

## THE PARADOX OF SECURITIES MARKETS EFFICIENCY: WHERE TO NEXT?

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This article examines the claim of securities markets efficiency based on the efficient markets hypothesis (EMH), which Fama proclaimed to be a well substantiated truth in 1978. Behavioural theory shows that individuals do not act to maximise their utility as asserted by neoclassical economists, while entrepreneurial theory explains share price movements to be the product of error prone guesswork by market participants. Alongside this, the emergence of the shareholder value concept in the late 1980s advocated by both corporate managers and outsider market makers has undermined the very foundations of share price efficiency. This undermining seems to have been caused by forces exogenous to the firm. Nonetheless, securities markets are highly competitive. This article explains the need for a new theory to explain the inherent paradox.

The efficient market hypothesis (“EMH”) rests on three assumptions: (1) economically rational behaviour by market participants (utility maximisation behaviour),<sup>1</sup> (2) homogeneous expectations of participants in the marketplace, and (3) price movements based on the instantaneous transfer of information by arbitrageurs. Based on these assumptions the paradigm asserts that securities prices reflect their fundamental value, are rightly priced, and securities markets are therefore efficient.<sup>2</sup> Also based on this model of assumed behaviour and implied result, and evidence garnered from various models of analysis,<sup>3</sup> some legal and financial economics academics have claimed that securities markets are efficient both in an individual as well as an aggregate market sense.<sup>4</sup> This assertion of *per se* efficiency of securities markets in the EMH sense, as well as the assumptions underlying it have all been vigorously contested, more recently by behavioural economic theorists generally, as well as behavioural accounting and finance theorists.<sup>5</sup> These behavioural theorists (“BT”) show that decision making by individuals is conditioned by limits to their knowledge,

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<sup>1</sup> That is the discounted sum of expected future cash flows, where in forming expectations investors correctly process all available information, and where the discount rate is consistent with a normatively acceptable preference specification. See Nicholas Barberis & Richard Thaler, “A Survey of Behavioral Finance” in George M. Constantinides, Milton Harris, & Rene Stulz, eds., *Handbook of the Economics of Finance* (Boston: Elsevier North-Holland, 2003) 1053 [Barberis & Thaler].

<sup>2</sup> For a further discussion, see *infra* Part I.

<sup>3</sup> *Ibid.*

<sup>4</sup> *Ibid.*

<sup>5</sup> Barberis & Thaler, *supra* note 1 and the works cited in Part II *infra*.

past experience, beliefs, perceptions, and the decision making context itself. More startling is the evidence from shareholder market value theorists (“SMV”) which show securities markets prices to be artificial constructs propped up by dominant professional players in the marketplace. Nonetheless, securities markets continue to be dynamic in the sense of constant price movement, and it is this feature which is explored in this article.

The received models of efficiency, EMH and the Capital Asset Pricing Model (“CAPM”),<sup>6</sup> treat share price movements as being the sum of managerial actions within the firm which are constantly evaluated and disciplined by players outside the firm. In other words, these models assume a simple causality where managerial actions within a firm are judged and acted upon by the marketplace and its version of profit maximisation. This article by contrast shows that price movements in securities markets are not the outcome purely of such calculated and strategic behaviour, but rather the product of idiosyncratic behaviour filled with expectations, prejudices and phobias and strewn with a good mix of rational and irrational herd behaviour—all of which while strategic in their own way—nevertheless fall far short of EMH efficient behaviour. Based on this, the article suggests the adoption of a new model which accommodates these various types of behaviour—a model which would help explain the vibrancy of securities markets in the face of actions which are essentially in conflict with one another (for every buyer there must be a seller and *vice versa*) but yet moves on relentlessly. The discussion in this article is structured as follows. Part I provides a potted history of securities valuation and the concept of securities market efficiency under EMH, Part II examines insights provided by behavioural theory into investor behaviour, Part III examines the relationship between price and information in respect of securities markets, and Part IV concludes.

## I. SECURITIES MARKET EFFICIENCY: A POTTED HISTORY

The claim of efficient securities markets has its origins in the work of Louis Bachelier,<sup>7</sup> who in analysing the French commodities’ market in 1900 found the market’s contract prices to be unbiased estimates of future prices and consequently neutral towards both buyers and sellers. He also observed that the changes in commodity prices were the result of new information (positive or negative), the emergence of which was random. The claim of securities market efficiency in its modern form of EMH is traceable to Professor Eugene Fama’s seminal paper of 1970,<sup>8</sup> prior to

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<sup>6</sup> The CAPM is a variant of Modern Portfolio Theory and has its origins in the works of William F. Sharpe, “Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk” (1964) 19 J. Fin. 425, and John Lintner, “Security Prices, Risks and Maximal Gains from Diversification” (1965) 20 J. Fin. 587. 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 (see *infra* note 140).

<sup>7</sup> Louis Bachelier, *Theorie de la Speculation* (Gauthiers-Villars, 1900), online: <[http://archive.numdam.org/ARCHIVE/ASENS/ASENS\\_1900\\_3\\_17\\_/ASENS\\_1900\\_3\\_17\\_21\\_0/ASENS\\_1900\\_3\\_17\\_21\\_0.pdf](http://archive.numdam.org/ARCHIVE/ASENS/ASENS_1900_3_17_/ASENS_1900_3_17_21_0/ASENS_1900_3_17_21_0.pdf)>.

<sup>8</sup> Eugene Fama, “Efficient Capital Markets: A Review of Theory and Empirical Work” (1970) 25 J. Fin. 383 [*Fama (1970)*].

which the standard forms of analysis employed by security analysts were technical (or Chart) analysis, and fundamental analysis.<sup>9</sup> EMH rejects both technical and fundamental analysis, and for that matter any other method which claims to consistently be able to earn abnormal profits.

There are several definitions of securities market information efficiency.<sup>10</sup> The earliest was by Graham, Dodd, and Cottle<sup>11</sup> 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.<sup>12</sup> Share valuation was thus a process inviting the skill of the analyst. The subsequent definition by Fama that "a market in which prices always 'fully reflect' available information is called 'efficient'" moved away from this notion of intrinsic value altogether.<sup>13</sup> In such a market, individuals will not be able to beat the market. Fama staked out three forms of efficiency, namely, weak, semi strong, and strong. According to the weak form, 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 out 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.<sup>14</sup> The strong form holds that even investors with non-public information such as insider information and proprietary conclusions developed from public data by professional investment managers cannot earn superior investment results. However, the process of transmogrification from information to efficiency is itself not explained. This was attempted by Gilson and Kraakman, who explained it as flowing from the complex interaction of at least four imperfect price-moving market mechanisms: "universally informed trading", "professionally informed trading", "derivatively informed trading" (including both "trade decoding" and "price decoding"), and "uninformed trading".<sup>15</sup> However, they go on to acknowledge that the path toward efficiency is strewn with transaction costs, and by the roles played by intermediaries such as investment bankers.<sup>16</sup>

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<sup>9</sup> Though both of these methods recognise the continuous movements of share prices, technical analysis attempts to predict future share prices by reference to past share price movement patterns on the assumption that history repeats itself. While extreme adherents of technical analysis place exclusive reliance on past share prices, its more moderate adherents seek confirmation of their predictions by reference to fundamental analysis. Fundamental analysis, on the other hand, claims that market prices are a random process where price changes are independent of past price changes, as are distributions of rates of returns. It sees its task as being to determine whether a given security is under or overpriced in relation to an intrinsic price arrived at by reference to a variety of formulaic factors.

<sup>10</sup> See for *e.g.* those listed in George Foster, "Capital market Efficiency: Definitions, Testing Issues and Anomalies in contemporary Accounting thought" in M.J.R. Gaffikin, ed., *Contemporary accounting thought: essays in honour of Raymond J. Chambers* (Sydney: Prentice-Hall of Australia, 1984) 175 at 175-176.

<sup>11</sup> Benjamin Graham, David L. Dodd & Sidney Cottle, *Security Analysis: Principles and Techniques*, 4th ed. (McGraw Hill, 1962).

<sup>12</sup> *Ibid.* at 28-29.

<sup>13</sup> Fama (1970), *supra* note 8.

<sup>14</sup> See, *e.g.* Michael J. Murphy, "Efficient Markets, Index Funds, Illusion and Reality" (1977) 6 J. Portfolio Management 5.

<sup>15</sup> Ronald Gilson & Reinier Kraakman, "The Mechanisms of Market Efficiency" (1984) 70 Va. L. Rev. 549 at 565-592 [*Gilson-Kraakman* (1984)].

<sup>16</sup> *Ibid.* at 592-626.

It is not possible to test EMH directly as this requires, among other things, knowledge of the market's anticipated net operational cash flows and anticipated required rates of return for all future periods. Instead, proxy tests in the form of 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) are used.<sup>17</sup> As Fama<sup>18</sup> points out, market efficiency is *per se* un-testable, as testing the hypothesis requires a model of expected returns which is actually tested together with the hypothesis. Given this, Fama shifts the onus on to critics of EMH by stating that only evidence that it is possible to systematically beat the market can defeat the claims of EMH. Problematic also is the circular nature of the definition: efficiency is dependent on available information, suggesting that market efficiency is a matter of definition in a volatile market where what is past, present, and future is not capable of easy compartmentalisation.<sup>19</sup>

Securities market efficiency has also been explained by reference to the rational expectations hypothesis ("REH"). The hypothesis originally formulated by Muth<sup>20</sup> states that market participants form expectations based on all available information and that such expectations coincide with what the relevant economic theory predicts,<sup>21</sup> *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.<sup>22</sup> Some writers have equated REH with EMH.<sup>23</sup> However, REH like EMH faces the same problem of model

<sup>17</sup> Eugene Fama, *Foundations of Finance: Portfolio Decisions and Securities Prices* (New York: Basic Books, 1976) at 133 and 137 [Fama (1976)].

<sup>18</sup> Eugene Fama, "Market Efficiency, Long-Term Returns and Behavioural Finance" (1998) 49 *J. Fin. Econ.* 283.

<sup>19</sup> See *infra* Part III for the discussion on entrepreneurship.

<sup>20</sup> John F. Muth, "Rational Expectations and the Theory of Price Movements" (1961) 29 *Econometrica* 315. Contrast Herbert Simon's notion of bounded rationality, *infra* note 44. See also, Steven M. Sheffrin, *Rational Expectations* (Cambridge: Cambridge University Press, 1983).

<sup>21</sup> 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 Kenneth Holden, David A. Peel & John L. Thompson, *Expectations: Theory and Evidence* (New York: St. Martin's Press, 1985) at 18.

<sup>22</sup> As described by Muth, *supra* note 20 at 316:

[E]xpectations 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 (*e.g.*, 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).

<sup>23</sup> See Sheffrin, *supra* note 20 at 112. Sheffrin states:

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

formulation for testing, *i.e.*, of specifying it, and of testing it. Gilson and Kraakman explain the claim by Fama that in an efficient securities market, securities prices will “always fully reflect all available information”, and that consequently, individuals will not be able to beat the market as being “really a shorthand for the empirical claim that ‘available information’ does not support profitable trading strategies or arbitrage opportunities”.<sup>24</sup> And as informational efficiency cannot by itself explain how markets become efficient, Gilson and Kraakman invoke the assistance of the CAPM<sup>25</sup> to explain how market participants use information to estimate values and set prices. Together, EMH and CAPM are used to produce a joint prediction that in an informationally efficient market, prices will also be fundamentally efficient, *i.e.*, securities with identical estimated levels of market risk will trade at prices that imply identical expected rates of return.<sup>26</sup> The usefulness of this explanation, however, is subject to all of the limitations inherent in EMH and CAPM, namely, the circular reasoning inherent in these two models, as well as their reliance on efficient arbitrage activity which has been hotly contested.<sup>27</sup> As Stout says, “[c]ombining the ECMH with the CAPM produces a prediction of fundamental value efficiency through a different and more troubling analytical path—by tautology”.<sup>28</sup>

Challenges to EMH include, its underlying assumptions, evidence relied in support of efficiency both in an individual and an aggregate sense, and the collection of evidence contradicting EMH.<sup>29</sup> Evidence advanced to show the existence of EMH has been shown to be of trivial moment at best.<sup>30</sup> Similarly, evidence of slow absorption of information by the marketplace has been used to refute claims of instantaneous transfer of information to the marketplace.<sup>31</sup> Moreover, the reality of, and limits imposed by, transaction costs in relation to arbitrage activity has been used to demonstrate why price cannot reflect all available information.<sup>32</sup> Conversely, evidence that individuals do beat the market, some consistently, has further dented the claim of an ineluctable and autonomous form of market efficiency.<sup>33</sup> And complementing these are the collection of studies by financial academics dating from as far back as the 1970s by Grossman and Stiglitz,<sup>34</sup> who demonstrated among other

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securities are freely flexible and reflect all available information. In its more formal statements the model asserts that prices are related to conditional expectations.

<sup>24</sup> *Gilson-Kraakman (1984)*, *supra* note 15 at 555.

<sup>25</sup> 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). CAPM has been subject to criticism on many grounds including its underlying assumptions which are similar to those of EMH.

<sup>26</sup> See Lynn Stout, “The Mechanisms of Market Inefficiency: An Introduction to the New Finance” (2002-2003) 28 *J. Corp. L.* 635 at 640.

<sup>27</sup> See *infra* Part IV.

<sup>28</sup> Stout, *supra* note 26 at 641.

<sup>29</sup> See *e.g.*, Richard H. Thaler, ed., *Advances in Behavioral Finance* (New York: Russell Sage Foundation, 1993) [*Thaler (1993)*]; Andrei Shleifer, *Inefficient Markets: An Introduction to Behavioral Finance* (Oxford: Oxford University Press, 2000) [*Shleifer (2000)*]; and *Barberis & Thaler*, *supra* note 1.

<sup>30</sup> See Razeen Sappideen, “Securities Market Efficiency Reconsidered” (1998) *U. Tasm. L. Rev.* 1 [*Sappideen, Securities Markets Efficiency*]; Louis Lowenstein, “Pruning Deadwood in Hostile Takeovers: A Proposal For Legislation” (1983) 83 *Colum. L. Rev.* 249, at 283.

<sup>31</sup> Stout, *supra* note 26.

<sup>32</sup> *Ibid.*

<sup>33</sup> *E.g.*, the much celebrated successes of Warren Buffet and George Soros.

<sup>34</sup> See *e.g.*, Sanford Grossman, “On the Efficiency of Competitive Stock Markets where Traders have Diverse Information” (1976) 31 *J. Fin.* 573; Sanford Grossman & Joseph Stiglitz, “On the ‘Impossibility

problematic features of financial markets, the problem of information asymmetry in securities markets. They have been followed by others such as Shleifer and Vishny,<sup>35</sup> and Shleifer<sup>36</sup> who demonstrate the lack of efficiency of securities markets in the EMH sense. To this scholars such as Shiller<sup>37</sup> have added the problem of “irrational exuberance” in securities markets. These and further challenges to EMH made by behavioural finance theorists such as De Bondt and Thaler (1985)<sup>38</sup> have so shaken EMH as to force its advocates to either reformulate their views<sup>39</sup> or assert a claim so weak that EMH is made to exist in name only.<sup>40</sup> The insights from BT are examined in greater detail below.

## II. INSIGHTS FROM BEHAVIOURAL THEORY

EMH assumes that individuals behave in an economically rational manner, and that in so doing, maximise their expected utility by reference to weighted sums of the various possible outcomes, where each weighting is equal to the probability that the corresponding outcome will be realised.<sup>41</sup> As against this, BT show that individuals do not and often cannot, behave in an economically rational manner for any number of reasons, especially in relation to securities markets.<sup>42</sup> Reasons include first, limited access to information, cost-benefits of acquiring needed information, and

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of Informationally Efficient Markets” (1980) 70 Am. Econ. Rev. 393, Sanford Grossman & Joseph Stiglitz, “Information and Competitive Price Systems” (1976) 66 Am. Econ. Rev. 246.

<sup>35</sup> Andrei Shleifer & Robert W. Vishny, “The Limits of Arbitrage” (1997) 52(1) J. Fin. 35.

<sup>36</sup> Shleifer (2000), *supra* note 29.

<sup>37</sup> Robert Shiller, “Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends” (1981) 76 Am. Econ. Rev. 421.

<sup>38</sup> Werner F. M. De Bondt & Richard Thaler, “Does the Stock Market Overreact?” (1985) 40 J. Fin. 793 [*De Bondt & Thaler*].

<sup>39</sup> See, e.g., Ronald J. Gilson & Reinier Kraakman, “MOME in Hindsight” (2005) 27(4) Regulation 64, and Ronald J. Gilson & Reinier Kraakman, “The Mechanisms of Market Efficiency Twenty Years Later: The Hindsight Bias” (2002-2003) 28 J. Corp. L. 715 who in these later papers adopt a far less robust view of efficiency theory than they had advanced in their much celebrated paper of 1984 (*Gilson-Kraakman* (1984), *supra* note 15).

<sup>40</sup> See, e.g., Henry Manne, “Remarks on the Lewis and Clark School Business Law Forum: Behavioural Analysis of Corporate Law: Instruction or Distraction?” (2006) 10(1) Lewis & Clark L. Rev. 169-176, who distances himself from the position proclaimed by Fama in 1970 (see *Fama* (1970), *supra* note 8), and restates EMH by, e.g., substituting “quickly” for “instantaneously” on the rapidity with which information is translated into price, and securities prices as reflecting the “average price” instead of the fundamentally efficient or informationally efficient price claimed by Fama. Nonetheless, Manne regards price as embodying all information. Manne’s claims are examined below, see *infra* Part III.

<sup>41</sup> This is in the manner prescribed in Baye’s Law. See John von Neumen and Oskar Morgenstern, *Theory of Games and Economic Behaviour* (Princeton: Princeton University Press, 1947). The standard principles used in financial economics to model probability judgment are concepts of statistical sampling, and Baye’s rule for updating probabilities in the face of new evidence. Colin F. Camerer and Loewenstein, “Behavioural Economics: Past, Present, Future” (draft: 10/25/02), point out at 9 that Baye’s rule is unlikely to be correct given its assumptions which are cognitively unrealistic, see online: <<http://www.hss.caltech.edu/~camerer/ribe239.pdf>>.

<sup>42</sup> See John Conlisk, “Why bounded rationality?” (1996) 34 J. Econ. Literature 669. Conlisk lists many instances where single individuals faced with decisions which have objectively correct answers, do not respond as expected. To quote (at 670):

There is a mountain of experiments in which people: display intransitivity; misunderstand statistical independence; mistake random data for patterned data and vice versa; fail to appreciate law of large number effects; fail to recognise statistical dominance; make errors in updating probabilities on

limitations associated with the processing of complex information.<sup>43</sup> Secondly, and perhaps more importantly, are limitations arising from human traits which make rational economic behaviour in an EMH sense an impossible dream. Herbert Simon, an early behavioural theorist used the term “bounded rationality” to describe the limitations of *homo sapiens*. *Homo sapiens*, unlike their economic counterparts *homo economus*, argued Simons, act for various reasons to “satisfice” rather than “maximise” their pursuits.<sup>44</sup> In other words, Simons identifies a trade-off between the emotional stresses and strains of seeking and comprehending additional information to acting on that which enables one to get by, or as described by Prentice, “rational ignorance”.<sup>45</sup> BT takes this notion further and attempts to explain in systematic fashion the market implications of these limitations to utility maximisation theory

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the basis of new information; understate the significance of given sample sizes; fail to understand covariation for even the simplest  $2 \times 2$  contingency tables; make false inferences about causality; ignore relevant information; use irrelevant information (as in sunk costs fallacies); exaggerate the importance of vivid over pallid evidence; exaggerate the importance of fallible predictors; exaggerate the ex ante probability of a random event which has already occurred; display overconfidence in judgment relative to evidence; exaggerate confirming over disconfirming evidence relative to initial beliefs; give answers that are highly sensitive to logically irrelevant changes in questions; do redundant and ambiguous tests to confirm an hypothesis at the expense of decisive tests to disconfirm; make frequent errors in deductive reasoning tasks such as syllogisms; place higher value on an opportunity if an experimenter rigs it to be the “status quo” opportunity; fail to discount the future consistently; fail to adjust repeated choices to accommodate intertemporal connections; and more.

<sup>43</sup> See, e.g., the writings of Grossman, Stiglitz, and Shiller referred to *supra* notes 34 and 37.

<sup>44</sup> The term bounded rationality, and given this the notion of “satisficing” instead of maximisation, was first used by Herbert Simon, in his 1989 paper “Cognitive Architectures and Rational Analysis”, referred to in his later paper, Herbert Simon, “Invariants of human behaviour” (1990) 41 Annual Rev. of Psychology 1-19. In this latter paper, he says (at 6-7):

Since we can rarely solve our problems exactly, the optimising strategy suggested by rational analysis is seldom available. We must find techniques for solving our problems approximately, and we arrive at different solutions depending on what approximations we hit upon. Hence, to describe, predict and explain the behaviour of a system of bounded rationality, we must both construct a theory of the system’s processes and describe the environments to which it is adapting. ... In tasks of any complexity, knowledge and strategies do not allow the expert to find an optimal solution, but only to find approximations ...

And again (at 17):

When intelligence explores unfamiliar domains, it falls back on “weak methods,” which are independent of domain knowledge. People satisfice—look for good-enough solutions – instead of hopelessly searching for the best. They use means-ends analysis to reduce progressively their distance from the desired goal. Paying attention to symmetries and orderly sequences, they seek patterns in their environments that they can exploit for prediction. Problem solving by recognition, by heuristic search, and by pattern recognition are adaptive techniques that are compatible with bounded rationality.

In this connection the remarks of Gary S. Becker, “Nobel Lecture: The Economic Way of Looking at Behaviour” (1993) 101 J. Political Econ. 385-409, should also be noted. Becker said (at 386):

Forward-looking behaviour, however, may still be rooted in the past, for the past can exert a long shadow on attitudes and values. Actions are constrained by income, time, imperfect memory, and other limited resources, and also by the opportunities available in the economy and elsewhere. These opportunities are largely determined by the private and collective actions of other individuals and organisations.

<sup>45</sup> See Robert A. Prentice, “The Case of the Irrational Auditor: A Behavioural Insight into Securities Fraud Litigation” (2000) 95 Nw. U.L. Rev. 133 at 143-181.

and by implication to EMH.<sup>46</sup> In all, BT demonstrates significant deviations from the expected utility maximisation model.

While the wealth of BT scholarship is enormous, their outer boundaries roughly consist of the following: (1) *perception bias* (e.g., on selection, confirmation, matters hindsight, and mind suppression of contrary data); (2) *prediction bias* (arising from undue optimism, overconfidence, self serving, and regret); (3) *probabilities bias*<sup>47</sup> (inability to estimate probabilities caused by e.g., bounded rationality, anchoring and adjustment, sunk cost effect—throwing good money after bad, and time delay trap); and (4) Prospect theory's view of how individuals go about making decisions (framing, mental accounting, preference for avoiding losses than making gains). These are examined further below. These studies show that individuals, far from maximising their utility through use of complicated statistical analysis, act in a very subjective way<sup>48</sup> and instead use simple rules of thumb to make decisions.

#### A. Perception Bias

Flaws in decision making resulting from *selective perception* (perceiver's expectations bias) as well as the process of their *confirmation* (preference for evidence that confirms rather than contradicts the viewpoint of the perceiver) are well documented.<sup>49</sup> Likewise are the difficulties encountered by reason of *hindsight bias* (the tendency to regard past happenings as having been normal and expected) and of *memory limitations* (in the reconstructing of past events). Other biases affecting perception include *bounded willpower* (which may cause a skipping of steps needed to ascertain the viability of alternative choices),<sup>50</sup> and *cognitive dissonance* (prior

<sup>46</sup> The debate on the subject of course has its parallels in the similar debate on the theory of the firm, where according to the traditional neoclassical model of the firm, firms act to maximise their profits in the face of discipline administered by the marketplace (product, finance, market for corporate control, and market for corporate managers). In essence the corporation was a black box disciplined by the marketplace. Given this disciplining effect, firms were said to be efficient in both an operational and allocational sense. The first dent into this notion of the corporation as a black box was made by Berle and Means in their celebrated separation of control and ownership thesis in 1932. Subsequent inroads include the alternative view advanced by e.g., Baumol, Williamson, and Marris, that agents (managers) act to further own self interest, and engage not in profit maximisation on behalf of the firm, but in satisficing. Responses to these criticisms e.g., by Alchian, Demsetz, Jensen and Meckling, and Fama, have taken the form of rejecting the classical model of the firm as a profit maximisation entity, but attributing classical forms of behaviour to agents within the firm. Of these, the most famous is the theory advanced by Jensen and Meckling in 1978, which advocates the controlling of the managerial agency problem through employment contracts by using remuneration as an incentive to align the interests of managers and the firm. Even Jensen has had to admit to lack of success of his theory in containing the agency problem following debacles such as Enron and others: See, Michael C. Jensen, "Agency Costs of Overvalued Equity" (2005) 34 Fin. Mgmt. 5; Joseph Fuller & Michael C. Jensen, "Just Say No To Wall Street: Putting an End to the Earnings Game" (2002) 14 J. App. Corp. Fin. 41.

<sup>47</sup> See generally Prentice, *supra* note 45 at 143-181.

<sup>48</sup> Daniel Kahneman & Amos Tversky, "On the Psychology of Prediction" (1973) 80(4) Psychological Review 237, use the notion of "subjective probability heuristics" to explain what individuals rely on when assessing the likelihood of alternative events.

<sup>49</sup> See the citations on these in Prentice, *supra* note 45 at 145.

<sup>50</sup> *Ibid.* at 150 and 180.



justification of, or subsequent reluctance to admit to, a bad decision).<sup>51</sup> Individual perception is also affected by the *availability heuristic* (individuals extrapolating by reference to the most vivid and emotionally strongest of their past experiences), and *information familiarity* (considering as less risky stocks whose assets they are familiar with) causing what has been called the *home country bias*<sup>52</sup> (preference for home country stocks).

Investors have also been found to be biased against investing in businesses that are low in leverage (low debt) (believing to be better managed than highly speculative transactions which may deliver higher market returns),<sup>53</sup> and stocks that are volatile (under the assumption that their volatility will continue into the long term).<sup>54</sup> They have also been found to sell stocks that have appreciated while continuing to retain stocks that have been declining in value. The latter characteristic was first noted by Shefrin and Statman, and has been described by Kahneman and Riepe<sup>55</sup> as the *disposition effect*. Thaler<sup>56</sup> explains the situation as one where investors find the prospect of closing an account with a loss more painful, than to take on an opportunity to make a possible gain by changing stocks. Given the inherent bias against loss aversion, investors have also been found to keep stock that has been declining (sure loss) than change over to a stock that has the potential of not losing anything. Shapira and Venezia,<sup>57</sup> have found the practice to be prevalent even amongst professional investors. Odean<sup>58</sup> has found that extraneous considerations such as tax also influence investors to sell both appreciating and declining stocks to produce for themselves the most favourable tax result.

### B. Prediction Bias

Prediction bias results in an underestimation of the inherent risks in an investment and causes the assessment to be flawed.<sup>59</sup> *Overconfidence* causes individuals to

<sup>51</sup> To quote Donald C. Langevoort, "Where Were the Lawyers? A Behavioural Inquiry into Lawyer's Responsibility for Client's Fraud" (1993) 46 Vand. L. Rev. 75 at 102:

When people voluntarily commit themselves to a certain position, attitude or belief, the subsequent discovery of information that indicates harmful consequences flowing from that commitment directly threatens their self-concept as good, worthwhile individuals. Thus cognitive processes will work to suppress such information if at all possible.

<sup>52</sup> Michael Kilka & Martin Weber, "Home Bias in International Stock Returns Expectations" (2000) 1 J. Psychology & Financial Markets 176.

<sup>53</sup> Michael E. Solt & Meir Statman, "Good Companies, Bad Stocks" (1989) 15 J. Portfolio Management 39.

<sup>54</sup> Werner F.M. De Bondt, *Earnings Forecasts and Share Price Reversals* (Charlottesville: Research Foundation of the Institute of Chartered Financial Analysts, 1992).

<sup>55</sup> Daniel Kahneman & Mark W. Riepe, "Aspects of Investor Psychology" (1998) 24 J. Portfolio Management 52 [*Kahn & Riepe*].

<sup>56</sup> Richard H. Thaler, "Mental Accounting Matters" (1999) 12 J. Behavioural Decision Making 183.

<sup>57</sup> Zur Shapira & Itzhak Venezia, "Patterns of Behaviour in Professionally Managed and Independent Investors" (2000) 25 J. Banking & Finance 1573.

<sup>58</sup> Terrance Odean, "Volume, Volatility and Profit When All Traders are Above Average" (1998) 53 J. Fin. 1887-1934.

<sup>59</sup> Langevoort, *supra* note 51 at 139-141, argues that frauds relating to securities by corporate managers is often the result of simple recklessness born of self serving and overly optimistic views of the firm's future which have little basis in reality than egregious intentional fraud.

overestimate their ability to outguess others as to when a particular stock or industry is reversing its trend, and causes them to change their investments more frequently than they would otherwise. Another bias allied to loss aversion is *regret* of wrong decisions. Kahneman and Riepe say that regret of past outcomes arises due to either a wrong decision, or from failure to exploit a good opportunity. Those who suffer greater anxiety from having missed out on a good opportunity than from having lost by a wrong decision tend to carry out riskier strategies to exploit the lost opportunity. Regret arising from this latter has been characterised as the illusion of control, being yet another manifestation of overconfidence. The *self serving* bias arises from peoples' beliefs that they are generally a cut above the ordinary in terms of skills needed, care given, or ethical behaviour. More importantly, they also tend to attribute successes to their special abilities and efforts, and failures to bad luck.<sup>60</sup> There has also been found a *gender* bias. Women have been found to be more risk-averse in their behaviour and to invest in less risky stocks.<sup>61</sup> Women have been found to perceive as more risky stock which may fall in price, whereas men saw as risky investments with a higher returns variance.<sup>62</sup> Men have also been found to trade their stocks much more aggressively and more often than women did.<sup>63</sup>

### C. Probabilities Bias

Investors have been found to be conditioned by their *preconceptions* when approaching their investment strategy and to not assess investment risk objectively. For example, studies by Mertz, Slovic, and Purchase,<sup>64</sup> and Slovic<sup>65</sup> show that individuals rarely saw risk assessment in objective terms, and that they avoided the most risky alternatives. The findings are further confirmed in the study by Shefrin and Statman<sup>66</sup> that stocks are not evaluated in terms of risk-return ratios, but by way of a general attitude toward them. Thus higher returns are expected from stocks the assets of which they are familiar with, and which they perceive as being "good stocks". In other words, investors are said to find it unattractive to go against the market trend. Likewise, Samuelson and Zeckhauser<sup>67</sup> show that risk aversion often influences investors to maintain existing investments, than switch to securities that may generate uncertain results. This has been described as the *status quo bias*.<sup>68</sup> This

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<sup>60</sup> See Prentice, *supra* note 45 at 168, citing Max H. Bazerman, *Judgment in Managerial Decision Making*, 6th ed. (Hoboken: J. Wiley, 2006).

<sup>61</sup> Annika E. Sunden & Brian J. Surette, "Gender Differences in the Allocation of Assets in Retirement Plans" (1998) 88 Am. Econ. Rev. 207.

<sup>62</sup> Robert A. Olsen & Constance M. Cox, "The Influence of Gender on the Perception and Response to Investment Risk: The Case of Professional Investors" (2001) 2 J. Psychology & Financial Markets 29.

<sup>63</sup> Brad M. Barber & Terrance Odean, "Boys Will Be Boys: Gender, Overconfidence and Common Stock Investment" (2001) 116 Q. J. Econ. 261.

<sup>64</sup> C.K. Mertz, Paul Slovic, & I.F.H. Purchase, "Judgment of Chemical Risks: Comparisons among Senior Managers, Toxicologists and the Public" (1998) 18 Risk Analysis 391.

<sup>65</sup> Paul Slovic, *The Perception of Risk* (London: Earthscan Publications, 2000).

<sup>66</sup> Hersh Shefrin & Meir Statman, "The Disposition to Sell Winners Too Easily and Ride Losers Too Long: Theory and Evidence" (1985) 40 J. Fin. 777 [*Shefrin & Statman*].

<sup>67</sup> William Samuelson & Richard Zeckhauser, "Status Quo Bias in Decision Making" (1988) 1 J. Risk Management 7.

<sup>68</sup> Samuelson and Zeckhauser conducted an investment experiment using two groups. The first group was told that they had inherited a large amount of money and were asked as to how they would like the

devotion to the status quo bias is further reinforced by the finding that investors tend to assess the correctness of their opinion by reference to a confirmation strategy than through falsification as a result of which investors have been found to assess available information when it tallies with the explanation they have arrived at and to overlook information which does not.<sup>69</sup> Individuals are shown to judge the future volatility of a stock by *anchoring* it to a past reference point of the stock. Research by Mitra<sup>70</sup> and Shefrin<sup>71</sup> show that according to this heuristic, individuals make estimates based on a reference point or the anchor, and update or *adjust* their subjective probabilities based on new information they obtain. The point here is that the updating is conditioned by their reference point, and not by reference to Bayesian maximisation.

There is also ample evidence that investors generally follow the trend set by market leaders as to share price, and engage in *herd* behaviour. Evidence of the first type is found in the concern expressed by market makers of small investors' free riding on their efforts in a one share, one value world. Evidence of varying degrees of herd behaviour is found where corporations are subjected to restructuring stress (*e.g.*, in the face of a hostile bid,<sup>72</sup> or when a secured creditor enforces its security,<sup>73</sup> and more importantly when the stock market is itself under siege (*e.g.*, stock market crashes of 1929 and 1984). Valuable studies have been undertaken in this regard by Ghosh and Ray (1997),<sup>74</sup> De Bondt and Forbes (1999),<sup>75</sup> and Shiller (2000),<sup>76</sup> which point out that group behaviour in these circumstances, sometimes over optimistic, sometimes unduly pessimistic, is by no means rational. Herd behaviour in these instances dispels any notion of cold calculating utility maximisation. Moreover, individuals have also been found to both *under-react* (*e.g.*, news relating to a particular stock is responded to very slowly and over periods of time) and *overreact* (where the initial response to information on a stock is corrected) to situations<sup>77</sup> in the face of information that is elusory, unmanageable, or contrary to perceived beliefs.<sup>78</sup>

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money to be invested as between two different investments. The second group was told that the money they had inherited had already been invested, and had to decide whether to maintain the investments as they were (status quo) or to modify it. The results showed that the first group preferred an equal split between stocks and bonds, whereas the second preferred to stay with the existing portfolio (status quo) than change it.

<sup>69</sup> Robert Forsythe *et al.*, "Anatomy of an Experimental Stock Market" (1992) 82 *Am. Econ. Rev.* 1142.

<sup>70</sup> Anusree Mitra, "Price Cue in Product Evaluations" (1995) 33 *J. Business Research* 187.

<sup>71</sup> Hersh M. Shefrin, *Beyond Greed and Fear: Understanding Behavioural Finance and the Psychology of Investing* (Boston: Harvard Business School Press, 2000).

<sup>72</sup> A stampeding effect is present in hostile takeover bids in the absence of an equal opportunity, equal time, and equal price rule regulating target shareholder conduct: see Razeen Sappideen, "Takeover Bids and Target Shareholder Protection: The Regulatory Framework in the United States, United Kingdom and Australia" (1986) 8(3) *J. Comparative Business & Capital Market Law* 281.

<sup>73</sup> As evidenced during the Asian financial crisis of 1984. See also, Graciela E. Kaminsky & Sergio L. Schmukler, "What Triggers Market Jitters? A Chronicle of the Asian Financial Crisis" (1999) 18 *J. Int'l Money & Finance* 537.

<sup>74</sup> Dipankar Ghosh & Manash R. Ray, "Risky Ambiguities and Decision Choice: Some Additional Evidence" (1997) 28 *Decision Sciences* 81.

<sup>75</sup> Werner De Bondt & William R. Forbes, "Herding in Analysts Earnings Forecasts: Evidence From the UK" (1999) 5 *European Financial Management* 143.

<sup>76</sup> Robert J. Shiller, *Irrational Exuberance* (Princeton: Princeton University Press, 2000).

<sup>77</sup> *De Bondt & Thaler, supra* note 38.

<sup>78</sup> See Nicholas Barberis, Andrei Shleifer & Robert Vishny, "A Model of Investor Sentiment" (1998) 49 *J. Fin. Econ.* 307.

Forgas,<sup>79</sup> *e.g.*, shows that individuals when faced with future uncertainty, intuitively judge as correct information that is easier to understand and provided by trustworthy sources. Likewise, Hsee,<sup>80</sup> and Legrenzi, Girotto, and Johnson-Laird,<sup>81</sup> observe that individuals in these situations limit themselves to easily comprehensible materials, accept such materials as being correct, often overweight their significance, and make no additional inferences based on these materials.

#### D. Prospect Theory

According to Prospect theory,<sup>82</sup> individual decision making involves a two stage process, namely, an initial editing stage, followed by an evaluation stage. In the *editing* stage, individuals *frame* prospects in terms of losses and gains by reference to a benchmark or *reference point*.<sup>83</sup> Individuals do so by employing *heuristics* (rules of thumb or mental shortcuts), to assist them in forming beliefs and processing information, causing *biases* (systematic errors). Heuristics help give a structure to the managing of uncertainty. In the *evaluation* stage, following the framing of the various prospects as either gains or losses, the prospect with the highest value is chosen.<sup>84</sup> Individuals have also been found to have greater aversion to losses with a preference for a certain gain as against a higher risk higher gain alternative. Examples of these practices include the *loss aversion* or bird in the hand bias (*i.e.*, fear of losing out on a sure gain as against a potential higher gain, and desire to avoid sure loss by opting for a more riskier outcome that may avoid this loss) feeling, and the *house money effect* (whereby investors are risk averse following a loss, and risk preferring or less risk-averse following a gain).<sup>85</sup> In other words, decision making is shown as involving a subjective *framing and evaluation* of facts and processes.

Investors are said to resort to a process of *mental accounting* when making financial decisions, whereby they differentiate and separate gains and losses into different accounts.<sup>86</sup> For example in an experiment conducted by Benartzi and Thaler where investors had before them two lots of shares and one lot of bonds, the researchers found that investors viewed their investments as comprising of three separate funds rather than a single diversified portfolio of stocks and bonds with a stock to bond ratio. They explained such behaviour as also evidencing the investor's inability to

<sup>79</sup> Joseph P. Forgas, *Emotion and Social Judgments* (New York: Pergamon Press, 1991).

<sup>80</sup> C. Hsee, "Less is Better: When Low Value Options are Valued More Highly than High Value Options" (1998) 11 J. Behavioural Decision Making 79.

<sup>81</sup> P. Legrenzi, V. Girotto & P.N. Johnson-Laird, "Focussing in Reasoning and Decision Making" (1993) 49(1) Cognition 37.

<sup>82</sup> In their path-breaking 1974 article, Tversky and Kahneman argued that heuristics and biases created probability judgments which deviated from statistical principles. This was followed by their 1979 paper, documenting violations of expected utility and proposing a theory to explain these violations.

<sup>83</sup> That is, individual preferences are measured not by reference to utility maximisation, but by reference to the situation and expectations of the investor, meaning that changes are measured by reference to the individual's status quo, and not by reference to overall change in the individual's wealth.

<sup>84</sup> See Henriette Prast, "Investor Psychology: A Behavioural Explanation of Six Finance Puzzles", Research Supervision No. 64 (Feb 2004, De Nederlandsche Bank) at 8.

<sup>85</sup> Richard H. Thaler & Eric J. Johnson, "Gambling With the House Money and Trying to Break Even: The Effects of Prior Outcomes on Risky Choice" (1990) 36 Management Science 643.

<sup>86</sup> Shlomo Benartzi & Richard H. Thaler, "Naïve Diversification Strategies in Defined Contribution Savings Plans" (2001) 91 Am. Econ. Rev. 79.

properly comprehend the notion of portfolio diversification.<sup>87</sup> Mental accounting has been explained as evidencing the desire by individuals to ensure a degree of *self control* against the likelihood of impulsive behaviour with respect to the entire investment.<sup>88</sup> Mental accounting in combination with loss aversion is said to result in what has been described as the *framing effect*,<sup>89</sup> meaning that the answer often depends on how a question is framed. Thus a decision framed in terms of losses may cause the selection of a risky outcome, and conversely when framed in terms of winning, may prompt a choice which avoids risk. Another result of individuals combining mental accounting and loss aversion is that people tend to attach value to both changes and final states, rather than to final states only given mental accounting and preference for loss aversion.<sup>90</sup>

The *equity premium puzzle*, as described by Mehra and Prescott<sup>91</sup> illustrates the risk aversion problem further by an explanation on why the average returns expected on stocks are much higher than returns to bonds. On the whole a return equivalent of 7% more than the equity premium predicted is expected to be necessary by theoretical economic models measuring risk and return.<sup>92</sup> Financial theorists explain these high returns as being what is demanded by stockholders for the higher risks perceived in the short term as compared to the long term when stocks are known to deliver higher returns compared to other types of investments. However, Benartzi and Thaler, and Kahneman and Riepe offer an alternative explanation. This is that investor aversion was not in relation to the high return variability, but to the possibility of ending up with a loss, *i.e.*, the investor's worry is that the price of their stock would have declined when assessing the performance of their investments. This explanation ties in the notion of risk aversion to loss aversion, *i.e.*, where risk-averse investors dislike decreases in wealth so intensely as to accept additional risk in order to gain a chance of avoiding such losses.<sup>93</sup> Benartzi and Thaler determined that an average investor assessed the performance of their portfolios at least once in 13 months (myopic loss aversion), and that the measurement in the performance of equities within any 13 month period could often be inferior to bonds, even where the overall gains from stocks exceeded that from bonds. To explain, since investors assessed their portfolios around each year, they also modified their reference point for each of these periods

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<sup>87</sup> Benartzi and Thaler conducted an experiment on the relation between portfolio allocation strategies and the tendency of using different mental accounts to represent the investment solutions available. Participants in their experiment could decide among different investments to build up their portfolio. Their research found that where both stocks and bonds were available, investors tended to split their portfolio between the two. However, when a third fund of stocks was made available, they tended to spread the new funds three ways resulting in two stock accounts and a bond account.

<sup>88</sup> Richard H. Thaler & H.M. Shefrin, "An Economic Theory of Self Control" (1981) 89 J. Political Econ. 392; Richard H. Thaler, "Toward a Positive Theory of Consumer Choice" (1980) 1 J. Econ. Behaviour 39; and *Shefrin and Statman*, *supra* note 66.

<sup>89</sup> See Prast, *supra* note 84 at 8.

<sup>90</sup> See the illustration given in Antonides, cited by Prast, *supra* note 84, where in a lottery A won \$20, while B won \$100 but suffered \$80 damage to his carpet, persons thought that A was better off.

<sup>91</sup> Rajnish Mehra & Edward C. Prescott, "The Equity Premium: A Puzzle" (1985) 15 J. Monetary Econ. 145.

<sup>92</sup> Shlomo Benartzi & Richard H. Thaler, "Myopic Loss Aversion and the Equity Premium Puzzle" (1995) 110 Q. J. Econ. 73.

<sup>93</sup> See the illustration given by Stout, *supra* note 26 at 661, where a risk-averse individual who would accept a certain \$100 as against a probable 50% chance at \$200, opts also for a 50% gamble of losing \$200 over a certainty of losing \$100.

of time, abandoning thereby any overall judgment of stock performance measured on returns obtained over the long term. This also meant that investors were more influenced by stock value variations than by the uncertainty associated with reaching the goals set for any specific time horizon. These studies provide further evidence that individuals evaluate their losses and gains in an asymmetric manner (*e.g.*, show risk-averse behaviour when winning, and risk-taking behaviour when losing), and are generally more sensitive to losses than to gains. Individuals are also shown to be influenced by the recent history of activity (*e.g.*, less willing to take risks after experiencing a series of financial losses, while their risk aversion decreases following a series of gains).<sup>94</sup> They also highlight the importance of how a decision is *framed*, *i.e.*, when investing decisions are framed as potential gains compared to their point of reference people tend to be risk averse, and conversely if framed as potential loss then they tend to be risk taking.<sup>95</sup>

In summary, BT makes three fundamental points: that, (1) investors rather than engaging in utility maximisation, rely on heuristics and biases to make sense of complexity, (2) such heuristics are essential human traits which are difficult if not impossible to overcome, and (3) consequently, stock prices are reflective not only of economic fundamentals, but also of an irrational (emotional) component. Moreover, as noted in the introduction section of this article, securities markets have been found to be dynamic in the sense that prices move in random fashion. As to what explains these movements, and why they are unpredictable, is explored further in the discussion following.

### III. EXPLAINING SHARE PRICE MOVEMENTS

While markets may be institutionalised through the form of custom, and formal and informal rules, they still are a collection of buyers and sellers, sometimes physically proximate, at other times linked through communication systems. What links individual sellers and buyers is price as price both transmits and aggregates information.<sup>96</sup> When transmitting, price conveys to the uninformed, information in the possession of the informed; when aggregating, price co-ordinates the different information

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<sup>94</sup> See Prast, *supra* note 84.

<sup>95</sup> Robert A. Olsen, "Prospect Theory as an Explanation of Risky Choice by Professional Investors: Some Evidence" (1997) 2 *Rev. Fin. Econ.* 225.

<sup>96</sup> Israel M. Kirzner, *Competition and Entrepreneurship* (Chicago: University of Chicago, 1973) [*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).

held by different individuals. In other words, while information causes price movements, these movements in turn become a source of information. The quality of the information released, however, is another matter.

Prices transmit information when informed traders use their information to take a position in the market. However, the acquisition of information is costly, and traders will not acquire costly information unless they can earn a return on the investment.<sup>97</sup> Less informed traders will, by observing current prices learn about information in the hands of the informed, and use this to adjust their expectations of share price enabling thereby a degree of free riding.<sup>98</sup> However, as price is a noisy signal,<sup>99</sup> it does not transmit all the information from the informed to the uninformed. Moreover, much of the economically relevant information is also tacit, and may take the form of a skill, or be embodied in a custom or unarticulated rule of behaviour which may not be able to be communicated.<sup>100</sup> This has the implication that the nature of the information can be successfully withheld from other participants for at least a period of time. Consequently, some information will remain private, *i.e.*, price may not show *e.g.*, how B, C and D arrived at their decisions on which A supposedly relies. As Hayek's<sup>101</sup> well-known example of the scarcity of tin 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. However, Hayek goes on to make the further 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. This may not necessarily be the case, as participants would want to know the underlying cause of the scarcity to plan for the future, *e.g.*, whether the delay is temporary or otherwise, given the expenditure and opportunity costs involved in finding alternative sources and suitable substitutes.<sup>102</sup>

Price, by aggregating different pieces of information, reveals to market participants information which is of higher quality than that possessed by any single individual. Price aggregates information when each of the informed participants has a piece of information and is aware of it. Participants bear in mind that both they and other participants have information and that market prices reflect this information. Based on this, it is said that competition would aggregate all of the market's information in the form of price.<sup>103</sup> And so long as the market clearing price conveys

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<sup>97</sup> See generally Sanford Grossman & Joseph Stiglitz, "On the Impossibility of Informationally Efficient Markets" (1980) 70 Am. Econ. Rev. 393 [*Grossman & Stiglitz (1980)*].

<sup>98</sup> Sanford Grossman & Joseph Stiglitz, "Information and Competitive Price Systems" (1976) 66(2) Am. Econ. Rev. 246 [*Grossman & Stiglitz (1976)*].

<sup>99</sup> See *infra* note 113 and accompanying text.

<sup>100</sup> Gerald P. O'Driscoll & Mario J. Rizzo, *The Economics of Time and Ignorance* (Oxford: Basil Blackwell, 1985) at 104.

<sup>101</sup> F.A. Hayek, "The Use of Knowledge in Society" (1945) 35 Am. Econ. Rev. 519 at 526.

<sup>102</sup> See also Sanford J. Grossman, "On the Efficiency of Competitive Stock Markets Where Traders Have Diverse Information" (1976) 31 J. Fin. 573 at 574 [*Grossman (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 (*i.e.*, 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 (*i.e.*, knowledge of the states of nature determining current price).

<sup>103</sup> *Ibid.*

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.<sup>104</sup> Thus while price is an indispensable guide or signal for decision making, 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, for it is ultimately people, and not prices, that allocate resources. In this context, market participants are seen not only as responding to, but also creating change.<sup>105</sup> What is important then is to understand how decisions of individual participants in the market interact to generate the market forces which cause price to change, meaning that the efficiency of the price system should be judged not in terms of any supposed equilibrium, but as being the starting point for decision making by market participants. For the efficient use of knowledge requires more than awareness of share price; it also requires co-ordination of the individual's decision with the anticipated decisions of other participants in the market.

Given the above, it is important to enquire as to how prices are formed in a competitive dynamic market comprising of many buyers and sellers with heterogeneous expectations. How then is information translated into price? While strict adherents of EMH such as Fama simply assume this process to happen by itself, the discussion in the next few paragraphs show that this view is not uniformly shared now even by neoclassical efficiency based theorists. Moreover, the Austrian School of Economics, which is also efficiency based, adopts a diametrically opposite view to that of the neo-classicists with their notion of entrepreneurship. Following the Enron and other scandals, economic sociologists specialising in financial markets show securities market prices to be artificial constructs set in motion by complicit managers, analysts, brokers, and institutional investors. This view blows out of the water the claims of EMH as being the product of a strictly competitive marketplace. These views of the price mechanism in relation to securities markets are examined next.

#### A. *The Neoclassical View*

According to Manne,<sup>106</sup> EMH:

... finessed this problem by assuming that price formation was a given, an automatic one at that. In fact, at times, Fama would use the word 'mystical', and he never tried to explain why the results he found happened.

<sup>104</sup> Beth Allen, "Generic Existence of Completely Revealing Equilibrium for Economics With Uncertainty When Prices Convey Information" (1981) 49 *Econometrica* 1173.

<sup>105</sup> As O'Driscoll & Rizzo, *supra* note 100, 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.

<sup>106</sup> Manne, *supra* note 40 at 174.



Manne then goes on to state that the price referred to under EMH is the “average (mean) price”<sup>107</sup> and cites with approval an explanation<sup>108</sup> of how the average of all of the guesses of visitors to a village fair about the weight of a cow on display had approximated to its real weight. Average price as in this reference is to *fundamental value efficient* price as it assumes a core price which is correct, with those above and those below it being incorrect. That this is so is evident in Manne’s citation<sup>109</sup> of Alchian as follows:

Another famous economist, Armen Alchian, made a similar or related point that the notion of price was not what was represented by a hard data point, the dollar price as it were, though that is how Fama and others treated it. Rather Alchian said that the notion of price was best thought of as a distribution around a mean, certainly a complementary notion to Hayek’s. Together these notions mark the beginnings of a theory of price formation.

But neither Manne nor Alchian attempt to explain how and why these bids came into being. Gilson and Kraakman attempt to do so by providing an explanation of how market participants and intermediaries use information to estimate values and set prices by linking EMH with CAPM, and using this to produce a joint prediction that in an informationally efficient market, arbitrage will ensure that prices will also be fundamentally efficient. They do not, however, explain how arbitrageurs and investment bankers bring about this result.

By contrast, the Austrian School of economics sees price movements as the product of entrepreneurial activity engaged in by individual actors attempting to beat the market. They attribute the neglect of the entrepreneurial role to the dominance of neo-classical theory and their preoccupation with ends and means satisfaction and final equilibrium positions. As is obvious, in the absence of such individual competitive activity, economic activity would be perfectly coordinated with no scope for profit making activity. Accordingly, the Austrian School sees price movements as resulting from the competitive entrepreneurial market process, where participants sometimes win and at other times lose, there being no winning formula to beat the market. This view is explored next.

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<sup>107</sup> *Ibid.*

<sup>108</sup> To quote Manne, *supra* note 40:

A recent minor best-seller, ‘The wisdom of Crowds,’ by James Surowiecki, a financial writer for the New Yorker, adds some much needed clarity to Hayek’s and Alchian’s thoughts on this subject. The book begins with a little anecdote about a well known statistician and geneticist in England who went to a country fair in 1906. At the country fair there was a contest to guess the correct dressed weight of an ox that was on display. ... No one’s guess came very close to the actual final weight, but the mean (average) of all of the answers given was only one pound off the actual weight of 1788 pounds, a completely negligible difference. The average of all those guesses from people with only the slight knowledge they obtained from looking at this ox, as well as their own endowments, was to all intents and purposes perfect. That is very analogous to the process by which a market price is determined, and it is perfectly consistent with what both Hayek and Alchian were saying about the process by which price is determined.

<sup>109</sup> *Ibid.* at 174-175.

### B. *Theory of Entrepreneurship*

Entrepreneurialism assumes that dynamic markets such as stock markets are volatile, in a state of flux, and constantly adjusting and readjusting themselves in the face of actions taken by its various participants to make a gain. In other words, this view sees decision making in securities markets (and other dynamic markets) as being subjective and error prone. It sees entrepreneurial opportunities as existing whenever markets are not perfectly coordinated, with the spotting of opportunities for gain, initiating actions, and reaping their consequences as being the function of the entrepreneur.<sup>110</sup> According to this view, the arbitrageur and investment banker, therefore, are as much subject to uncertainty as anticipated conditions do not often materialise and losses result for although entrepreneurial profit opportunities may exist, they are uncertain in the face of time and ignorance. This is particularly so of investment transactions as parties enter into them with opposite expectations.<sup>111</sup>

Moreover, since actions are based on the individual's store of knowledge, the inability to predict one's future knowledge means that one's future decisions will have to be based on guesstimates. Such a dynamic view of expectations does by definition preclude objective knowledge. Moreover, a group of individuals even when presented with common information will, because of their different expectations of outcome based on their different appreciation of such knowledge, not necessarily come to the same conclusion.

Subjective decision making then is an inevitable by-product of future time and ignorance. It explains 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, and that 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. In other words, decision making cannot be divorced from expectations.<sup>112</sup> This is because all economic action is shaped by plans dependent on expectations. And as expectations are not confined to the discovery of an already determined future but the result of free indeterminate decisions of actors, it is actually created by them. 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 securities markets is at the same time both longer and shorter than those of product markets. Additionally, almost any news is sufficient to give momentum to change in securities markets, which goes to explain volatility in these markets.

At the same time, what an individual decides to do depends in large part on what he expects others to do. For unless some degree of predictable decision making from others is forthcoming, no meaningful exercise of choice in the outcome of the decision process is possible. 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

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<sup>110</sup> E.C. Pasour, "The Efficient-Markets Hypothesis and Entrepreneurship" (1987) 3 *Rev. of Austrian Econ.* 95.

<sup>111</sup> See *Kirzner (1973)*, *supra* note 96 at 97-98.

<sup>112</sup> O'Driscoll & Rizzo, *supra* note 100 at 29.

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.

Kirzner explains that market participants are very much alert to shortcomings of their own knowledge, of knowledge possessed by others, and of future uncertainty. Alertness as used by Kirzner, 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. In other words, being alert is not merely to anticipate the future but to also help create what in a sense is self motivating. 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 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. Two factors induce such action: First, is the concern of where one would be placed, if no action was taken, and secondly, the lure of profits to be made by guessing rightly as to what price it would clear. As decision making is *ex ante* and not *ex post*, it is the anticipation of profit and not actual realisation which is important.

This competitive-entrepreneurial explanation, unlike the explanation by reference to equilibrium conditions, touches at the heart of the market process itself. 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.

The above point is better explained by research on the presence of "noise"<sup>113</sup> in markets, and the costs incurred in obtaining information. Studies in this regard<sup>114</sup>

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<sup>113</sup> Noise, *i.e.*, indiscernible randomness or the unobserved variation of another factor, see Douglas W. Diamond & Robert E. Verrecchia, "Information Aggregation in a Noisy Rational Expectations Economy" (1981) 9 J. Fin. Econ. 221 at 223.

<sup>114</sup> See the series of essays by Grossman and Stiglitz: Sanford Grossman, "On the Efficiency of Competitive Stock Markets Where Trades Have Diverse Information" (1976) J. Fin. 573; Sanford Grossman, "The Existence of Futures Markets, Noisy Rational Expectations and Informational Externalities" (1977) Rev. Econ. Studies 43; Sanford Grossman, "Further Results on the Informational Efficiency of Competitive Stock Markets" (1978) J. Econ. Theory 81; Sanford Grossman, "An Introduction to the Theory of Rational Expectations under Asymmetric Information" (1981) 1 Rev. Econ. Studies 541; Sanford Grossman & R. J. Shiller, "The Determinants to the Variability of Stock Market Prices" (1981) 71(2) Am. Econ. Rev. 222; R. J. Shiller, "Do Stock Prices Move Too Much to be Justified by Subsequent Changes in Dividends?" (1981) 71(3) Am. Econ. Rev. 421; Joseph Stiglitz, "Some Aspects of the Pure Theory of Bank Finance: Bankruptcies and Takeovers" (1973) Bell J. Econ. 458; Joseph Stiglitz, "Equilibrium in Product Markets with Imperfect Information" (1979) 69(2) Am. Econ. Rev. 339; Joseph Stiglitz, "Potential Competition May Reduce Welfare" (1981) 71(2) Am. Econ. Rev. 184; Joseph Stiglitz, "Information and Economic Analysis" in J. M. Parkin & A. R. Norbay, eds., *Current Economic Problems* (Cambridge: Cambridge University Press, 1975) 38; Joseph Stiglitz, "Ownership Control and Efficient

suggest that where information is not costly and there is no noise, markets will be in equilibrium.<sup>115</sup> 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.<sup>116</sup> 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 lends to the dilemma that Keynes made known through his famous example of the newspaper beauty contest. It follows from all this that markets cannot adjust to information fully and prices never fully reflect all information possessed by the informed individuals.<sup>117</sup> The information market is constantly subjected to new shocks to which it

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Markets: Some Paradoxes in the Theory of Capital Markets”, in K. D. Boyer & W. C. Shepherd, eds., *Economic Regulation: Essays in Honour of James R. Nelson* (East Lansing: Michigan State University Press, 1982) 311; Joseph Stiglitz, “Information and Capital Markets” in W. F. Sharpe & C. M. Cootner, eds., *Financial Economics: Essays in Honour of Paul Cootner* (Englewood Cliffs: Prentice Hall, 1982) 118; Joseph Stiglitz, “Information and Economic Analysis: A Perspective” (1985) *Econ. J.* 21; *Grossman & Stiglitz (1980)*, *supra* note 97; *Grossman & Stiglitz (1976)*, *supra* note 98; Sanford Grossman & Joseph Stiglitz, “On Value Maximisation and Alternative Objectives of the Firm” (1977) 32(1) *J. Fin.* 389; Sanford Grossman & Joseph Stiglitz, “Stockholder Unanimity in Making Production and Financial Decisions” (1980) *Q. J. Econ.* 543; Joseph Stiglitz & D. M. G. Newbery, *The Choice of Techniques and the Optimality of Market Equilibrium with Rational Expectations* (Mime: 1979). See also Niels Christian Nielsen, “The Investment Decision of the Firm under Uncertainty and the Allocative Efficiency of Capital Markets” (1976) 31 *J. Fin.* 587; Michael C. Jensen & John B. Long, Jr. “Corporate Investment under Uncertainty and Pareto Optimality in the Capital Markets” (1972) 3 *Bell J. Econ.* 151; Richard Schmalensee, “Imperfect Information and the Equitability of Competitive Prices” (1984) 99 *Q. J. Econ.* 441.

<sup>115</sup> In the sense that price will summarise all the information in the market. See *Grossman (1976)*, *supra* note 102 at 593.

<sup>116</sup> *Ibid.* at 585.

<sup>117</sup> As *Grossman & Stiglitz (1976)*, *supra* note 98, observe (at 248-249):

Indeed, it is only because prices do not accurately represent the true worth of the securities (*i.e.*, 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. ... 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 of the allocation of the portfolio but whether to be informed or uninformed. (Citations omitted)

Similarly, with respect to market aggregation they observe (at 250):

This paradox can be put in 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?’ ...

seeks to adapt. In between, partial 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”<sup>118</sup>—a degree sufficient enough to lure traders to expend resources to acquire information and gain disproportionate benefits.<sup>119</sup> 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 arbitrage and entrepreneurship activity. And it is the latter which makes securities markets competitive and places them on the road towards efficiency.<sup>120</sup>

The study of securities markets efficiency then is about how individuals come to acquire and use knowledge toward their own end in the face of dynamic uncertainty, and of how they second guess and interpret the actions of other players in the market. The view that all available information is captured by market price instantaneously (quickly), and that “available information does not support profitable trading strategies or arbitrage opportunities”<sup>121</sup> portrays an equilibrium condition. By contrast, 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 corrections at times of disequilibrium.<sup>122</sup> This process of correction is the function of the entrepreneur. In such markets, equilibrium conditions tend to be constantly disrupted by the changing of plans following from the acquisition of new knowledge, interpreted in a subjective manner. 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.<sup>123</sup>

Equally, if not more damaging, to the claim that EMH has its basis on the notion of a fundamental value has been the impact of shareholder market value theory (“SMV”). Its emergence in the late 1980s as the new form of corporate strategy turns the claim of securities markets efficiency and its underlying notion of fundamental value on its head. It shifts the fulcrum of power from the actions of managers within the corporation as shapers of share prices, to one of doing the bidding of players outside the firm, namely analysts, brokers, institutional investors, takeover specialists, and accountants. SMV demonstrates that while market movements do generate profits (losses) to its participants, it could just as well be the product of marketplace contrivance. In other words share prices can be a purely artificial construct having no relevance to any notion of fundamental value. The emergence of this phenomena

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<sup>118</sup> Grossman & Stiglitz (1980), *supra* note 97 at 393.

<sup>119</sup> See Margaret Bray, “Futures Trading, Rational Expectations, and the Efficient Markets Hypothesis” (1981) 49 *Econometrica* 575. 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 summarising all the information.

<sup>120</sup> See Sappideen, *Securities Markets Efficiency*, *supra* note 30.

<sup>121</sup> See Gilson-Kraakman (1984), *supra* note 15.

<sup>122</sup> See Kirzner (1973), *supra* note 96 at 6-7.

<sup>123</sup> Duncan W. Reekie & Ronald Savitt, “Marketing Behaviour and Entrepreneurship: A Synthesis of Alderson and Austrian Economics” (1982) 16 *European J. Marketing* 55.

and its legacy are explored next, and with it the limited relevance, if at all, of SMV and EMH in relation to share pricing.

### C. Shareholder Market Value

The 1980s and 1990s saw several waves of financial reorganisation.<sup>124</sup> Financial engineering became the name of the game and SMV the catchcry. SMV has been described as both an ideology based on balance sheets, and as a set of strategies where the job of managers was to ensure that the assets of the firm were returning the highest possible profits for shareholders to the exclusion of all other constituents, *e.g.*, employees. The underlying theory is that the relationship between managers, directors, and equities markets involves monitoring, rewarding and sanctioning managers to ensure that managers maximised share prices and in so doing raise the price of the stock, failing which managers were to be replaced. Where boards failed to monitor managers, share values would plummet and the firm itself would be a target for takeover. SMV gained rapid acceptance because by the late 1980s corporate boards, Chief Executive Officers (CEOs) and Chief Financial Officers (CFOs) had come under the sway of institutional investors, analysts, and the large accounting firms.<sup>125</sup>

SMV is said to have resulted in increased volatility in stock prices, and more importantly enticed corporate managers to match analysts' predictions of share price. Using data on thousands of quarterly reports between 1974 and 1996, DeGeorge, Patel, and Zeckhauser (1999)<sup>126</sup> show that firms are significantly more likely to report earnings that exactly matched analysts' predictions than report earnings that overshoot, but did not certainly let it undershoot. Collingwood<sup>127</sup> explains that such a systematic pattern could have emerged only where managers were able to manage earnings in a myriad ways, and that CEOs and CFOs used every imaginable accounting trick to "make the quarter." He gives the example of how executives at Sunbeam reported as current earnings, expected future earnings on sales of barbecues at Wal-Mart and Sears, and of how the stock crashed when word got out. Similarly, executives at SmithKlein Beecham's venture capital group lost millions in potential profits when their bosses refused to sell a biotechnology unit at the peak of the biotech market, for fear of reporting profits dramatically higher than analysts were projecting. Biotech stock dropped erasing the paper profit. To quote Collingwood:<sup>128</sup>

There's a tyrant terrorising nearly every public company in the US—it's called the quarterly earnings report. It dominates and distorts the decisions of executives, analysts, investors, and auditors. Yet it says almost nothing about a business's health. How did a single number come to loom so large?

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<sup>124</sup> Mark S. Mizruchi & Howard Kimeldorf, "The Historical Context of Shareholder Value Capitalism" (2005) 17 *Political Power & Social Theory* 213 at 214.

<sup>125</sup> Neil Fligstein & Taek-Jin Shin, "Shareholder Value and Changes in American Industries, 1984-2000" (University of California, Berkeley, Institute for Research on Labor and Employment Working Paper Series, 2005).

<sup>126</sup> Francois DeGeorge, Jayendu Patel & Richard Zeckhauser, "Earnings Management to Exceed Thresholds" (1999) 72 *J. Business* 1.

<sup>127</sup> Harris Collingwood, "The Earnings Game: Everyone Plays, Nobody Wins" (June 2001) 79(6) *Harvard Business Review* 65.

<sup>128</sup> *Ibid.* at 65.

What then accounts for this dramatic change? The industrial organisation history view of Chandler<sup>129</sup> would explain this in benign terms of the evolutionary efficiency of firms, particularly in the case of US firms. Economic sociologists explain these changes in terms of power struggles and shifts. For example, Neil Fligstein<sup>130</sup> sees these changes as having been caused by internal struggles within the firm, *e.g.*, the struggle for power by marketing specialists, and later financial diversification experts, to win control over firm strategy—not because they necessarily had superior strategies, but because they gained executive positions—by convincing management and boards to adopt their strategies. Each change represented a new social construction of corporate efficiency. But this does not explain how SMV rapidly became the industry norm in such a short space of time as alluded to by Collingwood. In this context, the explanation given by Dobbin and Zorn, though less sanguine is far more illuminating: they see the changes as resulting from pressure exerted by forces outside the firm, namely, takeover strategist, institutional investors, and stock analysts as explained above.

Mizruchi<sup>131</sup> explains the growth in influence of these latter groups as being partly due to happenstance and partly because three significant forces—organised labour, the state, and the banks—had either abdicated or been driven from their former roles in helping to keep corporations, and corporate abuse, in check. Without the internal discipline provided by the banks and the external discipline provided by the state and labour, the corporate world was left to professionals who manipulated the vital information about corporate performance which investors depended on. Accounting firms were now advising firms on how to make their balance sheets look more attractive, while financial analysts were telling CFOs how they wanted their books to look. The function of the CFOs now became all important, their main job being to manage the relationship between the firm, institutional investors, and stock analysts and paying attention to factors that would help increase stock price. This process of beautification eventually led to the debacle of Enron and the ensuing Sarbanes-Oxley Act in the U.S.<sup>132</sup> Enron was the epitome of a firm that viewed SMV as their primary business. As Dobbin and Zorn note:<sup>133</sup>

... in July 2001, half a year before Enron declared bankruptcy, the Wall Street Journal reported ‘the number of corporate earnings restatements has skyrocketed during the past three years, driven in large part by stepped-up enforcement at the SEC’.... We now know that earnings restatements were becoming widespread for another reason—executives were increasingly cooking their books to satisfy securities analysts and institutional investors. They massaged profit reports to keep their companies on analysts “buy” lists (although we now also know that analysts seldom recommended anything but “buy” at the turn of the millennium),

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<sup>129</sup> See *e.g.*, Alfred D. Chandler, Jr., *The Visible Hand: The managerial revolution in American business* (Cambridge: Belknap Press of Harvard University Press, 1977).

<sup>130</sup> Neil Fligstein, “The End of (Shareholder Value) Ideology?” (2005) 17 *Political Power & Social Theory* 223.

<sup>131</sup> Mizruchi & Kimeldorf, *supra* note 124 at 220.

<sup>132</sup> For regulatory developments in the U.K. on this count, see *e.g.*, David Kershaw, “Evading Enron: Taking principles too seriously in accounting regulation” (2005) 68 *Mod. L. Rev.* 594.

<sup>133</sup> Frank Dobbin & Dirk Zorn, “Corporate Malfeasance and the Myth of Shareholder Value” (2005) 17 *Political Power & Social Theory* 179 at 179-181.

and to keep institutional investors pumping new pension contributions in their direction.

Corporate malfeasance took a new form in the 1990s. Executives ... lied about how much money their firms made. ... They lied to make corporate earnings appear to rise at a constant rate toward an infinite horizon, and to conform to the projections of securities analysts. They cooked the books in both directions, withholding news of exceptional earnings as insurance against a rainy day. Five executives at Freddy Mac, the semi-public mortgage company, were deposed after famously under-reporting earnings by 5 billion dollars between 2000 and 2002.

Dobbin and Zorn show how these three groups with their new clout in financial markets succeeded in imposing their will on corporations by first redefining the notion of corporate efficiency (to mean capacity to meet securities analysts' profit projections instead of the prevailing notion of profit maximisation), and secondly by realigning the material interests of the corporation's claimants. These were achieved through a two stage process: first convincing corporate outsiders of the good of the changes, and then by persuading internal managers that the changes were needed in their own interest as well as the organisations they were custodians of. As Swedberg explains:<sup>134</sup>

This change set off a search for accounting gimmicks that would allow firms to report the kinds of numbers analysts liked to see. These three groups had important accomplices of course. The big accounting firms vetted the profit reports of major corporations and peddled accounting gimmicks that would help them to 'make the quarter.' Securities analysts working for financial institutions that managed initial public offerings (IPOs) of upstarts recommended that investors buy stock in those very upstarts.

Along with this new rhetoric of shareholder value, was also forged in a new compensation strategy. To quote Swedberg again:<sup>135</sup>

Institutional investors encouraged firms to compensate executives with stock options designed to align executive interest with shareholder interest—with the predictable consequence that executives would fib about profits. The big accounting firms enabled this fibbing by hawking instruments that made profits appear and disappear, and by lobbying against the accounting of stock options as expenses. Securities analysts were complicit, for the financial institutions they worked for had a vested interests in seeing firms perform well.

Moreover, as key employees of institutional investors also rely on stock options for a substantial part of their remuneration, it was in their interest to ensure not only that the dividends received were high, but also that stock prices remained high. Furthermore, to the extent that stock prices are reliant on stock analyst recommendations, institutional investors sought a free hand to diversify their own investment portfolios and be able to increase their monitoring of corporate management in the firms they invested in. In addition, institutional investors, like the other beneficiaries of

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<sup>134</sup> Richard Swedberg, "Conflicts of interest in the US brokerage industry" in Knorr Cetina & Alex Preda, eds., *The Sociology of Financial Markets* (London: Oxford University Press, 2005) 194.

<sup>135</sup> Werner De Bondt, "The Values and Beliefs of European Investors" in Knorr Cetina & Alex Preda, eds., *The Sociology of Financial Markets* (London: Oxford University Press, 2005) 163 at 181.



takeovers, welcomed the dismantling of conglomerates, and favoured the practice of stock option based remuneration to the extent that it forced corporate managers to ensure that the market price of their stock remains high. As stock analysts tended to specialise in particular industries, they had difficulty in valuing diversified conglomerates, and for this reason tended to mark down their value. Not surprisingly, they too welcomed the dismantling of conglomerates as this made their job easier. However, the overall point made in relation to SMV here is not to downplay the role of the players therein, *e.g.*, of analysts, for in their absence even less accurate information may end up getting into the marketplace. What is important is that given that managers have been found to track their information disclosures too closely to what analysts predict the task is to devise means to ensure the independence of both in recognition of the fact that intermediaries such as analysts have both good and bad effects for share price accuracy.<sup>136</sup> While the disclosure rules under the Sarbanes-Oxley Act in the U.S. must be seen as an important step in this direction, it still leaves the problems identified by BT and entrepreneurship theory to be addressed.

#### IV. CONCLUDING THOUGHTS

Assume that investor X has \$300, and there are three stocks A, B, and C, each priced at \$10 per stock in period 1. X can buy 30 of stock A, B, or C, 10 stock each of A, B, and C, or opt for a whole heap of other intermediary positions. Assume that in period 2, the price of stock A is \$10, stock B \$12, and stock C \$8. Now if X had bought only 30 of stock A, X's worth will be \$300, if only 30 of stock B then it will be \$360, and if only 30 of stock C it will be \$240. What modern portfolio theory tells us is that such risky outcomes can be minimised by portfolio diversification. Thus if X had instead bought, 10 each of stocks A, B, and C, X's overall position will be \$300. Sharpe<sup>137</sup> and Lintner<sup>138</sup> refined this idea of portfolio diversification of Markowitz<sup>139</sup> by identifying the *beta factor*<sup>140</sup> in the risk associated with stock prices. They identified in addition to the diversifiable component of stock price risk illustrated above, a non-diversifiable component (systematic risk) which would affect all stock. They maintained that given the availability of portfolio diversification, securities risk management should be concerned only with risk relating to the beta

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<sup>136</sup> My thanks to an anonymous referee for this point.

<sup>137</sup> William F. Sharpe, "Capital Asset Prices: A Theory of Market Equilibrium Under Conditions of Risk" (1964) 19 J. Fin. 425.

<sup>138</sup> John Lintner, "Security Prices, Risks and Maximal Gains from Diversification" (1965) 20 J. Fin. 587.

<sup>139</sup> Harry M. Markowitz, "Portfolio Selection" (1952) 7 J. Fin. 77.

<sup>140</sup> The beta factor 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. 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), critics observe that the statistical estimation of the parameters is plagued with thorny problems including missing data, non-stationary return distributions, and errors-in-variables, as well as other problems connected with the assumptions underlying the model: see, *e.g.*, Hess & Reinganum, "Efficient Capital Markets" in James L. Bicksler, ed., *Handbook of Financial Economics* (Amsterdam: North Holland Pub. Co, 1979) 5, and Richard Roll, "A Critique of the Asset Pricing Theory's Tests; Part I: On Past and Potential Testability of the Theory" (1977) 4 J. Fin. Econ. 129. See also *supra* note 6.

factor. Building on these findings, neo-classical financial economics theorists of whom Fama was the most prominent made the claim that securities markets were efficient in the EMH sense.

As noted, however, the claims of EMH and its underlying assumptions have all been subjected to serious challenges. Recent studies show that even in an aggregate sense, observed stock prices and portfolio choices do not conform to the implications of well known financial markets models such as the EMH and CAPM.<sup>141</sup> And as BT has highlighted, not all investors utility maximise as the reference points, heuristics, and ensuing biases adopted by individuals in assessing and evaluating complex situations cause investor perceptions to differ from the EMH model on four matters (1) stochastic process (random behaviour) of stock prices, (2) value, (3) management of risk and return, and (4) trading practices.<sup>142</sup> Nonetheless, individuals still continue to strive to have control of the future destiny of their investments—of where they would be if they took no action, and of where they would like to be—and do not leave it altogether to destiny. In other words, as individuals seem to be incapable of utility maximisation given their inherent human traits (even assuming they have access to needed information), they nonetheless try to do the best they can in the face of future uncertainty, to which ironically individual actions seem to contribute to. Such a state of dynamic uncertainty in relation to discrepant markets fits in with the notion of a market being in “an equilibrium state of disequilibrium”, a theory developed by Kirzner, on the foundations laid by Mises.<sup>143</sup>

Fama has claimed that even if the evidence of the above type shows investor irrationality, it does not affect the overall claim of EMH since arbitraging by a few rational investors would wash away the discrepancy and restore the market to efficiency.<sup>144</sup> This view has been challenged by Barberis and Thaler who show that this does not necessarily follow since there are risks and costs involved in arbitrage, which may only cause the irrationality to increase. Such arbitrage cost include, commissions and fees, costs of going long and short, restrictions on certain institutional investors going short, and the fear that arbitrageurs will be left holding stock in the event that the rest of the market moved more slowly than what the arbitrageurs had hoped for. It may also be impossible to arbitrage as the market

<sup>141</sup> Abbigail Chiodo *et al.*, “Subjective Probabilities: Psychological Theories and Economic Applications” 86(1) Federal Reserve Bank of St Louis Review 33 at 33.

<sup>142</sup> See Werner de Bondt, “Behavioural economics: A portrait of the individual investor” (1998) 42 European Econ. Rev. 831.

<sup>143</sup> Israel M. Kirzner, *Perception, Opportunity and Profits* (Chicago: University of Chicago Press, 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 economising 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).

<sup>144</sup> Fama (1976), *supra* note 17.

may refuse to or fail to appreciate the relevance of the information.<sup>145</sup> More importantly, Prentice<sup>146</sup> demonstrates in relation to auditors, and Langevoort<sup>147</sup> in relation to lawyers, that even members of these two highly skilled professions are prone to the biases identified by behavioural theorists in the carrying out of their respective professions.

SMV, for its part, demonstrates that price movements can be the product of manipulation by powerful market players than competitive market forces, with ensuing price movements having little or no relationship to the notion of fundamental value. An appreciation of this helps understand why the dotcoms of the information technology boom era of the 1990s, became dotbombs at the turn of the century. In other words, the random walk of securities markets appears not to correlate with the claims of EMH. Moreover, while EMH theorists tend to dismiss the behaviour of “uninformed” investors as mere “noise trading” and treat it as a fringe problem, others such as Grossman, Stiglitz, and Shiller see such investor behaviour as an endemic feature of human behaviour. Reactions of the former type have the unfortunate consequence of overlooking the imperative for a theory which analyses and explains investor behaviour peculiarities that sits alongside the *beta factor* employed to explain systematic risk.

The final blow to EMH is perhaps delivered by no other than Professor Michael Jensen. Jensen points out the false foundations of share value and price, of the artifice it is, and more importantly of the emptiness of EMH in this context. To quote:<sup>148</sup>

Suppose that for one reason or another, a firm’s stock price becomes overpriced. This can be actually consistent with efficient markets, because such a market doesn’t say that a stock’s price is always right, just that on average the stock prices are right. At any given time, for any given company we know the price is wrong, but if the market is efficient we know that the price is as likely to be overvalued as undervalued. Indeed, market efficiency is also consistent with a situation in which many firms become overvalued at the same time.

Jensen explains elsewhere of just how stock prices come to bear no relationship to their underlying value. To quote:<sup>149</sup>

Just as managers’ compensation suffers if they miss their internal targets, CEOs and CFOs know that the capital markets will punish the entire firm if they miss analyst’s forecasts by so much as a penny. Generally, the only way for managers to meet those expectations year in and year out is to cook their numbers to mask the inherent uncertainty in their businesses. And that cannot be done without sacrificing value.

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<sup>145</sup> Sendhil Mullainathan & Richard H. Thaler, “Behavioural Economics” (NBER Working Paper no. 7948, 2000).

<sup>146</sup> Prentice, *supra* note 45.

<sup>147</sup> See *supra* note 51.

<sup>148</sup> Michael C. Jensen, “The Agency Costs of Overvalued Equity and the Current State of Corporate Finance” (2004) 10 *European Financial Management* 549 at 554 [*Jensen (2004)*].

<sup>149</sup> Michael C. Jensen & Kevin J. Murphy, “Performance pay and top management incentives” (1990) 98 *J. Political Econ.* 7.

And again:<sup>150</sup>

almost all organisations of any size punish their managers for telling the truth, and pay them for lying, in a very important and critical business process, namely the budgeting process. ...Of course higher level managers know this is going on so they lie about what their subordinates can do. All this is considered proper behaviour and simply part of the negotiation process. But the result of this system is that no one has the incentive to provide unbiased data to the critical process by which firms coordinate disparate parts of complex organisations.

... these budgeting systems train managers to forsake integrity and honesty. And once so-trained, the lack of integrity and honesty inevitably gets extended beyond the budgeting process to many other areas of organisational life, up to and including top-level managers and the Board of directors.<sup>151</sup>

Jensen's concern about overvalued stock is that it enables the overvalued entity to have access to capital priced below the normal risk-return assessment of the marketplace, which would in turn enable it to engage in acquisitions which are value destroying in the long run,<sup>152</sup> excessive internal spending, and risky negative net present value ("NPV") projects which the market thinks will generate value, the failure of which will lead to further accounting manipulation. Once on the treadmill they say, there is no going back as it is not possible to make it known that the stock is overpriced and must be reduced. As Jensen says (at 10), "the likely result for any CEO in this

<sup>150</sup> *Jensen (2004)*, *supra* note 148 at 550.

<sup>151</sup> And of the process of price setting itself, *ibid.* at 556:

... the forecast are biased systematically high. But of course, the analysts revise their forecasts as the quarter draws to an end. And what happens is—and this explains the GE and the Microsoft phenomena—they allow the managers to guide them down during the quarter. So they start out with forecasts for one or more quarters in the future that are biased systematically high. These forecasts are then walked down as the quarter-end approaches. ... But then a very interesting phenomenon shows up in the data: the forecasts in the days just before the end of quarter end up being biased low. It appears that analysts were colluding with managers to lower their positively biased forecasts sufficiently so that by quarter end the forecasts are low, but not by much. In this situation managers get the best of both worlds: the longer term projections (which have more impact on stock prices) are biased high (thus causing market prices to be potentially biased high) but then walking those forecasts down so that the end of quarter earnings surprises are positive, not negative, thus giving another positive boost to the stock price. ... Why do investors apparently allow themselves to be taken in by such manipulation? Why do market prices fail to adjust to what is going on? ... how could analysts underestimate Microsoft's quarterly earnings 47 times in a row ... It appears that this phenomenon is due to outright lying on the part of both managers and analysts. The evidence indicates that if you meet or beat the analysts' consensus forecast you get a 3% premium in return for the quarter. That is a big number, and it is highly significant. But why this reward persists for actions that in the end destroy value leaves me puzzled. ... What I believe has been overlooked in this system is that we can manipulate the numbers, and we can also manipulate the business and the real operating decisions.

<sup>152</sup> Rhodes-Kopf and Viswanathan (2004) show that firm specific and market wide mis-valuations cause merger waves. Ang and Chen (2005) test confirm the findings of Shleifer and Vishny, and Rhodes-Kopf and Viswanathan, and find in keeping with Jensen that overvalued firms are both more likely to make acquisitions and more likely to use stock in doing so. They also found that shareholders of bidders realised long term wealth appreciation even where the acquiring firm was overvalued as long as it was more overvalued than the target. Many other studies point to the value destroying acquisitions made during the height of the internet bubble: See, Christopher Tobler, "Corporate governance and the agency costs of overvalued equity", online: <[http://www.fma.org/SLC/Papers/CORP\\_GOV\\_AND\\_OVERVALUED\\_EQUITY.pdf](http://www.fma.org/SLC/Papers/CORP_GOV_AND_OVERVALUED_EQUITY.pdf)>.

situation is that the Board would respond by saying: 'If you cannot do it we will get someone who can'.<sup>153</sup> Jensen's claim that the agency costs of overvalued equity will manifest itself in the form of value destroying acquisitions has been confirmed in various findings.<sup>154</sup> There is also evidence that overvalued equity leads to substantial overinvestment on high risk projects and even negative net present value projects.<sup>155</sup>

In light of the discussion above it may be claimed that not all is right with the separation of the risk factor in securities into an alpha (diversifiable) and beta (non-diversifiable) component and the claimed diversifiability of the former, for SMV shows that securities prices can be the subject of market manipulation by both insiders as well as outsiders, and whether separately or in combination. What is needed then is a theory of securities markets behaviour which takes into account the distortionary effect of the following three types of subjective purposeful behaviour now well recognised as being present in securities markets trading: (1) inherent heuristics and biases, (2) the inherent force of entrepreneurialism, and (3) the potential for further distortion caused by the behaviour of those having a vested interest in the outcome of share price movements (*e.g.*, managers, analysts, and takeover artists). In other words, the need is for a theory which incorporates behavioural aspects of investors and market makers which goes beyond the assumed causality of managerial efficiency and capital markets. Such a theory may be seen as complementing the existing *beta* factor, and for want of a better term be referred to as the *theta* factor.

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<sup>153</sup> Jensen cites the case of Enron as an illustration. He says that at the time of Enron's peak market value of \$70 billion, it was actually worth about \$30 billion. It was a good, viable business; the company was a major innovator. But senior manager's efforts to defend the \$40 billion of excess valuation (which was a mistake that was going to go away anyway) effectively destroyed the \$30 billion core value. Enron's managers had a choice: they could have helped the market reduce its expectations. They could have found the courage to reset the company's value. Instead, they destroyed it by trying to fool the markets through accounting manipulations, hiding debt through off balance sheet partnerships, and other hyped new ventures such as their broadband futures effort. See Jensen & Murphy, *supra* note 149 at 11.

<sup>154</sup> Sara B. Moeller, Frederik P. Schlingemann & Rene Stulz, "Wealth Destruction on a Massive Scale? A Study of Acquiring-Firm Returns in the Recent Merger Wave" (2005) 60 J. Fin. 757, provide both the evidence of, and the consequences, where bidders are substantially overvalued. Likewise, Shleifer and Vishny (2003) argue, it is possible for a firm to use its overvalued stock to acquire real assets at less than their economic value and confer a benefit on its original shareholders even if its stock price later falls. See also, Jensen & Murphy, *supra* note 149 at 11.

<sup>155</sup> See *e.g.*, Tim Opler, *et al.*, "The Determinants and Implications of Corporate Cash Holdings" (2000) 52 J. Fin. Econ. 3. Likewise, Oguzhan Ozbas, "Corporate Fraud and Real Investments", online: <<http://www-rcf.usc.edu/~ozbas/CFRI.pdf>>, documents greater capital expenditures among high valued companies leading eventually to the commitment of fraud.