so.²² A different equilibrium model came to be used later. It only required the expected return on any asset to be positive, for if the market were efficient and current equilibrium prices fully reflected all available information any trading strategy based on moving into and out of the market yielding in excess of a buy-and-hold strategy would automatically negate the joint hypothesis.²³ Despite claims to the contrary by Alexander²⁴, Fama and Blume²⁵ were able to show expectations of the joint hypothesis to prevail. The assertion, however, is with respect to the weak form version only.

The market model came to be used in the late 1960s. The model sought to explain the price movements of a security *vis a vis* the price movement of all other securities. While not an equilibrium model, it was consistent with many equilibria. Notable studies using this model include those by Ball and Brown²⁶ (1968), and Fama, Fisher, Jensen and Roll (1969).²⁷ Claims by these two studies as substantiating the semi strong version have been severely criticised by Hess and Reinganum.²⁸ The more recent studies adopt the Capital Asset Pricing Model (CAPM). The Capital Asset Pricing Model (CAPM) is a variant of MPT and has its origins in the works of Sharpe and Lintner. Sharpe and Lintner showed that not all risk in a corporation's stock was diversifiable and that there lay in each stock a quantum of non-diversifiable risk attributable to factors outside the peculiarities of the individual corporation. The latter they termed systematic risk as against the former, unsystematic risk. The key contention, however, was that systematic risk (even though not diversifiable) was estimatable on the basis of a particular stock's past record and is referred to as the *beta* factor. It involves the placing of a numerical value to a subjective assessment of the movements of an individual stock (or portfolio) compared to the movements of the market as a whole.²⁹ By implication then, the reference to risk in a stock meant systematic or non-diversifiable risk. The market supposedly compensates stockholders only for systematic risk and not also for unsystematic (or diversifiable) risk. Despite the strengths of the model, (it is a financial

model which explicitly formulates assumptions that lead to equilibrium pricing relationships based on the optimal behaviour of individuals), as Hess³⁰ concludes, the statistical estimation of the parameters is plagued with thorny problems including missing data, non-stationary return distributions, and errors-in-variables. There are other problems connected with the assumptions underlying the model.³¹

More recently, securities market efficiency has been explained by reference to Rational Expectations Hypothesis (REH).³² The hypothesis originally formulated by Muth³³ states that market participants form expectations based on all available information and that such expectations coincide with what the relevant economic theory predicts³⁴, i.e. there is a connection between subjective individual expectations and the outcome projected by the economic system. The implication is that participants use information available to them in an efficient manner.³⁵ Some writers have equated REH with EMH. To quote Sheffrin:³⁶

The proposition that markets process information efficiently may be controversial for macroeconomic models but has served as the foundation of research in financial markets for some time. The rational expectations hypothesis, under the name of the 'efficient markets model', has been used quite extensively in financial market research. The efficient markets model asserts that prices of securities are freely flexible and reflect all available information. In its more formal statements the model asserts that prices are related to conditional expectations.

Such a claim is highly misleading if not erroneous. It blurs a major difference in what the concepts are intended to serve, *viz*, IMH asserts an end result - that markets are efficient - while REH attempts to explain a process, the process of acting in anticipation of extraneous events and other people's actions. The essence of EMH rests on its tripartite claims of instantaneous absorption, all available information being reflected, and no gains to be made while REH recognizes that there are gains to be made by exploiting inefficiencies in the relevant model. It may be argued that REH is the process by which markets become efficient - warts and all. But this is a far cry from saying that REH results in EMH, and even less so that REH is a substitute, a mirror image, or is synonymous with EMH. The truth is that REH, in relation to the securities market, is a dressed up version of Fundamental analysis - no more, no less. It is hard to contemplate factors that will be taken into account in formulating REH not already taken into account by Fundamental analysis.

Critics of REH and EMH point to the difficulty in formulating a model: (1) of specifying it, and (2) of testing it. The former reflects the inherently circular nature of the problem, *viz*, if participants make the best use of all available information then it is always possible to define all available information to accommodate the hypothesis. The difficulty of testing the hypothesis for accuracy springs from the fact that it cannot be

tested independently of a model of behaviour. This gives rise to the problem of statistical identification, ie of disentangling from the data separate estimates of all the relevant theoretical parameters of the model. Expectations based on an incorrect view of the model will affect behaviour and hence the data to be used in empirical work which seeks to quantify the model itself.³⁷ Such difficulties are compounded by changes in policy by the relevant institution and the presence of noise.³⁸ In terms of the EMH, models such as the Random Walk Model, the Market Model, and the CAPM come up against the same objections. As one group of commentators observe:³⁹

Hence it is almost always possible to 'explain away' the failure of the rational expectations hypothesis to survive an attempt to refute it by arguing that the rest of the model is at fault. Only if one is absolutely certain (and one never really can be) about the model with which the rational expectations hypothesis is combined can one really be sure about whether it is the rational expectations hypothesis itself which is being tested. In practice, if in a variety of contexts, the rational expectations hypothesis is consistently rejected, this will suggest - though not prove - that the rational expectations assumption is itself invalid.

There is also the related problem of 'observational equivalents' ie for any model that fits the data there will always be a different model which fits the data equally well. The implication is that even if the rational expectations model passes conventional empirical tests, it does not necessarily justify acceptance of the hypothesis. The decision whether to accept or not depends then not on the model having passed the test, but on a value judgment independent of the non-rational expectations model.⁴⁰

The other major criticism is directed at the process of being informed, viz (1) the available information, (2) information gathering and (3) user of such information. The former situations distinguish between information generally known and obtainable at no cost, and information obtainable by research or through the services of professionals (paid information). While it may be expected of participants to make use of information generally known, this assumption may be incorrect with respect to paid information. In keeping with general economic theory, the decision to acquire paid information will require extensive cost-benefit analyses. Thus it may never be profitable or rational to obtain 'complete' information. Yet, as Arrow⁴¹ observes 'in the rational expectations hypothesis, economic agents are required to be superior statisticians, capable of analyzing the future general equilibria of the economy'. Rational Expectation theorists respond to this by suggesting that it is sufficient if participants in forming their expectations act as if they know the correct model of behaviour (it not being necessary for them to be in possession of and have digested such information); and that it is sufficient if one group of participants formed such expectations and others merely followed.⁴²

These points become clearer in the light of two other claims by Rational Expectation advocates, that (1) prices reflect all available information, and for this reason (2) today's price embodies anticipated future changes in price.⁴³ These claims are the same as those made by Efficient Market theorists and confuse process with end result. They also beg the question, viz, if expectations are rational/markets are efficient, what makes them so? And why? In other words, if market prices reflect all available information participants need only observe such price to infer the relevant information. If all participants adopt this line of reasoning, dynamic markets will become inefficient while static markets will be in a perpetual state of equilibrium without any trading at all - there being no incentive to trade. REH also lends itself to caricature. For example, in an oligopolistic situation, if A anticipates B anticipating A's conduct, then A will attempt to forestall B so anticipating; B will in turn anticipate A's attempt to forestall, and so on. How does this resolve itself? Another possibility is that there may be no uniquely rational course of action to follow in a given circumstance. And where no such rational course of action exists for the policy maker, by definition agents cannot be in possession of rational expectations.⁴⁴ Additionally, the point made earlier that according to REH today's price embodies anticipated future changes in price should once again be noted. While the theoretical justification for this viewpoint is certainly different, it reminds us once again the notion of Static Expectation theory.

PART II

DYNAMIC TIME AND UNCERTAINTY

Securities markets, like other dynamic markets, exist in the face of uncertainty. Uncertainty prevails in securities markets for several reasons. First, securities trading is forward looking and is concerned with what the price will be at the next point of time. Secondly, information is costly, and in any case not all participants have equal access to information. Thirdly, the future is not only unknown, but unknowable. Stated differently, it is not possible to predict future events with any degree of accuracy. Finally, and flowing from the factor of ignorance so far highlighted, future price forecasting becomes essentially a matter of subjective guesswork. None of the 'models' discussed above seem to recognize these limitations to decision making in the face of future uncertainty. Instead these 'models' proceed on the Robbinsian basis of reconciling ends and means. Robbins saw the problem of economics as being one of allocating known available resources amongst competing claimants. This approach necessarily presumes knowledge of both availability of resources and the ends to which they could be put to use. Such a presumption may be correct of what is generally described as a static or homogeneous market. In fact competitive securities markets are

neither static nor homogeneous. Competitive securities markets are by definition not only heterogeneous, but also dynamic. Markets of this type have been described as 'discrepant' markets. This difference between homogeneous, heterogeneous and discrepant markets has been explained as follows:⁴⁵

A homogeneous market can be cleared by adjustments of price and quality. A heterogeneous market is cleared by information matching two sets, one ranging over heterogeneous demand and the other over heterogeneous supply. A discrepant market can only be cleared by innovation ... If strongly motivated problem solvers face each other ... it can never be cleared but only moves in the direction of that equilibrium state. Another state, representing new requirements and new opportunities, has arisen before the last is satisfied.

And also:⁴⁶

in the case of the homogeneous market, price is the clearance mechanism. For the static heterogeneous market, information serves that function (at least in principle). The discrepant market, however, (which is dynamically heterogeneous) is never cleared. Full congruence is never attained. The problem is to ascertain how human beings in the discrepant market place act in order to maximise each other's satisfaction. Although the problem can be simply stated, it is not easily resolved.

The distinguishing feature of discrepant markets is that not only is decision making *ex ante* (as in the case of all *dynamic* markets) but also such *ex ante* decision making is in the face of uncertainty. These twin elements constitute also the essential characteristics of competitive securities markets, characteristics which models other than the discrepant market model have ignored. The consequence of such non-attention has been the unexplained void in such models. Recognition of the discrepant model explains why there exists the void. This problem has been contributed to by the improper appreciation of the difference between risk, uncertainty, and ignorance.⁴⁷ The first two are 'Knightian'⁴⁸ concepts. Risk represents a condition where all possible states of the future are presumed known and a probability distribution defined for those states. The task of the decision maker is to forecast the equilibrium using the expected value criterion and to allocate resources accordingly. Uncertainty assumes greater complexity. While, as in the case of risk, all possible outcomes are presumed known, uncertainty recognizes numerous probability distributions with associated subjective weights. Ignorance highlights the impossibility of predicting all possible outcomes. Ignorance in this sense does not connote imperfect knowledge but ignorance of events to occur. It connotes unexpected change. Consequently, in the words of Loasby, there is always present a state of 'partial ignorance'. It is this latter that discrepant markets have to face up to. Such ignorance is

the inevitable consequence of dynamic, continuous, or real time and with it the flow of novel experiences. Dynamic time, in this sense, is synonymous with the happening of new events, and has been described as the dimension of all change.⁴⁹ It is impossible for time to elapse without the constellation of knowledge changing. Knowledge shapes action and action shapes the observable human world. It is, therefore, impossible to predict any future state of the world.

Dynamic time focuses on three interrelated features: (1) dynamic rather than mathematical continuity; (2) heterogeneity; and (3) causal efficacy.⁵⁰ The crucial elements of the first are memory and expectations. Memory links the present inextricably with both the past (the knowable) and the future (the unknowable). It also differentiates each successive period thereby making each period novel. This linkage and differentiation of each successive movement is what makes time also heterogeneous. In this process, the individual's memory is continually enriched causing the subjective standpoint from which the world is experienced to undergo change. At the same time, expectations based on the predicted event itself undergo change.⁵¹ The reason is that where the predicted event is dependent on a subjective state of affairs such as the expectations of individuals, the event itself is altered by the predictions because the outcome is then viewed in terms of the prediction. Causal efficacy follows immediately from heterogeneity. It recognizes that action takes place through time and that the mere lapse of time adds to novelty. Since the addition to memory changes the perspective from which the world is seen, time is seen as being both causally potent and creative. Amidst this, the growth of knowledge is regarded as the endogenous force which endlessly propels the system⁵² with competition as a process of discovery producing changes that are unpredictable rather than reflecting a position of equilibrium. Together, time and ignorance constitute complementary ways of conceptualizing the unknowability of the future. Thus while dynamic time highlights uncertainty, ignorance emphasises subjectivity.⁵³

Subjective decision making is the inevitable by product of future time and ignorance. The standard treatment of decision making under uncertainty, however, does not come to grips with this. Instead, it proceeds to explain by simply modifying a theory based on the assumption of perfect knowledge.⁵⁴ Such modification takes place at two stages: First, in the analysis of risk, the decision maker is assumed to be equipped not with precise knowledge of the outcome of the exercise of choice but with a complete list of the set of all possible outcomes relevant to each choice and also with the probability distribution fully defined over that set. On the basis of such information it is presumed possible to calculate every possible outcome of each choice, and the expected value of each. The weightings are appropriately adjusted so as to reflect the decision maker's attitude to risk. To obtain the necessary results it is felt necessary to only substitute such expected values for the known values. The resulting set of outcomes together with the probability distribution applied is thereby

regarded as constituting 'objective knowledge'. This notion of an objective probability distribution carries with it a strong (but unstated) implication about the nature of the world, namely, that it generates all the necessary (and quite unambiguous) frequency distributions from a stable population of events. It has been remarked that the mere statement of this implication is, in itself, enough to show its implausibility as a general proposition.⁵⁵ To sidestep this 'implausibility' the second stage modification is effected. The decision maker is presumed not to know the relevant probability distributions even though he is regarded as still possessing a complete list of outcomes. Even this second stage modified analysis of uncertainty leads to awkward problems.⁵⁶ The most favoured way around such 'embarrassing indeterminacy' is by resort to the use of subjective probability thereby transferring the problem into a form equivalent to a state of risk.⁵⁷

The traditional approach is thus concerned with discovering the unknown by way of either an objective or subjective probability distribution. The future is thus knowable as it is presumed to exist independently of the autonomous choices of individuals. This approach neglects a fundamental aspect of ignorance, *viz*, 'the (perceived) unlistability of all possible outcomes'.⁵⁸ Not only is the possibility of recurrence of a given set unknown, but the information set itself is unbounded. Thus even subjective probability reflects no more than subjectivism in its static form. While it demonstrates how aggregate phenomenon and their subjective meaning are in turn built up from the meanings of many individuals, it does not specify causal processes in which learning and the transmission of information are involved. By contrast, the dynamic subjectivist approach attempts to do precisely this. It seeks to explain not only how individual valuations interact to form prices but also how the acquisition of knowledge and the projection of expectations occur. It emphasises that where there are several participants, subjectivism is multiplied. While each one of them contributes to and benefits from market price, it cannot in any sense be said that a static, objective, or equilibrium price has thereby been reached.

The underlying premise of dynamic subjectivism is that decisions are not the determinate result of clearly specifiable causes.⁵⁹ Explanatory models embody non-deterministic processes with respect to both learning and expectation formation. Genuine learning is not merely the result of a determinate processing of what is already known but extends to unpredictable shifts in the method of processing itself. Similarly, expectations are not confined to the discovery of an already determined future but is the result of free, indeterminate decisions of actors and hence, is actually created by them. Furthermore since actions are based on the individual's stock of knowledge, the inability to predict one's future knowledge also means that one cannot predict one's future decisions. It is logically impermissible, therefore, to develop mind constructs in which decisions are purely deterministic. A theory of dynamic expectations, then, by definition precludes objective knowledge. Thus a group of

individuals even when presented with common information will, because of different objectives they may wish to achieve, and because of different expectations of the outcome, learn different things. While the stock of knowledge will be useful to everyone, there will nevertheless be a division or distribution of knowledge. This does not mean that the learning process is purely random. In the terminology of Popper⁶⁰, it lies within the sphere of 'plastic control' standing between mechanical determination on the one hand and blind chance on the other. In this in between world while what individuals learn will not be determinate, it is clear that they will seek to learn and learn.

Recognition of dynamic subjectivism, thus, heralds several consequences. One is the realisation that actions of individuals are unlikely to be perfectly co-ordinated. Market activity takes on the form of individual goal directed action aimed at correcting errors and co-ordinating behaviour. The market thus is an unending process never leading to a state of determinate equilibrium. Error and the correction of errors are the important features of the market place and not the attainment of equilibrium. Another important consequence is the shift away from mathematical maximization models. Recognition of the unboundedness of expectations has meant that market participants are regarded as following rules of thumb or engaging in entrepreneurial discovery (ie, the filling of co-ordinated gaps, or the discovery or creation of possibilities that have been overlooked). A third consequence is the recognition of spontaneity or the unintended consequences of individual action. This is in contrast to the neo-classical notion of individual optimising. Uncertainty arising from future time and ignorance preclude participants from engaging in optimising conduct. Instead, one learns in the marketplace through trial and error, the market process being one of discovery.

Decision making, however, cannot be divorced from expectations.⁶¹ All economic action is shaped by plans dependent on expectations. Expectations are as autonomous as human preferences are and divergent as between individuals. For this reason, individual expectations come to be constantly modified. Human expectations diverge due to the occurrence of unexpected change as well as the inconsistency of human plans. Such divergence of expectations have an important positive function in a market economy. As Lachman describes it, 'it is an anticipatory device'.⁶² Lachman observes:⁶³

Those who take their orientation from the future rather than the present, the 'speculators', permit the future to make its impact on the market process earlier than otherwise. They contrive to inject a glimpse of future knowledge into the emergent market pattern. Of course they may make mistakes for which they will pay. Without divergent expectations and incoherent plans, it could not happen at all.

The market process consists of a sequence of individual interactions, each denoting the encounter (and sometimes collision) of a number of plans, which, while coherent individually and reflecting the individual equilibrium of the actor, are incoherent as a group. The process would not go on otherwise. Unsuccessful plans are constantly revised, from which experience, planners no doubt learn. What they learn, however, is not known. And different people learn different lessons.

Expectations are more important in asset markets such as the Stock Exchange than in product markets. This is not only because of the greater divergence of expectations in the former (of bulls and bears) but also because the time period considered in product markets is generally shorter. Additionally, almost any news is sufficient to give momentum to change in securities markets. This explains the volatility of such markets. This factor of divergence highlights the distinction between the unknowable future and the knowable past. All knowledge belongs to the past, and the past alone is known or knowable. The future is not only unknown but is unknowable as the autonomy of the human mind precludes determination. Where knowledge shapes action and action shapes the human world, the future is unpredictable. To quote Shackle:⁶⁴

We cannot have experience of actuality at two distinct 'moments'. The moment of actuality, the moment in being, 'the present' is solitary. Extended time, beyond the moment, appears in this light as a figment, a product of thought.

Furthermore, new knowledge need not be additive. It can just as well be substitutive or complementary. New knowledge may render the old obsolete or enhance the horizons of the old, opening new fields for the combined application of both the old and the new.⁶⁵

As Eggar stated:⁶⁶

All individual action hinges upon the comparison: 'What will things be like if I don't act', versus 'what will they be like if I do?' To make such a decision the individual must construct hypothetical states of the future, one conditional on the individual's act and the other on its absence ... It is the ability to isolate correctly the relevant-causal aspects of a situation or an ongoing process, and hence to accurately predict its future in both the absence and presence of one's own action, which constitutes successful entrepreneurship.

As noted earlier, what an individual decides to do depends in large part on what he expects others to do. Unless a great deal of predictable decision making from others is forthcoming it will be impossible for any meaningful choice in the decision process. There is thus encountered here a problem of a different sort, *viz*, the contradiction between decision making that is both unbounded in degree and quantitatively unlimited with

the opposite that no decisions at all can be made when the future is completely unpredictable. This does not render decision making pointless. Rather, it emphasises that the point at which decisions are made is at the interstices.

HANDLING UNCERTAINTY

Genuine uncertainty is endogenous and consequently inherently ineradicable. It is endogenous in that it deals with a contest requiring individuals to predict better than others, and because such individuals are required to make predictions of predictions, rather than of tastes or availability of resources. What others are predicting does itself constitute relevant information. Faced with a range of choices and an open ended set of possibilities the task becomes inherently ineradicable. The acquisition of additional knowledge will not enable an individual to overcome the uncertainty as the target is a moving one. Additional knowledge helps transform the uncertainty rather than eradicate it. Knowledge grows with the passage of time giving rise to endogenously produced change. Based on the new knowledge, the guessing game will continue. No equilibrium point whether of the exact or stochastic variety will be reached.

However, individual action, while unpredictable, is at the same time purposive. It is purposive⁶⁷ in that it is the product of conscious decision. Purposefulness highlights the logic of human choice. Were the future completely unpredictable in all respects, then planning and acting would be almost purposeless. O'Driscoll and Rizzo see as the solution to this paradox 'the recognition of *typical* and *unique* aspects of future events'.⁶⁸ Typification is the process of 'extracting what stability and regularity there is in the flow of reality'.⁶⁹ Uniqueness refers to the non-repeatable aspects or the specific time-dependent features of an event. Non-repeatability emerges from its order in the flow of events. Any attempt to anticipate the unique aspects of an event changes their face value since the anticipation will itself affect the eventual experience - the endogeneity of genuine uncertainty. There is a notion of equilibrium offered by O'Driscoll and Rizzo which takes into account both time and uncertainty. Termed 'pattern co-ordination',⁷⁰ it makes use of both Hayek's version of 'compatibility of plans'⁷¹ and their own version which distinguishes between typical and unique aspects of future events. According to this model, the plans of individuals are in a pattern equilibrium if they are co-ordinated with respect to their typical features, even if their unique aspects fail to mesh.⁷² Hayek's model while attempting to marry time and equilibrium takes account only of static (Newtonian) time and not dynamic time.⁷³

O'Driscoll and Rizzo's pattern co-ordination co-ordinates plans but not the actual activities. It recognizes that plans need to be open ended with details to be filled in as actions and events come to pass. 'Thus, co-ordination can exist with respect to plans or the typical features of planned

activities but not with respect to the actual activities themselves'.⁷⁴ By so doing, the model incorporates real time and genuine uncertainty. Equilibrium in this less rigid sense, does not entail the complete absence of all tendencies to change.

PART III

EFFICIENCY AND THE ROLE OF PRICE

The mainstay of EMH is price. Prices are said to both transmit and aggregate information.⁷⁵ In the first situation, price conveys to the uninformed information in the possession of the informed; in the second, different individuals have different information and price acts to aggregate all such information. Price, in this sense is said to reflect both the actions of the informed individuals and the markets' collective response to such information. Trading in securities takes place because traders differ in endowments, preferences and beliefs on the stock's worth. The more numerous the events which can bear on the stock's valuation, the more widely will opinions diverge as to how likely these events will be. The only way that traders can make a gain is by use of superior information. The acquisition of information is costly and traders will not acquire costly information unless they can earn a return on the investment.⁷⁶

PRICES AS TRANSMITTING AND AGGREGATING INFORMATION.

Prices transmit information when informed traders use their information to take a position in the market. Uninformed traders by observing current prices learn about information in the hands of the informed and use this to form their judgments. This may create the possibility of free riding, *viz*, of uninformed traders expending no resources to collect information but using to advantage the information of informed traders as reflected in current share prices.⁷⁷ However, the price system does not transmit all the information from the informed to the uninformed since price is a noisy signal. Price does not, for eg, show how B C and D arrived at their decisions on which A supposedly relies. Nor does it explain how A arrives at a decision in the presence of noise. Furthermore, it must be assumed that informed traders gain more than the uninformed (subsequently informed) for otherwise there will be no incentive for traders to expend resources to acquire information. Such an assumption, however, is contrary to the efficient market hypothesis. Price aggregates information when each of the informed participants has a piece of information. Participants bear in mind that both they and other participants have information and that market prices reflect this information. Price, by aggregating the different pieces of information, reveals to each participant information which is of higher quality than his

own. From this, it has been argued that competition aggregates all the market's information in such a way that the equilibrium price summarizes all the information in the market.⁷⁸ Gains will not flow from attempted free riding since market prices would already reflect such information. And so long as the market clearing price conveys additional information about the final outcome, agents will have an incentive to keep changing their bids. Where agents incorporate such aggregate information into their consumption decisions it alters such decisions, generally altering thereby the previous equilibrium price.⁷⁹ When all agents realize that the market clearing price conveys additional information a Rational Expectations equilibrium is supposedly reached. In this Rational Expectations equilibrium state, one price supposedly conveys all the information available for forecasting even though the sources themselves are numerous.

This Rational Expectations view recognizes the dependence of A's action, for eg, on information possessed by B, C and D and *vice versa*. But it leaves unanswered whether gains made for eg by B, are followed by C, D and A (in that order) making gains or whether there is a wild scramble. In a dynamic stock market, prices will immediately adjust following the transaction entered into by C, leaving no gains to be made by D and A. The former claim, therefore, is self defeating. In the second situation, ie, where the parties do not act in a co-ordinated manner, it is not so much the claim of awareness by each individual that others possess information similar or more or less than similar that is important. What is important is the uncertainty facing each and all of the participants as decisions of others, anticipated and acted upon may prove to be erroneous either in degree or in occurrence. Stated differently, ignorance of the decisions which others are in fact about to make may cause decision makers to make unfortunate plans - plans that are doomed to disappointment or plans which fail to exploit existing market opportunities - explicable in terms of over-optimism and undue pessimism.⁸⁰ This inevitably results in a revised set of decisions. Decision-making in this latter sense is, therefore, not perfectly dovetailing. Decisions fail to be carried out and opportunities lie for exploitation. Participants fail to forecast decisions of others and likewise are unable to predict with any accuracy the effects of their own actions. The market in this sense is in a continuous process of adjustment and re-adjustment and never in equilibrium.

To state that price embodies information is not the same as stating that information determines price. The former suggests, for eg, that *only* known information will be reflected in price as distinct from unknown or withheld information. By contrast, the latter impliedly suggests that even withheld information will be reflected in price. It disregards the possibility of some information not being reflected in price. It is important to highlight the relationship of price to known and unknown information as it makes clear that price reflects information and adapts to it rather than it being synonymous with information. As Hayek's⁸¹ well-

known example of the scarcity of time and its consequent rise in price shows, price reflects only a fraction (though a significant fraction) of the bundle of knowable information. Some knowledge (*viz*, the cause of the scarcity) will remain uncommunicated at any given time. Hayek⁸² goes on to claim that the cause of the scarcity is in itself unimportant and that the higher price will induce them to counteract scarcity in an efficient way. Such a claim, however, may well be questioned. Learning to live with scarcity will only be a temporary solution. Resourceful market participants would wish to find producers and substitutes for the same product. Since this will incur delay and heavy capital expenditure, they will wish to know the cause of the price rise.⁸³

As an examination of the work of Fundamental Analysts shows, non-price information covers a broad range of matters. Some of the information so relied on is direct (for eg retained earnings), while most of it is indirect (eg its response in relation to an event). The latter is the subject of opinion based on opinion. Thus non-price information is information yet to be captured by price including new direct and indirect information, and also the correction of old direct information, and the fresh evaluation of opinions of indirect information. EMH attempts to fend off non-price information by resort to two measures. First, by claiming that price anticipates future information, and secondly, by claiming that prices adjust instantaneously to new information. The first claim falls on its face as it cannot be demonstrated how unknowable information could ever be anticipated or for that matter, whether expectation formation on knowable information can be anticipated within a high degree of accuracy. The second claim fails in the face of contrary evidence.⁸⁴ Both claims have received the mileage they have because of the inherent circularity of the definition of efficiency.

In summary, while price is an indispensable element it offers no more than a guide or signal for decision making. There is nothing called a correct price, and price is subject to constant revision. Prices and markets function as part of a wider economic/social system and such systems generate many kinds of rules and signals besides prices. Such non-price rules and signals are as much a constraint to actions in the market place as much as price is. It is ultimately people, and not prices, that allocate resources. In this context, market participants do not merely respond to, but also create change.⁸⁵ What is important is to understand how the decisions of individual participants in the market interact to generate the market forces which cause price to change. The efficiency of the price system should, therefore, not be judged in terms of any supposed equilibrium, but be regarded as the starting point for decision making in the face of partial ignorance.

CHARACTERISTICS OF MARKET INFORMATION

Despite claims by the strongest form of EMH (that insider information too is revealed in price) and of REH (there is nothing called private information - market participants actions anticipate information), a large part of market information is private. The randomness of share price movements can partly be explained in terms of the exploitation of privately acquired information. Unless so explained, there is the necessary implication that share prices move without there being any trading. While this may occur on occasion it certainly will not be a characteristic feature of dynamic markets.

Participants in the marketplace are recognized as being endowed with two types of private knowledge, *viz*, preferences, and knowledge of being the man on the spot (right place, right time). But efficient use of knowledge requires more than the possession of such knowledge; it also requires co-ordination of the individual's decision based on such knowledge with the decisions of other participants in the market. One suggestion is that such co-ordination is achieved through the processes of data reduction and foreknowledge embodied in the notion of price.⁸⁶ As Hayek explains:⁸⁷

Fundamentally, in a system in which the knowledge of the relevant facts is dispersed among many people, prices can act to co-ordinate the separate actions of different people ... The mere fact that there is one price for any commodity - or rather that local prices are connected in a manner determined by the cost of transport, etc - brings about the *solution* which (it is just conceptually possible) might have been arrived at by one single mind possessing all the information which is in fact dispersed among all the people involved in the process (emphasis added).

Hayek's 'solution' does not refer to a state of equilibrium. Rather, it refers to the process or tendency towards equilibrium. Such a tendency exists because of the opportunities for gain conveyed in price differentials. Price differentials persist because of the diffusion of knowledge. Entrepreneurial action acts to narrow the price spread.

Information sought by economic agents is also of an empirical nature in the sense of 'knowledge of the particular circumstances of time and place'.⁸⁸ Such information is of 'temporary and fleeting significance',⁸⁹ with its profitable exploitation being dependent on its remaining private. Again, much of the economically relevant information is tacit. Tacit knowledge may take on the form of a skill or may be embodied in a custom or unarticulated rule of behaviour.⁹⁰ This has the implication that the nature of the information can be successfully withheld from other participants for a period of time. Conversely, such intractability may prevent the information from being communicated or explained to other

participants.⁹¹ Consequently, some information will remain private.⁹² Dynamic markets also generate unintended consequences and hence unforeseen results and surprise. This is the inevitable result of diverse expectations amongst competitive participants and of expectations based on expectations. In the face of this, plan revision is constant.

Price by its nature, is backward looking and is of historical importance. The market participant's concern, indeed his *only* concern, is what it will be at the next moment in time. This is essentially to delve into the unknowable future using present price as a starting point. The causes for past price changes may hold out lessons for the future. But the future in terms of price at the next point of time, is independent of what it is and what it was. Any decision whether to buy, sell or to simply hold on are not influenced by a given price at any particular moment in time or by reference to an intrinsic value alone. Rather, such decisions are influenced purely by considerations of what it will be next moment. In this sense, price is no more than a point of exchange. What is of importance is the reason for the exchange, *viz*, information. Price does not, and cannot capture all expectations, as expectations by their nature fall into the realm of future uncertainty. Participants hazard a guess and act in anticipation. Actions in the market place are nothing more than that. To the extent the prediction proves correct, gains flow. If not, losses may be incurred. The profits from guessing right flow only to the extent that some others have been wrong on this occasion.

Information markets may be viewed at several different levels. At the simplest level, participants A and B, for eg, having come into contact with each other proceed to contract. At the next level A, additionally, hazards B's assessment (and *vice versa*) of A's situation of which B is conscious. At the third level, there are a great many A's and B's trying to determine what the market will determine. The process goes on. The whole scenario is typified in Keynes's very famous illustration of the newspaper photographs beauty contest. EMH fails to come to grips with this third level of decision making as it fails to recognize the subjective process of price formation. Its trilogy of claims lays stress on the supposed inability of participants to beat the market and attempts to nurture along with this, a feeling of helplessness. Accordingly, benefits flowing from the research efforts and position of risk taken by the various market makers are ignored. This approach fails to acknowledge that every movement in price represents the conscious actions of market participants and that it is these actions which transform the marketplace to its state of efficiency. Stated another way, while evidence of doing better than the market is relevant, of greater importance is whether the market change is the result of individual attempts to beat the market. The fact that it is these actions that bring about market efficiency is evidence of pace setting, of people being in the know, and consequently of gains being made. The persistency and variety of such efforts indicate the success of these attempts.

The statement that the market is efficient carries with it the automatic inference that it will continue to be so at the next point of time. This is its crucial thrust. This begs the question as to what is meant by efficiency. As observed earlier, efficiency as defined by EMH is circular. Markets are efficient if they reflect all available information.⁹³ Available information as we have noted consists of information known, that can be known (insider information), and anticipations of information which by definition is unknowable (*viz* people's anticipation of other people's anticipations including known information and insider information). Thus, the claim of efficiency is reducible to what people anticipate the position to be. And on this opinions are varied. One investor's desire to avoid loss at a particular point of time corresponds with another investor's desire to make gains at a future point of time. Divergence of viewpoints as to the future is the cause of uncertainty.

PART IV

THE EVIDENCE WITH RESPECT TO MARKET EFFICIENCY

Fama's review article⁹⁴ (1970) synthesises a large body of material in support of the Efficient Market Hypothesis. The claim is that except for insiders, there exists negligible hope for systematic abnormal gains. Several pieces of evidence are relied on for support of the hypothesis. These include the performance of mutual funds, block trades, stock splits, and new issues. Evidence with respect to these four and some other instances are investigated below.

THE PERFORMANCE OF MUTUAL FUNDS

In an article published in 1968, Jensen⁹⁵ having reviewed the performance of mutual funds concluded that the 115 funds under review not only were not able to predict security prices well enough to our perform a buy-the market-and-hold policy but also that there was very little evidence that any individual fund was able to do significantly better than that which could be expected from mere random chance. This was said to be true even when fund returns were measured gross of management expenses (ie on the assumption that bookkeeping, research, and other expenses except brokerage commissions were obtained free). Such evidence, it was claimed, was supportive of strong form efficiency. The later study by Mains⁹⁶ strongly challenges these claims. Mains' study found that almost 80 per cent of Jensen's fund posted gains and that,

... Jensen's empirical analysis and conclusions were based on questionable methods of estimating the mutual fund rates of return and levels of systematic risk ... that Jensen's methodology (1) understated the mutual fund rates of return (and therefore understated the measures of excess return), and (2) introduced unnecessary measurement error into the analysis of assuming that the measures of systematic risk for the mutual funds were stationary over time.⁹⁷

The study found mutual funds rather than being 'inferior' performers on a net return basis, '... were approximately neutral performers, with a majority of the funds recording positive performance statistics'. It concluded as follows:

Clearly, these results reject the idea that mutual funds should abandon security selection and market timing activities in favour of buy-and-hold policies. Nor do the gross return results support the 'strong' form of the efficient market hypothesis. Adding back expenses showed a large majority of the mutual funds earning sizeable excess returns, an untenable result if security prices fully reflect all information too quickly for professional portfolio managers to use this knowledge effectively.⁹⁸

The empirical evidence as to EMH is only a partial response to the issue considered in this paper.

A later study (1979) of the performance of 49 mutual funds for the period 1960-71 by Kon and Jen⁹⁹ attempts to give support to Jensen's claims. But the study is forced to conclude that the evidence goes both ways.¹⁰⁰ Strangely, no reference is made at all to Mains' paper. Despite continuous reliance on Jensen's paper by adherents of EMH, the weak foundations on which the paper rests cannot, and should not, be overlooked.

The pricing of closed-end investment company shares provides yet another example against the efficiency claims. Closed-end investment companies, like open-end mutual funds, invest in a portfolio of stocks and other securities. However, closed-end companies, unlike mutual funds, neither issue new shares nor redeem outstanding ones. Purchases and sales of closed-end company shares thus are on the open market only with share prices reflecting not the net asset values of the companies but rather the supply and demand for the shares. The evidence against the efficiency claim is that the shares of closed end investment companies usually sell at discounts (sometimes at substantial discounts) from the actual values of the portfolios of stocks they hold.¹⁰¹

BLOCK TRADES

Block trade has been defined as a transaction involving a large number of shares that can readily be handled in the normal course of the auction market.¹⁰² Several studies show evidence of price decline following a block trade. Kraus and Stoll¹⁰³, and Scholes¹⁰⁴ show such decreases to have persisted for at least a month following the trade, the actual figure itself being small (around 2 per cent in two weeks). Since the magnitude of the price adjustment did not appear to be related to the size of the issue, Scholes attributes the adjustment to negative information implicit in the sale of a large block of shares and by reference to the identity of the vendor. Since corporate insiders need to report their sales only within 6 days of the event, Scholes study asserts that the market, on average, adjusts to the information by then.¹⁰⁵ However, the process of price adjustment commences several months (if not years) before the event.¹⁰⁶ It is not possible, therefore, to investigate a stock's elasticity of demand by looking at the change in price in the period around the sale. Contrary to Scholes' overall reliance on the substitution hypothesis¹⁰⁷, Allen and Postlewaite rely on the price-pressure hypothesis.¹⁰⁸ While the evidence supports the view that shareholders act in anticipation, since the process of adjustment is over such a long period it offers no great support for claims of semi-strong efficiency. Another study by Dann, Myers and Raab¹⁰⁹ using intra-day price yields show results consistent with the weak form of the efficiency hypothesis. They show that it takes up to 15 minutes for prices to adjust after a block trade enabling at least insiders (NYSE members) to make a gain.¹¹⁰

STOCK SPLITS

In their study of the announcement of stock splits, Fama, Fisher, Jensen and Roll¹¹¹ present evidence to the effect that investors cannot systematically realize profits from split securities in the period between announcement of the split and the effective date of the split. From this it is argued that security prices not only adjust to new information but also anticipate new information. The study shows that for a sample of 940 stocks, the average residual return becomes positive 29 months before the split date at which time it returns to zero.¹¹² In a subsequent study Charest¹¹³ replicated and refined the Fama *et al* analysis, concentrating on the dates of the split proposal, approval by stockholders, and split realizations. Trading rules based on the earlier dates were found to yield only slim excess profits not viable in an economic sense. Charest concluded that the NYSE appeared to be reasonably efficient with respect to publicly available stock split information, but less efficient than estimated from the past literature.¹¹⁴

Splits in themselves are not necessarily sources of new information as their only apparent result is to multiply the number of shares per

shareholder without increasing claims to real assets. The Fama study, however, presumes that the market reads splits as conveying information of a fundamental nature such as future earnings being able to sustain increased dividend payments. While the presumption and the evidence may confirm efficiency in the weak sense, any claims beyond this are suspect. Asks one writer, 'How much insight into intrinsic value can an investor squeeze out of a stock split and how long should it take him to squeeze it dry?'¹¹⁵

NEW ISSUES

The study of Ibbotson¹¹⁶ (1975) demonstrates clearly that initial issues of stock are underpriced implying thereby that market pricing of initial issues is either inefficient or that underwriters purposely underprice the issue. Evidence of the former would suggest pricing inefficiency by the market. However, Ibbotson's study on the matter is inconclusive.¹¹⁷ The study concentrated on 'unseasoned' stocks on the over the counter market for the period 1960-69. It shows that even after adjusting for the higher rates of the over the counter market, investors on average could gain abnormally in the short term by taking advantage of the upward price movement between the offer date and the price at the end of the month of issuance. From the second month on, the evidence is consistent with market efficiency.¹¹⁸

The evidence with respect to direct claims of efficiency appears not to be impressive. Furthermore, there is an impressive body of evidence to the contrary. Some early analysis of this is found in the special issue of the *Journal of Financial Economics* (Vol 1 June 1978) which brings together 'scattered pieces of anomalous evidence regarding Market Efficiency'.¹¹⁹ These include studies on earnings announcements, the relationship between stock prices and option prices, the relationship between cash and stock dividends, and techniques of estimating abnormal returns.

ACCOUNTING INFORMATION AND PRICE CHANGES

An extensive body of literature has examined the information content of accounting information and the efficiency of the market with respect to their disclosure. These several studies, notably Benston, Ball and Brown, Brown and Kennelly, Foster, amongst others, present convincing evidence that accounting information, particularly earnings, possesses informational content and that awareness of forthcoming earnings announcements yields an abnormal return. Overall, these studies suggest that unexpected earnings changes (both annual and quarterly) and unexpected price changes or returns move in the same direction.¹²⁰ Other collections of studies have concentrated on the security price effects of voluntary or required disclosures which do not necessarily have a direct impact on reported earnings. These include such areas as the effect of changing

prices and inflation, and audit qualifications. The enquiry is whether accounting changes (short term announcement effects) affect prices in some noticeable way. Studies in these areas lead to few solid conclusions except that they provide timely and relevant information to individuals acting in the financial markets.¹²¹ Evidence also shows that security prices are not influenced by choice of accounting method.¹²² However a firm's price-earnings ratio seems to be greatly influenced by the selection of accounting method, the effect being borne directly in the ratio's denominator (ie earnings).¹²³

Several studies also evidence the existence of price adjustments after earnings announcements had been made. Such adjustments have been noted to continue for several weeks or months after the announcement. The studies suggest less than complete and instantaneous impounding of information into security prices and cast, therefore, considerable doubt on the semi-strong version of efficiency. These include those of Joy, Litzenberger and McEnally¹²⁴, Brown¹²⁵, Latane and Jones¹²⁶ and Jaffe.¹²⁷ However, Ball¹²⁸ in an article which has received wide publicity offers an alternative explanation for these observed inefficiencies. Ball's paper surveys the evidence contained in 20 previous studies of stock price reaction to earnings announcements and found sufficient abnormal returns following the announcement to cast doubts on claims of semi strong efficiency. Ball suggests that these observed inefficiencies may be due to inadequacies in the two parameter asset pricing model used in the studies to adjust for risk differentials and not to inefficiencies in the pricing of shares.¹²⁹ Ball also recommended procedures which might mitigate the effect of these weaknesses. However, a study by Watts¹³⁰ has found 'statistically significant abnormal returns even after taking all the steps suggested by Ball'. Watts attributes this to market inefficiencies rather than asset pricing model deficiencies. Research by Givoly and Lakonishok¹³¹ too points towards market inefficiency. They too followed the procedures recommended by Ball.

FINANCIAL ANALYSIS FORECASTS

The corollary to the claims that markets reflect all information instantaneously is that no winners can be picked. As one group of writers have observed, this 'apparent difficulty of "picking winners" has generated a certain skepticism about the economic value of professional advice'. Early studies by Cowles (1933)¹³², Coker (1963)¹³³, Diefenback (1972)¹³⁴, Logue and Tuttle (1973)¹³⁵ confirmed this viewpoint.¹³⁶ However, two studies in this early period show evidence of possible gains. These were the studies by Cheney (1969)¹³⁷ and Black (1973).¹³⁸ Cheney investigated the recommendations of several investment advisory services and Black, the Value Line stock rankings. These early studies only provided modest evidence of information exploitation. Later studies by Lloyd-Davies and Canes (1978)¹³⁹, Givoly and Lakonishok (1979)¹⁴⁰, Groth, Lewellen, Schlarbaum and Lease (1979)¹⁴¹, Holloway (1981, 1983), Fried and Givoly

(1982)¹⁴², and Bjerring, Lakonishok and Vermaelen (1983)¹⁴³ provide much more impressive evidence of market inefficiencies.¹⁴⁴ On these latter studies, Bjerring *et al* comment:¹⁴⁵

It is interesting that the more recent studies which report positive abnormal performance are more careful in adjusting for risk, and concentrate on returns achieved by customers of the brokerage house/investment adviser, rather than by readers of a more widely disseminated publication (such as the *Wall Street Journal*).

Two other studies, one dealing with Value Line Recommendations (VLR)¹⁴⁶ and the other dealing with the recommendations of a Canadian brokerage house¹⁴⁷ also demonstrate that investors could achieve superior abnormal returns by following the recommendations of financial analysts. The evidence in the Canadian study is much stronger. The Value Line study shows that when transaction costs are ignored, abnormal returns are found. When realistic transactions costs are added, active trading according to VL recommendations yielded abnormal returns though not significantly so. However, for a buy and hold policy VL recommendations did yield abnormal returns even when transaction costs were included. The Canadian study differs from Value Line in two fundamental respects. Bjerring *et al* comment:¹⁴⁸

First, unlike Value Line (a publication available in many public libraries), the recommendations of the brokerage firm studied here are not widely disseminated but are available only to the brokerage firm's customers. Although one could argue that 'anyone could become a customer of the brokerage firm', the empirical fact is that the vast majority (especially in the US market) of investors do not receive its recommendations. Market prices adjust to new information only if informed investors have enough clout to adjust the market price; for an individual risk-averse investor it does not pay to take a position until all arbitrage profits (without accounting for risk) are wiped out. Second, although the *data* may be publicly available, the *information* content is clearly not. In order to assess the information content, investors may need a lengthy history for evaluation.

Elsewhere, it is stated:¹⁴⁹

The results of this paper show that the brokerage firm provided a valuable service to its customers in selecting stocks which achieved positive abnormal returns during the recommendation period. Moreover, the information content of the recommendations is not 'immediately' reflected in market prices. The findings of this paper are similar to the ones reported by Black, Cheney, Lloyd-Davies and Canes, Groth, et al and Copeland and Mayers who demonstrate that customers of financial analysts could have

achieved superior abnormal returns by following their recommendations. (Citations omitted.)

Two reasons explain why financial analysts' forecasts provide a better surrogate for market expectations than forecasts generated by the traditionally used time-series models. First, financial analysts use a broader information set which includes non-accounting information on the firm, its industry and the general economy. Secondly, there is the timing advantage in that such forecasts are issued some time after the fiscal year and thus contains more recent information.¹⁵⁰

MISCELLANEOUS EVIDENCE

A related line of research focuses on the excess returns of portfolios classified by various firm or stock characteristics. In his well known study Basu¹⁵¹ shows that portfolios comprising low price-earnings ratio shares earn excess returns even after adjustment for risks.¹⁵² Also Givoly and Lakonishok¹⁵³ in their study, report excess returns on portfolios consisting of companies with a recent upward revision in analysts' earnings forecasts.¹⁵⁴ Studies by Galai¹⁵⁵ and Chiras and Manaster¹⁵⁶ provide further evidence of avenues for positive profits. Galai found that the New York Stock Exchange and the Chicago Board of Exchange Options did not behave as a single synchronized market and that positive profits could be made through a trading rule on call options (based on violations of the lower boundary condition of the option price) on the CBOE and their respective stocks on the NYSE. Chiras and Manaster in their study conclude that in the period covered by their data (June 1973 - April 1975), the prices of options on the CBOE provided the opportunity to earn economic profits with the implications that the CBOE market was inefficient.

THE CAPITAL ASSET PRICING MODEL

CAPM measures risk by comparing the volatility of a given portfolio's return to the volatility of the market portfolio's return (the *beta* factor). The market portfolio is given a *beta* of 1. The individual investor can choose a portfolio of his own with a *beta* of 1 (in which case his gains and losses do correspond with the movements of the market portfolio) or choose either to increase his returns (by picking a *beta* in excess of 1 by in fact putting his money more into that portfolio) or reduce his returns (by picking a *beta* of less than 1). Thus in the investor's hands lies the decision whether or not to derive increased returns choosing the amount of money he put into the market portfolio and not by picking stocks with or without a high *beta* factor. *Beta* alone links the investors expectations of returns from his portfolio of stocks with expected returns from the market portfolio of stocks.¹⁵⁷

As observed earlier, *beta* measured risk is the product of factors not peculiar to the particular corporate entity. Three main factors influence such events: (1) the responsiveness of the asset's or portfolio's returns to economic events; (2) the relationship of the firm's basic characteristics (such as its debt level) with the average characteristics of firms in the market; and (3) the uncertainty attached by investors to main economic events generally. Change in any of these underlying relationships will cause the expected *beta* for a firm to change.¹⁵⁸

The measurement of risk by reference to *beta* has been heavily criticised (as have been the other underlying assumptions of the CAPM itself). Risk as relative volatility of returns is suspect for the reason that future volatility is impossible to predict by reference to a stocks' past record (a 'bastard cousin' of Technical Analysis).¹⁵⁹ There is the difficulty, firstly, of determining the best way to capture the important information contained in history.¹⁶⁰ Second, is the doubt as to suitability of an historical *beta* to forecast risk.¹⁶¹ This is manifest in the different *betas* estimated by popular *beta* services.¹⁶² There is also the difficulty in using regression analysis to compute the data. One consequence is the wide variation in results depending on the choice of input data. These have included the historical period over which *beta* is estimated, the average market returns during the period studied, whether the investor actually used the market model¹⁶³, the market proxy chosen, the measurement intervals used within the holding period, and the form of the market model used. The calculation of a historical *beta* involves a choice with respect to each of these matters creating irreconcilable difficulties.¹⁶⁴

The model, therefore, appears to suffer from two potential sources of error, *viz*, of misspecification and of inadequacy. Misspecification could be due either to fault of the model itself or due to faulty test procedures. Error in any of these senses would lead to wrong conclusions and wrong decisions. Misspecification has been examined by reference to the model's ability to explain past behaviour and to predict future behaviour. Studies generally show a lack of relationship between the model and reality. Typical are those of Douglas (1969)¹⁶⁵ (discrepancies between what was expected on the basis of the CAPM and the actual relationships that were apparent in the Capital Markets)¹⁶⁶; Miller and Scholes (1972)¹⁶⁷ affirming Lintner's¹⁶⁸ results on grounds that model could have been wrong); Black, Jensen and Scholes (1972)¹⁶⁹ (expecting to find the intercept to be equal to the risk free rate instead found it to be different; expected riskier securities to provide higher returns instead found that high risk securities earned less and low risk securities earned more; and that for some short periods the safer lower *beta* stock went up more than the more volatile securities).¹⁷⁰

It appears, therefore, that in the short run investors who took on additional risk have been penalized, while in the long run they have been inadequately rewarded for high risk and overcompensated for low risk. Furthermore, in all periods, some unsystematic risk seems to have been

positively valued by the market. Thus the relationship between *beta* theory and actual rates of return bear no correspondence. The relationship has proved to be undependable in the short run and has failed to work even with reference to periods as long as 7-8 years.¹⁷¹ Nor has *beta* been stable from period to period. Instead it has proved to be sensitive to the particular market proxy against which it is measured.¹⁷²

It was pointed out previously that CAPM has also been criticised for its underlying assumptions. These include that:

1. Investors act to maximise the utility of terminal wealth.
2. Investors have homogeneous expectations of risk and return.
3. Investors have identical time horizons.
4. Information is freely available to investors.
5. There is a risk-free asset, and investors can borrow and lend at the risk-free rate.
6. There are no taxes, transaction costs, or other market imperfections.
7. Total asset quantity is fixed, and all assets are marketable and divisible.¹⁷³

The former assumptions take it for granted that investors show no preference as between capital gains and dividends and accept each with indifference. Such restrictive assumptions further remove the model from reality. This latter criticism, however, is directed at CAPM generally as the assumptions apply equally to both diversifiable and non-diversifiable risk.

In the meantime the search for a better *beta* continues as evidenced by the *multivariable analysis* used by Beaver, Kettler and Scholes (1970)¹⁷⁴ and fundamental *betas* by Rosenberg¹⁷⁵ and Marathe (1975).¹⁷⁶ There have also been attempts to move away altogether from the CAPM by substitution of new measurement criteria, for example Ross' Arbitrage Pricing Theory. While CAPM is a one factor model, APT is a multi-factor model, ie it takes into account factors other than the market rate of return and the covariance factor. These include such items as sensitivity to changes in National Income, in interest rates, and in the rate of inflation. Thus CAPM has come to be described as a special case of APT.¹⁷⁷ However, tests conducted so far have not proved in favour of APT.¹⁷⁸

PART V
EFFICIENCY AND THE ROLE OF
ENTREPRENEURSHIP

The discussion above indicates that securities markets are not as efficient as claimed. The evidence clearly refutes any claim of the strong form. The counter evidence, when taken along with the specific examples used to support semi strong efficiency, makes claims of efficiency of the latter form also dubious. The question, 'how much insight ... can an investor squeeze out of a stock split and how long should it take him to squeeze it dry'¹⁷⁹ can be directed just as well to evidence with respect to Block Trades and New Issues. With respect to semi-strong efficiency, there is the question as to when is news stale? This question arises with respect to information staring at one's face, but which has not been taken advantage of due to oversight.¹⁸⁰ In the face of such oversight in respect of existing information, and of uncertainty with respect to future events (and hence prices), it appears impossible to sustain any claim of efficiency. As has been stressed repeatedly in this paper, competition and efficiency in the sense used in this paper, are not the sides of the same coin. They are in fact antithetical to one another. Arbitraging and entrepreneurship cause securities markets to be competitive and to be put on the tracks of efficiency. The lure of profit induces participants to exploit hitherto unexploited opportunities and to seek out and speculate on future possibilities. It is these conscious, calculated actions that activate, adjust and re-adjust the direction of securities markets towards efficiency. No sooner has movement begun when hitherto unnoticed and altogether new opportunities come to be perceived. These discoveries bring rewards to the discoverers and give momentum to the direction towards progress; at the same time, they move the goal of fulfilment further away. The end point is: If markets are efficient where lies the incentive to gather information given that information is the essential factor in a constantly changing market. For this reason, if for no other, markets can never be as efficient as claimed.

The above point is better understood if one takes to account the presence of 'noise'¹⁸¹ in markets, and the costs incurred in obtaining information. Studies in this regard¹⁸² suggest that where information is not costly and there is no noise, markets will be in equilibrium.¹⁸³ Where information is costly markets will not be in equilibrium (at least in a permanent state) whether or not there is noise, though for different reasons. Where information is costly and there is no noise, price will freely transmit information causing a perfectly competitive market to break down. Markets will break down because of the tendency to free ride. Where no one collects information, markets will not be in equilibrium. In this event there is an incentive for individuals to collect costly information. When many individuals are lured to do so price will

tend to aggregate their information and a form of market equilibrium will emerge. The cycle will continue varying between disequilibrium and a form of equilibrium. When information is costly and there is noise, the price system will not aggregate information perfectly. The presence of noise enables traders to hide information from one another.¹⁸⁴ Since share prices reflect information, information gatherers will want to be secretive about their intentions and actions. At the same time REH expects traders to anticipate such conduct from each other. This leads to the dilemma that Keynes made known through his famous example of the newspaper beauty contest. It follows from all this that markets never adjust to information fully and prices never fully reflect all information possessed by the informed individuals.¹⁸⁵ The information market is constantly subjected to new shocks to which it seeks to adapt. In between, equilibrium points are reached when uninformed traders catch up with information in the hands of the informed. Such markets have been described as being in an 'equilibrium degree of disequilibrium'¹⁸⁶ - a degree sufficient enough to lure traders to expend resources to acquire information and gain disproportionate benefits.¹⁸⁷ In other words, securities markets can never be efficient in the sense of the trilogy of claims advanced by Fama. There always will be the opportunity for profit given hitherto unexploited opportunities and uncertainty with respect to the future. Market price is only the starting point for arbitraging and entrepreneurship activity. And it is the latter which makes securities markets competitive and places them on the road towards efficiency.

The theory developed by Kirzner and built on the foundations laid by Mises,¹⁸⁸ seeks to explain this equilibrium state of disequilibrium. Their explanation emphasizes that market participants are alert to opportunities - of having their eyes and ears open to opportunities that are 'just around the corner'. Alertness as here used means much more than the mere possession of knowledge or of being aware. It also means waiting and being continually receptive to something that may turn up, of obtaining and deploying knowledge, of seeking out and acting where appropriate. It is this alertness to opportunity which constitutes the entrepreneurial element in human action and which converts the theory of market equilibrium into a theory of market process. This notion of entrepreneurship in the sense of alertness consists of two related elements. On the one hand it consists of rectifying past errors in the sense of making good opportunities that had been staring at one's face but had been overlooked. On the other it consists of action in the face of future uncertainty though future uncertainty may well be the reason why opportunities had been missed in the past. Being alert, however, is not merely to anticipate the future but to also help create it. Such action is in a sense self motivating, but two factors induce such action. First, is the conundrum of where one would be in the divergence/disco-ordination spectrum if one fails to act. Secondly, there is the lure of profits to be made, the idea of getting something for nothing if only one can see what it is that can be done. As decision making is *ex ante* and not *ex post*, it is the anticipation of profit and not actual realization which is important. This

is in stark contrast to Robbinsian maximization where comparison of known alternatives is the incentive.

Being alert, however, does not guarantee the discovery of the truth. Despite their alertness participants err in their decision making. What it emphasises is that participants possess a propensity to discover what is useful to them and set into motion a process. In the words of Kirzner¹⁸⁹ '[t]he market process emerges as the necessary implication of the circumstances that people act, and that in their actions they err, discover their errors, and tend to revise their actions in a direction likely to be less erroneous than before'.

Alertness assumes special relevance in relation to action in the face of future uncertainty. Participants formulate the future as they envisage it with a view to enhancing their position in that future. By this they are aware that other participants are acting likewise in studying the impact of their action on each other and to enhance themselves at the expense of each other. The extent of each participant's success is dependent on the degree of divergence/disco-ordination of the future as unfolded and the future as envisaged by each of the participants. What is envisaged and what eventuates will of course be different. What is important is the endeavour of each participant to glimpse the future, peer through the fog, to construct the envisaged future as near as possible to what will eventuate, and to bring about as near a correspondence between the envisaged and realized futures.¹⁹⁰ As Kirzner says, 'were man totally lacking in alertness he could not act at all'.¹⁹¹ He goes on to say:¹⁹²

... his blindness to the future would rob him of any framework for action. (In fact, were man totally lacking in potential for alertness, it would be difficult to identify a notion of error altogether: were unalert man to act, it would not be on the basis of an erroneously forecast future. It would be on the basis of no relevant forecast at all. Not recognizing that he might - had he been more alert - have avoided the incorrect picture of the future, he could not in any meaningful sense blame himself for having erred.)

Viewed in this sense it becomes apparent that the problem of partial ignorance and alertness or entrepreneurial action in respect of it are two sides of the same coin.

PART VI

CONCLUSION

Claims by EMH that share prices reflect all available information and that no abnormal gains can be made by share trading (except possibly by the use of inside information) are directly traceable to the twin neo-classical claims that markets are (1) perfectly competitive and (2) are in equilibrium. These latter claims also form an integral part of CAPM which assumes markets to be 'perfectly competitive'. Being equilibrium¹⁹³ models they simply assume away what has to be explained, viz, the process by which markets become competitive and hence efficient. Explanation of the process of market-efficiency or the transformation from disequilibrium to equilibrium is relevant for several reasons, chief of which is that what happens in disequilibrium is different from what happens in equilibrium. In equilibrium prices and quantities do not change, in disequilibrium they do; in equilibrium actions are based on the basis of correct knowledge, while in disequilibrium they are 'on the one hand, acting on the basis of partial ignorance and, on the other hand, engaged in a process of learning'. The need, therefore, is a theory of market process which takes explicit notice of the way in which systematic changes in the information and expectations upon which market participants actions lead them towards equilibrium.

The main obstacle to the search for a theory explaining the market price as being evolutionary has been the influence exerted by the ends and means approach of Lord Robbins. According to Robbins, economics is the science which studies human behaviour as a relationship between ends and means which have alternative uses. This given ends and means, sees economics as being no more than an exercise in the pure logic of choice.¹⁹⁴ The fundamental failing of such a given means and ends approach is the assumption that what is available and what is needed are known, whereas, in reality, the fundamental problem is to catch a glimpse of availability and need. What is available may not be available at a later point, and more importantly, not needed tomorrow. Again, whether it is available and needed will itself not be known till the next point of time. The past and present are informative, but not conclusive of the future. Economics as a subject then, relies on the presumption of 'partial ignorance',¹⁹⁵ and not on notions of perfect markets and equilibrium. This notion of partial ignorance is easily comprehensible when it is realized that to a decision maker not all of the existing information will be known, nor will decisions being made by others (which will bear on our decision maker's plans), or details of future events. Decisions will, therefore, not dovetail perfectly; some decisions will not be given effect to, some opportunities not exploited, some decisions of others will be wrongly guessed, while the import of one's own decisions will be miscalculated. But this does not mean that market participants stand by idly. Market participants are very much alert to shortcomings of their

own knowledge, of knowledge possessed by others, and of future uncertainty. This leads to decisions being constantly revised. As opportunities are exploited by those in possession of knowledge, or those willing to undertake risk, the gap in knowledge narrows. But new uncertainty generated by the continual flow on of events keeps in momentum the cycle of partial ignorance. This continuous process of knowledge seeking and of exploitation of opportunities has been referred to as 'entrepreneurship'¹⁹⁶ a phenomena inherent in the competitive process. In other words, there cannot be a competitive process devoid of entrepreneurship; and for entrepreneurship to manifest itself, the process must be competitive. It is for this reason that competition and entrepreneurship have been likened to the two sides of the same coin, where each is crucial to the other.¹⁹⁷ As described by Kirzner:¹⁹⁸

... the competitive market process is essentially entrepreneurial. The pattern of decisions in any period differs from the pattern in the preceding period as market participants become aware of new opportunities. As they exploit these opportunities, their competition pushes prices in directions which gradually squeeze out opportunities for further profit-making. The entrepreneurial element in the economic behaviour of market participants consists, as we will later discover in detail, in their alertness to previously unnoticed changes in circumstances which may make it possible to get far more in exchange for whatever they have to offer than was hitherto possible.

This competitive-entrepreneurial explanation, unlike the explanation by reference to equilibrium conditions, touches the heart of the market process itself. In equilibrium, there is no room for the entrepreneur as the decisions of all market participants dovetail completely. Lack of information, lack of co-ordination, and the need to realign resources are non-existent problems in a state of equilibrium. By contrast, these are the very problems the competitive-entrepreneurial process is concerned with and seeks to explain. One is necessarily the antithesis of the other. As viewed here, the 'economic problem' is not the reconciliation of any given 'ends and means', nor does it lie in the assumption of 'equilibrium' in any other form. Rather, it is the generation of sufficient information to facilitate the process of exchange. Economics is thus concerned with the efficient use of knowledge and of the exercise of choice in the face of uncertainty. What is important is an understanding of why people act in the way they do and any acknowledgment of this fact.

The view that price transmits and aggregates information attempts to portray an equilibrium condition. Typically, as in the 'ends and means' relationship and the 'market equilibrium' approach considered earlier, this view fails to explain the process of price formation, ie, how price changes from one point to another. The equilibrium approach simply presumes the change. It also assumes a certainty of correspondence between information and price. Such a mechanical approach is acceptable only in

a world of perfect knowledge and perfect prediction. Neither of these features is characteristic of the securities market. What is characteristic is the continuous flow of information and the constant revision of expectations in the face of available information and anticipated information. It is this unpredictability and imperfection in knowledge that provides 'alertness', the opportunity to co-ordinate differences in expectations between the various participants.

In terms of the securities markets, what is important is how the decisions of individual participants in the market interact to generate the market forces which cause price to change. This approach precludes the judging of price in terms of any supposed equilibrium. Rather, it regards price as the starting point for decision making. While there may be the possibility of equilibrium and being aware of means and ends with respect to each individual personally, this can never be so as *between* individuals. The one is not the other. This is in stark contrast to what is suggested by the means-ends and equilibrium approach. As noted previously, the latter approach implies that all facts are known and the discovery of new facts has ceased. Such a precondition is inconsistent with the idea of a continually adjusting information base as in the case of stock markets. Almost all of share market trading is the result of changing plans consequent upon changing knowledge most of which is of a subjective nature. To assert equilibrium or given means-ends in this context is to necessarily beg the issue. Dynamic time (and with it necessary change) and ignorance in the face of future uncertainty not only make economic processes necessary, but affect the very character of these processes. There is no stable endpoint toward which the process must lead nor a single path it must follow.¹⁹⁹ Devices such as the EMH assumptions not only fail to tell us anything about the adjustment process but imply that markets adjust automatically without any process of adjustment at all. By treating competition as a set of static conditions and not as a process, EMH assumes away the very essentials of competition. In such a static equilibrium, there can be no profit opportunities, and in fact, no role for the entrepreneur. By contrast, the approach adopted in this paper sees the entrepreneur as the active co-ordinating agent in a market process riddled with uncertainty.

In the theory of competition as a process, efficiency depends on the degree of success with which market forces can be relied upon to generate spontaneous corrections at times of disequilibrium.²⁰⁰ This process of correction is the function of the entrepreneur and is ever present in a discrepant or dynamically heterogeneous market. In such markets, equilibrium conditions tend to be constantly disrupted by the changing of plans following from the acquisition of new knowledge, most of it being of a subjective nature. All action is directed toward this end of influencing the future, of the period between initiation of the process and the period toward which the action is directed.²⁰¹

Underlying all this is the problem of future uncertainty. As stated by Kirzner:²⁰²

In the absence of uncertainty it would be difficult to avoid the assumption that each individual does in fact already know the circumstances surrounding his decision. Without uncertainty, therefore, decision making would no longer call for any imaginative, creative determination of what the circumstances really are. Decision making would call merely for competent calculation. Its results could, in general, be predicted without doubt.

And this precisely is what is not possible in a competitive, efficient securities market according to EMH.

FOOTNOTES

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¹ See B J Loasby, *Choice, Complexity and Ignorance*, (Cambridge University Press, 1976). The assumption of rationality in human conduct has been criticised for being unreal. It has been shown that conduct is often impulsive and without serious deliberation and or otherwise constrained by organizational factors: see H Leibenstein, *Beyond Economic Man*, (Harvard University Press, 1976); H A Simon 'Rational Decision Making in Business Organizations', 69 *American Economic Review* 493 (1979). The view expressed here, however, is different. It asserts that the very process of thoughtful, deliberate decision making in a competitive market setting by individuals gives rise to uncertainty and unpredictable decisions as *between* individuals.

² See Kirzner [1973], *infra* n 3.

³ The general tenet of Austrian Methodology is spelt out by I M Kirzner, 'On the Method of Austrian Economics, in *The Foundations of Modern Austrian Economics*, E G Dolan (Ed) (Sheed and Ward, Kansas City 1976), 40, 42 as follows:

The general outline of the Austrian position on methodology is well known. Austrian economists are subjectivists; they emphasize the purposefulness of human action; they are unhappy with constructions that emphasize equilibrium to the exclusion of market processes; they are deeply suspicious of attempts to apply measurement procedures to economics; they are sceptical of empirical 'proofs' of economic theorems and consequently have serious reservations about the validity and importance of a good deal of the empirical work being carried on in the economics profession today. These are the general features of the position that we know very well; yet within this general view we can distinguish two independent strands of argument. [viz, that human action is purposeful and secondly, that there is an indeterminacy and unpredictability inherent in human preferences, human expectations, and human knowledge.]

Works generally relied on for this view in this paper include the following: G P O'Driscoll and M J Rizzo, *The Economics of Time and Ignorance* (Basil Blackwell, 1985) cited hereinafter as O'Driscoll and Rizzo; I M Kirzner, *Competition and Entrepreneurship*, University of Chicago Press 1973, cited hereinafter as Kirzner [1973]; I M Kirzner, *Perception Opportunity and Profit* (University of Chicago Press 1979), cited hereinafter as Kirzner [1982]; E G Dolan (ed), *The Foundations of Modern Austrian Economics* (Sheed and Ward 1976), cited hereinafter as Dolan; L Spadaro (ed), *New Directions in Austrian Economics* (Sheed, Andrews and McNeal Inc. 1978) cited hereinafter as Spadaro; G P O'Driscoll, *Economics as a Co-ordination Problem* (Sheed Andrews and McNeil Inc. 1977) cited hereinafter as O'Driscoll 1977.

⁴ O'Driscoll, 10.

⁵ As O'Driscoll and Rizzo state (at 19):

A dynamic theory of price formation consists not only of showing how individual valuations interact to form prices but also how the acquisition of knowledge and the projection of expectations are involved.

And again (at 20):

More precisely, our self-imposed question is: How can individuals acting in the world of everyday life unintentionally produce existing institutions or, more generally, the overall patterns of social interactions

⁶ The set factors referred to above have been expressed in the following simplified form (where dividends are expected to grow at a steady annual rate):

$$\text{Expected return} = \frac{\text{Forecast dividend}}{\text{price}} + \text{growth}$$

where expected return equals dividend yield plus the expected rate of dividend growth.

This expression has been restructured (again, expected growth of dividends is at a steady annual rate):

$$\text{price} = \frac{\text{forecast dividend}}{\text{expected return} - \text{growth}}$$

The above forecasts, where necessary, are appropriately discounted for inflation.

⁷ L Bachelier, *Theorie de la Speculation* (Gauthiers-Villars, 1900).

⁸ See for eg G Foster, *Capital Market Efficiency: Definitions, Testing Issues and Anomalies in Contemporary Accounting Thought, Essays in Honour of R J Chambers*, M J R Gaffikin (ed), (Prentice-Hall of Australia 1984) at 175-176, cited hereinafter as Foster.

⁹ B Graham, D I. Dodd and S Cottle, *Security Analysis, Principles and Techniques* (McGraw Hill, 4th ed, 1962).

¹⁰ *Id* 28-29.

¹¹ E F Fama 'Efficient Capital Markets: A Review of Theory and Empirical Work', 25 *Journal of Finance* 383 (1970).

¹² At 383.

¹³ W H Beaver 'Reflections on the Efficient Market', *Annual Accounting Review* 1980, S Weinstein and M Walker (eds) (N Y Harwood Academic Publishers, 1980) 189.

¹⁴ At 192.

¹⁵ Foster, *supra* n 8 illustrates the point by reference to the following fact situation (at 155-156):

Tasminex was incorporated in August 1969 and held claims to explore for minerals at Mount Venn in Western Australia. The 1969-70 period was one of much interest in Australian mining stocks. One stock (*Poseidon*) reported finding ore samples carrying both copper and nickel sulphides on 28 September 1969. Earlier that week, the shares traded for \$1.22. Following some subsequent news releases, *Poseidon* reached \$190 on 23 December 1969. The chain of events in *Tasminex* was:

31 December 1969 - *Tasminex* closes at \$3.30, with a high of \$4.50 and a low of \$0.48 during 1969.

14th January 1970 - Company commences drilling at Mount Venn and geological samples are taken as drilling progresses.

23 January 1970 - Discovery of a 'sulphide residue' is made by an employee of *Tasminex* (Johnson), who shows it to a geologist on the site (McCammon). Geologist leaves site with residue to take it to Sydney for testing. (*Results of the test were not known until 29 January.*)

24 and 25 January 1970 - Chairman of Tasminex (Singline) flies into Mount Venn and is told of the discovery. Another director and a party of people fly in and are also informed of the discovery. The party flies back to Perth, where they celebrate. Phone calls to Sydney are made to directors of associated companies, telling them of the discovery. The celebration in Perth attracts notice. A Melbourne Stockbroker stated that 'late on Sunday the 25th January he received a phone call to the effect that the people of Tasminex were celebrating something in Perth and that "the rumours were that they had discovered sulphides while they were drilling for water"'.

27 January 1970 - Increases in turnover and price of *Tasminex* occur. Shares closed at \$3.30 on the prior trading day (23 January) and close at \$16.00 on 17 January. Melbourne Stock Exchange requests explanation from the company. Secretary of *Tasminex* reports to the Stock Exchange that 'the Company's Chairman and Manager are [at Mount Venn]. No information is available and the Secretary is unable to account for the fluctuation in its share price'. Later on 27 January, the Chairman of *Tasminex* (Singline) is interviewed by a Melbourne journalist (Sykes). The London market receives a report of the interview two hours before closing. *Tasminex* shares sell as high as \$96.00 in London.

28 January 1970 - Front page of Melbourne morning newspaper has the headline 'Shares jump \$86.00 and another nickel king born'. Singline is quoted as saying, 'The Company's first drill hole at Mount Venn had struck massive sulphides. No figures were available yet, but he expected assays "before long". "I reckon it could be better than Poseidon and bigger", he said'. *Tasminex* shares sell as high as \$75 in Melbourne and \$90 in Sydney. Company's geologist issues release to Stock Exchange, disassociating company from 'all recent newspaper speculation as to the merit of the prospect'. Following this announcement, price drops to a low of \$30, closing at \$36.

2 February 1970 - *Tasminex* issues a statement to Stock Exchange referring to 'disseminated sulphides including nickel and copper of minor values'. The announcement is associated with a fall in the price of *Tasminex* shares to \$20.

28 February 1970 - Sydney newspaper reports a Perth story that 'reports swept this city today that boom nickel concern *Tasminex* may not be able to produce an assay from its W A lease'.

3 March 1970 - *Tasminex* issues a statement to Stock Exchange referring to 'sparsely disseminated sulphides' and advises shareholders to minimize trading. The price of *Tasminex* closes at \$7.50.

5 May 1972 - Sydney newspaper reports that *Tasminex* was reducing its sphere of operations at Mount Venn. At this time, shares trade at less than \$0.50 a share.

Foster observes (at 158) that it does not appear that the price between 24 January and 28th January acted as if everyone (eg investors on the London Stock Exchange) knew the information possessed by the geologist.

¹⁶ *Supra* n 10.

¹⁷ See J M Murphy, 'Efficient Markets, Index Funds, Illusion and Reality', *The Journal of Portfolio Management*, 6 (1977).

¹⁸ E F Fama, *Foundations of Finance* (Basic Books, N Y 1976) 133, 137.

¹⁹ See P J Hess and M R Reinganum, 'Efficient Capital Markets' in *Handbook of Financial Economics*, J.L. Bicksler (ed) (North Holland, 1979), 5, cited hereinafter as Hess.

²⁰ *Ibid.*

²¹ Modern Portfolio Theory (MPT) has its origins in the pioneering work of Markowitz. Markowitz showed that greater benefits will flow to an investor from the holding of an appropriate portfolio of securities rather than from the holding of a large number of a single or few securities. A desirable result is supposedly reached with a holding of around twenty securities. Until Markowitz (H M Markowitz, 'Portfolio Selection' *Journal of Finance* 77 (1952) those theoretical models which did exist failed to explain the phenomenon of diversification or the element of risk.

Markowitz's theory begins with the very simple assumption that investors like return and dislike risk, as a consequence of which, investors seek out portfolios which provide the maximum return for a given level of risk or the minimum risk for a given level of return. It is left to the investor to select from the efficient set the single portfolio which best serves his needs. Markowitz's formulation of the problem assumes that the only investment objectives are to maximize the expected return and minimize the variance of return from a portfolio of securities. This formulation, however, hides some serious theoretical and practical limitations.

'Not least among these is the assumption that the variance is a good measure of risk. The use of variance assumes that deviations both above and below the level of expected return are equally undesirable. Markowitz attempted to circumvent this problem through the use of the semi-variance, a measure of dispersion which accounts for only the deviations on one side of the expected value. Unfortunately, the use of the semi-variance greatly complicates the computational problem.

In addition, the assumption that the only investment objectives are the acquisition of return and the avoidance of variance may be open to question. The distribution of returns between dividends and capital gains and the timing of the realization of income are frequently objectives which are important to investors.

The Markowitz model is also a point in time analysis. It is run at a single time period; the portfolio is purchased and remains unchanged until the next run. This introduces problems in the choice of a time period for consideration. The longer the period between runs, the further the portfolio may drift from the efficient region. The shorter the period, the greater the problem of data collection and the more costly the computer time involved'.

There are also practical problems, for example data collection is an enormous problem. It has been estimated thus

'for an analysis of 100 securities, the security analyst must estimate 100 returns expectations, 100 variances and 4950 covariances, a total of 5250 items of data. This problem is further complicated by the fact that few individuals are capable of estimating such sophisticated measures as variances and covariances. In addition, the enormity of the problem taxes the memory capacity of even the largest computers. The IBM 7090, one of the largest and fastest modern computers, can handle a total of only 300 securities. A computation time of 90 minutes is required to obtain the solutions to such a problem.'

See generally, B A Wallingford, 'A Survey and Comparison of Portfolio Selection Models 2' *Journal of Financial and Quantitative Analysis* 85 (1967).

The assumption is that the investor uses standard security analysis to estimate the returns and risk of different investments, and then uses portfolio theory to select an efficient portfolio. See E M Miller, 'Risk, Uncertainty, and Divergence of Opinion 32' *Journal of Finance* 1151 (1977), 1157. Risk is most commonly defined as the possibility that actual returns may vary from expected returns. The origin of this definition lies in statistics. A random variable is one for which actual outcomes may differ from the mean. See A A

Robichek, 'Risk and the Value of Securities', 4 *Journal of Finance and Quantitative Analysis* (1970) at 514. In general, the assumption is made that investors as a group tend to be risk averse (for example, that given equal expected returns, they prefer a security with no risk (or less risk) to one with more risk. Robichek *ibid* and that the manner in which risk affects value can be defined independently of the valuation process itself. It has, however, been demonstrated that risk and valuation are inseparable, as being two sides of the same coin. Robichek. *ibid*. Markowitz's analysis (and that of W F Sharpe, 'Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk' 19 *Journal of Finance* 425 (1964)) and J Lintner, 'Security Prices, Risks and Maximal Gains from Diversification' 20 *Journal of Finance* 587 (1965) showed that the risk of any individual security depends on how the addition of the security to a portfolio affects the risk of the portfolio. While each finding contributed towards a broader understanding of financial theory, their underlying assumptions appear questionable. These assumptions include the claims that:

- (1) The market is concerned only with the expected rate of return and the variance of portfolio.
- (2) Investment decisions are made using a one-period model.
- (3) The adjustment for risk and time can be made in the form of a 'rate per period'.

A number of writers have approached the problem of valuation in a 'state preference' framework. Basically, this approach assumes that the present values of uncertain future returns depend on the pattern of returns across various states-of-nature, the utility for money in the various states, and the likelihood of occurrence of the particular states.

However, it is inevitable that in these various states of nature investors would differ as to:

- (1) Investment goals, constraints, current incomes and consumption patterns;
- (2) Assessments of the relevant probabilities of states, returns, future purchasing power, and utilities toward monetary returns;
- (3) Knowledge of the universe of opportunities and available information;
- (4) Personal tax rates;
- (5) Analytical capability, and possibly other factors.

See generally, A Robichek, 'Risks and the Value of the Securities', 4 *Journal of Financial and Quantitative analysis* 513 (1970).

True diversification depends on having stock which is not all dependent on the same economic variables. Also, diversification should not be by reference to names or industries, but by reference to the determinants that influence the fluctuations of various securities and of a choice of securities that do not move in tandem with the general market: B G Malkiel, *A Random Walk Down Wall Street* (W Norton and Co 2nd ed 1981), 196, hereinafter cited as *Malkiel*.

²² E F Fama, 'The Behaviour of Stock Market Prices', 38 *Journal of Business*, 34 (1965).

²³ Hess, *supra* n 15, 6.

²⁴ S S Alexander, 'Price Movements in Speculative Markets: Trends or Random Walks' 2 *Industrial Management Review* 7 (1961) and 'Price Movements in Speculative Markets: Trends or Random Walks No. 2', 5 *Industrial Management Review* 25 (1964).

²⁵ E F Fama and M Blume, 'Filter Rules and Stock Market Trading Profits', 39 *Journal of Business* 226 (1966).

²⁶ K. Ball and Brown, 'An Empirical Evaluation of Accounting Income Numbers', 6 *Journal of Accounting Research* 159 (1968).

²⁷ E F Fama and L Fisher, M C Jensen and R Roll, 'The Adjustment of Stock Prices to New Information' 10 *International Economic Review* 1 (1969).

²⁸ Hess, *supra* n 19 at 7-8, criticises the estimation procedure of Fama, *et al*, their findings 'naturally suffered from similar deficiencies'. *Bickler* explains at 8:

But to give the reader a flavour of their analysis, it will be briefly sketched. FFJR examined the behaviour of the average and cumulative average of computed residuals. The idea is that the average and cumulative average for stocks that split should not be different from zero after the stock split is publicly announced. FFJR report their findings in numerical and graphical form. By inspection, the average residuals appear to be nearly zero, and the cumulative average residuals do not change very much. But FFJR do not present statistical tests to establish the significance of their findings.

In their averaging process, FFJR time date the residuals relative to the split month. Thus, the residual of a stock that split in, say, October 1929 would be averaged with another stock that split in June 1953. However, there is no reason to suspect that the 940 residuals sampled from different securities and at different time periods are drawings from the same population. The implication is that the FFJR average residual is not an estimate of a mean residual drawn from the same population. Rather, the average residual itself is a new random variable. In particular, the underlying distribution of the average residual can be interpreted as a linear combination of 940 random variables ... The problem is that one cannot reliably test any hypothesis on the basis of one drawing from a probability distribution.

They go on to say at 9:

FFJR and Ball and Brown concluded that their studies were consistent with the efficient market hypothesis. However, it is questionable whether the studies actually tested the efficient market hypothesis within the context of the market model because of serious estimation difficulties. As noted, the difficulties arise from non-stationary return distributions and the aggregation of error distributions which differ across securities and over time.

²⁹ Malkiel, 199.

³⁰ *Supra* n 15, at 9. See also R Roll, 'A Critique of the Asset Pricing Theory's Tests; Part 1: On Past and Potential Testability of the Theory', 4 *Journal of Financial Economics*, 129 (1977) *infra* n 161.

³¹ *Infra*.

³² Rational Expectations hypothesis (REH) is the most recent of the line of Expectation formations. The best known of its predecessors are the Static and the Adaptive Expectation hypotheses. However, neither of these latter models anticipate the likely affect of uncertain future events on present conduct. The Static Expectation hypothesis assumes that existing conditions will prevail in the future, with the result, expected future value become identified with current values. Such a fundamental assumption is in itself unrealistic. Adaptive expectations, on the other hand, assumes that one learns from past experience, particularly past mistakes. While it anticipates future uncertainty, its means of accommodating it is far from satisfactory. Thus if an item was traded at \$11 instead of the anticipated \$10, then its future price was estimated around say \$10.50. Such a response is weak at both fronts: (1) it offers no defensible explanation for the precise change in price it is prepared to recognise, and (2) in the implication that participants will continue to use the same expectations rule when its past performance has proved unsatisfactory. Since share prices move randomly and are not dependent on past experience alone or on any form of systematic change, neither of these hypotheses provide much direction in that they are no more than rules of thumb. REH grew in response to neo-Keynesian policy prescriptions. Unlike the Static and Adaptive Expectation systems it is forward looking, is based on maximising behaviour, and assumes that even the formation of expectations is part of the

optimization process. However, all of these assumptions are contentious in themselves. See generally, D K H Begg, 'The Rational Expectations Revolution in Macroeconomics, Thesis and Evidence', Philip Allan, 1982, 254; B. Kantor, 'Rational Expectations and Economic Thought' 17, *Journal of Economic Literature* 142, 1424 (1979); S.M. Sheffrin, *Rational Expectations* (Cambridge University Press, 1983) 1; G.K. Shaw, *Rational Expectations, An Elementary Exposition* (Wheatsheaf, UK 1984), 26; J.R. Wimble, 'The Rational Expectations Tautologies' 5 *Journal of Post Keynesian Economics* 199, 200 (1982-83); J.F. Muth, 'Rational Expectations and the Theory of Price Movements' 29 *Econometrica* 315 (1961). Compare Herbert Simon's notion of bounded rationality.

³³ J F Muth, 'Rational Expectations and the Theory of Price Movements', 29 *Econometrica*, 315 (1961). Contrast Herbert Simon's notion of bounded rationality, see S M Sheffrin, *Rational Expectations* (Cambridge University Press, 1983).

³⁴ Stated differently, agents form expectations in the same way as they undertake other activities - that is, they use economic theory to predict the value of the variable and this is their 'rational' expectation. Rational expectations are thus simply predictions from economic theory, using the information available at the time the predictions are made. See K Holden, D A Peel and J P Thompson, *Expectations, Theory and Evidence*, (MacMillan, 1985) 18.

³⁵ In Muth's words (*supra* n 33, 316):

Expectations since they are informed predictions of future events, are essentially the same as the predictions of the relevant economic theory.

At the risk of confusing this purely descriptive hypothesis with a pronouncement as to what firms ought to do, we call such expectations 'rational'. It is sometimes argued that the assumption of rationality in economics leads to theories inconsistent with, or inadequate to explain, observed phenomena, especially changes over time (eg Simon). Our hypothesis is based on exactly the opposite point of view: that dynamic economic models do not assume enough rationality.

The hypothesis can be rephrased a little more precisely as follows: that expectations of firms (or, more generally, the subjective probability distribution of outcomes) tend to be distributed, for the same information set, about the prediction of the theory (or the 'objective' probability distributions of outcomes).

³⁶ S M Sheffrin, *Rational Expectations*, (Cambridge University Press, 1983) 112.

³⁷ See D K H Begg, *The Rational Expectations Revolution in Macroeconomics, Theories and Evidence* (Philip Alan, UK 1982), 65.

³⁸ *Infra* n 181.

³⁹ See C L F Attfield, D Demery and N W Duck, *Rational Expectations in Macroeconomics, An Introduction to Theory and Evidence* (Basil Blackwell, IU 1985), 197. See also W H Butler, 'The Macroeconomics of Dr Pangloss, A Critical Survey of the New Classical Macroeconomics' 90 *The Economic Journal*, 34 (1980) where it is stated at 38:

How good an assumption are Muth-rational expectations? Unfortunately the hypothesis is seldom tested in isolation. Instead composite hypotheses tend to be tested: natural rate *cum* Muth-rational expectations, term structure *cum* expectations, etc. The hypothesis appears to be in danger of being consistent with any conceivable body of empirical evidence, because the assumption of optimal use of the available information cannot be tested independently of an assumption about the available information set.

⁴⁰ Attfield, *et al.* 30. As they explain, 'it is always possible to devise a non-rational expectations model which has exactly the same implications for any given set of data as the

rational expectations model. 'The data themselves cannot discriminate between the two theories which are said therefore to be observationally equivalent.' *Ibid.*

⁴¹ K J Arrow, 'The Future and the Present in Economic Life' 16 *Economic Inquiry* 157, 160 (1978).

⁴² D G Mayes, 'The Controversy over Rational Expectations, *National Institute Economic Review*, (May 1981) 53, 58.

⁴³ See R E Hall, 'Stochastic Implications of the Life Cycle-Permanent Income Hypothesis: Theory and Evidence, 86 *Journal of Political Economy*, 971, 972 (1978) cited in B Kantor, *supra* n 32.

⁴⁴ O'Driscoll and Rizzo, 218

⁴⁵ W. Alderson, *Dynamic Marketing Behaviour* (Richard D Irwin, 1965) 207, cited in W D Reekie and R Savitt 'Marketing Behaviour and Entrepreneurship: A Synthesis of Alderson and Austrian Economics', 16(7) *European Journal of Marketing*, 55, 60-61 cited hereinafter as Reekie and Savitt.

⁴⁶ Reekie and Savitt, 61.

⁴⁷ *Ibid.*

⁴⁸ See F. Knight, *Risk, Uncertainty and Profit* (University of Chicago Press, 1921).

⁴⁹ Lachman, 1978, p 2.

⁵⁰ O'Driscoll and Rizzo, 60.

⁵¹ As O'Driscoll and Rizzo illustrate (at 61):

Suppose that an individual tries to predict an event. Paradoxically, even if it occurs 'exactly' as predicted, it will not be *experienced* exactly as predicted. 'The simple reason is that before he made the forecast his standpoint was different. Afterwards, his memory incorporated the forecast and this changed his perspective (citations omitted).

⁵² *Ibid.*

⁵³ O'Driscoll and Rizzo, 2.

⁵⁴ Loasby, 7.

⁵⁵ Loasby, 8.

⁵⁶ States Loasby, at 8:

Even the state of risk produces uniquely optimal decisions only if the expected value criterion is accepted: and the state of uncertainty necessarily allows for a variety of possible criteria, depending both on the decision-maker's attitude to risk and the way in which he may choose to deal with the absence of a probability distribution. 'These criteria, such as optimism (aim for the best possible outcome), pessimism (assume that the worst will happen, and make that choice which minimises the damage), and minimum regret (in effect, minimise the opportunity costs) may, not surprisingly, lead to contradictory solutions.

⁵⁷ Loasby, at 9. Loasby continues:

Much of the content of decision theory consists of a variety of devices by which the trick may be done. Even this does not wholly resolve the analyst's problem, for he must still somehow predict the decision-maker's subjective assessment.

⁵⁸ O'Driscoll and Rizzo, 4.

⁵⁹ O'Driscoll and Rizzo at 24. They offer in the following five propositions a construct of dynamic subjectivism (at 22):

(1) The decision to take a specific course of action is the outcome of a process of projecting and weighting the consequences of the various course of action.

- (2) This projecting is based on a stock of knowledge, part of which is individually acquired and part of which is socially transmitted through institutions.
- (3) An individual's chosen course of action fit into an overall plan.
- (4) The social world consists of many such acting individuals.
- (5) There is a social distribution of knowledge and plans and, consequently, of chosen courses of action. Not all individuals know or do the same things.

60 K.P. Popper, *Objective Knowledge* (Oxford University Press 1979), 240.

61 O'Driscoll and Rizzo, p 29.

62 1976, p 131.

63 At 131-132.

64 G L S Shackle, *Expistemics and Economics*, (Cambridge University Press 1972), 245.

65 Lachman, 1978, 7.

66 1978, 25.

67 Purposefulness according to the Austrian traditions has many variants and is illustrative of the problem discussed here. As described by L. von Mises, *The Ultimate Foundations of Economic Science* (Sheed, Andrews and McNeil 1976), 34.

The characteristic feature of man is action. Man aims at changing some of the conditions of his environment in order to substitute a state of affairs that suits him less ... Action is purposive conduct. It is not simply behaviour begot by judgments of value, aiming at a definite end and guided by ideas concerning the suitability or unsuitability of definite means.

Kirzner [1976] at 45 explains the point by reference to his well-known illustration of a Martian trying to make sense of busses stopping to drop and pick up passengers at scheduled times:

Now this Martian researcher may be able to predict just when the person is going to miss the box [bus] entirely without reference to the fact that someone is trying to catch the bus because he wants to get to work on time. But if he does so, he has not told us everything there is to be learned about this situation. A theory of moving bodies and boxes that does not draw attention to the dimensions of purpose [ie stopping to drop and pick up passengers] gives a truncated picture of the real world. This is what economics, in the Austrian view, is all about. Economics has to make the world intelligible in terms of human motives.

What Kirzner is attempting to convey is that there are matters besides the facts of the external world and the relationships that may be postulated between these bare facts, viz, the 'realm of reality' encompassing human plans and motivations. Any attempt to explain the facts of the world without regard to the human purposes underlying these facts, says, Kirzner, will fail to explain everything there is to be explained, and fail to set forth everything there is to set forth. This notion of purposefulness is quite distinct from the notion of neo-classical rational man. In fact, it rejects the very assumptions on which neo-classical economics rests, viz, total knowledge about the range of choices man is confronted with, given tastes, consistency and transitivity between preferences, and time and taste changes as being exogenous. Instead, purposefulness contemplates goal directed behaviour and the adoption of individual strategies towards achieving these goals. Its essential feature is recognition that participants differ in tastes and abilities and that action is directed toward a future framed by time and ignorance. In this scheme, participants learn from both past experience of their own and of others,

such experience having a bearing on their current action. What is emphasised is the subjectivity of knowledge and of action.

⁶⁸ At 76. Emphasis added.

⁶⁹ *Ibid*, citing H. Bergson, *The Possible and the Real in the Creative Mind* (Trans) M L Andison (Westport 1946), 111. Stability refers not only to those features which have been repeated, but those features which are also repeatable in the sense that they are not affected by the mere passage of time. Thus stability refers to the pattern of anticipated conduct, certain or probable. The latter is in turn influenced by both the state of the environment and individual interaction, meaning rules of thumb and certain kinds of creative activity.

⁷⁰ At 85.

⁷¹ See F A Hayek, 'Economics and Knowledge', IV *Economica*, 33, 38 (1937).

⁷² O'Driscoll and Rizzo offer the following illustration (at 85-86):

Consider, as an illustration, Professors A and B, who teach in the same department and who plan to discuss their forthcoming jointly authored book. Their plans are co-ordinated with respect to the typical features of their activities if, for example, each expects the other to be in his office on the day he actually plans to be there. Since neither has decided his position on the book's central concern beforehand, the contents of their discussions can be seen as the unique feature. What they will say depends on the 'insights' that will arise only in the course of conversation. These insights are surely time-dependent. The plans of A and B are co-ordinated, therefore, in the sense that each will come into the office on the proper day and at the proper time, but they are not co-ordinated in the sense that each has planned what to say to the other. There is an open-endedness to their plans that allows for spontaneity or novelty. This is a pattern co-ordination.

There is also a looser form of pattern co-ordination, which we can call 'stochastic pattern co-ordination'. In this case, the typical features of activities are probabilistically co-ordinated. Thus, in the above illustration, both A and B may 'envisage' a probability distribution over the days of the week of the other coming into the office. They each decide when to come based on this probability distribution, sometimes the typical aspect of their activities will mesh in the exact sense and sometimes they will not. Overall, however, each individual is doing the best he can under the circumstances and so an equilibrium has been attained. The exact contents of the discussions, when they do occur, remain time-dependent. Therefore, this aspect of each individual's plans is not subject to stochastic characterization and must be truly open-ended.

⁷³ At 81.

⁷⁴ At 86.

⁷⁵ Kirzner [1973] observes (at 217) as follows:

The world of market equilibrium cannot be judged on its success in co-ordinating scattered dribblets of information; ignorance is simply assumed not to exist ... Such a world exhibits no ignorance, no absence of co-ordination, no opportunities for entrepreneurial profit, and in fact, no entrepreneurs at all.

And again (at 219):

The price system in equilibrium presents each decision maker with a fully co-ordinated set of signals which, if followed, will permit all plans to dovetail. In the market process, on the other hand, these price signals are themselves *developed* through a process of learning that is governed step by step by the interim sets of

prices; it is the latter process to which we refer as a process of communication of information (emphasis in original).

⁷⁶ See generally S Grossman and J Stiglitz on the 'Impossibility of Informationally Efficient Markets', 70 *American Economic Review* 393 (1980) cited hereinafter as Grossman and Stiglitz (1980).

⁷⁷ S Grossman and J Stiglitz, 'Information and Competitive Price Systems, 66 *American Economic Review* 246 (1976), cited hereinafter as Grossman and Stiglitz (1976).

⁷⁸ S Grossman, 'On the Efficiency of Competitive Stock Markets where Traders have Diverse Information, 31 *The Journal of Finance*, 573 (1976) cited hereinafter as Grossman (1976).

⁷⁹ B Allen, 'Generic Existence of Completely Revealing Equilibrium for Economies with Uncertainty when Prices Convey Information', 49 *Econometrica* 1173 (1981).

⁸⁰ Kirzner, 10.

⁸¹ F A Hayek, 'The Use of Knowledge in Society, 35 *The American Economic Review* 519, 526 (1945).

⁸² *Ibid.*

⁸³ See also S J Grossman, 'On the Efficiency of Competitive Stock Markets Where Traders have Diverse Information, 31 *Journal of Finance* 573, 574 (1976), who observes that Hayek's argument breaks down when the price system is noisy. In such cases Grossman states, each individual will want to know why the price has risen (ie what exogenous factors make the price unusually high). Such information though not self revealing, will be searched for. Grossman also observes that an optimal allocation of resources involve knowing why the price has risen (ie knowledge of the states of nature determining current price).

⁸⁴ *Infra*, n 94 and ff.

⁸⁵ As O'Driscoll and Rizzo observe (at 106-107):

They *outguess* market prices when these prices do not seem consistent ... Whether we call this entrepreneurship a capacity to find out 'particular circumstances' ... or 'alertness' ..., it is a *sine qua non* of a market economy. Yet this 'driving force' or market economies is absent from models of perfect competition.

⁸⁶ W D Reekie, *Markets, Entrepreneurship and Liberty: An Austrian View of Capitalism* (Wheatshaf Books 1984), 35.

⁸⁷ F A Hayek, 'The Use of Knowledge in Society', 35 *American Economic Review* 519, 526 (1945). See also the following articles by Hayek: 'Economics and Knowledge', IV *Economica* 33 (1937); 'The Meaning of Competition' in *Individualism and Economic Order* (University of Chicago Press 1945), 92; 'Competition as a Discovery Procedure' in *New Studies in Philosophy, Politics, Economics and the History of Ideas* (Chicago University Press 1978), 179; 'The Pretence of Knowledge' in *id.*, 23.

⁸⁸ 'The Use of Knowledge in Society', 521.

⁸⁹ O'Driscoll and Rizzo, 103.

⁹⁰ *Id.*, 104.

⁹¹ *Id.*, 105.

⁹² O'Driscoll and Rizzo comment (at 105) as follows:

Since much information is tacit and cannot be communicated, *even in equilibrium*, not everyone will know everything. Economic systems do not move toward a situation in which information is fully disseminated, at least not explicitly. Some knowledge will remain private.

⁹³ There are two alternative methods of measuring whether prices reflect all available information. The *ex ante* method examines the information content reflected in prices.

By its nature, it avoids the need to specify the correctness of expectations. This approach becomes inappropriate when imperfections in the nature of transaction costs and restrictions on short sales are taken into account. Prices cannot reflect all information since there will exist individuals who have not revealed their information via trade - except by abstaining. J Mayshar, 'On Divergence of Opinion and Imperfection in Capital Markets', 73 *American Economic Review* 114 (1983), 126, cited hereinafter as Mayshar. Even if it is assumed that the information of non-active investors is not of importance, realization that the prices and identity of active investors are simultaneously determined makes uncertain the nature of information reflected or conveyed by equilibrium prices. *Ibid.* The *ex post* method uses second-period hindsight to determine whether first-period prices of alternative assets were in some sense correct given all the information available at the later second-period. This method seems to have been the more widely used. According to E M Miller, 'Risk, Uncertainty, and Divergence of Opinion', 32 *Journal of Finance* 1151 (1977) 1157, *ex post* investment results cannot be used to measure *ex ante* investor expectations for the *average investor* as prices tend to reflect the expectations of the minority who buy the stock. Realized returns, as such, are not a good surrogate for the expectations of investors generally. Disregard of this appears to be the flaw with EMH and consequently the CAPM. Thus neither method is totally appropriate.

⁹⁴ E F Fama, 'Efficient Capital Markets: A Review of Theory and Empirical Work', *Journal of Finance* 383 (1970).

⁹⁵ M C Jensen, 'Risk, The Pricing of Capital Assets, and the Evaluation of Investment Portfolios', 42 *Journal of Business* 167 (1969). See also M C Jensen, 'The Performance of Mutual Funds in the Period 1945-1964', *Journal of Finance* 389 (1968).

⁹⁶ N E Mains, 'Risk, The Pricing of Capital Assets, and the Evaluation of Investment Portfolios: Comment', *Journal of Business* 371 (1977).

⁹⁷ At 384.

⁹⁸ *Ibid.*

⁹⁹ S J Kon and F C Jen, 'The Investment Performance of Mutual Funds: An Empirical Investigation of Timing, Selectivity and Market Efficiency', 52 *Journal of Business* 263 (1979).

¹⁰⁰ Thus it states at 288:

The empirical results on selectivity performance provide evidence both for and against the EMH. The case against the EMH, given the SLM equilibrium benchmark model, is that many more *individual* funds were able to generate significant superior selectivity performance for a subset of observations in the measurement interval. Given the Black (1972) equilibrium model, the methodology also displayed this evidence. In addition, given the SLM naive strategy, the estimates of overall selectivity performance did indicate that, *on average*, the sample of 49 mutual funds selected superior portfolios.

The case for the EMH in response to the above evidence is based on the bias in favour of low-risk securities using the SLM benchmark. That is, the average superior overall selectivity performance that characterized the mutual fund sample can be attributed to 78% of all risk-level decisions being less than 1.0 and the sets of funds with significantly positive and negative performance during the measurement interval were into disjoint subsets. We provide evidence that is not inconsistent with the *joint* hypothesis that the Black (1972) model is empirically valid and that mutual fund managers *individually* and *on average* are unable to consistently forecast the future prices on individual securities well enough to recover their research expenses, management fees, and commission expenses.

¹⁰¹ See generally, B G Malkiel, 'The Valuation of Closed-end Investment Company Shares', 32 *The Journal of Finance* 847 (1977). Malkiel concludes that the pricing of closed-end fund shares seem to provide an illustration of a market imperfection in capital asset pricing.

¹⁰² See A Kraus and H R Stoll, 'Price Impacts of Block Trading on the New York Stock Exchange', *The Journal of Finance* 569 (1972).

¹⁰³ A Kraus and H R Stoll, 'Price Impacts of Block Trading on the New York Stock Exchange', *The Journal of Finance* 569 (1972).

¹⁰⁴ M S Scholes, 'The Market for Securities: Substitution Versus Price Pressure and the Effects of Information on Share Prices', *Journal of Business* 179 (1972).

¹⁰⁵ See generally P A Griffin, 'Usefulness to Investors and Creditors of Information provided by Financial Reporting: A review of Empirical Accounting Research', Research Report Financial Accounting Standards Board 1982, cited hereinafter as *Griffin*.

¹⁰⁶ F Allen and A Postlewaite, 'Rational Expectations and the Measurement of a Stocks Elasticity of Demand', *Journal of Finance* 1119 (1984).

¹⁰⁷ I.e., shares of different companies, barring the risk factor, are substitutable for one another.

¹⁰⁸ I.e., when a large block is traded price necessarily falls to induce purchase of additional shares.

¹⁰⁹ L Y Dann, D Mayers and R J Raab Jr, 'Trading rules, Large Blocks and the Speed of Price Adjustment', 4 *Journal of Financial Economics* 3 (1977).

¹¹⁰ At 20.

¹¹¹ E F Fama, I. Fisher, M C Jensen and R Roll, 'The Adjustment of Stock Prices to New Information' 10 *International Economic Review* 1 (1969).

¹¹² See however, R A Schwartz, 'Discussion of Fama, Efficient Capital Markets' 25 *Journal of Finance* 422 (1970). Schwartz states:

While the market adjustment is thus completed before the occurrence of the event which stimulates it, this evidence also indicates that the process of adjustment takes place over a 29 month period.

Fama *et al* refer, as well, to the behaviour of the residuals computed for specific stocks, and note that, preceding the split date, successive residuals are not serially dependent, and tend to be 'abnormally large and positive for only a few months. Apparently, the few months of large, positive residuals varies from stock to stock, and thus the average, across stocks, is observed to be positive over the longer time span. This suggests that the adjustment process spans a few months rather than a 29 month period.

The length of the adjustment process is relevant for considerations of market efficiency, and a few months might appear long enough to suggest inefficiency. Because the Fama, Fisher, Jensen, and Roll study utilized monthly price data, it does not provide a sufficiently precise measure of the length of the adjustment period which might be of about a month's duration. *Thus, it does not yield evidence for or against efficiency in this particular sense.* Further examination, utilizing, perhaps, weekly data, might clarify the issue. One would also like to have knowledge of the systematic dispersion of information during the adjustment period before formulating a final judgment of market efficiency. (Emphasis added).

¹¹³ G. Charest, 'Split Information, Stock Returns and Market Efficiency' 1, 6 *Journal of Financial Economics* 265 (1978).

¹¹⁴ At 292.

¹¹⁵ L Lowenstein, 'Pruning Deadwood in Hostile Takeovers: A Proposal for Legislation', 83 *Columbia Law Review* 249, 283 (1983).

¹¹⁶ K G Ibbotson, 'Price Performance of Common Stock Issues', *Journal of Financial Economics* 235 (1975).

¹¹⁷ See the following reason as to why underwriters may deliberately underprice an issue, Ibbotson *supra* n 116, at 264:

(1) If regulations require underwriters to set the offering price *below* the expected value. (We have earlier indicated that implicit regulations may prevent underwriters from setting prices *above* the expected value. However, it appears very unlikely that regulations would even implicitly require underwriters to set the offering price *below* the expected value.)

(2) If underpriced new issues 'leave a good taste in investors' mouths' so that future underwritings from the same issuer could be sold at attractive prices. (Although this explanation is prevalent on Wall Street, it clearly violates an efficient market framework.)

(3) If underwriters collude or individually exploit inexperienced issuers to favour investors. (Since the population of underwriters is very large, one would expect competition among underwriters to eliminate exploitation possibilities.)

(4) If firm commitment underwriting spreads do not include all of the risk assumption costs, so that the underwriter must underprice to minimize these risks. (Underwriters could receive side payments from investors that are equal to the cost of the one-sided risks.)

(5) If through tradition, or some other arrangement, the underwriting process consists of underpricing offerings with full (or partial) compensation via side payments from investors to underwriters to issuers.

(6) If the issuing corporation and underwriter perceive that underpricing constitutes a form of insurance against legal suits. For example, errors in the prospectus may be less likely to result in legal suits when the stock's initial performance is positive.

¹¹⁸ See generally Griffin, 58.

¹¹⁹ M C Jensen, 'Some Anomalous Evidence Regarding Market Efficiency', 6 *Journal of Financial Economics* 95 (1978), cited hereinafter as *Jensen*.

¹²⁰ Griffin, 183-187. Griffin sums up the research (at 187 as showing three major results:

(1) Securities prices respond contemporaneously with the announcement of earnings, despite the availability of other, more timely data such as dividend and forecast announcements. (2) At the time of announcement, unexpected earnings and unexpected price changes are positively correlated in both direction and magnitude. (3) The responsiveness of unexpected price changes to unexpected earnings is positive but small (though statistically significant). Hence, it is almost inconceivable that investors do not find information about earnings useful for investment decision making.

He concludes that it is almost inconceivable that investors do not find information about earnings useful for investment decision making.

¹²¹ See B Lev and J A Ohlson, 'Market-Based Empirical Research in Accounting: A Review, Interpretation and Extension', 20 *Journal of Accounting Research* 249, 261 (1982). Griffin, 196 sums up the position thus:

Unfortunately, except in some fairly trivial situations, accounting researchers can offer little in the way of conceptual guidance that would enable managers, users, and policymakers to predict the timing, direction and magnitude of the market's

response, if any. The result is that most of the 'accounting change' studies simply describe what happened to security returns when information about the accounting change was thought to have been conveyed to the market. Such studies provide a plausible explanation of the findings.

¹²² Griffin 209. See also the evidence cited therein.

¹²³ *Ibid.*

¹²⁴ O M Joy, R H Litzenberger and R W McInally, 'The adjustment of Stock Prices to Announcements of Unanticipated Changes in Quarterly Earnings', *Journal of Accounting Research*, 207 (1977).

¹²⁵ S L Brown, 'Earnings Changes, Stock Prices, and Market Efficiency', *Journal Finance*, 17 (1978).

¹²⁶ H Latane and C Jones, 'Standardized Unexpected Earnings - A Progress Report', *Journal of Finance*, 1457 (1977).

¹²⁷ J F Jaffe, 'Special Information and Insider Trading', *Journal of Business*, 410 (1974).

Joy *et al* examined market reaction to the interim earnings announcement of 96 New York Stock Exchange firms over the period 1963-68 and concluded that for a group of firms with large positive unexpected earnings changes, post announcement abnormal return for a 26 week period was over 4.0% with the comparable figure for large negative earnings changes being 2.6%. These results were common for several alternative estimates of systematic risk and residual rates of return. See R D Hines, 'The Usefulness of Annual Reports: The Anomaly between the Efficient Markets Hypothesis and Shareholder Surveys', *Accounting and Business Research*, 296, 304 (1982) cited hereinafter as Hines. Brown's study with respect to quarterly and annual earnings announcements comprised of 158 companies on the New York and American Stock Exchanges for the period 1968-71. Brown concluded that these announcements created significant price trends around 45 days of their announcement. This view is further confirmed by the studies of Latane and Jones who found unexpectedly high (low) earnings were significantly associated with high (low) holding period returns over the 3 months following the announcement, Hines at 304. Protracted price adjustments to earnings announcements are also reported in the study by D Morse, 'Price and Trading Volume Reaction Surrounding Earnings Announcements: A Closer Examination', *Journal of Accounting Research* (Autumn 1981), 374-83. This body of accumulated evidence suggests the mean of post-disclosure drift to be virtually undistinguishable from the predisclosure drift. See B Lev and J A Ohlson, 'Market based Empirical Research on Accounting: A Review, Interpretation, and Extension', 20 *Journal of Accounting Research*, 285. Further evidence of less than complete and instantaneous impounding of information into securities is found in the study of J F Jaffe, 'Special Information and Insider Trading', *Journal of Business* (1974) 410. The study shows that investment in shares following required disclosure by 'insiders' (as defined under the *Securities Exchange Act* (1934) under s 16(a) of the *Securities Exchange Act* (1934), would have yielded an eight month cumulative abnormal return of 4.93% - an abnormal return significant at least at the 0.001 significance level. See Hines, *supra* 304.

¹²⁸ R Ball, 'Anomalies in Relationships between Securities Yields and Yield Surrogates', 6 *Journal of Financial Economics* 103 (1978).

¹²⁹ See also Jensen, *supra* n 119, 97.

¹³⁰ R L Watts, 'Systematic "Abnormal" Returns after Quarterly Earnings Announcements', 6 *Journal of Financial Economics*, 127 (1978).

See also R Thompson, 'The Information Content of Discounts and Premiums on Closed-end Fund Shares', 6 *Journal of Financial Economics* 151 (1978). Thompson found that a relatively simple trading rule (based on discounts for closed end funds) earned statistically

significant abnormal returns. Thompson attributes the abnormal returns to inadequacies of the asset pricing model and not to market inefficiency 'since the data was widely available over the entire period and extensively discussed in the professional press'. See M C Jensen, *supra* n 119, 99.

Cf also J B Long, 'The Market Valuation of Cash Dividends, A Case to Consider', 6 *Journal of Financial Economics* 235 (1978), where the writer concludes that the explanation for different market valuation of cash dividends over stock dividends with respect to otherwise identical stocks (a slight premium on cash dividends) lies in the inadequacy of the two parameter valuations model.

¹³¹ D Givoly and J Lakonishok, 'The Information Content of Financial Analysis Forecasts of Earnings', *Journal of Accounting and Economics* 165 (1979).

¹³² A Cowles, 'Can Stockmarket Forecasters Forecast', 1 *Econometrica* 309 (1933).

¹³³ S Coker, 'An Analysis of Security Recommendations by Brokerage Houses' 3 *Quarterly Review of Economics and Business* 19 (1963).

¹³⁴ R Diefenback, 'How Good is Institutional Brokerage Research', 28 *Financial Analysts Journal* 54 (1972).

¹³⁵ D Logue and D Tuttle, 'Brokerage House Investment Advice', 8 *Financial Review* 38 (1973).

¹³⁶ Cowles examined the securities recommendations of 16 financial services, 25 financial publications and the editors of *The Wall Street Journal* and concluded that the stocks advocated typically underperformed broad market averages by around 1-4% per annum in periods immediately following the observed recommendations. Colker analysed a sample of retail brokerage house research studies reported in *The Wall Street Journal* during 1960 and 1961 and concluded that an investor who accepted the advice offered would have ended up doing as well as the markets' overall trend. Diefenback appraised the stock selections of a group of institutional brokerage firms between late 1967 and mid 1969 and concluded likewise. Logue and Tuttle examined securities recommended by six major brokerage houses as compiled in *The Wall Street Journal* (comparing them with concurrent return on randomly selected stock portfolios over holding periods of 3, 6 and 12 months after the recommendation appeared and found little difference in aggregate performance though they also found that one of the firms considered did in fact seem to have fairly consistent success in picking winners. See generally J C Groth, W G Lewellen, G G Schlarbaum, and R C Lease, 'An analysis of Brokerage House Securities Recommendations', *Financial Analysts Journal*, 32, 33, (1979).

¹³⁷ H Cheney, 'How Good are Investment Advisory Services?', 37 *Financial Executive* 30 (1969).

¹³⁸ F Black, 'Yes Virginia, There is Hope: Test of the Value Line Ranking System, 29 *Financial Analyst Journal* 10 (1973).

¹³⁹ P Lloyd-Davies and M Canes, 'Stock Prices and the Publication of Second Hand Information, 51 *Journal of Business*, 43 (1978).

¹⁴⁰ D Givoly and J Lakonishok, 'The Information Content of Financial Analysts' Forecasts of Earnings: Some Evidence of Semi-Strong Inefficiency, 1 *Journal of Accounting and Economics* 165 (1979).

¹⁴¹ R Groth, W Lewellen, G Schlarbaum and R Lease, 'An Analysis of Brokerage House Securities Recommendations', 35 *Financial Analyst Journal*, 32 (1979).

¹⁴² D Fried and D Givoly, 'Financial Analysts' Forecasts and Earnings, A Better Surrogate for Market Expectations', 4 *Journal of Accounting and Economics*, 85 (1982).

¹⁴³ J H Bjerring, J Lakonishok and T Vermaelen, 'Stock prices and Financial Analysts' Recommendations', 38 *Journal of Finance* 187, cited hereinafter as Bjerring, et al. See also

the study of T Copland and D Mayers, 'The Value Line Enigma', *Working Paper UCLA 1981* cited in Bjerring, et al, *supra*.

144 Lloyd-Davies and Cane examined the effect on market prices of the publication of analysts' recommendations in *The Wall Street Journal* column 'Heard on the Street'. In each of the situations clients of the analysts had received the information before being sent to *The Wall Street Journal*. The interval between the clients' receipt of the recommendation and publication of the *Journal* is between a few days to a fortnight. On the basis of this analysis Lloyd-Davies and Cane found that stock prices do adjust to revisions in analysts recommendations. They go on to say (at 55):

Further, we reject the hypothesis that purchase or sell recommendations released to a small group of investors are immediately and fully reflected in the stock price. Instead, it appears that subsequent dissemination of the information as a significant impact on the price. This is consistent with the idea expressed earlier that a few investors with inside information will not eliminate all abnormal returns because of the abnormal risks that such a portfolio shift on their part would entail. Our evidence also gives some indication that investors who use analysts' services are getting something of value. In other words, there is here some evidence that analysts' recommendations do provide inside information and are not mere self-fulfilling prophecies.

At the same time they point out that information readily available by reading 'Heard on the Street' appears to be very quickly incorporated into stock prices. The observation is crucial as it puts in perspective claims of efficiency made by Fama, Brown and Ball etc based on information appears on *The Wall Street Journal*. They also note that the information in the 'Heard on the Street' column cannot be used to power a trading rule when transaction costs must be paid.

Givoly and Lakonishok found that financial analysts' forecasts (and revisions thereof) had information content and that markets do not adjust instantaneously. Thus while abnormal returns began to form around two months prior to the release of the revision, contrary to the efficient markets hypothesis, significant abnormal returns continued to prevail during the two months subsequent to the revision. To quote from their study (at 86):

Not only are the reported abnormal returns significant, but they are of considerable magnitude as well. Holding a stock during four months surrounding an upward revision of over 5% results, on average, in an abnormal return of 4.7% representing a 195% improvement over a buy-and-hold policy. Furthermore, a substantial portion of this abnormal return, 2.7% is observed in the two months following the revision month. This implies that an investor acting on publicly available information and incurring the full transaction cost could still earn an abnormal return of 0.7% during this two-month period (outperforming and buy-and-hold policy by 58%).

It must be noted that the experimental design adopted in the study follows the conditions outlined by Ball *Journal of Financial Economics* 103 (1978), *supra* to avoid any overestimating bias.

Groth, Lewellen, Schlarbaum and Lease studies returns from a brokerage house's recommendations to its individual customers during the 1960's. They found the recommendations to be genuinely valuable even after allowing for transaction costs and risk. However, abnormal returns were found to be associated primarily with buying rather than sell recommendations. The stock was found positive in the six months prior to the recommendations and remained essentially zero thereafter. They reason that if the large positive returns in the month of the recommendation were merely the result of trading

pressure induced by the recommendation, those returns would have been followed by reversals. The absence of such reversals, they say, suggests that the brokerage houses' recommendations were associated with genuine changes in the value of the securities.

¹⁴⁵ At 187.

¹⁴⁶ See C Holloway, 'Testing and Aggressive Investment Strategy Using Value Line Ranks: A Reply', 38 *Journal of Finance* 263 (1983).

¹⁴⁷ See Bjerring, et al, *supra* n 143.

¹⁴⁸ At 203.

¹⁴⁹ At 202-230. The writers further state at 202:

The superior results reported here, however, cannot be explained by such 'luck' for the following reasons:

First, the brokerage firm was successful in outperforming both the TSE 300 with their Canadian recommendations and the SP 500 with their US recommendations, though conditions in the two markets were different. In particular, the Canadian market was a bull market with the TSE 300 advancing 24.3% per year during the test period, whereas the SP 500 barely kept up with inflation with a rise of 9.7% per year.

Second, many of the 93 companies floated between the recommended and representative lists. Since the recommended list did much better than the representative list (.279% abnormal return per week for the recommended list versus .056% for the represented list) we must conclude the brokerage firm has timing ability.

Finally, in one analysis the performance of each case while it was on the list (active period) was compared with its performance during the 15 weeks before appearing on the list and the 15 weeks after being removed from the list (control period). Moreover, each week in the test period was involved in the active period about as often as it was in the control period. Thus, the 93 companies did better when on the recommended list than when off, even though the individual 'on' and 'off' times were spread pretty evenly across the test period.

One source of potential bias could be the practice of analysts to recommend stocks after an abnormal price decline, so that the abnormal returns during the recommendation period are biased upwards. Note that this bias will creep in regardless of whether we use the Market Model approach or the Control Period approach because part of the control period includes the period before the recommendation. However, our results cannot be explained on the basis of this bias for the following reasons.

¹⁵⁰ D Fried and D Givoly, 'Financial Analysts' Forecasts of Earnings: A Better Surrogate for Market Expectations', 4 *Journal of Accounting and Economics* 85, 99 (1982).

¹⁵¹ S Basu, 'Investment Performance of Common Stocks in relation to their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis', *Journal of Finance* 663 (1977).

¹⁵² Using two different analytical procedures he found that from a sample of 753 firms on the New York Stock Exchange for the period 1956-69, portfolios comprised of low price-earnings ratio stocks earned 2-4 1/2% more than implied by their level of systematic risk, while high price-earnings portfolios earned 2 1/2% to 3% per annum less than implied by their level of risk. See Hines, *supra* n 127, 303-304.

¹⁵³ *Supra* n 131.

¹⁵⁴ See also Lev and Ohlson, *supra* n 121.

¹⁵⁵ D Gjalai, 'Empirical Tests of Boundary Conditions for CBOE Options', 6 *Journal of Financial Economics* 187 (1978).

¹⁵⁶ D P Chiras and S Manaster, 'The Information Content of Option Prices and a Test of Market Efficiency', 6 *Journal of Financial Economics* 213 (1978).

¹⁵⁷ D R Harrington, *Modern Portfolio Theory and the Capital Asset Pricing Model* (Prentice Hall 1983), 66, hereinafter cited as Harrington.

¹⁵⁸ *Id.*, 68-69.

¹⁵⁹ Malkiel, 218.

¹⁶⁰ Harrington, 66.

¹⁶¹ Roll has shown that by changing the market index against which *betas* are measured one can end up with different measures of the risk level of individual stocks or portfolios leading to different predictions about the expected returns. Roll's argument is that it is impossible to observe the markets' return because the market, in principle, includes all stocks, numerous other financial instruments and even certain non-marketable assets such as an individual's investment in education. Thus measuring market risk by using an imperfect proxy will inevitably result in a quite imperfect estimate of market sensitivity. See R Roll, 'A Critique of the Asset Pricing Theory's Test; Part 1: On Past and Potential Instability of the Theory', 4 *Journal of Financial Economics* 129 (1977). See also Malkiel, 225.

¹⁶² Harrington, 67.

¹⁶³ The *market model*, while resembling CAPM differs from the latter in that it does not rely on any of the assumptions inherent in CAPM. It simply states that the returns generating process is a linear relationship between the returns from the asset and the returns from the market. See Harrington, 71.

¹⁶⁴ Harrington identifies the problems of the historical *beta* as follows (at 89):

Thus, we find that *betas* for individual securities are not particularly stable, nor do most securities remain in the same risk class from one period to another. Analysis of mean squared errors shows that although some components of error can be reduced, the major portion of standard error can be lessened only by adding more securities to the portfolio. Finally, we find that the best way to estimate a correlation coefficient is to use the average coefficient for an entire universe of stocks. If historical *betas* are not particularly stable and we cannot refine them significantly, they cannot be very useful in estimating future *betas*. After reviewing these data, one of my colleagues commented: 'Stock *betas* are very nearly random variables with almost no economic content'.

Still, *beta* (or relative volatility) is risk: Over time, returns from their securities are profoundly influenced by socioeconomic and political events. Other firms' returns have been (and perhaps will continue to be) dominated by micro-economic, firm-specific factors: superior management, market power, patent protection, or process innovation. Nonetheless, no firm and thus no security can escape the direct or indirect effect of events in the larger world.

And previously (at 80):

How should *betas* be measured, using history? The disconcerting answer is that we do not know. Finding the best way to measure *beta* is not merely a theoretical problem; it is a practical one. The search still requires trial-and-error experimentation.

¹⁶⁵ G W Douglas, 'Risk in the Equity Markets: An Empirical Appraisal of Market Efficiency', *Yale Economic Essays* 3 (1969).

¹⁶⁶ D Harrington explains that theoretically, the minimal rate of return from the portfolio (the intercept) and the actual risk free rate for the period should have been equal though they were not.

¹⁶⁷ M Miller and M Scholes, 'Rate of Return in Relation to Risk: A Re-examination of Recent Findings', *Studies in the Theory of Capital Markets* (Ed) M Jensen (Praeger, 1972).

¹⁶⁸ J Lintner, 'Security Prices, Risk and Maximal Gains from Diversification', 20 *Journal of Finance* 587 (1965).

¹⁶⁹ F Black, M Jensen and M Scholes, 'The Capital Asset Pricing Model: Some Empirical Tests', in *Studies in the Theory of Capital Markets* (Ed) M Jensen (Praeger, 1972).

¹⁷⁰ See Harrington, 44-45.

¹⁷¹ Malkiel, 218.

¹⁷² Malkiel, 231.

¹⁷³ See generally, *Harrington*, 22.

¹⁷⁴ W Beaver, P Kettler and M Scholes, 'Association between Market Determined and Accounting Determined Risk Measures', 45 *Accounting Review* 654 (1970).

¹⁷⁵ Barr's 'bionic betas', Malkiel, 224.

¹⁷⁶ B Rosenberg and V Marathe, 'Tests of the Capital Asset Pricing Hypothesis', Working Paper No 32 of the Research Program in Finance, Berkeley: Graduate School of Business and Public Administration, University of California, May 1975, cited in *Harrington*, 90.

¹⁷⁷ As explained by R Roll and S A Ross, 'An Empirical Investigation of the Arbitrage Pricing Theory', 35 *Journal of Finance* 1073 (1980), at 1074:

The APT is a particularly appropriate alternative because it agrees perfectly with what appears to be the intuition behind the CAPM. Indeed, the APT is based on a linear return generating process as a first principle, and requires no utility assumptions beyond monotonicity and concavity. Nor is it restricted to a single period; it will hold in both the multiperiod and single period cases. Though consistent with every conceivable prescription for portfolio diversification, no particular portfolio plays a role in the APT. Unlike the CAPM, there is no requirement that the market portfolio be mean variance efficient.

There are two major differences between the APT and the original Sharpe 'diagonal' model, a single factor generating model which we believe is an intuitive grey eminence behind the CAPM. First, and most simply, the APT allows more than just one generating factor. Second, the APT demonstrates that since any market equilibrium must be consistent with no arbitrage profits, every equilibrium will be characterized by a linear relationship between each asset's expected return and its return's response amplitudes, or loadings, on the common factors. With minor caveats, given the factor generating model, the absence of riskless arbitrage profits - an easy enough condition to accept *a priori* - leads immediately to the APT. Its modest assumptions and its pleasing implications surely render the APT worthy of being the object of empirical testing (citations omitted).

¹⁷⁸ See for example M R Reinganum, 'Empirical Tests of Multi-Factor Pricing Models, The Arbitrage Pricing Theory: Some Empirical Results', 36 *Journal of Finance* 313 (1981) concluding that the evidence indicates that a parsimonious APT fails the test (at 320), that APT was unable to account for the empirical anomalies that arise within the CAPM (at 320).

¹⁷⁹ *Supra*, n 115.

¹⁸⁰ See Kirzner [1973].

¹⁸¹ Noise, ie indiscernible randomness or the unobserved variation of another factor. See D W Diamond and R E Verrecchia, 'Information Aggregation in a Noisy Rational Expectations Economy', 9 *Journal of Financial Economics* 221, 223 (1981).

¹⁸² See the series of essays by S Grossman (cited hereinafter as Grossman) and J E Stiglitz (cited hereinafter as Stiglitz): Grossman, 'On the Efficiency of Competitive Stock Markets

Where Trades Have Diverse Information', *Journal of Finance*, 573 (1976), 'The Existence of Futures Markets, Noisy Rational Expectations and Informational Externalities', *Review of Economic Studies* 43 (1977), 'Further Results on the Informational Efficiency of Competitive Stock Markets', *Journal of Economic Theory* 81 (1978), 'An Introduction to the Theory of Rational Expectations under Asymmetric Information', *Review of Economic Studies* 541 (1981), Grossman and R J Shiller, 'The Determinants to the Variability of Stock Market Prices', *American Economic Review* 222 (1981), R J Shiller, 'Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?', *American Economic Review* 421 (1981); Stiglitz, 'Some Aspects of the Pure Theory of Bank Finance: Bankruptcies and Takeovers', *Bell Journal of Economics* (1973) 458; 'Equilibrium in Product Markets with Imperfect Information', *American Economic Review* 339 (1979), 'Potential Competition May Reduce Welfare' *American Economic Review* 184 (1981); 'Information and Economic Analysis', in J M Parkin and A R Norbay (Eds) *Current Economic Problems* (Cambridge University Press, 1975), 38; 'Ownership Control and Efficient Markets: Some Paradoxes in the Theory of Capital Markets', K D Boyer and W C Shepherd (Eds) *Essays in Honour of J R Nelson* (Michigan State University Press, 1982), 311; 'Information and Capital Markets', W F Sharpe and C M Cootner (Eds), *Financial Economics: Essays in Honour of Paul Cootner* (Prentice Hall, 1982), 118; 'Information and Economic Analysis: A Perspective', *The Economic Journal* 21 (1985); Grossman and Stiglitz, 'On the Impossibility of Informationally Efficient Markets', *American Economic Review*, 393 (1980), 'Information and Competitive Price Systems', *American Economic Review*, 246 (1976); 'On Value Maximization and Alternative Objectives of the Firm', *Journal of Finance*, 389 (1977); 'Stockholder Unanimity in Making Production and Financial Decisions', *Quarterly Journal of Economics*, 543 (1980); Stiglitz and D M G Newberg, *The Choice of Techniques and the Optimality of Market Equilibrium with Rational Expectations* (Mime: 1979). See also N C Nielsen, 'The Investment Decision of the Firm under Uncertainty and the Allocative Efficiency of Capital Markets', *Journal of Finance*, 587 (1976); M C Jensen and J B Long, Jr, 'Corporate Investment under Uncertainty and Pareto Optimality in the Capital Markets', *Bell Journal of Economics* 151 (1972); R Schmalensee, 'Imperfect Information and the Equitability of Competitive Prices', *Quarterly Journal of Economics*, 441 (1984).

¹⁸³ In the sense that prices will summarise all the information in the market. See Grossman (1976) 593.

¹⁸⁴ Grossman (1976) 585.

¹⁸⁵ As Grossman and Stiglitz observe (at 248-249):

Indeed, it is only because prices do not accurately represent the true worth of the securities (ie, the information of the informed is not fully conveyed through the price system, to the uninformed) that the informed are able to earn a return to compensate them for the costs associated with the acquisition of the information. (Emphasis added)

... But contrary to strong versions of the efficient market hypothesis, prices do not fully reflect all available information, in particular, that of the informed: the informed do a better job in allocating their portfolio than the uninformed. 'Efficient markets' theorists state that costless information is a *sufficient* condition for prices to fully reflect all available information (Eugene Fama, p 387). They are not aware that it is a necessary condition as well. But this is a *Reductio ad absurdum*, since prices are important only when information is costly. (See Friedrich A Hayek and Grossman 1975b). Thus, an individual who throws darts at a dartboard to allocate his portfolio will not do as well as the informed individual;

what can be decided by a toss of the coin is not the allocation of the portfolio but whether to be informed or uninformed. (Citations omitted)

...

The discussion so far as focused on the decision of whether to be informed or uninformed. There is an alternative way of looking at this question, which may shed some light on an old question discussed by John M Keynes (p 156). He suggested that the stock market might be viewed as a beauty contest, where the participants are not concerned with judging who is the most beautiful woman, but with judging who the other judges will believe is the most beautiful woman. Keynes made these remarks with more than a hint of disapproval; our analysis suggests that this may be unwarranted. It may be more efficient for some individuals to obtain information from others - through the price system or by other mechanisms - rather than obtain it directly. (Citations omitted).

Similarly, with respect to market aggregation they observe (at 2500):

This paradox can be put another way. If the market aggregated their information perfectly, individuals' demands would not be based on their own information, but then, how would it be possible for markets to aggregate information perfectly? ...

So far, we have discussed some of the basic properties of our approach to equilibrium when information is costly. These models can also be used to address conventional questions related to existence, comparative statics and welfare.

¹⁸⁶ Grossman and Stiglitz (1980) 393.

¹⁸⁷ See M Gray, 'Futures Trading, Rational Expectations, and the Efficient Markets Hypothesis', 49 *Econometrica* 575 (1981). Bray develops a model in which traders were both producers and speculators. Traders form rational expectations about market demands (based on the spot price and consequent to holding futures) and their own supply (based on their production division). Constant absolute risk aversion utility functions and normal distributions are assumed in the model. In general, the market price is found not to communicate all available information to the traders. Information about the demand side of the market is found to interfere with information from the supply side and prevents the market price from summarizing all the information.

¹⁸⁸ Kirzner [1979] at 28 explains the concept of human action as follows:

Human action, in the sense developed by Mises, involves courses of action taken by the human being 'to remove uneasiness' and to make himself 'better off'. Being broader than the notion of economizing, the concept of human action does not restrict analysis of the decision to the allocation problem posed by the juxtaposition of scarce means and multiple ends. The decision, in the framework of the human action approach, is not arrived at merely by mechanical computation of the solution to the maximization problem implicit in the configuration of the given ends and means. It reflects not merely the manipulation of given means to correspond faithfully with the hierarchy of given ends, but also the very perception of the ends-means framework within which allocation and economizing is to take place ... Mises' *homo agens* ... is endowed not only with the propensity to pursue goals efficiently, once ends and means are clearly identified, but also with the drive and alertness needed to identify which ends to strive for and which means are available [Emphasis in original].

¹⁸⁹ [1979] at 30.

¹⁹⁰ Kirzner [1979] 149-50.

¹⁹¹ *Ibid.*

192 *Ibid.*

193 The notion of equilibrium has been described in many ways. According to one description it means 'if and only if market price and quantity traded are stationary over time'. O'Driscoll, 'Economics as a Co-ordination Problem', p 23, footnote 31. Where there are a multitude of transactions such as in a stock market, equilibrium is seen as a state of affairs characterized by universally correct anticipations of the actions of other people. Neo-classical equilibrium theory has its origins in the Marshallian cross (and its subsequent development by others) and the Walrasian auctioneer. Marshall focused on quantity adjustment to arrive at equilibrium in his supply and demand diagrams, while Walras introduced the process of *tatonnement* where an imaginary auctioneer continuously adjusts prices until the market clearing price is reached. The weakness of both of these approaches is the claim (1) to uniqueness, i.e. they rule out the possibility of more than one price even in disequilibrium. In other words, each date is associated with one and only one price; (2) that all participants are price takers, with the result that they are able to buy or sell the amount they choose without price being changed as a result of their actions; and (3) that price changes come about not through the deliberate decisions of any market participants (since everyone is a price taker) but through the agency of an imagined individual such as the Walrasian auctioneer. Rejection of the mythical auctioneer thus creates a vacuum in the theory as no alternative means of explanation as to how prices change is offered.

194 As Kirzner [1973] comments at 32-33:

.. this analytical vision of economizing, maximizing, or efficiency-intent individual market participants is in significant respects, misleadingly incomplete. It has led to a view of the market as made up of a multitude of economizing individuals, each making his decisions with respect to *given* series of ends and means. And in my opinion this view of the market is responsible for the harmful exclusive emphasis upon equilibrium situations already discussed. A multitude of economizing individuals each choosing with respect to given ends and means cannot, without the introduction of further exogenous elements, generate a market process (which involves systematically *changing* series of means available to market participants).

195 Loasby, 7.

196 See Kirzner [1973].

197 See Kirzner [1973], 16.

198 *Id* 15-16.

199 O'Driscoll and Rizzo 10-12.

200 Kirzner, 1974, 6-7.

201 Reekie and Savitt, *supra* n 45, 63.

202 1982, at 145.